When the Clock Binds: Delay, Recovery, and the Cost of Insolvency in India

Abstract

This paper documents three case-level patterns in the early operation of India's Insolvency and Bankruptcy Code, using an analytical sample of 3,794 closed Corporate Insolvency Resolution Process cases drawn from 3,978 cases closed between January 2017 and March 2025. Larger admitted claim cases are more often observed in the resolution pathway than in liquidation. Conditional on resolution, recoveries scale less than proportionally with admitted claims, absolute recoveries rise, but with an elasticity of 0.88, statistically below unit elasticity. More than two-thirds of closed cases exceed the 330-day statutory benchmark, with implied opportunity-cost exposure of approximately USD 3.9 billion per year. These patterns are consistent with the asset specificity, case complexity, creditor coordination, and business-group mechanisms that co-move with the admitted claim size, we treat the asset specificity reading as an interpretive frame rather than an identified causal channel. The contribution is a descriptive case level mapping of how young, high-volume bankruptcy regime in an emerging market performs against benchmarks from the global empirical literature.

1. Introduction

Decades of empirical research on bankruptcy in mature jurisdictions have pointed to a consistent set of empirical regularities. Recovery rates tend to be lower when defaulting firm's industry experience concurrent distress (Acharya et al., 2007; Pulvino, 1998). Fire-sale discounts are associated with piecemeal liquidation as opposed to going concern sales (Eckbo & Thorburn, 2008). Specialised assets attract fewer pools of bidders and requires longer search periods (Benmelech & Bergman, 2008; Shleifer & Vishny, 1992). Judicial outcomes are determined by court caseload and the structure of procedural frameworks (Bernstein et al., 2019; Iverson, 2018; Li & Ponticelli, 2022). Across mature regimes, the time duration of bankruptcy creates welfare costs that often surpass the distributional burden of priority deviation (Dou et al., 2021). Whether such regularities hold younger, high volume bankruptcy regimes, where institutional capacity, creditor coordination, and case complexity develop in parallel withing rising cash volumes remains a subject on inquiry in comparative literature.

Cross-country dimension literature has evolved in tandem. (La Porta et al., 1998) show that creditor protection and institutional foundations of legal systems influence financial development at the country level. Djankov, McLiesh, and Shleifer (2007) extended the picture to private credit volumes across 129 jurisdictions, and Djankov, Hart, McLeish, and Shleifer (2008) provided a benchmark 88 country comparison of debt enforcement efficiency, against which India ranked persistently below regimes of comparable per-capita income. Outside the

United States, recent empirical work has documented related patterns in Brazil (Ponticelli & Alencar, 2016) and China (Li & Ponticelli, 2022). Firm level evidence, however, remains concentrated in mature jurisdictions, the closest non-causal precedent being Davydenko and Franks (2008) examine three European jurisdictions with case counts in the low hundreds per country, well below what a single emerging market regime now offers.

The post IBC insolvency regime in India constitutes a unique context for investigating bankruptcy-regime performance at scale. The Insolvency and Bankruptcy Code 2016 replaced a fragmented enforcement and restructuring regime[1] with a unified Corporate Insolvency Resolution Process administered by the National Company Law Tribunal (NCLT), a 330-day outer limit on completion of proceedings, formal committee of creditors voting on resolution plans, and terminal outcomes of resolution plan approval or liquidation order.[2] Three features make the Post-IBC environment particularly attractive for descriptive case level study. First, the regime is young but no longer nascent, with roughly nine thousand admissions over eight years, the closed case universe is large enough to support systemic inference. Second, the binary terminal outcome, resolution or liquidation is cleanly observable and recorded by a single regulator. Third, the IBBI public filings provide harmonized case level information on admission dates, statutory sections invoked, admitted claims, creditor composition, NCLT bench, and realized recoveries a combination rarely available outside U.S. chapter 11 data. We use the 3,978 cases closed between January 2017 to March 2025, comprising 1,211 resolution plan approvals and 2,767 liquidation orders to examine whether the patterns established in the global empirical bankruptcy literature obtain in a high-volume emerging market regime on recent vintage.

The paper's contribution is the case level mapping of the regime's first eight years against the global empirical literature, not the identification of any particular friction channel. Three patterns emerge from the closed cases. First, larger admitted claim cases are more often observed in the resolution pathway than in liquidation. Second, conditional on resolution, the same cases recover proportionally less per rupee admitted, with the elasticity of absolute recoveries with respect to admitted claims of 0.88, statistically distinct from both zero and unit

[1] The pre-IBC architecture comprised the Sick Industrial Companies (Special Provisions) Act 1985, which created the Board for Industrial and Financial reconstruction, the Recovery of Debts Due to Banks and Financial Institutions Act 1993, which created the Debt Recovery Tribunals, and the Securitisation and Reconstruction of Financial Assets and Enforcement of Securities Interest Act 2002 (SARFAESI), which enables secured-creditor enforcement outside courts.

[2] The IBC was notified on 28 May 2016. Sections 7, 9, 10, governing admission, came into force on 1 December 2016, with the first admission recorded in January 2017. The 330-day outer limit derives from section 12 as amended in 2019 (the original 2016 enactment specified 180 days plus a 90-day extension). In Committee of Creditors of Essar Steel Limited v. Satish Kumar Gupta (2019), The Supreme Court read down the word "mandatorily" from Section 12, holding that a CIRP must ordinarily be completed within 330 days but allowing exceptional extensions.

elasticity, ruling out a mechanical denominator interpretation. Third, the 330-day statutory benchmark is exceeded in more than two third of closed cases, with the implied opportunity cost exposure at the FY2025 ten-year Government of India bond yield reaching approximately USD 3.9 billion per year at the conservative discount rate. In benchmark calculation this delay exposure dominates the cumulative distributional shortfall by a factor of 2.75, paralleling the structural decomposition for US Chapter11 in (Dou et al., 2021). Bench level variation in resolution probability survives controls for case composition, parallel to the institutional capacity channel that Iverson (2018) documents for US courts and Li and Ponticelli (2022) for China. The three patterns are consistent with predictions of the asset specificity friction emphasised in literature, but admitted claim size is a multi-channel proxy that does not isolate asset specificity from co-moving scale dimensions (firm size, leverage, creditor coordination cost, business group affiliation, regulatory exposure), we treat the asset specificity reading as an interpretive frame and the contribution as descriptive.

The objective is descriptive and foundational: to map against the empirical regularities documented in the U.S., European, and emerging market bankruptcy literatures, how India's Insolvency and Bankruptcy Code has performed in its first eight years of operation. The empirical work rests on two pieces of data construction. We link IBBI case level filings to firm level financials through a three-stage corporate identifier match, identifying 1,934 cases to balance sheet pairs with an audited four percent false positive rate. This linkage allows us to characterize selection into resolution versus liquidation along admitted claim size, sector, and capital structure dimensions. We next define the boundaries of closure selection envelope using Manski-style worst-case bounds, enabling the headline patterns to be examined relative to the admitted CIRP instead of the solely closed sub-sample. The remaining part of the paper is structured as follows. Section 2 reviews the existing literature on corporate bankruptcy and Section 3 presents the data, conceptual framework, and empirical strategy followed in the study while Section 4 reports the findings. Section 5 provides discussions on welfare exposures and policy implications and then concludes.

2. Literature

A contemporary understanding of corporate bankruptcy understood from the premise of a single observation, when a firm is unable to meet its obligations, the central question is not whether a firm should default, but how assets should be treated thereafter. The classical formulation of this question, set out in Williamson (1979) and developed in (Aghion et al., 1992) and (Hart & Moore, 1998), stems from the recognition that debt contracts are fragmentary and the bankruptcy is the institution via which this incompleteness is addressed. Shleifer and Vishny (1992) sharpened the economic content of the problem, the natural buyers of distressed assets

are industry peers, whose own balance sheets are typically impaired when the seller is distressed, so the liquidation value of specialized assets is endogenously depressed at exactly the moment those assets need to be sold. Bankruptcy law therefore performs two intertwined tasks. It must select the firms that warrant reorganization rather than piecemeal sale, and it must implement the chosen outcome at acceptable cost in time, distortion and direct expense. Both tasks are difficult in practice, and the patterns of failure are systematic enough across institutional settings to support testable predictions in any reasonable structured bankruptcy regime.

Selection between reorganisation and liquidation is the first of these tasks, and the empirical record on it is well-developed. The asset specificity and fire-sale logic of (Shleifer & Vishny, 1992) suggests that cases involving larger and more specialized distressed assets are more likely to preserve going-concern value through reorganisation than through piecemeal sale, since piecemeal sale of such assets imposes the steepest fire-sale discounts when natural redeployers are themselves distressed. This prediction does not require admitted claim size to be a direct measure of asset specificity, larger admitted claims more plausibly proxy for the joint distribution of operational scale, asset complexity, multi class creditor coordination problems, and group affiliation that the asset specificity literature emphasises. The prediction is reinforced by the coordination friction literature, (Bolton & Scharfstein, 1996; Gertner & Scharfstein, 1991) show theoretically that large numbers of dispersed creditors make workout bargaining costly, pushing complex cases into formal proceedings where collective action problems can be resolved within a single procedure. Empirically, Asquith, Gartner, and Scharfstein (1994) document bargaining failures in junk bond restructuring, Gilson (1997) measures the transaction costs of capital structure recontracting outside formal bankruptcy. (Bris et al., 2006; Eckbo & Thorburn, 2008) compare auction and bargaining based bankruptcy procedures and find that the choice between them shapes which firms emerge as going concerns. (Strömberg, 2000) provides a case level analysis of conflicts of interest in Swedish bankruptcy auctions that anticipates many of the selection issues the present paper takes up in the Indian context.

Recovery conditional on reorganisation is more complex than selection, and three distinct mechanisms in the literature have been identified as candidates for the wedge between admitted claims and realized value. The first is asset market illiquidity. Pulvino (1998) provides the cleanest demonstration as distressed aircraft sales trade at roughly thirty percent discounts to comparable transactions, with the discount sharpest when industry peer balance sheets are weak and Acharya, Bharath, and Srinivasan (2007) generalise the test to US corporate defaults, finding recoveries lower when the defaulted firm's industry is simultaneously distressed. Acharya and Subramanian (2009) link cross-country recovery rates to creditor protection regimes and document a debt versus equity composition effect. The second mechanism is

bargaining and priority distortion. (Franks & Torous, 1989; Hotchkiss, 1995; Weiss, 1990) establish the basic facts about direct costs, deviations from absolute priority, and post-bankruptcy operating performance, Benmelech and Bergman (2008) tie liquidation values to renegotiation outcomes in airline lease data. (Almeida & Philippon, 2007; Andrade & Kaplan, 1998) quantify the broader costs of financial distress that follow from both channels. The third mechanism is procedural delay and within process inefficiency. Antill (2022) identifies excess liquidation among firms with positive continuation value, while (Dou et al., 2021) in the same journal decompose Chapter 11 inefficiency into excess liquidation and excess continuation, finding excess delay to be the single largest component. The dual size pattern this paper documents in the Indian setting, selection toward reorganisation for large cases coexisting with proportionally smaller per rupee recoveries on those same cases has a direct counterpart in this body of work.

Bankruptcy outcomes vary not only with the substantive law but with the courts that administer it. Iverson (2018) shows that crowded US bankruptcy courts impose measurable costs on case outcomes, and Müller (2022) shows that a fall in court congestion shortens time in bankruptcy and raises recovery values. Bernstein, Colonnelli, and Iverson (2019) exploit random judge assignment in US bankruptcy to identify causal effects of bankruptcy decisions on subsequent asset reallocation. Li & Ponticelli (2022) document analogous bench level variation across specialized Chinese bankruptcy courts. The broader law and finance comparison initiated by (La Porta et al., 1998) and further developed by Djankov, Hart, Mcliesh, and Shleifer (2008) shows that creditor rights and enforcement quality shape recovery outcomes across jurisdictions, (Djankov et al., 2007) extend the analysis to private credit market depth. (Davydenko & Franks, 2008) provide closest cross country case level comparator to the present paper, documenting how outcomes differ across France, Germany, and the United Kingdom under nominally similar legal frameworks. (Ponticelli & Alencar, 2016) exploit a Brazilian bankruptcy reform to identify effects of court enforcement on firm level outcomes. Together, they establish that the institutional architecture of bankruptcy, court capacity, bench level administrative variation, and procedural rules is a first order determinant of how cases resolve.

These three strands of evidence align closely with the observable features of any structured bankruptcy system. Selection can be viewed in the final outcome of the case and in the size, sector, and creditor structure attributes of cases assessing each pathway. Recovery growth is visible in the observed pattern of recovery rates conditional on resolution, examined against admitted claim size. The strength of institutions or institutional capacity shows up in two ways: first, how far proceedings stay within the statutory timelines, and second how much the outcome varies from the across courts administering the process.

The empirical analysis that follows uses these three observable connections as an organizing structure for a descriptive case level account of India's post-IBC regime.

There exists a large section of empirical literature examining pre-IBC credit enforcement in India, and IBC itself was explicitly designed to address some of these issues. For instance, Visaria (2009) and von Lilienfeld-Toal, Mookherjee, and Visaria (2012) show that Debt Recovery Tribunals, set up under the 1993 Act, Vig (2013) demonstrate that the SARFAESI 2002 reform improved enforcement for secured creditors, and altered firms' choice of debt contracts. Gopalan, Mukherjee, and Singh (2016) related the effectiveness of debt contract to financing and asset choices at the firm level financing decisions and asset structure. The DRT and SARFAESI reforms were effective in improving creditors enforcement at the margins; however, debt enforcement framework prior to the introduction of IBC had a fragmented forum structure, uneven creditor coverage, and was ineffective in persevering going concern value, along with strategic defaulting and limited resolution of firms witnessing operational distress. The broader institutional environment in which these frictions operated has been characterized by (Bertrand et al., 2002) on Indian business groups and by (Banerjee & Duflo, 2014) on Indian credit constraints, both lines of work suggest that internal capital markets and credit supply frictions interact with formal enforcement in determining how distressed firms operate.

The Insolvency and Bankruptcy Code 2016 was specifically designed to deal with the frictions identified by this existing literature. It brought the fragmented forum under one unified Corporate Insolvency Resolution Process administered by the National Company Law Tribunal, placed initiation rites jointly in financial creditors, operational creditors, and the corporate debtor itself, and introduced statutory timelines to keep the process disciplined, 180 days originally with one 90 day extension, which was later revised to 330-day outer limit that involves time taken in legal proceedings. The case outcomes are binary, either approval of a resolution plan by the Committee of creditors or, where no acceptable plan is submitted within the allotted time, an order for liquidation were intended to produce a clear outcome, rather than allowing indefinite procedural delays that had characterized earlier Indian distress proceedings. The reform's design therefore makes the post-IBC regime a useful setting in which to examine whether the three established patterns reappear in a young, high volume emerging market system, whether larger admitted claim cases are observed disproportionately in the resolution pathway, whether recoveries scale less than proportionally with admitted claims among resolved cases, and whether the statutory deadline binds in practice.

Building on this body of evidence, we ask three questions of India's post-IBC case level record. Do larger admitted claim cases enter the resolution pathway disproportionately? Do realized recoveries among resolved cases scale less than proportionally with admitted claims? Does the

statutory 330-day deadline bind in practice, and do outcomes vary across the NCLT benches that administer the regime? The three questions are framed as patterns to be characterized at the case level rather than channels to be identified, the contribution lies in the case level mapping itself, against the global empirical literature.

3. Data and Methodology

3.1 Sample and variables

The empirical analysis draws on the universe of closed Corporate Insolvency Resolution Process cases admitted at India's NCLT between January 2017 and 31 March 2025, comprising 1,211 resolution plan approvals and 2,767 liquidation orders. Case level information, admission dates, IBC sections invoked, admitted financial and operational creditor claims, outcomes, realized recoveries, and closure dates comes from the Insolvency and Bankruptcy Board of India's public filings. NCLT bench identifiers are harmonized using 27,026 tribunal orders, with 97 percent bench identifier coverage after manual cleaning. Pre-admission balance sheet covariates come from the Centre for Monitoring Indian Economy's commercial firm level panel, linked to IBBI cases via a three-stage corporate identifier match, the combined match identifies 1,934 cases to balance sheet pairs with an audited false positive rate of approximately four percent.

Table 1 reports the sample construction filter. From the raw IBBI universe of 3,978 closed cases, we drop 56 with missing corporate identifiers (including 29 LLPs outside scope), leaving 3,922 descriptive observations, and a further 128 cases with missing values on at least one main regressor, producing the analytical sample of N = 3,794. The 128 covariate dropped cases are not missing at random (78 percent ended in liquidation versus 69 percent in the analytical sample). We compute Manski-style worst case bounds for the main size coefficient and obtain (+0.176, +0.196) in logit units, the main estimate of +0.191 lies inside the interval[3].

Table 1. Sample construction

Notes: Sample construction from the raw IBBI case universe to the analytical sample. Cases without a corporate identifier are excluded, the analytical sample further excludes cases missing on the main regressor. Source: IBBI public filings.

Filter step	N
Raw IBBI closed cases	3,978

[3] Implementation follows (*Manski*, 2003). Regressor values for the 128 dropped cases are imputed at analytical sample means, the resolution probability logit is re-estimated under all liquidation and all resolution attribution rules. The Manski exercise is also applied to the unconditional resolution rate to bound the implication of approximately 2,000 cases under proceedings, withdrawal review, or appeal at our cutoff, the closed sample rate of 30.4 percent is bounded between 20.3 percent and 53.7 percent in the admitted CIRP universe.

Drop missing corporate identifier / out of scope LLPs	-56
Descriptive sample	3,922
Drop missing main regressors	-128
Analytical sample	3,794
Resolution outcomes (recovery sample)	1,160
Log-recoveries specification (excludes zeros)	1,157

The principal regressor is ln (admitted claims), the natural logarithm of total admitted creditor claims in rupees crore, a case level scale measure capturing the joint of underlying firm size, leverage at admission, and admission practice decision, not a pure firm size proxy.[4] Matched subsample specification substitute ln (pre-admission assets). Creditor composition enters via financial creditor share, trigger section indicators distinguish financial creditor and operational creditor initiation from corporate debtor admissions. A defunct firm indicator and tribunal bench fixed effects complete the specification. Table 2 reports descriptive statistics by outcome. Admitted claims are heavily right skewed, median admitted claims in resolved cases are roughly 2.6 times in liquidated cases. Durations are extreme, the median closed case lasts 447 days against the 330day statutory benchmark, with the resolved subsample running 50 percent longer at the median (594 versus 396 days). Recovery rates are right skewed, with mass concentrated below 0.20 and a separate boundary mass at 1.0.[5]

Table 2. Descriptive statistics

Variable	**Full Sample**		**Resolution**		**Liquidation**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
ln (admitted claims)	3.82	2.47	4.60	2.21	3.48	2.50
Admitted claims (INR cr)	629	3,179	1,023	4,663	456	2,211
Financial creditor share	0.75	0.33	0.79	0.26	0.73	0.36
Section 7 indicator	0.51	0.50	0.61	0.49	0.47	0.50
Section 9 indicator	0.39	0.49	0.33	0.47	0.42	0.49
Defunct indicator	0.66	0.47	0.40	0.49	0.78	0.41
Process duration (days)	566	387	707	415	504	356
Covid-period cohort indicator	0.07	0.25	0.08	0.27	0.06	0.24

[4] Throughout the study we treat ln (admitted claims) as case level scale measure capturing the joint of underlying firm size, leverage at admission, and admission practice decision by the Resolution Professional and the Committee of Creditors, rather than as a pure firm size proxy.

[5] The IBBI published recovery rate field is clipped to (0,1). In our sample, 24 cases had raw recovery claim ratios ranging from 1.00 to 1.93 and were clipped from above, 41 cases sit naturally at 1.0 and 3 at exactly 0. The 65-case boundary mass shown in Figure 1 is the union of these. The log-recoveries specification is unaffected by upper-boundary clipping.

Recovery rate (resolved cases only)	0.33	0.29	0.33	0.29	-	-
N	**3,794**		**1,160**		**2,634**	
Median (right skewed variables)						
Admitted claims (INR cr)	51		100		38	
Process duration (days)	447		594		396	
Recovery rate	0.24		0.24		-	

Note: Sample 3,794 closed CIRP cases, January 2017to March 2025. Recovery rate is observed only for resolution pathway cases. Source: IBBI.

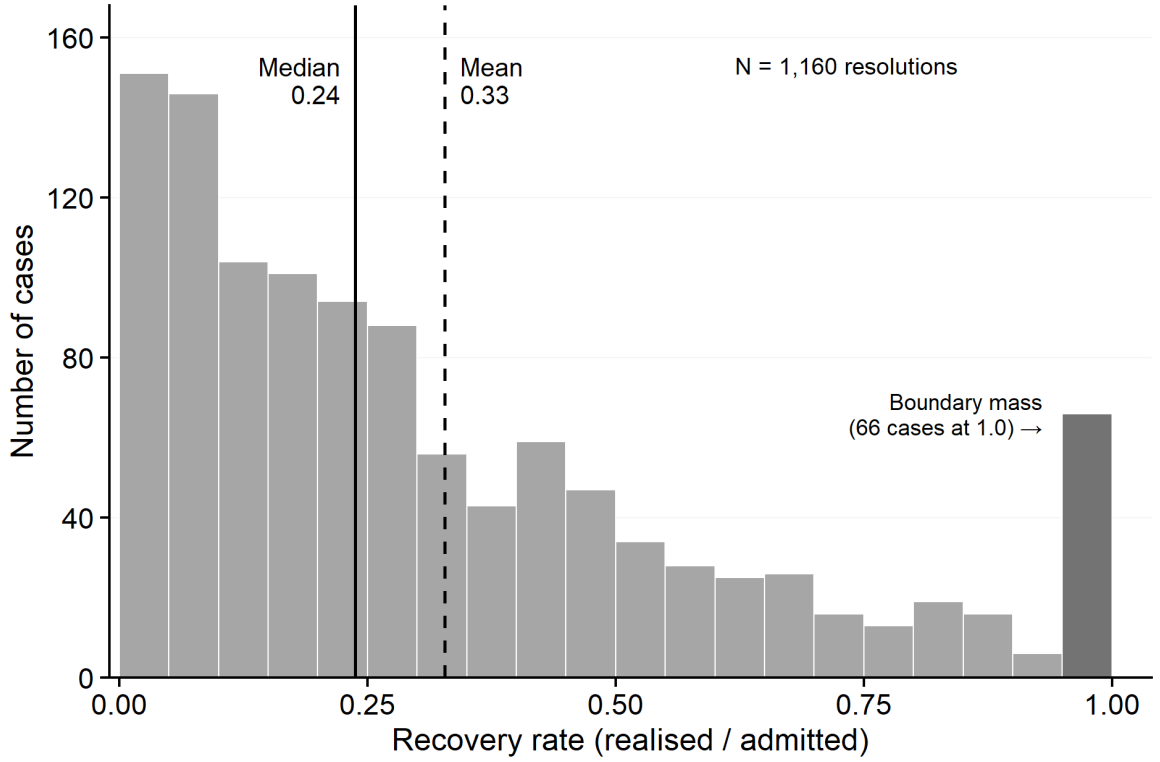


Figure 1. Recovery rate distribution among 1,160 resolved CIRPs (median 0.24, mean 0.33). The dark bar at 1.0 represents 65 cases at the boundary, of which 41 sit naturally at 1.0 and 24 are clipped from above.

3.2 Conceptual framework

The empirical analysis takes (Shleifer & Vishny, 1992) as its organizing lens. Their central insight that the natural buyers for a distressed firm's assets are industry peers, who are themselves typically impaired when one of their number defaults, implies a single friction with three consequences for bankruptcy outcomes. Where assets are specialized, going concern value substantially exceeds piecemeal liquidation value, but the same specialization thins the bidder pool through which that going concern value must be realized. For three decades this asymmetry has served as a foundational pillar of bankruptcy literature, with its predicted patterns are now well established in mature financial systems.

Three predictions guide our analysis. The first relates to the selection; in a well-functioning system, more specialized cases should be channeled through reorganization rather through piecemeal liquidation, where the going concern surplus is larger and creditors have stronger incentives to accept a continuation plan (Bernstein et al., 2019; Strömberg, 2000). The second focuses on the cost of keeping the firm alive: the specialization that makes reorganization desirable can also make reduce the bidder pool, depressing realized prices and reducing proportional recovery (Acharya et al., 2007; Antill, 2022; Eckbo & Thorburn, 2008; Pulvino, 1998). Consequently, selection and recovery are inversely related along the specificity dimension, while the friction pushes the case towards reorganization, it does so at the expense of the firm's creditors. The third relates to time dimension, matching specialized assets with suitable bidders often involves lengthy search and negotiation process, so excess duration should concentrate in the same cases that exhibit the size recovery friction (Dou et al., 2021; Iverson, 2018).

Pattern 1. Selection. Among closed cases, larger admitted claim cases are observed in the resolution pathway at higher rates than in liquidation.

Pattern 2. Sub-proportional recovery. Among resolved cases, the elasticity of absolute realized recoveries with respect to admitted claims is positive but strictly less than one.

Pattern 3. Duration concentration. Excess duration over the 330-day statutory benchmark concentrates disproportionately in the same cases that exhibit Pattern 2 that is, duration and the size recovery friction co locate.

Two qualifications attach to these. First, the predictions are stated in terms of admitted claim size, not asset specificity directly. Admitted claim size is a multi-channel proxy, it captures firm scale, leverage at admission, creditor coalition complexity, public visibility, and regulatory salience, alongside the underlying asset specificity that motivates the framework. The largest cases in our sample are recognizably specialized industrial assets, steel plants, housing finance loan books, NBFC infrastructure, thermal power assets, but the same cases also have the most contested creditor coalitions, the longest appellate histories, and frequent business group affiliation. The asset specificity reading should accordingly be understood as the interpretive frame within which we organize the patterns, not as a channel identified against alternatives, Second, the framework is silent on cross-bench variation in resolution probability, the bench heterogeneity documented in section 4.4 invokes a separate institutional capacity channel ((Iverson, 2018; Li & Ponticelli, 2022).

3.3 Specifications and inference

We estimate four specifications, each implementing one of the three predictions. The resolution probability specification (M1) model the binary outcome as a logit, with a linear probability counterpart reported for robustness, following (Bernstein et al., 2019; Bris et al., 2006; Davydenko & Franks, 2008; Iverson, 2018). The regressor set includes ln (admitted claims), financial creditor share, trigger section

indicators, a defunct firm indicator on the matched subsample, a COVID period cohort indicator, and tribunal bench fixed effects. The recovery rate specification (M3) models the recovery rate by (Papke & Wooldridge, 1996) fractional logit. The recovery rate is bounded on (0,1) with non-trivial boundary mass, 65 cases at unity, three at zero, which makes OLS misspecified and Tobit's censoring assumption inappropriate. Fractional logit imposes a logistic mean function with quasi likelihood inference and accommodates the boundary directly.

A companion log recoveries specification (M3 R3) addresses the principal alternative interpretation of recovery rate finding. Because the recovery rate has admitted claims in the denominator, any sub-proportional growth of absolute recoveries would mechanically depress the rate even if creditors of larger cases were not systematically worse off. To distinguish the substantive prediction from the denominator artefact, M3 R3 re-estimates the size effect on ln (realized recoveries) by log linear OLS, dropping three zero-recovery cases and tests the unit elasticity null H_0: $\beta = 1$ directly. The duration specification (M4) models ln (duration) in OLS, with a companion logit on the 330-day exceedance indicator for the binary version of Pattern 3. Table 6 augments the resolution probability logit with full tribunal bench fixed effects and reports HC3 standard errors with a likelihood ratio joint test of bench heterogeneity.

Standard errors are clustered at tribunal bench level. With 15 bench level clusters (14 bench dummies plus the Mumbai reference), the few clusters concern of Cameron, Gelbach, and Miller (2008) is non trivial, particularly for headline resolution size coefficient. We therefore re-test the headline coefficient with the wild-cluster bootstrap (Webb six point weights, 999 replications, null imposed) following MacKinnon & Webb (2018), whose six point distribution is preferred to the two point Rademacher scheme at this cluster count. The bootstrap p-value does not alter inferential conclusions in any of the four specifications. We do not adjust for multiple hypothesis testing because the eight columns of Table 3, five of Table 4, and two panels of Table 5 expose a single coefficient, ln (admitted claims), to varying controls, functional forms, and subsample restrictions, rather than test independent hypotheses.

3.4 Empirical design

The study adopts a descriptive case level design. Identification of causal effects would require exogenous variation in resolution versus liquidation outcomes, through random assignment of cases to NCLT benches, a sharp regulatory threshold, or a clean contemporaneous control regime, and none of these is available in Indian setting. NCLT benches are assigned by territorial jurisdiction rather than randomly. The two natural quasi experiments in the sample window, the March 2020 Section 9 threshold change and Section 10A suspension, both overlap with COVID era macroeconomic shocks and cannot separate policy effects from confound. We therefore interpret the results as descriptive associations between case characteristics and outcomes, with population level inference bounded by Manski envelope.

The closest design precedents is (Davydenko & Franks, 2008), a case level study of corporate defaults across three European jurisdictions without random assignment, relying on within sample variation and robustness across specifications. The closest precedent in setting, case level bankruptcy data, binary resolution outcomes, asset specificity interpretation is (Bernstein et al., 2019), whose random judge assignment identification is unavailable to us. We adopt the descriptive design of the former and share the data structure and substantive question of the latter. Channel isolating extensions, industry fixed effects, asset tangibility ratios, business group affiliations, listed versus unlisted status, and industry level distress indicators of the kind used by (Acharya et al., 2007) are natural directions for future work.

4. Results

4.1 Size and resolution

Larger admitted claim cases are conditionally more likely to be resolved than liquidated. Table 3 reports the resolution probability logit. The headline coefficient on ln (admitted claims) is +0.191 in the main specification (Column 1, wild cluster bootstrap $p < 0.01$), at the sample mean resolution rate of 0.306, this translates to approximately +2.8 percentage points per doubling of admitted claims.

The size coefficient is stable across the robustness sweep. Incorporating the defunct firm variable changes (Column 2), the sign of the size coefficient to +0.126 but significant at the one percent level. Excluding Bhushan Power and Steel, which holds the largest admitted claim, does not change the coefficient (Column 3: +0.190). In the linear probability model, the marginal effect of +0.038 (Column 4), which is consistent with the logit coefficient. A quadratic specification in ln (admitted claims) shows the linear term substantially larger (+0.317) with a small negative quadratic (-0.015), the implied turning point is at 99.8^{th} percentile, thus monotonically increasing relationship between size and resolution. On the matched balance sheet subsample with pre-admission total assets in place of admitted claims (Column 6, N = 400), the coefficient on ln(pre-admission assets) is +0.093 ($p = 0.10$) directionally consistent but smaller, as expected when the regressor produce results that are consistent in sign but smaller.

The finding is consistent with the going concern surplus mechanism of (Strömberg, 2000) and the asset allocation framework of (Bernstein et al., 2019), cases with larger admitted claim pools, which are plausibly more complex and may involve more specialized assets, sort into the resolution pathway. Two secondary coefficients merit comment. First, the section 7 trigger carries a robust +0.566 (SE 0.197, $p < 0.01$) financial creditor initiated CIRPs resolve at substantially higher rates than corporate debtor initiated cases, consistent with the Committee of Creditors design giving secured financial creditors the dominant voice in resolution plan approval. Second, the financial creditor share carries a small negative coefficient that is not robust across specifications, and we draw no inference from it. The COVID cohort indicator (Column 5: 0.439, $p < 0.01$) is positive and significant but cannot be interpreted causally, the

cohort overlaps with the Section 10A suspension, the post-suspension admission stay, and pandemic era macroeconomic stress, none of which are separable on our data.

4.2 Size and recovery: the dual-size effect

Conditional on resolution, the same cases that sort into resolution recover less per rupee admitted. Table 4 reports the recovery rate specifications. The coefficient on ln (admitted claims) is -0.184 in the fractional logit main specification (Papke & Wooldridge, 1996), approximately -3.5 percent points of recovery rate per log unit increase in admitted claims. Together with the resolution results, this is the dual-size pattern, the same dimension of case size moves the regime in opposite directions across two margins. Both halves follow from the asset specificity friction, specificity rises going concern value relative to liquidation value, sorting the case into resolution, while the same specificity thins the bidder

Table 3.

Regressor	(1) Main	(2) Defunct	(3) Excl. BPSL	(4) Linear probit	(5) COVID	(6) Matched	(7) Quadratic	(8) Trimmed
ln (admitted claims)	+0.191***	+0.126***	+0.190***	+0.038***	+0.192***		+0.317***	+0.196***
	(0.011)	(0.014)	(0.011)	(0.002)	(0.011)		(0.030)	(0.012)
ln (admitted claims)^2							-0.015***	
							(0.003)	
ln (pre-admission assets)						+0.093*		
						(0.056)		
Financial creditor share	-0.176	-0.223	-0.176	-0.044**	-0.166	-1.321*	-0.242*	-0.199
	(0.127)	(0.138)	(0.127)	(0.022)	(0.125)	(0.719)	(0.128)	(0.128)
Section 7 indicator	+0.566***	+0.560***	+0.565***	+0.110***	+0.552***	+1.067***	+0.573***	+0.667***
	(0.197)	(0.198)	(0.197)	(0.034)	(0.197)	(0.357)	(0.201)	(0.222)
Section 9 indicator	+0.294	+0.261	+0.294	+0.051	+0.280	+0.732	+0.289	+0.370
	(0.232)	(0.223)	(0.232)	(0.040)	(0.232)	(0.504)	(0.236)	(0.256)
Defunct indicator		-1.518***						
		(0.094)						
COVID cohort indicator					+0.439***			
					(0.117)			
Bench FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,794	3,782	3,793	3.794	3,794	400	3,794	3,756

pool for going concern sale, compressing proportional recovery.

Table 4. Recovery rate and absolute recoveries

Regressor	**(1) Fractional logit**	**(2) Defunct**	**(3) OLS rate**	**(4) ln(recoveries)**	**(5) Matched**
Ln(admitted claims)	-0.184*** (0.011)	-0.202*** (0.013)	-0.039*** (0.002)	+0.877*** (0.018)	-
Ln(pre-admission assets)					+0.008 (0.040)
Financial creditor share	+0.303 (0.156)	+0.275 (0.176)	+0.064* (0.037)	+0.329* (0.177)	-0.197 (0.335)
Section 7 indicator	+0.173 (0.220)	+0.138 (0.223)	+0.034 (0.050)	+0.090 (0.191)	-0.536 (0.408)
Section 9 indicator	+0.094 (0.248)	+.041 (0.230)	+0.013 (0.052)	+0.095 (0.181)	-0.485 (0.496)
Defunct indicator		-0.522*** (0.068)			
Bench FE	Yes	Yes	Yes	No	Yes
N	1,160	1,149	1,160	1,157	229

Notes: Dependent variable: the recovery rate in (0,1) in Columns 1, 2, 3, and 5, the natural logarithm of realized recoveries in Column 4. Coefficients with bench clustered SEs in parentheses. Column 4 drops three zero-recovery cases, the unit elasticity null $\beta = 1$ is rejected with $t = -6.88$ ($p < 0.001$). Column 5 uses the matched balance sheet subsample with pre-admission assets. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The natural objection is mechanical. Because the recovery rate carries admitted claims in the denominator, sub-proportional growth of absolute recoveries would compress the rate even if larger cases were not worse for creditors. Column 4 reports the re-estimated size effect on log realised recoveries at once, dropping the three zero-recovery cases. The elasticity is +0.877 (cluster robust SE 0.018, N = 1,157) strongly positive but rejected against the unit elasticity null at $t = -6.88$ ($p < 0.001$). A one percent increase in admitted claims is associated with a 0.88 percent increase in realized recoveries, the missing 12 percentage points of elasticity are the empirical magnitude of the recovery compression that asset specificity, bidder pool, and creditor coordination mechanisms predict. The dual size pattern is therefore a distributional feature of the data, not a denominator artefact, and confirms pattern 2.

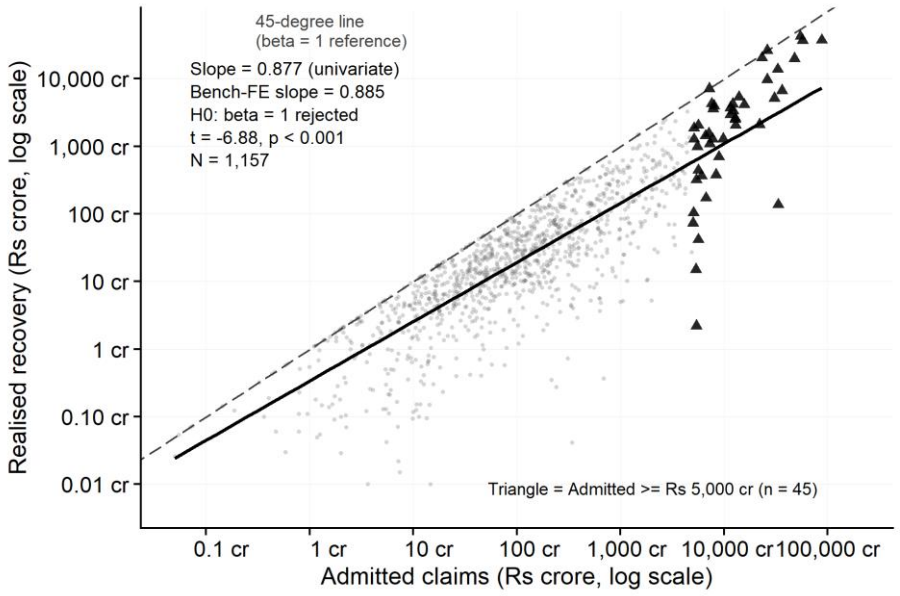


Figure 2. Realised recovery against admitted claims on the log-log scale (N = 1,157). The solid line is the OLS fit (univariate slope 0.877, with bench fixed effects 0.885), the dashed line is the 45-degree unit elasticity reference. Black triangles mark the 45 cases with admitted claims at or above Rs 5,000 crore. The unit elasticity null is rejected at t = -6.88, p < 0.001.

4.3 Tracking Benchmark Overruns

Process durations are substantially long. The 330-day Section 12 benchmark, treated after Essar Steel (2019) as an ordinary outer limit that may be extended to exceptional circumstances rather than a mandatory ceiling, is exceeded in 68.5 percent of closed cases. For the cases that cross this benchmark, the delay is not marginal: the median excess is 256 days, while the mean excess duration is of 385 days among those that breach. Figure 3 shows the distribution, a mode below the benchmark, a long right tail extending past 2,000 days, and the bulk of the mass to the right of the 330-day line.

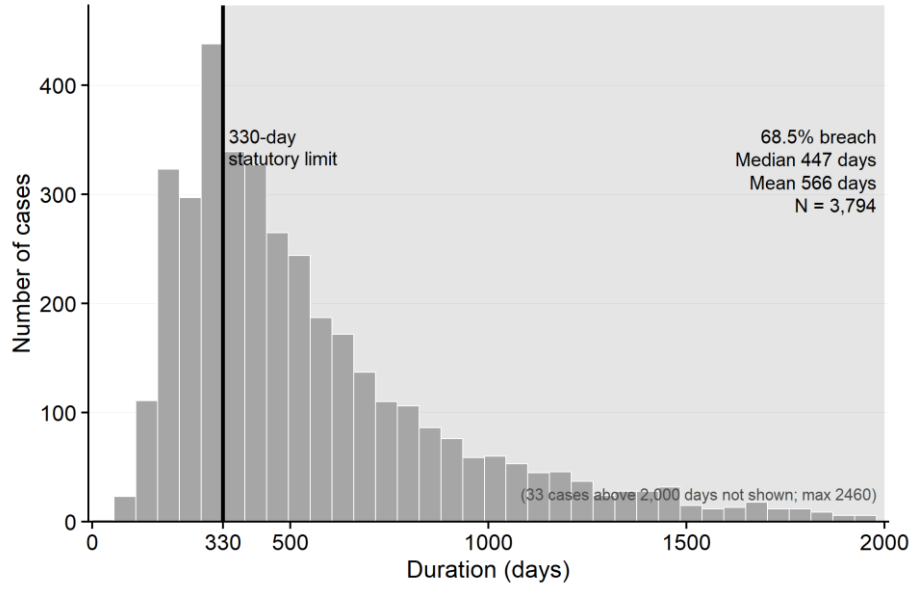


Figure 3. CIRP duration distribution with 330-day statutory benchmark (N = 3,794, median 447 days, mean 566 days). 68.5 percent of closed cases breach the benchmark. 33 cases above 2,000 days (maximum 2,460) are excluded for display.

Table 5 reports the duration analysis. Panel A regresses log duration on case characteristics. Resolution cases run approximately 40 percent longer than liquidation in the conditional mean (the outcome indicator coefficient is +0.336, so exp(0.336) -1 ≈ 0.40), and larger admitted claims lengthen duration modestly (0.035 per log-unit, p<0.01). Panel B regresses the 330-day exceedance indicator on the same regressors and confirm the pattern on the extensive margin, resolution raises the exceedance probability by +22.4 percentage points in the linear-probability specification (+1.313 in logit), the section 7 trigger by +0.641 (p < 0.01), and admitted claim size by +0.102 (p<0.01).

Table 5. Process duration and statutory benchmark

Regressor	Panel A: ln(duration)	Panel B: exceedance (logit)	Panel B: exceedance (linear prob.)
ln(admitted claims)	+0.035*** (0.010)	+0.102*** (0.027)	+0.020*** (0.005)
Financial creditor share	+0.048 (0.042)	+0.125 (0.183)	+0.030 (0.037)
Section 7 indicator	+0.122** (0.051)	+0.641*** (0.211)	+0.136*** (0.046)
Section 9 indicator	+0.172*** (0.052)	+0.626** (0.252)	+0.136** (0.053)
Resolution Outcome indicator	+0.336*** (0.020)	+1.313*** (0.109)	+0.224*** (0.016)
Bench FE	Yes	Yes	Yes
N	3,794	3,794	3,794

Notes: Panel A: log of process duration on case characteristics with bench fixed effects. Panel B: indicator for exceedance of the 330-day benchmark on the same regressors, logit and linear probability. SEs cluster at tribunal bench level. Significance: *** p < 0.01, ** p <0.05, * < 0.10.

That admitted claim size lengthens duration, raises exceedance probability, and compresses recovery locates all three frictions on the same dimension of case size. Duration does not appear as an independent inefficiency but concentrates in the same large, complex cases that exhibit the size recovery friction.

4.4 Bench heterogeneity

NCLT benches differ systematically in resolution probability after controlling for case characteristics. Table 6 provides the resolution probability logit with bench fixed effects and HC3 standard errors. The joint test for bench effects rejects the null hypothesis at p < 0.001 (with a likelihood ratio statistic of 49.91 and 14 degrees of freedom). Chennai bench is the key finding of the analysis. Its coefficient relative to Mumbai is -0.542 (HC3 SE 0.144, p < 0.001), implying a marginal effect of approximately -10 percentage points of resolution probability after covariate adjustment. Chennai is the only bench among the 14 with a statistically significant negative deviation. The smaller positive deviations at Allahabad, Jaipur, Guwahati, and Chandigarh exhibit huge confidence reflecting smaller sample size.

Table 6. Tribunal composition and resolution probability

Variable	Coefficient (HC3 SE)
ln(admitted claims)	+0.191*** (0.017)
Financial creditor share	-0.176 (0.126)
Section 7 indicator	+0.566*** (0.145)
Section 9 indicator	+0.294* (0.151)
Bench: Allahabad	+0.516 (0.257)
Bench: Amaravati	+0.018 (0.330)
Bench: Bengaluru	-0.120 (0.223)
Bench: Chandigarh	+0.414** (0.189)
Bench: Chennai	-0.542*** (0.144)

Bench: Cuttack	+0.365 (0.383)
Bench: Guwahati	+0.744** (0.367)
Bench: Hyderabad	+0.229 (0.145)
Bench: Jaipur	+0.603** (0.288)
Bench: Kochi	+0.062 (0.342)
Bench: Kolkata	+0.115 (0.127)
Bench: New Delhi	+0.214 (0.112)
Bench: Indore	+0.592 (0.511)
Cases	**3,794**

Notes: logit model of resolution probability estimated with bench fixed effects and HC3 standard errors. Mumbai serves as the omitted reference. The Indore bench (N = 19) is pooled into the other. The bench fixed efects joint test is significant at $p < 0.001$ (LR = 49.91, df = 14). Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

5. Implications and Conclusion

5.1 The Opportunity cost of delays

The 68.5 percent exceedance rate can be interpreted directly as an opportunity cost. Claims that remain locked beyond the statutory benchmark reflects the returns forgon by while the resolution is still pending. Across the 2,600 benchmark exceeding cases, the admitted claims total is recorded at Rs 19.5 lakh crore (USD 230 billion at the FY2025 rate of 85/USD). Further, weighting each case by its excess days over the 330-day limit and dividing by 365.25 provides us with 3.85 million crore years of benchmark exceedance exposure. Applying the FY2025 ten year Government of India bond yield of 6.94 percent, the cumulative exposure over the FY2018-FY2025 window is approximately Rs 2.66 lakh crore, USD 31.3 billion, or roughly USD 3.9 billion per year. The estimate varies with the discount rate; specifically it is Rs 3.44 lakh crore (USD 40.5 billion) at the FY2025 SBI one year MCLR of 9.00 percent, and Rs 4.59 lakh crore (USD 53.9 billion) on a 12 percent weighted average cost of capital (WACC) proxy.

These figures are indicative and not structural welfare estimates. They comes from inflation, from default risk premia on the alternative investment, and from equilibrium effects on creditors' marginal cost of capital. They also discount at the risk free rate, which understates the true cost, Almeida and Philippon (2007) show that distress costs rise substantially once systematic risk premia are incorporated to 4.5 percent of pre-distress firm value for a BBB rated firm under risk adjusted probabilities, against 1.4 percent under historical probabilities. Computed without that adjustment, our figures are conservative.

The headline is not the level but the comparison. The cumulative opportunity cost of delay (Rs 2.66 lakh crore) is roughly 2.75 times the cumulative distributional shortfall we compute. We emphasise that this is a comparison of rankings, not of magnitudes, our reduced form opportunity cost calculation is not the same object as a structural welfare decomposition, and the two figures are not directly comparable in levels. What survives the difference in method is the ordering. (Dou et al., 2021) reach the same ordering for US Chapter 11 through a structural model, finding excess delay, not excess liquidation or excess continuation, the dominant source of inefficiency. That two bankruptcy regimes as different as India's IBC and US Chapter 11 place delay above distributional inefficiency, by methods as different as a structural decomposition and a reduced form opportunity cost calculation, suggests that delay is a structural feature of time bound creditor driven insolvency rather than an artefact of either jurisdiction or either method.

5.2 Distributional Shortfall in large claim cases

The sub-unit elasticity implies that creditors of larger claim pools recover proportionally less than under proportional scaling. Anchoring a counterfactual at $\beta = 1$, with the geometric-mean case held at its observed recovery, total realised recoveries across the 1,157 cases in the log recoveries specification would have been approximately Rs 96,606 crore higher than observed, equivalent to USD 11.4 billion. The shortfall is heavily concentrated. The 45 cases with the admitted claims above Rs 5,000 crore account for Rs 74,141 crore, 77 percent of the total, at a per case mean of approx. Rs 1,648 crore, the remaining 1,112 cases average roughly Rs 20 crore each. The largest four percent of resolution cases therefore account for more than three quarters of the dual size shortfall.

This concentration is what the asset specificity framework predicts, and the identity of the large cases provides important insights, the steel plants of Essar and Bhushan, the housing finance loan book of Dewan Housing Finance, the non-banking financial company assets of Reliance Capital, and the thermal power and infrastructure assets of Lanco and Jaypee are exactly the kind of assests that attract fewer bidders and face the biggesr pressure in bargaining. However, the same cases are also complicated which means they invloves greater creditor groups, longer appellate histories, and frequent business group affiliation, all of which may affect recovery through channels other than asset pricing (Bertrand et al., 2002). We cannot identify on our data whether the concentration is driven by asset specificity, case complexity, business group dynamics, regulatory exposure for systemically important debtors, or some combination. What the data establish is the concentration itself, the dual size shortfall is overwhelmingly a large case phenomenon.

5.3 Limitations and policy implications

Several limitations qualify these results. Tribunal cases are not randomly assigned, and the two quasi experiments in the sample window, the March 2020 Section 9 threshold change and Section 10A suspension overlap with COVID-era shocks and yield no clean exogenous variation. Closure selection is a further concern, roughly 2,000 admitted cases remained under proceedings, withdrawal, or appeal at the cutoff, and Manski bounds place the population resolution rate between 20.3 and 53.7 percent against a closed sample rate of 30.6 percent, so the within-sample sample associations should not be read as population parameters. Admitted claim size is also a multi channel proxy, it bundles firm size, leverage, creditor coordination cost, business group affiliation, and regulatory exposure with the asset specificity that motivates our framework, and separating these channels using industry, tangibility, business group, and case complexity covariates is the natural next step on the present case level extract, Finally, we observe outcomes only at closure, whether resolved firms survive operationally, a substantively distinct question (Gilson, 1997; Hotchkiss, 1995), is a follow on study for which the roughly 244 firms with at least one post resolution balance sheet observation, declining to 130 with three or more years provide a starting sample.

These patterns carry policy implications, though at the level of stylised facts rather than identified effects. The pervasiveness of delay a 68.5 percent exceedance rate and roughly USD 3.9 billion in annual opportunity cost exposure indicates that the IBC's time bound architecture is not operating as designed, and the concentration of the distributional shortfall in 45 large cases sharpens the case for a specialised pathway for the largest debtor rather than uniform capacity expansion. A small, identifiable set of complex debtors accounts for most of the value at stake, so targeted procedural capacity would address a disproportionate share of the problem. The bench level capacity differences are economically meaningful, the Chennai bench's negative deviation from Mumbai survives controls for case composition but their proximate channels, whether member composition, caseload, or procedure, cannot be resolved without NCLT member level data, which leaves the design of any bench level intervention contingent on data the regulator holds but does not currently release.

5.4 Conclusion

This paper provides the first case level account of how India's Insolvency and Bankruptcy Code 2016 among the largest corporate bankruptcy regimes in the world by case volume performs against the benchmarks the global literature established. The picture is one of a regime whose selection works while its execution lags, larger and more complex cases reach reorganisation, as economic merit would dictate, but they recover proportionally less and conclude more slowly than a statute envisions. Selection and execution pull on the same lever. The cae characteristics that route a firm toward rescue are the ones that make rescue slow and shallow.

The central result is that value is lost mainly through value, rather than through misallocation. The opportunity cost of the regime's chronic exceedance of its own statutory clock is far larger than the distrubutional shortfall by a large margin and India shares this ranking with US chapter 11 despite institutions that could hardly be more distant. That convergence is the paper's most significant and portable finding, it suggests that the delay is not unique to Indian experience, but forms a deeper feature of time bound, creditor driven insolvency systems, and that the design problem regulators face is less about getting the selection process is about prioritizing process accuracy over speed traps. Several questions remains open, including why benches differ, whether a dedicated track for the largest debtors would help, whether rescued firms endure. These are questions the present evidence raises but cannot settle. What it settles is the shape of the regime's first cohort, in enough detail to make those questions answerable.

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