

The Licence as Burden: Regulatory Risk Reallocation, Foreign Capital, and the Debt Turn in Indian Fintech

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Highlights

- India's 2022 Digital Lending Guidelines doubled licensed NBFCs' debt-round probability
- The debt turn is concentrated in young licensed lenders after FLDG restrictions
- Foreign equity participation falls 15–20 pp against matched comparable fintechs
- Intensity margins are unchanged: withdrawal occurs at the participation threshold
- Foreign capital migrated up the capital structure, toward impact-credit debt funds

Abstract

India's September 2022 Digital Lending Guidelines shifted the credit risk of app-based consumer lending onto the balance sheets of licensed non-banking financial companies (NBFCs). Partnership guarantees had offered licensed lenders credit-protected scale, letting investors underwrite them as platform-like growth assets; the Guidelines re-rated them into spread lenders whose growth consumes capital and bears first loss. Using 4,217 funding rounds by 1,490 Indian fintech firms over 2016–2026, with treatment coded from the RBI register as it stood one month before the event, we find licensed lenders' probability of raising debt rose 15 percentage points — a near-doubling — concentrated in licensees without internal funding substitutes: young firms (+22 points) and, most sharply, those with no pre-event debt-market access (+29 points). Against matched comparables, the probability that any foreign equity investor participates in a licensed lender's round falls 15–20 points, while intensity margins — share, lead roles, entry versus follow-on — are unchanged, treated firms' equity-round rate does not fall relative to controls, and regulated categories without balance-sheet exposure show no debt turn. Foreign equity treated the licence as a burden rather than a certification; debt capital — domestic venture-debt funds and foreign impact-credit lenders — financed the balance sheets that new foreign equity would not.

Keywords: Foreign institutional investment; Fintech regulation; Digital lending; NBFC; Difference-in-differences; Entrepreneurial finance

JEL classification: G23, G24, G28, O16, F21

1. Introduction

Emerging-market fintech ecosystems are funded to a striking degree by foreign capital, yet the rules that govern these markets are written by domestic regulators whose interventions can abruptly redistribute risk among the firms foreign investors hold. The regulatory instruments involved are increasingly conduct rules — disclosure mandates, fund-flow restrictions, limits on risk-sharing contracts — rather than capital controls, and they leave cross-border investors formally untouched while transforming the economics of the firms they finance. When such a rule moves credit risk from unregulated technology platforms onto the balance sheets of licensed lenders, the economic meaning of the licence itself changes: an asset that once earned rents by renting regulatory capacity to app-based partners becomes an obligation that concentrates first-loss exposure. How funding markets — and foreign investors in particular — reprice that change is the question of this paper.

The question matters beyond its setting. A lending licence in an emerging market admits two readings that pull capital in opposite directions. Under a certification reading, the licence resolves information asymmetries that weigh most heavily on distant investors: it signals supervised governance, audited books, and a regulator's continuing scrutiny, and clarity about the regulatory perimeter should draw foreign capital toward licensed firms. Under a burden reading, the licence marks the firm on which regulation concentrates risk: when conduct rules assign first-loss exposure, compliance obligations, and capital requirements to licensees, the same signal that certifies also encumbers. Which reading dominates is not decidable in theory, and evidence from listed markets — where regulation and disclosure are jointly determined — cannot settle it. A sharp regulatory event in a private funding market can.

We exploit such an event. On 2 September 2022 the Reserve Bank of India issued the Guidelines on Digital Lending, requiring direct disbursement between the regulated lender and the borrower, eliminating pass-through structures, and restricting the first-loss default guarantees (FLDGs) through which app-based lending service providers had absorbed credit risk on behalf of their licensed partners; a June 2023 circular capped such guarantees at five per cent of the outstanding portfolio, far below prevailing practice. In substance, the regulatory package relocated the credit risk of India's digital lending model onto the balance sheets of licensed non-banking financial companies — specifically, the Investment and Credit Company (ICC) category that conducts balance-sheet lending. For the licensed lender the change was economic, not merely legal: partnership guarantees had offered credit-protected scale — growth underwritable without bearing the underlying consumer credit risk — and their removal re-rated the equity claim itself. India is a demanding laboratory in the best sense: it is among the world's largest digital lending markets, foreign investors participate in more than half of fintech funding rounds, and the event was sharp, well-publicised, and applied to a well-defined licence category.

Three findings emerge from a difference-in-differences design in which treatment — an ICC licence held at the event date — is coded from the RBI register as it stood on the eve of the Guidelines. First, a debt turn: licensed lenders' probability of raising a debt round rises by 15.1 percentage points relative to unlicensed fintech lenders, a near-doubling of the pre-period share in raw means (22.3 to 41.7 per cent), an estimate stable across matched

designs (14–22 points), robust to wild cluster bootstrap inference ($p = 0.001$), and visible in raw means. Second, an exposure gradient consistent with the mechanism: the debt shift concentrates in licensees without internal funding substitutes — young firms (+21.5 points) and, most sharply, licensees with no pre-event debt-market access (+28.7 points, against an insignificant +8.7 for those with established borrowing relationships) — and it is absent, indeed reversed, among regulated lender categories without balance-sheet lending exposure, such as peer-to-peer platforms — a within-perimeter placebo that separates risk reallocation from regulation per se. Third, an extensive-margin withdrawal of foreign equity: against matched comparable fintechs, the probability that a licensed lender's round includes any foreign investor falls by 15–20 percentage points after the Guidelines, while every intensity margin — foreign share conditional on participation, first-time entry versus follow-on, lead versus follower roles — is unchanged. Foreign investors already inside relationships with licensed lenders behaved as before; fewer new ones crossed the threshold.

The timing structure sharpens the interpretation. There is no differential movement at the November 2021 Working Group report that signalled regulation was coming, no effect at a placebo event date placed in 2019, and the two responses unfold on different clocks: the foreign-participation decline appears at the event quarter itself, while the debt expansion builds gradually and reaches full strength only after the June 2023 circular finalised the FLDG cap. Equity repriced the licence on announcement; balance-sheet funding adjusted as the risk transfer became contractually binding. Both clocks are consistent with the risk-reallocation mechanism and difficult to reconcile with confounding accounts based on the global funding cycle, which quarter fixed effects absorb and which would not respect the licence boundary, the licence-category placebo, or the event dates.

Together the results discipline the two readings of the licence. The extensive-margin foreign withdrawal, the null on every intensity margin, and the simultaneous debt expansion point to the burden reading — more precisely, to a re-rating of the licensed business model from platform-like growth asset, whose downside the partnership contracts had exported, to spread lender, whose growth consumes capital and bears first loss. It is not the licence that markets priced but the risk delivered to it: both exposure gradients and the within-perimeter placebo locate the response exactly where the credit risk landed. The licence nonetheless belongs in the title, for a reason the results supply — it is the address at which markets could see, and price, the arriving risk. There is a twist, visible in the identity of the new creditors. The foreign share of licensed lenders' debt rounds rose from 23 to 36 per cent post-Guidelines, supplied disproportionately by specialised impact-credit funds and regional banks. Foreign capital did not leave the regulated segment so much as migrate up the capital structure, from equity claims on platform growth to credit claims on regulated balance sheets.

The paper contributes to three literatures. To work on regulation and cross-border capital (Houston et al., 2012; Ongena et al., 2013; Forbes, 2007; Fratzscher, 2012; Carney et al., 2024), it adds evidence from private early-stage markets that conduct regulation which reallocates risk — without restricting capital movement — is priced by foreign investors on the participation margin, and that the pricing respects the precise boundary of the risk transfer rather than the broader regulatory perimeter. To the literature on fintech

regulation's real effects (Buchak et al., 2018; Tang, 2019; Berg et al., 2022; Cornelli et al., 2023; Hau et al., 2024), it shows that regulatory risk reallocation reshapes not only credit markets but the funding architecture of the regulated firms themselves, shifting the instrument composition of entrepreneurial finance from equity toward debt — the margin the staging literature identifies as the natural response to changed downside risk (Gompers, 1995; Tian, 2011; Ewens et al., 2018), and one where regulation's role has gone unexamined in the small literature on start-up lending (de Rassenfosse and Fischer, 2016; Hochberg et al., 2018). And to the skin-in-the-game literature (Keys et al., 2010; Hartman-Glaser et al., 2012; Demiroglu and James, 2012; Begley and Purnanandam, 2017), it supplies the margin retention studies rarely observe: the Guidelines are, in economic substance, a risk-retention rule — the FLDG cap mirrors post-crisis securitisation retention requirements at the same five per cent focal point — and we show what mandatory retention does to the retaining firms' own funding.

The remainder of the paper proceeds as follows. Section 2 develops the hypotheses against the related literature. Section 3 describes the institutional setting and the regulatory process. Section 4 presents the data and the measurement of treatment and outcomes. Section 5 sets out the identification strategy. Section 6 reports the main results, Section 7 the robustness battery, and Section 8 discusses interpretation, policy implications, and limitations. Section 9 concludes.

2. Related literature and hypotheses

2.1 Regulation and cross-border capital

A long literature shows that regulatory differentials redirect cross-border financial flows. Houston et al. (2012) document regulatory arbitrage in international bank flows; Ongena et al. (2013) show that home-country regulation shifts bank risk-taking abroad; Forbes (2007) and Desai et al. (2006) study the financing costs of capital controls; Fratzscher (2012) separates push from pull factors in crisis-period flows. Closer to our setting, Carney et al. (2024) show that geopolitical risk raises the cost of equity capital in emerging economies, moderated by institutional context, and a literature following Bloom (2009) and Pástor and Veronesi (2012, 2013) establishes that policy uncertainty depresses investment and raises risk premia through option-value channels. Nearly all of this evidence comes from banking systems and listed markets, and from rules that restrict or tax the movement of capital itself. We extend the line to private early-stage funding and to conduct regulation: rules that leave foreign investors formally free to invest while transforming the risk profile of the domestic firms they would invest in.

2.2 Fintech regulation and its real effects

Work on fintech lending has concentrated on credit-market outcomes: regulatory arbitrage and the rise of shadow banks (Buchak et al., 2018), substitution between fintech and bank credit (Tang, 2019), borrower selection (Di Maggio and Yao, 2021), the structure and growth of fintech credit markets (Berg et al., 2022; Cornelli et al., 2023), credit access for small business (Cornelli et al., 2024b), and the real effects of fintech credit on

entrepreneurial growth (Hau et al., 2024). Policy mappings document the range of regulatory responses across jurisdictions (Ehrentraud et al., 2020). Closest to our question on the funding side, Cornelli et al. (2024a) show that regulatory sandboxes — supportive regulation — expand fintech firms' access to capital; we study the converse experiment, regulation that reallocates risk onto the funded firms themselves. The upstream question — how the investors who fund fintech firms respond when regulation redistributes risk among them — has received far less attention, although cross-border venture flows are known to respond to regulatory and geopolitical signals (Akcigit et al., 2024; Lerner et al., 2024). We study that upstream margin directly, and we study it at the level where regulation actually bit: the allocation of credit risk between licensed and unlicensed firms.

2.3 Foreign investors, certification, and the instrument margin

Foreign investors in emerging-market private markets face information frictions that local investors partially avoid (Lerner and Schoar, 2005; Nahata et al., 2014), and host-country institutions shape cross-border venture outcomes (Liu and Maula, 2021). Because resolving such frictions requires costly, destination-specific information acquisition, participation itself — not just portfolio weight — is the margin on which distant investors adjust (Van Nieuwerburgh and Veldkamp, 2009). Certification mechanisms — credible third-party signals that resolve information asymmetry — are correspondingly most valuable to distant investors (Megginson and Weiss, 1991). A lending licence granted by a credible regulator is a natural candidate certifier: it embodies supervised governance and a continuing regulatory relationship. But a licence is also a claim on the holder's balance sheet. When regulation shifts first-loss credit risk onto licensees and caps the contracts that previously exported that risk, the same signal that certifies regulatory viability also marks the firm as the residual risk-bearer. Which force dominates is an empirical question.

The entrepreneurial finance literature suggests where to look for the answer. Investors respond to changes in downside risk by recontracting on instruments and stage — toward securities with seniority, covenants, and cash-flow rights — rather than only by exiting (Gompers, 1995; Tian, 2011; Ewens et al., 2018). If the Guidelines raised the riskiness of equity claims on licensed lenders while creating a new, collateralisable funding need (loan books that must now sit on own balance sheets), the natural prediction is a shift in the instrument composition of the licensed sector's funding, alongside whatever happens to participation. Start-up debt is no curiosity: a lending literature documents when venture lenders extend credit to young firms — against collateralisable assets and committed investors (de Rassenfosse and Fischer, 2016; Tykvová, 2017; Hochberg et al., 2018), and venture debt expands and contracts with the funding cycle (Davis et al., 2020) — a regulated lender's loan receivables are collateral of exactly this kind.

Viewed through a wider lens, the Guidelines are a risk-retention regulation. The FLDG restrictions force the originating balance sheet to retain credit risk that contract design had transferred to a third party — the mirror image, at almost the same five per cent focal point, of the skin-in-the-game rules imposed on securitisers after the global financial crisis. That literature establishes why regulators want risk held by those who originate it — screening deteriorates when credit risk is fully passed through (Keys et al., 2010) — and how retention is priced: retained first-loss exposure is costly for the risk-bearer but

informative and reassuring for outside financiers (Hartman-Glaser et al., 2012; Demiroglu and James, 2012; Begley and Purnanandam, 2017). Our setting supplies the margin that literature rarely observes: what happens to the retaining firms' own funding when retention becomes mandatory. The responses we document — a higher participation threshold for outside equity, expanded collateralised debt — are the entrepreneurial-finance counterpart of retention pricing.

The institutional structure of Indian digital lending gives this prediction specific content. Under the partnership model, first-loss guarantees offered the licensed lender *credit-protected scale*: loans sat on its book, but the downside was contractually exported to the app partner, so the equity claim could be underwritten as a growth asset — expansion without exposure to the underlying consumer credit risk. This is what made partnership licensees legible to venture capital, and especially to foreign venture capital, which has the least capacity to evaluate that credit risk directly. The Guidelines removed the protection: every incremental rupee of growth now consumes regulatory capital and carries first-loss exposure, re-rating the firm from platform-like growth asset to spread lender. A re-rating of this kind carries twin predictions. The growth option embedded in the equity claim loses value, so new equity underwriting slows at the entry margin; and the loan book that replaces it is precisely what debt finances. Both funding responses follow from a single change in what the business is.

2.4 Hypotheses

H1 (burden versus certification). The licence itself was not news: every treated firm held it, observably, before the Guidelines. What the Guidelines changed is what holding it entails, so H1 concerns the repricing of a pre-existing signal rather than the arrival of a new one. If the reallocation of credit risk made the licence a balance-sheet burden, foreign equity participation in licensed lenders falls after implementation relative to comparable unlicensed fintechs. If instead the new regime raised the value of the signal — regulatory clarity, together with the competitive moat created by prohibiting the rent-a-licence partnership model — participation rises. Because both forces can operate at once, H1 identifies the *net* repricing of the licence: a negative net effect does not exclude certification value, only its dominance. The margin of any response — participation threshold versus intensity within continuing relationships — helps attribute the friction at work.

A second implication of the institutional setting disciplines magnitudes. The risk reallocation bound with different intensity within the licensed group: an ICC that originated through partner apps under first-loss guarantees absorbed a genuine transfer of credit risk, whereas an ICC lending through its own channels already carried its credit risk and faced mainly conduct-compliance costs — and plausibly a competitive gain, since the Guidelines outlawed the partnership model on which its unlicensed rivals relied. Because partnership dependence at the event date cannot be measured from any point-in-time source (Section 5.1), treatment is defined at the licence level and the estimates average across exposure intensities. Under the natural assumption that less-exposed licensees responded less, the estimates bound the effect on partnership-exposed licensees from below.

H2 (instrument adjustment). Because the Guidelines shifted credit risk onto licensed balance sheets and capped off-balance-sheet risk-sharing, licensed lenders' funding needs changed in both level and kind: loan books that previously grew under partner-provided first-loss cover must now be funded, provisioned, and capitalised on the licensee's own balance sheet, creating a continuing demand for external capital that scales with origination. Debt is the natural instrument on both sides of this market. For the firm, borrowing funds the loan book without selling equity at valuations depressed by the re-rating — the standard pecking-order response when insiders believe the market undervalues the equity claim (Myers and Majluf, 1984); Section 6.5 returns to whether the equity response is ultimately firm- or investor-driven, and concludes the latter. For investors, debt claims are backed in substance by loan receivables, carry seniority and covenants against regulatory downside, and price the book rather than the growth story — precisely the claims that remain underwritable after the platform thesis dies. H2 therefore predicts that, after implementation, licensed lenders' probability of raising debt rises relative to unlicensed fintech lenders, and — by the re-rating logic — that the debt expansion and any equity withdrawal arise jointly from the same change in business model. Two auxiliary implications follow and are tested below: the shift should strengthen as the risk transfer becomes contractually binding, that is, after the June 2023 cap on default loss guarantees (Section 7.1); and it should be strongest among licensees lacking internal funding substitutes — young firms without retained earnings or established bank borrowing relationships, the gradient developed as H3.

H3 (exposure gradient). If the operative treatment is the reallocation of credit risk rather than regulatory attention per se, the funding responses predicted by H1 and H2 should be strongest where the new balance-sheet exposure binds most tightly, and absent where it does not bind at all. Within the licensed group, the binding constraint is internal funding capacity, which we test through two measurable proxies: firm vintage — young licensees have had little time to accumulate retained earnings, whose direct measurement would require statutory balance-sheet data — and pre-event debt-market access: a licensee that had already raised debt before the Guidelines possessed the borrowing relationships that the newly risk-bearing model requires, while one that had not, did not. H3 predicts stronger responses among young licensees and among those without pre-event debt-market access. Across the perimeter, H3 predicts no response among licence categories inside the regulatory perimeter but outside balance-sheet lending — peer-to-peer platforms, account aggregators — which provide a within-perimeter placebo.

3. Institutional background

3.1 The partnership model and the allocation of risk

India's digital lending market grew through the 2010s on a partnership model, and grew at remarkable speed: among entities sampled by the RBI's Working Group, loan disbursements through the digital mode expanded more than twelvefold between 2017 and 2020, from ₹11,671 crore to ₹1,41,821 crore (roughly USD 19 billion), with the NBFC share of digital lending rising from 6.3 to 30.3 per cent over the same period (Reserve Bank

of India, 2021). The venture market financing these firms is of matching international rank: India has been the third-largest fintech funding destination in the world, behind only the United States and the United Kingdom, with USD 5.7 billion raised in 2022 alone (Tracxn, 2022). In the partnership model underlying this growth, licensed NBFCs supplied the lending licence and the balance sheet; technology-first firms ran customer acquisition, underwriting interfaces, and servicing through digital lending apps. Obtaining an NBFC licence requires minimum net owned funds, fit-and-proper governance, and continuous supervisory reporting — barriers most technology startups did not clear, and did not need to clear so long as a licensed partner could be found. The economic glue of the partnership was the first-loss default guarantee: the app-based partner indemnified the licensed lender against initial portfolio losses at levels frequently amounting to multiples of the five per cent cap later imposed — the Working Group documented structures in which the unregulated partner bore the substantial majority of portfolio losses, in some arrangements approaching full cover (Reserve Bank of India, 2021) — so that credit risk sat, economically if not legally, with the unregulated side of the partnership. By 2021 the RBI's Working Group counted over 1,100 lending apps in operation, many with limited transparency about the identity of the underlying lender or the terms of the arrangement (Reserve Bank of India, 2021).

3.2 The regulatory process

The regulatory process unfolded in stages that our design exploits. The Working Group on Digital Lending, constituted in January 2021, reported on 18 November 2021 with roughly forty recommendations; the report was advisory but signalled unambiguously that binding rules were coming. A consultation period followed. On 10 August 2022 the RBI announced by press release which recommendations it had accepted, and on 2 September 2022 the binding Guidelines on Digital Lending were issued by circular (Reserve Bank of India, 2022), with existing arrangements given until 30 November 2022 to comply. The key provisions: loan disbursement and repayment must flow directly between the regulated entity's and the borrower's accounts, eliminating pass-through and pooling structures; the regulated entity bears responsibility for loans originated through app partners, including grievance redressal and data obligations; and first-loss default guarantee arrangements were restricted. In June 2023 a follow-on circular formalised and capped default loss guarantees at five per cent of the outstanding portfolio (Reserve Bank of India, 2023a), completing the transfer of credit risk to regulated balance sheets. In May 2025 the RBI consolidated the 2022 Guidelines and the 2023 circular into unified Digital Lending Directions (Reserve Bank of India, 2025), restating their substance and, in accompanying provisioning norms, requiring NBFCs to compute expected credit losses without recognising DLG cover — a further tightening partially reversed in February 2026, when DLG recognition under the expected-credit-loss framework was restored subject to accounting conditions (Reserve Bank of India, 2026). Section 7.2 shows the results are robust to ending the sample in 2025Q4, before this final easing. Throughout, “the Guidelines” refers to the September 2022 circular, our event date (2022Q3); Section 7.1 examines the November 2021 signal and the June 2023 cap separately.

3.3 The ICC licence category

The RBI registers NBFCs in functional categories, and the distinction matters for where the Guidelines bit. Investment and Credit Companies (ICCs) — the overwhelming majority of registered NBFCs — are balance-sheet lenders: they hold loan assets funded by own capital and borrowings, and they are the entities onto which direct-disbursement and FLDG restrictions load credit risk. Other categories inside the perimeter do not bear balance-sheet credit risk in the same way: peer-to-peer platforms intermediate between lenders and borrowers without holding loans; account aggregators move data, not money; core investment companies hold group investments; factoring companies purchase receivables under a distinct framework. The Guidelines' risk reallocation therefore binds on the ICC category specifically. This motivates both our treatment definition — ICC licence at the event date — and the within-perimeter placebo of Section 6.7, which asks whether non-ICC licensees, equally inside the regulatory perimeter but outside balance-sheet lending, show the same funding response.

3.4 Foreign capital in Indian fintech

Foreign capital is central to this market: 52.5 per cent of sample rounds include at least one foreign investor. Licensed lenders entered the event period with foreign participation of 55.9 per cent of rounds and substantially larger rounds than the fintech average — a median of USD 4.8 million against USD 0.6 million pre-event, reflecting their later stage and capital intensity. Whether that foreign engagement survived the repricing of the licence, and in what form, is the outcome of interest.

4. Data and measurement

4.1 Sources and sample

Funding-round data are from Tracxn, a commercial venture-data provider with deep coverage of Indian private markets, extracted for all Indian fintech firms with at least one recorded funding round. The raw extraction covers January 2016 through June 2026. Each round records the date, round name, amount (where disclosed), and the full list of participating investors; a companion investor-level file records, for every investor-round pair, the investor's name, type (institutional or individual), headquarters location, and whether the investor led the round. Firm-level attributes include founding year, subsector classification, business-model flags including consumer-facing status, and — critically for treatment measurement — all associated legal entities with their Ministry of Corporate Affairs Corporate Identification Numbers (CINs). A lending-exposure flag identifies firms whose business is lending-related, combining Tracxn's practice-area classification with manual review of the most frequently observed firms; it defines the lending-classified control group used in Sections 6.3 and 7.2.

Table 1 traces the sample construction. Rounds are classified by stage as Early (seed, angel), Growth (Series A–B), Late (Series C and beyond, private equity), or Debt (conventional, convertible, and venture debt); rounds without a stage classification —

grants, token sales, post-IPO transactions, and unattributed rounds — are excluded, as are rounds reported without a day-precise date and rounds with missing firm age. Firms holding non-ICC RBI licences at the event date are excluded from the estimation sample for reasons given below. The analysis sample comprises 4,217 rounds by 1,490 firms: 549 rounds by 89 licensed (ICC) lenders and 3,668 rounds by 1,401 control fintechs, spanning 2,747 pre-event and 1,470 post-event rounds.

Table 1. Sample construction.

	Rounds	Firms
Tracxn fintech rounds with stage classification, 2016Q1–2026Q2	4,310	1,518
Less: missing firm age	4,302	1,511
Less: firms holding non-ICC RBI licences at event date	4,217	1,490
of which: treated (ICC licence at 31 July 2022)	549	89
of which: control	3,668	1,401
Pre-event (2016Q1–2022Q2)	2,747	1,120
Post-event (2022Q3–2026Q2)	1,470	748

Notes: Stage classification per Section 4.1. The 25 non-ICC licensees (17 peer-to-peer platforms, 3 account aggregators, 2 factoring companies, 2 microfinance institutions, 1 core investment company) correspond to 21 sample firms with in-window rounds; they are inside the RBI perimeter but outside balance-sheet lending, and Section 6.7 uses them as a placebo arm. Firm counts by period are not additive because firms appear in both periods. The initial row retains one vendor-duplicated round; removing it changes no estimate at reported precision.

4.2 Treatment: licence status at the event date

Treatment must reflect licence status as of the event date. A register accessed at the time of research reports current licensees: firms licensed after the event are indistinguishable from long-standing licensees, and firms that exited have vanished. Because post-event licensing and exit are both plausible responses to the regulation, coding from a current register would misclassify treatment in a manner correlated with outcomes. We therefore code treatment archivally. It is taken from the RBI register of registered NBFCs as archived on 31 July 2022, one month before the Guidelines (retrieved via the Internet Archive); RBI press releases confirm that no Certificates of Registration were granted between the register vintage and the 2 September circular, so the measure is exact at the event date.

Treated firms are those holding an ICC licence at that date. Matching the register to Tracxn proceeds in three steps. First, all associated legal-entity names of each Tracxn firm are normalised (case, punctuation, legal-form suffixes) and matched exactly against normalised register names; exact matches are accepted. Second, remaining candidates are fuzzy-matched and every candidate pair was resolved by manual review. Third, firms whose licence is held by a differently named subsidiary or group entity — common among prominent digital-lending brands — were verified individually against the register, using

CIN records to confirm entity identity. The procedure yields 95 treated firms, 89 of which have at least one sample-period round. An independent re-implementation of the full coding pipeline identified three borderline register matches; the archival coding is retained throughout and is, for the debt result, the conservative choice.¹

Three supplementary registers complete the coding. A February 2023 register vintage identifies firms licensed shortly after the event; together with individually verified later licensees, ten firms are flagged as post-event licensees and, consistent with intention-to-treat, remain in the control group — their licensing is plausibly an outcome of the regulation. Section 7.2 shows robustness to their exclusion. RBI cancellation lists flag five treated firms whose registration was subsequently withdrawn; they remain treated under intention-to-treat, and results are robust to their exclusion. Finally, twenty-five firms holding non-ICC licences at the event date are excluded from the main sample: inside the regulatory perimeter but outside balance-sheet lending, they belong in neither treatment nor control.

4.3 Outcomes

Stage and size outcomes are defined at the round level: indicators for Early, Growth, Late, and Debt rounds, and the log of the round amount where disclosed. Foreign-participation outcomes derive from the investor-level file. An investor is foreign if its recorded location is outside India; because Tracxn records location as of extraction rather than at the round date, and because India-focused vehicles are sometimes domiciled offshore, Section 7.2 verifies robustness to reclassifying investors located in pure domiciliation hubs (Mauritius, Cayman Islands, Cyprus, Jersey, Guernsey, the British Virgin Islands, and GIFT City), which account for 3.1 per cent of foreign investor-round records; GIFT City is listed for completeness — no sample investor is recorded there, and GIFT-domiciled entities carry Indian locations, so they are domestic under the baseline rule. We construct: an indicator for any foreign investor in the round; the foreign share of participating investors; indicators for foreign institutional participation (company- or fund-type investors) and for a foreign institutional lead; and, exploiting each firm's funding history, indicators separating first-time foreign entry — the firm's first round with any foreign participation — from follow-on foreign participation in firms with existing foreign relationships. The distinction between institutional investors and individual angels follows Tracxn's investor typing; lead status follows the recorded lead investor of each round.

¹ The three cases are a control firm sharing a brand name with a treated licensee, a licensee whose register entity surfaces only in a later vintage of the vendor data, and a dual-entity group holding ICC and non-ICC licences through sister companies. Recoding all three moves the baseline debt estimate from +15.1 to +15.7 points and the foreign-participation estimate from -6.0 to -5.2, leaving every conclusion unchanged.

4.4 Descriptive statistics

Table 2 reports raw outcome means by group and period. Three features anchor what follows. First, the debt turn is visible without regression: licensed lenders' debt share of rounds rises from 22.3 to 41.7 per cent across the event, against 3.0 to 5.2 per cent for controls. Second, licensed lenders' early-stage share collapses (37.1 to 12.7 per cent) — but controls' early-stage share also falls across the global funding contraction, and once the common cycle and the debt expansion itself are absorbed, the early-stage differential is statistically indistinguishable from zero (Table 3): raw composition shifts and causal effects part ways here, previewing why quarter fixed effects and matching matter. Third, foreign participation drifts down for both groups (55.9 to 49.0 per cent treated; 53.7 to 49.7 control), foreshadowing the full-sample null on foreign participation and the need for a comparable counterfactual: the interesting question is not whether foreign participation fell — it fell everywhere after 2022 — but whether it fell differentially at the licence boundary once composition is held fixed.

Table 2. Raw outcome means by group and period.

	Rounds	Firms	Early	Growth	Late	Debt	Foreign	Foreign inst.	Median amt (USD m)
Licensed (ICC), pre	345	77	0.371	0.261	0.145	0.223	0.559	0.490	4.80
Licensed (ICC), post	204	65	0.127	0.235	0.221	0.417	0.490	0.461	7.23
Control, pre	2,402	1,043	0.716	0.186	0.068	0.030	0.537	0.439	0.57
Control, post	1,266	683	0.642	0.231	0.074	0.052	0.497	0.427	1.20

Notes: Post = from 2022Q3. Stage shares are unconditional per-round probabilities; the four stage columns sum to one within each row. Median amounts computed over rounds with disclosed amounts.

5. Identification strategy

5.1 Baseline specification

We estimate, at the round level,

$$Y_{it} = \alpha + \beta \cdot \text{ICC}_i + \gamma \cdot (\text{ICC}_i \times \text{Post}_t) + \delta' X_{it} + \mu_t + \lambda_s + \varepsilon_{it},$$

where ICC_i indicates an ICC licence at 31 July 2022, Post_t equals one from 2022Q3, X_{it} contains firm age and consumer-facing status, and μ_t and λ_s are quarter and subsector fixed effects. The coefficient of interest is γ , the differential post-event change for licensed

lenders. Quarter fixed effects absorb the global funding cycle — including the sharp 2022–2023 contraction — and subsector fixed effects absorb segment-specific funding conditions. With a single, common event date, the two-way fixed-effects estimator does not face the staggered-adoption problems highlighted by de Chaisemartin and D’Haultfœuille (2020) and Callaway and Sant’Anna (2021).

Because treated firms cluster in lending subsectors, Section 7.2 additionally reports specifications with subsector $\times$ Post interactions and a full set of subsector $\times$ quarter fixed effects — absorbing segment-specific funding shocks, including the possibility that the 2022 rate cycle repriced lending business models globally — as well as specifications restricting the control group to lending-classified fintechs.

The licence-level treatment embeds an intention-to-treat choice worth making explicit. Within the licensed group, exposure to the risk reallocation varied: partnership-dependent licensees lost first-loss cover, while own-channel lenders already bore their credit risk on their own books. Exposure intensity at the event date is not measurable without reintroducing the timing problem that Section 4.2 eliminates — the only public register of app–lender partnerships is a current-state directory operational since 2025, which cannot establish 2022 partnership structures, and platform-level disclosure of partner lenders began only in mid-2023. We therefore estimate the average effect across licensed lenders and interpret it as a lower bound on the effect for partnership-exposed licensees. The vintage gradient of Section 6.6 — the strongest responses among young, digital-era licensees, the cohort most reliant on partnership origination — is consistent with this reading.

A final point concerns the estimand. The Guidelines regulated digital lending as an activity, not licensed lenders alone: unlicensed lending fintechs — much of the control group — also faced the new conduct regime, and many lost the partnership business model outright. The coefficient γ therefore measures the differential response across the boundary where credit risk landed, not the effect of regulation against an unregulated counterfactual; this is precisely the comparison the hypotheses concern, and the within-perimeter placebo of Section 6.7 confirms that regulatory attention alone does not generate the funding patterns we document. Partnership ties between treated and control firms raise a related interference concern: the Guidelines dissolved contracts *between* the two groups, so their responses need not be independent. To the extent that partnership dissolution pushed both sides toward funding distress, it compresses the treated–control differential and biases the debt estimate toward zero — reinforcing the lower-bound reading above. The same interference concern applies, with a different sign structure, to the foreign-participation comparison. The control group contains the app-based lenders that lost the partnership model outright; if their foreign equity access deteriorated in parallel, or if foreign investors reallocated from dissolved partners toward licensed originators, both channels compress the measured differential toward zero, making the licence-boundary estimates conservative. The one channel that would inflate them — foreign equity substituting out of licensed lenders into unlicensed lending fintechs — is the reallocation across the risk boundary that the estimand is designed to capture, not a confound of it. The comparison against lending-classified controls (Section 6.3), where any such substitution must appear,

is therefore the interference-relevant benchmark; its estimate (−12.0 points) sits between the full-sample null and the matched estimates.

5.2 Selection into treatment and matched designs

Licence holding is not random. Licensed lenders are older and larger than the average sample fintech (mean age 6.0 versus 4.1 years; median pre-event round USD 4.8 million versus USD 0.6 million). Level differences are absorbed by the treatment main effect; the identification threat is differential exposure to time-varying shocks — most obviously, the possibility that the funding winter hit large, late-stage firms differently than seed-stage ventures. We address selection with five matched or reweighted designs estimated in parallel: nearest-neighbour matching 1:2 and 1:1 on founding year, pre-period round count, pre-period median round size, consumer-facing status, and subsector; 1:1 matching with a caliper discarding the worst quartile of matches; coarsened exact matching on binned versions of the same covariates (Iacus et al., 2012); and inverse-probability-of-treatment weighting from a logit propensity model. The baseline 1:2 matched sample contains 206 firms — all 89 treated and 117 unique controls — and 1,010 rounds, with close covariate balance (matched control means: founding year 2016.3 versus 2015.3 treated; pre-period rounds 3.0 versus 3.9; log median round size 14.2 versus 14.7). The 1:2 nearest-neighbour design is the paper's primary licence-boundary specification, designated *ex ante* on two grounds: it is the tightest-balanced design that retains all 89 treated firms, and its counterfactual is disciplined by the same covariates that predict licence holding. The remaining schemes are reported as sensitivity; Section 6.4 shows the primary estimate is stable across re-implementations of the matching step and against a doubly robust alternative.

5.3 Inference

Standard errors are clustered at the firm level throughout (Bertrand et al., 2004). Because treated clusters number 89 — adequate but not abundant — headline coefficients are additionally assessed with wild cluster bootstrap p-values using Rademacher weights with the null imposed and 999 replications (Cameron et al., 2008; Roodman et al., 2019), on both the full and matched samples.

5.4 Validity

Three validity checks precede the results. First, pre-trends: joint tests of the eight pre-event treatment–quarter interactions (2020Q3–2022Q2), re-estimated on the final sample, do not reject parallel trends for any outcome: debt ($p = 0.33$), foreign participation ($p = 0.58$ full sample; $p = 0.65$ matched), foreign institutional participation ($p = 0.24$), or the early-stage share ($p = 0.13$). The round-weighted matched variant rejects ($p = 0.03$) solely on account of a single positive deviation eight quarters before the event (2020Q3) — opposite in sign to the estimated effect; excluding that quarter gives $p = 0.73$, and the four quarters nearest the event give $p = 0.93$. Matched debt pre-trends give $p = 0.19$ (unweighted) and $p = 0.07$ (weighted). Second, event-study dynamics (Figure 1) locate the foreign-participation decline at the event quarter and show the debt response building over the following year — timing examined formally in Section 7.1. Third, anticipation: the November 2021

Working Group report was a public signal that regulation was coming; Section 7.1 shows no differential response in the signal window, consistent with investors waiting for binding rules whose content — in particular, where credit risk would land — was not knowable in advance.

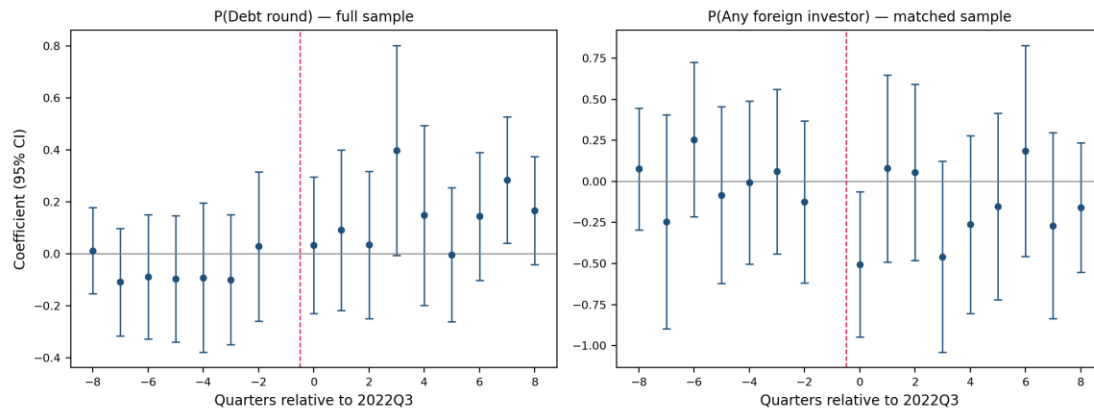


Figure 1. Event-study estimates around 2022Q3. Left: $P(\text{Debt})$, full sample. Right: $P(\text{Any foreign investor})$, matched sample. Points are quarterly coefficients relative to $t = -1$; bars are 95 per cent confidence intervals from firm-clustered standard errors. Pre-event coefficients are jointly insignificant (debt $p = 0.33$; matched foreign $p = 0.65$).

6. Results

6.1 The debt turn

Table 3 reports the baseline estimates. After the Guidelines, licensed lenders' probability of raising a debt round rises by 15.1 percentage points (SE 4.2; wild bootstrap $p = 0.001$) relative to unlicensed fintech lenders — against a pre-period treated debt share of 22.3 per cent; in raw means the share nearly doubles, from 22.3 to 41.7 per cent (Table 2). The estimate is stable across every design in the paper: +21.6 points in the 1:2 matched sample, +18.8 to +20.0 under caliper and 1:1 matching, +19.7 under coarsened exact matching, +14.1 under inverse-probability weighting, and +13.7 to +16.8 across the sample-window and exclusion variants of Section 7. H2 is strongly supported.

Table 3. Baseline difference-in-differences estimates (ICC $\times$ Post).

Outcome	ICC $\times$ Post	SE	Wild bootstrap p	N
P(Early)	-0.050	(0.051)	0.349	4,217
P(Growth)	-0.105**	(0.052)	0.055	4,217
P(Late)	+0.004	(0.036)	—	4,217
P(Debt)	+0.151***	(0.042)	0.001	4,217
ln(Amount)	-0.325	(0.224)	0.142	3,791
P(Foreign)	-0.060	(0.055)	0.299	4,217

P(Foreign inst.)	-0.054	(0.052)	—	4,217
Foreign share	+0.048	(0.043)	0.269	4,217

*Notes: Firm-clustered SEs in parentheses; wild cluster bootstrap p-values (999 replications, null imposed). All models include firm age, consumer-facing status, quarter and subsector fixed effects. Treated rounds span 89 firm clusters of 1,490. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

6.2 Stage and size margins

The remaining stage margins are quieter. Growth-stage probability declines by 10.5 points ($p = 0.045$; bootstrap $p = 0.055$) in the full sample but is not robust to matching, where it flips sign and loses significance; we treat it as suggestive. Early-stage and late-stage probabilities and round size show no significant differential change. The stage composition of licensed lenders' funding did shift dramatically in raw terms (Table 2), but most of that shift is explained by the common funding cycle and by the debt expansion itself: debt rounds mechanically displace stage-classified equity rounds within a firm's funding sequence.

A round-composition outcome cannot by itself distinguish equity withdrawal from debt layering: the probability that a given round is debt rises whether equity retreats or debt is simply added. Firm-level counts settle the question. Collapsing the sample to a firm $\times$ half-year panel (18,591 observations), treated firms' debt-round count rises by 56 log points relative to controls after the event (Poisson, $p = 0.03$), against 25 log points for equity-round counts ($p = 0.02$) — both estimates relative to control-group dynamics. In absolute terms, treated firms' equity issuance fell by more than half — broadly tracking the market-wide contraction — while their debt issuance held steady in a period when comparable firms' debt-round rate nearly halved. The recomposition is therefore real rather than mechanical: debt expanded differentially and against the cycle, while equity, in absolute terms, followed the market down.

6.3 Foreign participation in the full sample

In the full sample, foreign-participation outcomes are precisely estimated nulls: -6.0 points for any foreign participation (95 per cent confidence interval -16.8 to +4.8), -5.4 for foreign institutional participation, +4.8 points on foreign share. Taken alone, these estimates would say the Guidelines left foreign engagement with licensed lenders unchanged. But the full-sample counterfactual is the entire fintech population — dominated by seed-stage ventures with sub-million-dollar rounds and no realistic prospect of foreign institutional interest. A licence-boundary comparison demands comparable firms.

Sharpening the counterfactual within the regression delivers the first correction (Table 7, sector-time rows). Absorbing subsector-specific time shocks — subsector $\times$ Post interactions, or a full set of subsector $\times$ quarter fixed effects — moves the estimate to -11.5 points ($p = 0.06$ -0.07), and restricting the control group to lending-classified fintechs yields -12.0 points ($p = 0.06$); foreign institutional participation behaves identically (-10.2 to -10.3 points, $p < 0.10$). The baseline null, in other words, reflects benchmarking licensed

lenders against payments and investment-technology firms whose foreign funding followed a different cycle. Against lending-sector comparators, the withdrawal is visible before any matching.

6.4 Foreign participation against matched comparables

Matching completes the progression. Table 4 reports the licence-boundary estimates on matched samples: against comparable fintechs, the probability that a licensed lender's round includes any foreign investor falls by 19.1 points (firm-clustered $p = 0.009$; wild bootstrap $p = 0.016$), and foreign institutional participation by 15.5 points (bootstrap $p = 0.035$). The coefficient is negative in all five schemes (-10.6 to -22.9) and significant in the three with the tightest covariate balance — 1:2 nearest-neighbour, caliper, and coarsened exact matching (-20.2 , $p = 0.005$) — attenuating below conventional significance under 1:1 matching, where power drops, and inverse-probability weighting, where distant controls re-enter with positive weight. Matched pre-trends are flat (joint $p = 0.65$) and the event study (Figure 1, right panel) places the decline at the event quarter itself. Across designs, the estimates align monotonically with the quality of the counterfactual: -11.5 to -12.0 points with sector-time controls or lending-only controls, -15.5 to -20.2 points matched — the pattern of a true negative effect diluted by dissimilar controls, not of a matching artifact. Neither implementation detail nor the pre-period deviation noted in Section 5.4 drives the estimate: across re-implementations of the matching step that vary the distance metric, tie-breaking, and the imputation of missing pre-period round sizes, the any-foreign coefficient ranges from -0.187 to -0.222 (all $p \leq 0.011$); excluding 2020Q3 gives -0.168 (SE 0.073); and beginning the estimation window in 2020Q4 — which discards two-thirds of the pre-period — leaves the point estimate at -0.138 (SE 0.091). A doubly robust check — the inverse-probability weights combined with regression adjustment for the matching covariates — returns -0.105 (SE 0.070), indistinguishable from the unadjusted IPW estimate: the attenuation under weighting reflects which controls receive weight, not functional form, consistent with the dilution reading. Within-firm estimates on the matched sample point the same way (Section 7.2). H1 is resolved in favour of the burden reading.

Table 4. Foreign participation across matching schemes (ICC × Post).

Scheme	P(Foreign)	P(Foreign inst.)	Foreign share	P(Debt)	N
NN 1:2 (baseline)	-0.191*** (0.073)	-0.155** (0.074)	+0.042 (0.059)	+0.216*** (0.057)	1,010
NN 1:1	-0.115 (0.090)	-0.073 (0.089)	+0.119* (0.066)	+0.200*** (0.074)	829
NN 1:1, caliper	-0.229** (0.114)	-0.192* (0.111)	+0.019 (0.081)	+0.188** (0.081)	590
Coarsened exact matching	-0.202*** (0.072)	-0.199*** (0.068)	-0.019 (0.055)	+0.197*** (0.044)	1,893
IPW-ATT	-0.106 (0.071)	-0.072 (0.070)	+0.073 (0.050)	+0.141*** (0.053)	4,217

Notes: Firm-clustered SEs in parentheses. Matching covariates: founding year, pre-period round count, pre-period median round size, consumer-facing status, subsector. Wild bootstrap p-values on the baseline matched sample: $P(\text{Foreign})$ 0.016; $P(\text{Foreign inst.})$ 0.035; $P(\text{Debt})$ 0.002. Coarsened exact matching bins founding year at $\{\leq 2010, 2011\text{--}2014, 2015\text{--}2017, \geq 2018\}$ and pre-period round count at $\{0, 1\text{--}2, 3\text{--}5, \geq 6\}$, with exact matching on consumer-facing status and subsector.

6.5 Which margin moved: participation thresholds, not relationships

Table 5 decomposes the foreign response. Foreign share conditional on participation is unchanged in every scheme. Splitting by role, neither foreign lead (−4.8 points, n.s.) nor foreign follower participation moves significantly in the full sample, and in equity-only rounds the lead coefficient is essentially zero. Splitting by relationship history, first-time foreign entry into a firm shows no differential change, and follow-on participation in firms with existing foreign relationships is negative but insignificant. Excluding debt rounds — to rule out the concern that the debt expansion mechanically dilutes foreign equity measures — leaves the matched participation decline intact.

Table 5. Margins and investor types of the participation response (ICC × Post).

<i>Panel A: margins</i>	Full sample	Equity rounds only			
P(Any foreign investor)	−0.060 (0.055)	−0.063 (0.064)			
P(Foreign lead)	−0.046 (0.043)	+0.018 (0.057)			
P(Foreign follower)	−0.025 (0.053)	−0.067 (0.060)			
P(First foreign entry)	+0.007 (0.026)	−0.042 (0.029)			
P(Foreign follow-on)	−0.066 (0.054)	−0.021 (0.066)			
Foreign share	+0.048 (0.043)	+0.011 (0.047)			
<i>Panel B: investor types</i>	Full sample	Matched (NN 1:2)	Treated pre-period rate		
P(Foreign institutional)	−0.054 (0.052)	−0.155** (0.074)	0.490		
P(Foreign angel)	−0.034 (0.033)	−0.077* (0.046)	0.159		
P(Domestic institutional)	−0.072 (0.057)	−0.127* (0.074)	0.629		
P(Domestic angel)	−0.002 (0.048)	−0.096 (0.089)	0.391		

*Notes: Firm-clustered SEs in parentheses. Panel A: full-sample N = 4,217; equity-only N = 3,917; no Panel A coefficient is significant at the 10 per cent level. Panel B: institutional = company- or fund-type investors; angel = individuals; matched estimates use the baseline 1:2 nearest-neighbour sample. ** $p < 0.05$, * $p < 0.10$.*

Read together with Table 4, the pattern identifies the friction. The aggregate decline concentrates at the extensive margin — whether any foreign investor participates — while every within-relationship margin is stable. This is the signature of a participation threshold: the Guidelines raised the fixed cost of underwriting a balance-sheet lending exposure — capital-adequacy analysis, FLDG-cap compliance, direct-disbursement architecture, and the residual uncertainty of a newly repriced licence — without changing terms inside relationships where that cost was already sunk. It is difficult to reconcile with the certification reading of H1, under which participation should have risen where information frictions bind hardest, and difficult to attribute to the funding cycle, which does not respect the licence boundary.

Panel B of Table 5 splits participation by investor type and origin, and disciplines the interpretation. On the matched sample the decline appears across types: foreign institutional participation falls by 15.5 points ($p = 0.035$, bootstrap), domestic institutional by 12.7 points ($p = 0.09$), and foreign angel participation by 7.7 points ($p = 0.09$) on a pre-period base of only 16 per cent, while domestic angels show the least precise response (-9.6 , n.s.). The gradient — steepest and most precisely estimated for institutional and foreign capital — is consistent with participation thresholds that bind hardest on investors with formal underwriting processes and the least local knowledge. But the differences across types are not statistically sharp, and we do not claim the withdrawal was exclusively foreign: domestic institutions also retreated, more modestly. What is common to every type is the margin — participation, not intensity.

The firm-level counts of Section 6.2 separate this investor-side interpretation from its firm-side alternative. Under issuer reluctance (Myers and Majluf, 1984) — treated firms withholding equity that the re-rating has, in their view, underpriced — equity rounds themselves should become differentially scarce, while the foreign propensity of the rounds that do occur should be unchanged. The data show the opposite configuration: treated firms' equity-round rate did not fall relative to controls, but the probability that any new foreign investor participates in those rounds did. Licensed lenders kept coming to the equity market; fewer foreign investors met them there. The response sits on the investors' side of the market.

This raises an obvious follow-on question: if the re-rating lowered the value of the equity claim, who bought the equity that treated firms continued to issue? Two features of the setting resolve it. First, a licensed lender cannot simply stop issuing equity: capital-adequacy requirements tie regulatory capital to a growing loan book, so equity issuance is quantity-inelastic for precisely the firms expanding their books — the re-rating must clear through price and composition rather than volume. Second, the composition is exactly what Table 5 shows adjusting: continuing issuance was met by the capital for which the re-rated claim is cheapest to evaluate — existing relationships (follow-on margins unchanged across types) and domestic and individual investors, whose participation declined least. A

re-rated claim is not an unsellable claim; it is a claim that sells to closer investors, plausibly on adjusted terms our valuation data are too sparse to price. Far from contradicting the re-rating, the continued issuance is what a re-rating looks like when regulation makes equity quantity inflexible.

6.6 The exposure gradient: internal funding capacity

Table 6, Panel A, splits treated firms by vintage. The debt turn is driven entirely by entrants founded in 2016 or later: +21.5 points ($p < 0.001$) against +8.9 (n.s.) for incumbent licensed lenders, with the difference falling just short of conventional significance ($p = 0.11$). This is the first gradient H3 predicts: FLDG restrictions removed off-balance-sheet risk-sharing precisely for the cohort with the least time to accumulate internal funding capacity. Foreign-participation effects show no significant vintage gradient — the extensive-margin withdrawal applies across treated cohorts.

The second proxy — pre-event debt-market access — yields the sharpest gradient in the paper (Table 6, Panel B). Among treated firms that had never raised a debt round before the Guidelines (60 of 89), the debt effect is +28.7 points ($p < 0.001$); among the 29 licensees with established pre-event debt access it is +8.7 points and insignificant, with the differential significant at the ten per cent level ($p = 0.06$). Decomposing by sequence, the expansion loads on repeat borrowing (+14.5 points, $p < 0.001$) rather than on the per-round probability of a first-ever debt raise (+0.6, n.s.): licensees new to debt markets did not make a single precautionary raise — they entered and kept borrowing, the funding pattern of a continuously growing loan book. Both gradients point the same way: the funding consequences of the Guidelines concentrated in licensees that lacked internal substitutes for the risk-sharing they lost.

6.7 A within-perimeter placebo

If the operative treatment is balance-sheet risk rather than regulatory attention generally, licence categories inside the RBI perimeter but outside balance-sheet lending should show no debt turn. Table 6, Panel C, assigns the excluded non-ICC licensees — peer-to-peer platforms, microfinance institutions, and factoring companies — their own treatment arm alongside ICC in an expanded sample. The non-ICC arm shows a *negative* debt coefficient (−6.8 points, $p = 0.001$) and a late-stage decline (−9.9 points, $p = 0.009$): the opposite of the ICC pattern, while the ICC estimates are unchanged. With 21 firms in the arm we read the contrast as supportive rather than dispositive, but it ties the funding recomposition to where credit risk landed, not to the regulatory perimeter as such.

Table 6. Heterogeneity and within-perimeter placebo.

	P(Debt)	P(Early)	P(Foreign)
<i>Panel A: vintage split ($ICC \times Post$)</i>			
Incumbents (founded before 2016)	+0.089 (0.066)	−0.014 (0.083)	−0.034 (0.091)
Entrants, incremental ($\times$ Entrant)	+0.126 (0.079)	−0.080	−0.030

		(0.102)	(0.114)
Entrants, total	+0.215***	-0.093	-0.064
	(0.043)	(0.058)	(0.068)

*Panel B: pre-event debt-market access
(P(Debt) only)*

With pre-event debt access (29 firms)	+0.087 (0.096)
Differential (× no pre-event access)	+0.200* (0.107)

Without pre-event debt access, total (60 firms)	+0.287***
	(0.048)

Panel C: two treatment arms

ICC × Post	+0.151***	-0.051	-0.059
	(0.042)	(0.051)	(0.055)
Non-ICC regulated × Post	-0.068***	-0.083	-0.072
	(0.021)	(0.240)	(0.218)

*Notes: Panel A: triple-interaction specification; Entrant = founded 2016 or later; total effects with delta-method SEs. Panel B: triple interaction with an indicator for no pre-event debt round, fixed at the event date; reported for the debt outcome. Panel C: expanded sample including the 21 non-ICC lending licensees (P2P, MFI, factoring; 18 with in-window rounds) as a separate arm; account aggregators and the core investment company remain excluded. Firm-clustered SEs. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

6.8 Who supplies the debt

Descriptively, the foreign share of licensed lenders' debt rounds rises from 23 to 36 per cent after the Guidelines, against 17 to 22 per cent for controls; the within-debt difference-in-differences on 302 debt rounds (the stage-classified panel before the non-ICC exclusion) is underpowered ($p = 0.35$), and we present composition rather than causal estimates. By value, the picture is the same: rounds with at least one foreign investor account for 63 per cent of treated round value pre-event and 73 per cent post-event (43 and 58 per cent of treated debt-round value), so the extensive-margin narrowing documented above occurs among smaller and newer rounds, not in the aggregate flow of funds. The identity of the post-period creditors is nonetheless informative. The most frequent foreign debt providers to licensed lenders are specialised impact-credit funds — Enabling Qapital (four post-event treated debt rounds), BlueOrchard (three), Blue Earth Capital (two) — and regional banks (DBS, two), alongside domestic venture-debt and structured-credit houses (Northern Arc, four; Alteria, three; BlackSoil, two). Individual counts are small, and we read the roster as illustrative of the creditor mix rather than as a ranking. Read together with Section 6.5, the pattern suggests that foreign capital did not exit the regulated segment so much as migrate up the capital structure: from equity claims on platform growth to credit claims — often development-mandated — on regulated balance sheets.

7. Robustness

7.1 Timing: placebo dates, anticipation, and dynamics

Table 7 collects the timing tests. A placebo event placed at 2019Q3, estimated on the pre-Guidelines sample only, produces nulls on all outcomes (debt -5.5 points, n.s.; foreign -1.0 , n.s.): nothing in the pre-period mimics the post-2022 pattern. Interacting treatment with a signal-window indicator (2021Q4–2022Q2, following the November 2021 Working Group report) alongside the post indicator shows no differential response during the signal window (debt -1.0 , n.s.) while the post-event debt coefficient is unchanged ($+14.9$, $p = 0.001$) — consistent with investors waiting for binding rules whose content, in particular where credit risk would land, was not knowable from the advisory report.

The dynamics of the two responses differ instructively. Estimated over a window ending 2023Q1 — before the June 2023 circular capped default loss guarantees — the debt coefficient is positive but insignificant ($+6.4$), while the matched foreign-participation decline is already visible at the event quarter (Figure 1). The debt turn reaches full strength only after the FLDG cap made the risk transfer contractually binding, whereas equity participation repriced on announcement. We therefore interpret the treatment as the 2022–2023 regulatory package anchored at the 2022Q3 circular: the announcement moved the price of participation; the cap moved the balance sheets.

One further event inside the window deserves explicit treatment: in November 2023 the RBI raised risk weights on unsecured consumer credit and on bank lending to NBFCs (Reserve Bank of India, 2023b), a direct shock to licensed lenders' funding costs. Two features separate it from our results. First, over a window ending 2023Q3 — after the FLDG cap but before the risk-weight circular — the debt coefficient is already $+11.4$ points ($p = 0.08$; Table 7), roughly three-quarters of the full-sample effect, so most of the build-up predates the hike. Second, the hike raised the *price* of NBFC debt; the further strengthening of debt issuance after it therefore occurred against a cost headwind — difficult to reconcile with the risk-weight change driving the result, and easy to reconcile with risk-transfer-driven funding demand.

7.2 Sample and specification

The debt and foreign results are insensitive to: excluding the COVID-disrupted quarters 2020Q2–2021Q1 (debt $+15.8$, $p < 0.001$); ending the sample at 2025Q4 to remove the 2026 extension and any recent-quarter reporting lag (debt $+13.7$, $p = 0.001$); excluding the ten post-event licensees (debt $+14.9$) or the five treated firms with subsequently cancelled registrations (debt $+16.8$); replacing the ICC definition with any NBFC licence at the event date (debt $+16.4$, $p < 0.001$); estimating binary outcomes by logit with year fixed effects (foreign average marginal effect -5.8 points, matching the linear estimate; the debt logit does not converge under full fixed effects owing to the near-absence of pre-period control debt rounds); and collapsing the panel to firm-by-period means to address serial correlation directly (Bertrand et al., 2004), which yields debt $+15.2$ ($p < 0.001$) and foreign -4.7 (n.s.), both within half a standard error of baseline. Estimating within firm — replacing the treatment main effect, the consumer-facing flag, and the subsector fixed

effects with firm fixed effects, quarter effects retained; identification comes from the 879 firms with multiple rounds — yields debt +13.1 points (SE 5.6, $p = 0.02$) in the full sample and, on the matched sample, debt +22.2 (SE 7.0) and foreign -21.6 (SE 10.8, $p = 0.046$); the full-sample within-firm foreign coefficient is -3.7 (n.s.), consistent with the full-sample null. Absorbing subsector-specific time shocks — subsector $\times$ Post interactions or full subsector $\times$ quarter fixed effects — and restricting the control group to lending-classified fintechs leaves the debt estimate intact (+12.5 to +15.7, all $p < 0.01$) and strengthens the foreign-participation estimate to -11.5 to -12.0 points ($p \approx 0.06$), as discussed in Section 6.3. Reclassifying offshore-hub investors as non-foreign leaves the matched foreign estimate at -15.2 points ($p < 0.05$).

Table 7. Extended robustness (coefficient on Treat $\times$ Post unless stated).

Test	P(Debt)	P(Foreign)	P(Foreign inst.)
Placebo event 2019Q3 (pre-period sample only)	-0.055 (0.057)	-0.010 (0.060)	-0.018 (0.059)
Treat $\times$ Signal window (2021Q4–2022Q2)	-0.010 (0.060)	-0.130 (0.095)	-0.109 (0.085)
Treat $\times$ Post, controlling signal window	+0.149*** (0.046)	-0.080 (0.058)	-0.071 (0.055)
Window ends 2023Q1 (pre-FLDG-cap)	+0.064 (0.066)	-0.126 (0.091)	-0.092 (0.086)
Window ends 2023Q3 (post-cap, pre risk-weight hike)	+0.114* (0.064)	-0.114 (0.080)	—
Excluding COVID quarters (2020Q2–2021Q1)	+0.158*** (0.044)	-0.062 (0.058)	-0.053 (0.055)
Window ends 2025Q4	+0.137*** (0.042)	-0.057 (0.056)	-0.057 (0.053)
Excluding post-event licensees	+0.149*** (0.042)	-0.061 (0.056)	-0.060 (0.053)
Excluding cancelled registrations	+0.168*** (0.040)	-0.072 (0.055)	-0.068 (0.052)
Any NBFC licence as treatment	+0.164*** (0.039)	-0.059 (0.053)	-0.038 (0.050)
Subsector $\times$ Post interactions	+0.149*** (0.046)	-0.115* (0.062)	-0.103* (0.057)
Subsector $\times$ quarter fixed effects	+0.157*** (0.045)	-0.115* (0.064)	-0.102* (0.059)
Control group: lending-classified fintechs only	+0.125*** (0.046)	-0.120* (0.064)	-0.103* (0.062)
Logit, average marginal effect	—	-0.058	-0.053

		(0.054)	(0.051)
Firm-level pre/post collapse	+0.152***	-0.047	-0.047
	(0.042)	(0.055)	(0.052)

*Notes: Firm-clustered SEs in parentheses. Full-sample specifications with quarter and subsector fixed effects except: placebo (pre-period sample), logit (year fixed effects), collapse (subsector fixed effects, round-weighted). The debt logit does not converge under full fixed effects (near-zero pre-period control debt rate). *** $p < 0.01$, * $p < 0.10$.*

7.3 Inference and power

All headline results carry wild cluster bootstrap p-values: debt at $p = 0.001$ (full sample) and $p = 0.002$ (matched); matched foreign participation at $p = 0.016$ and foreign institutional at $p = 0.035$. The foreign-institutional p-value is the more fragile of the two: under small, equally defensible perturbations of the matched control set — nearest-neighbour tie-breaking moves a handful of controls — it rises to roughly 0.06, while the any-foreign estimate and its p-value are stable; no claim in the paper rests on the institutional split alone. Two further checks address the sensitivity of the matched foreign estimate. Leave-one-out re-estimation, dropping each of the 89 treated firms in turn, yields a negative coefficient in every replication (range -0.170 to -0.203 around the baseline -0.191); no single firm drives the finding. Permutation inference — randomly reassigning treated status across matched-sample firms 500 times — yields $p = 0.02$, closely matching the bootstrap. The debt estimate passes the same battery: dropping each treated firm in turn keeps the coefficient between $+0.138$ and $+0.169$; the five most active treated borrowers account for 27 per cent of post-event treated debt rounds, and excluding those five firms entirely yields $+0.155$ (SE 0.042). The full-sample foreign null is informative but bounded: the design rules out extensive-margin declines larger than roughly 17 points at the 95 per cent level, and the matched estimates sit outside that band — which is precisely why we characterise the foreign result as a licence-boundary estimate against comparable firms and report every matching scheme, including the two that attenuate.

8. Discussion

8.1 Re-rating the business model

The results describe a coherent re-rating. Before the Guidelines, a partnership licensee offered equity investors credit-protected scale: loans on its book, downside contractually exported, growth underwritable without underwriting Indian consumer credit risk — platform economics built on a licence. The regulatory package of 2022–2023 removed the protection, and the firm re-rated to what its balance sheet now says it is: a spread lender whose growth consumes capital and bears first loss. Funding markets responded on the margins this re-rating predicts, and on its clocks. Equity — the claim whose growth option the re-rating extinguished — adjusted immediately and at the entry margin: fewer licensed-lender rounds attracted new outside underwriting, foreign institutional capital most visibly, while relationships already in place continued on unchanged terms. Debt —

the natural instrument of a lender's balance sheet — expanded as the risk transfer became contractually binding, and expanded most where the re-rating bit hardest: young licensees built on the partnership model, without retained earnings or bank borrowing relationships. Licence categories inside the perimeter but outside balance-sheet lending experienced neither. The licence boundary, the exposure gradient, the margin of the equity response, and the two-speed dynamics jointly triangulate the mechanism: markets re-rated the business model that regulation changed, not regulation per se. The most direct further test — compression in treated firms' equity valuations — remains beyond this paper: Tracxn reports a pre- or post-money valuation for 258 of the 387 treated equity rounds, but only 68 of these fall after the event, too few for credible within-firm valuation dynamics. We report the coverage so readers can judge the constraint, and leave the multiple-compression test to future work.

8.2 Policy implications

For regulators sequencing conduct rules in foreign-capital-dependent sectors, the findings cut two ways. The feared wholesale foreign exit did not occur: intensity margins were stable, existing relationships persisted, and foreign credit partially replaced foreign equity — much of it from development-mandated impact funds with an explicit financial-inclusion remit. But the participation threshold rose for precisely the young licensed lenders the perimeter is meant to encourage, and their forced turn to debt concentrates refinancing risk in the firms least able to bear it. Risk reallocation toward the regulated sector is not free; its cost surfaces in the capital structure of the regulated. A regulator that moves credit risk onto licensed balance sheets may wish to pair the move with transitional support for young licensees' funding access — or at minimum to monitor the leverage building where equity has thinned.

The lessons travel beyond India and beyond fintech. First, conduct rules that reallocate risk need not trigger foreign exit, but they raise the entry threshold for precisely the formal, distant capital that emerging markets court: existing relationships are sticky, new underwriting is not. Second, the adjustment surfaces in capital structure rather than in aggregate flows, concentrating refinancing risk in the youngest regulated firms — the margin a regulator watching only funding totals will miss. Third, instrument substitution — foreign credit replacing foreign equity — cushions the aggregate while changing who holds the downside. Jurisdictions imposing retention-style rules on digitally intermediated finance, the direction of travel in several emerging markets, should expect the same three margins to move.

8.3 Limitations

Five limitations bound the claims. First, Tracxn's coverage of private rounds is incomplete and debt rounds may be under-reported; under-reporting common to treated and control firms does not bias the difference-in-differences, but we cannot rule out differential reporting. Two patterns argue against a reporting artifact: the within-perimeter placebo arm — RBI-licensed entities whose debt events pass through the same coverage process — shows a negative debt coefficient, and the effect concentrates in young licensees with no pre-event debt records rather than in the large, well-covered NBFCs that a coverage

improvement would favour. A direct benchmark against Ministry of Corporate Affairs charge registrations is infeasible at scale for these mostly small private borrowers, and we flag it as the binding data constraint. Second, the foreign-participation estimate depends on the counterfactual: it is significant against matched comparables and attenuates toward zero as increasingly dissimilar firms enter the comparison. We report every scheme and let the reader weight them; our own reading is that the licence-boundary question demands the matched counterfactual. Third, our evidence on the balance-sheet mechanism is indirect — funding instruments rather than audited borrowings; direct tests on leverage from statutory filings are constrained by the thin coverage of small unlisted NBFCs in commercial databases and are left for future work. The same constraint applies to the retained-earnings component of the H3 gradient, which we proxy by firm vintage; the borrowing-relationship component is tested directly through pre-event debt-market access. Fourth, treatment is defined at the licence level rather than at the level of partnership exposure within it; because 2022 partnership structures are unrecoverable from any point-in-time source, the estimates average over licensees for whom the risk transfer bound tightly and those for whom it barely bound, and are correspondingly conservative for the former. Fifth, the design identifies the effects of one salient episode in one large market; the mechanism — risk reallocation repricing a licence — is general, but magnitudes need not travel.

9. Conclusion

India's Digital Lending Guidelines moved the credit risk of app-based lending onto licensed balance sheets — and doubled licensed lenders' probability of raising debt, an effect concentrated in young licensees and absent in perimeter categories without balance-sheet exposure, while reducing the probability that any foreign equity investor participates in a licensed lender's round by 15–20 percentage points against matched comparables, with no movement on any intensity margin. The licence, in short, was repriced as a burden, and the capital structure of the regulated sector absorbed the shock: equity participation narrowed at the threshold while domestic venture debt and foreign impact credit expanded. For the growing set of emerging markets writing conduct rules for digitally intermediated finance, the Indian episode suggests that the first-order funding consequence of reallocating risk toward the regulated perimeter is not who leaves, but what instrument the money arrives in — and on whose balance sheet the risk finally sits.

Appendix A. Data extraction

Funding-round data were extracted from Tracxn under a commercial licence in two batches — March 2026, covering January 2008 to March 2026 in three exports, and July 2026, covering January to June 2026 — for all Indian fintech companies with at least one recorded funding round. Each export carries three sheets: funding rounds (round date, round name, amount, pre- and post-money valuations where disclosed, and participating investors); investor-round pairs (investor name, type — institutional or individual — headquarters location as of extraction, and lead status); and company attributes (founding

year, sector and feed classification, business-model flags, and all associated legal entities with Corporate Identification Numbers — the field on which treatment matching relies, which must be requested explicitly in the export). Exports are combined with rounds de-duplicated on domain, date, and round name; rounds reported without a day-precise date are excluded (Section 4.1).

Regulatory registers are point-in-time vintages of the RBI list of registered NBFCs — 31 July 2022 (retrieved via the Internet Archive; treatment-defining), 28 February 2023, and 31 March 2026 — together with the corresponding cancellation lists. Full extraction specifications, the matching pipeline, and every manual decision are documented in the replication guide.

Data availability

Funding-round data are from Tracxn (commercial licence). NBFC registration data are from Reserve Bank of India registers (point-in-time vintages of 31 July 2022 and 28 February 2023, retrieved via the Internet Archive, and current lists) and RBI cancellation lists. Replication code is available from the author.

CRedit authorship contribution statement

Ankur Mehra: Conceptualisation, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review and editing.

Declaration of generative AI use

During the preparation of this work the author used AI tools to assist with data-analysis code and manuscript drafting. The author reviewed and edited all content and takes full responsibility for the content of the article.

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