sciendo

Research Article • DOI: 10.2478/law-2022-0003 LAW • 2 • 2022 • 20–34

Law and Business

On the Effectiveness of Insolvency and Bankruptcy Code, 2016: Empirical Evidence From India

Abhirami A[1], Rahul T[2]

[1]Department of Economics, University of Kerala, Thiruvananthapuram, Kerala, India; [2]Department of Statistics and Information Management, Reserve Bank of India, Thiruvananthapuram, Kerala, India

Abstract

The Indian insolvency regime has undergone a historic change with the introduction of the Insolvency and Bankruptcy Code, 2016. This paper empirically analyses the effectiveness of the Code in the Indian economy. The paper also studies the insolvency frameworks that existed in India, the distinguishing features, and the legal framework of the Code. The analysis of the current status of the Indian insolvency regime with time series and cross-sectional data clarifies the non-performing assets trajectory, recovery rates, and time required under different recovery mechanisms, a summary of cases under the new Code and the status of India in the international insolvency systems. The empirical evidence of this study suggests that the Code is an improvement over its predecessors in terms of recovery rates, resolution of non-performing assets, and resolution costs. The Code should be subjected to necessary improvements to evolve and become a foolproof mechanism. Suggestions to that effect are offered in the final section.

Keywords

bankruptcy • insolvency • IBC 2016 • India • liquidation • non-performing assets

Introduction

The introduction of the Insolvency and Bankruptcy Code (IBC) of 2016 was a landmark event in the Indian economy that consolidated the archaic insolvency laws and provided unified single legislation that extensively deals with the insolvency regime in India. The historical significance of the insolvency systems starts in the British era, but ancient Indian manuscripts point toward the existence of the debt recovery mechanisms from 200 BC involving religious aspects (Das et al. 2020). Before the introduction of IBC, there existed a wide spectrum of insolvency regulations summarised as the Government Regulations and the Reserve Bank of India (RBI) Regulations, most of which were suspended after the introduction of IBC. The IBC has reformed the insolvency mechanisms in India by introducing a whole set of insolvency conductors, such as the Insolvency and Bankruptcy Board of India (IBBI), Insolvency Professionals, Insolvency Professional Agencies, and Information Utilities through the institutional framework mentioned in the legislation.

The Code has been in existence for five years, and we have seen that there have been some hits and misses. It is important to focus on the gaps and strengthen the ecosystem. Some of the pain areas that have emerged from the research have thrown light on the need for more options for restructuring. Interestingly, delayed timelines have been the biggest roadblock to the realisation of promises into delivery for the Code. These pain areas are discussed in the subsequent part of this paper.

The objective of the paper is to specify the predecessors to the IBC 2016. The comparison with the previous legislation is imperative to understand how far the legislative framing process in India has come. The question of how the IBC benefits different stakeholders addresses how and what should be done for the improvement of the situations of the stakeholders under the regime. The effectiveness of the Code in solving the crisis of mounting non-performing assets (NPA) in the Indian banking system also forms a research question. The analysis of the current status of the Indian economy with time series and cross-sectional data helps in understanding the NPA trajectory, recovery rates and time required under different recovery mechanisms, a summary of cases under IBC and the status of India in the international insolvency systems.

Our study contributes to the literature on insolvency and bankruptcy laws by delivering robust empirical evidence from India on the effectiveness of IBC 2016. Insolvency and bankruptcy is a fruitful field of research that contains different dimensions. A large number of empirical research studies the effectiveness and efficiency of the bankruptcy and insolvency laws from a

†Corresponding author: Rahul T

E-mail: rahult@rbi.org.in

Open Access. © 2022 Abhirami A, Rahul T, published by Sciendo

This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 License.

cross-country perspective. Early on, the discussion by Modigliani and Miller (1958) on the optimal structure of capital, abstract from tax and bankruptcy issues, provoked a considerable amount of research (Warner 1977; Jappelli, Pagano, and Bianco 2005; Zoričák et al. 2020) in the last six decades. The pioneering work of Altman (1968) contributed to the fundamentals for research on predicting bankruptcy. Aghion, Hart, and Moore (1992) reviewed the bankruptcy procedures used in practice worldwide and proposed a new procedure from the perspective of the United Kingdom. The globalisation of the world economy motivates research for exploring the efficiency of insolvency and bankruptcy laws across countries (Franks, Nyborg, and Torous 1996; Claessens and Klapper 2005; Djankov et al. 2008; Succurro 2012; Arltová et al. 2016; Neira 2019; Stef and Dimelis 2020; Gopalakrishnan and Mohapatra 2020) and domestic settings (Chemin 2009a, 2009b; Visaria 2009; Araujo, Ferreira, and Funchal 2012; Camacho-Miñano, Pascual-Ezama, and Urquía-Grande 2013; Ponticelli and Alencar 2016; Staszkiewicz and Morawska 2019; Alarifi 2021).

However, the analysis of the impact and effectiveness of IBC in India has hitherto received much less attention. Branch and Khizer (2016) discuss the implications of various bankruptcy reforms that have been implemented in India and observe how these reforms moulded the Indian bankruptcy system into its current form. Gupta (2018) examines the contemporary debate surrounding the system of credit delivery and availability in India in light of the changes brought about by IBC 2016. Chatterjee, Shaikh, and Zaveri (2018) presented an empirical analysis of the economic effect of IBC and the performance of the judiciary based on the data of the first six months of insolvency cases under IBC 2016. Das et al. (2020) reviewed the insolvency and bankruptcy reforms in India and discussed the legal perspective on IBC 2016 in detail. Prasad, Gupta, and Mathur (2020) analysed the outcomes of the cases resolved under IBC of India to examine the treatment of admitted claims for operational and financial creditors. Das (2020) explored the challenges and opportunities regarding the cross-border system in the IBC, including a critical analysis of the Insolvency Law Committee's (ILC) recommendations. Handa (2020) analysed Corporate Insolvency Resolution Process (CIRP) as an effective route for acquisitions and identified problems that are relevant from an acquisition perspective, with the objective of strengthening and stimulating successful acquisitions and investments in the Indian economy. Bose, Filomeni, and Mallick (2021) examined the effects of a unique bankruptcy resolution mechanism in the context of the distressed corporate debt market in India. Singh and Thakkar (2021) developed a model to examine the dynamics of settlement and resolution under the IBC process in the aftermath of COVID-19. In this context, our study is of particular relevance for policymakers to evaluate the effectiveness of the reforms brought over by the new insolvency and bankruptcy law being operational in India since 28 May 2016, which makes the present study different from the cited literature on IBC.

The rest of the paper is organised as follows. Section 2 provides the background of the insolvency regimes in India. In section 3, we provide the detailed features of the new IBC reform. Section 4 briefly describes the impact of IBC on corporate governance, business practices and capital market. In section 5, we present the empirical results on the effectiveness of IBC 2016 and its impact on the recovery of NPAs in the Indian economy. Section 6 concludes with a summary of the findings and recommendations.

Insolvency and Bankruptcy Reforms in India

The legislations pertaining to insolvency are considered to be the most important as insolvency legislations involves the economical strengthening of a nation by assisting those entities which show potential to stay in business and by paving the way for a clean exit for those which cannot be revived. The Indian insolvency regime had been undergoing numerous repeals and amendments and was provided for by different legislation when it finally came to the unified insolvency system – the IBC 2016. Though it is widely acknowledged that India owes her insolvency framework to English law, Das et al. (2020), pointing out the absence of insolvency and bankruptcy law regimes before British intervention, argue that many of the modern principles of bankruptcy can be found in *Smriti* traditions of India from around 200 BC. The *Smriti* texts emphasise the legal as well as the moral duty of a person to pay his debts, as well as the ways in which a debt can be recovered, and specify eternal damnation as the punishment for non-repayment. The system of debt resolution was, thus, complex and intertwined with ardent religious beliefs in ancient India.

In the British era, the earliest insolvency legislation can be traced to sections 23 and 24 of the Government of India Act 1800. The starting point of special insolvency legislation in India was the passing of statute 9. The Indian Insolvency Act of 1848 was followed within the Presidency towns until the enactment of the Presidency Towns Insolvency Act, 1909. The primary attempt to introduce insolvency law in the mofussil was made through the incorporation of rules to the Code of Civil Procedure 1877, which conferred jurisdiction regarding insolvency matters to district courts. These rules were re-enacted with certain

modifications in the Code of Civil Procedure, 1882. The defects of the Code were removed by the Provincial Insolvency Act of 1907 and were repealed by the Provincial Insolvency Act of 1920.

The policy changes introduced by the Government are the result of the suggestions put forth by various committees. In the post-freedom period, the urgency arose to revise the Company Law for which the Bhabha committee was set up, leading to the amendment act of 1956. Section 425 of the act provided a base framework for dissolution, but it was not measurable to corporate insolvency procedures. To address Industrial Sickness, the Tandon Committee was appointed in 1975 by the RBI, and the committee put forward the idea of a new information system. The 1976 H. N. Ray committee suggested a merger mechanism for reviving sick industrial units. The Tiwari Committee of 1981 suggested the need for special legislation and the setting up of an exclusive quasi-judicial body to deal with the problem of industrial sickness. Thus, the Sick Industrial Companies Act (SICA) came into existence in 1985, and the Board for Industrial and Financial Reconstruction (BIFR) started functioning in 1987. Following the Liberalisation Privatisation Globalisation (LPG) reforms, the insolvency regime had also undergone transitions that can be divided as (i) the legislation put forth by the Government of India, and (ii) the changes in the course of action initiated by the RBI.

The Narasimham Committee appointed by the Government in 1991 suggested three modes to recover dues, and among them was the proposal for Special Tribunals, which led to the formation of the Recovery of Debts Due to Banks and Financial Institutions (RDDBFI) Act 1993. Debt Recovery Tribunals (DRTs) were established to facilitate debt recovery. The Narasimham Committee 2 in April 1998 submitted a report wherein the standards of asset categorisation, formation of Asset Reconstruction Companies (ARCs), and objectives for banks to reduce their NPAs were discussed. To legalise this report, the Andhyarujina Committee was instituted in 1998. The fruit was the Securitisation and Reconstruction of Financial Assets and Enforcement of Securities Interest (SARFAESI) Act 2002. The act paved the way for the formation of ARCs. The DRTs were the Adjudicating Authority (AA).

The RBI evolved its first formal debt restructuring mechanism known as the Corporate Debt Restructuring (CDR) Scheme in 2001, which is a voluntary system supported by debtor-creditor and inter-creditor agreements. The Joint Lender's Forum (JLF) was instituted in 2014, and its procedure is as follows. When an account is reported to the Central Repository of Information on Large Creditors (CRILC) as Special Mention Accounts-2, all lenders should form a lenders' committee JLF and form a corrective action plan. The 5:25 scheme was initiated in 2014, by which the lenders are allowed to fix a longer amortisation period for project loans. The Strategic Debt Restructuring Scheme (SDR) was begun in 2015 as an improvement over the JLF mechanism. Whilst in SDR, the promoters convert the debt into equity holdings and are delinked, and the 2016 Scheme for Sustainable Structuring of Stressed Assets (S4A) allows the promoters to continue in the management through the conversion of stressed assets into equity or debentures. Per the RBI circular on 7 June 2019, named the 'Prudential Framework for Resolution of Stressed Assets', most of the above-mentioned schemes were withdrawn.

For the insolvency regime, uniform legislation was a necessity, paving the way for the formation of the IBC 2016. According to the budget announcement of 2014–15, the Bankruptcy Law Reforms Committee (BLRC) was set up under Shri. T. K. Viswanathan on 22 August 2014 to study the corporate bankruptcy legal framework. The committee recommended a consolidation of the existing legal framework by repealing two laws and amending six laws and proposed to establish the IBBI as the regulator to maintain oversight over insolvency resolution in the country. The Code points out the procedure of insolvency for companies and individuals, the proceedings of which are managed by a resolution professional. The 2016 Code has the significant feature of the speed in insolvency proceedings, with a time limit of 180 days. The Committee proposed two tribunals to adjudicate grievances under the law, namely, the National Company Law Tribunal (NCLT) and the Debt Recovery Tribunal (DRT). The former has jurisdiction over insolvency resolution and liquidation of companies and limited liability partnerships, and the latter has jurisdiction over insolvency and bankruptcy resolution of individuals.

Insolvency and Bankruptcy Code, 2016

The IBC 2016 is a comprehensive compilation of laws, rules, and regulations about the subject of bankruptcy law in India. The Code is termed 'the umbrella legislation' under which all the insolvency legal frameworks of the nation compile. It was formed after an elaborate understanding and reconsiderations of previous laws that governed the insolvency proceedings of the land. The IBC 2016 is one of the biggest economic reforms, which provides uniform and comprehensive insolvency legislation. The objective of the Code is to consolidate and amend the laws relating to reorganisation and insolvency resolution of corporate persons, partnership firms, and individuals in a time-bound manner.

A core objective of IBC 2016 is to balance the interest of the stakeholders involved in the transaction. The IBC framework engages six categories of stakeholders, namely, creditors, debtors, banks, ARCs, the bond market, and the economy. With respect to the corporate insolvency system, it induces the need for the choice of the procedure of insolvency, keeping the primary stakeholders' interests as the prime motive. Since a corporation has funding from equity and debt resources, shareholders and creditors are the primary stakeholders. Corporate insolvency is initiated when the corporate defaults or when the equity owners become inefficient. It may be done through either Corporate Insolvency Resolution Process (CIRP) or liquidation, and the Code aims to maximise the value by striking a balance between the two. As the resolution process involves the maximisation of the value of assets and simultaneously benefits both stakeholders, if both procedures are weighed, the CIRP would be chosen.

The IBBI, which was established on 1 October 2016, is the regulator of the Code that has oversight over the insolvency intermediaries, namely Insolvency Professionals, Insolvency Professional Agencies, Insolvency Professional Entities, and Information Utilities. The IBBI is the authority that writes and enforces rules for processes under the Code. One of the core objectives of the Code was to separate the commercial and legal aspects of the process, and to this end, AA were set up to handle the legal aspects. Under section 5(1) of the Code, the AA for insolvency resolution and liquidation for corporate persons, i.e. companies and limited liability partnerships, is the NCLT. Similarly, in the case of individuals and partnership firms, section 79(1) of the Code provides that the AA for insolvency resolution and bankruptcy for individuals and partnership firms is the DRT. The IBBI has framed the IBBI (Insolvency Professional) Regulations, 2016, to regulate the working of Insolvency Professionals. The Insolvency Professionals act as intermediaries in the insolvency resolution process. Insolvency Professional Agencies (IPA) are those institutions that regulate Insolvency Professionals. To facilitate swift decision-making, the Information Utilities are set up to collect, collate, authenticate, and disseminate financial information of the debtors. National e-Governance Services Limited (NeSL) is the only registered Information Utility in the country.

The legal framework under the Code is divided into 5 parts with 255 sections: I. Preliminary, II. Insolvency Resolution and Liquidation for Corporate Persons, III. Insolvency Resolution and Bankruptcy for Individual and Partnership Firms, IV. Regulation of Insolvency Professionals, Agencies and Information Utilities, and V. Miscellaneous. Part I is an introductory part that involves basic features of the Code, such as title, extent, date of commencement, geographical, and legal applicability. Part II contains sections 4 to 77 in seven chapters elaborating on the process related to corporate persons. That part identifies two independent stages: CIRP and liquidation. Under the CIRP, a resolution process is drawn per the assessment of the viability of the debtor's business by the financial creditors, and if and when the CIRP fails, the debtor's business undergoes the Liquidation process. Part III of the Code, over sections 78 to 187, aims to consolidate laws relating to the liquidation and insolvency of corporate persons, partnership firms and individuals in India. The concerned parties may call for bankruptcy, which gives debt relief, or opt for a fresh start if the debtor owes a relatively low amount of money and has little or no income or assets to repay the debts. Part IV of the Code oversees the regulation of insolvency intermediaries, from section 188 to section 223. For insolvency resolution, liquidation, and bankruptcy of persons under the Code, a fund called the Insolvency and Bankruptcy Fund is instituted under sections 223 to 255 of Part V (IBC 2016). The board prepares a Budget and Annual Report yearly and also publishes quarterly reports of its functioning.

The Code had undergone a lot of improvements over time through various amendments, which were recorded yearly. The major developments are listed here: (a) one is the inclusion of section 29A, which identifies a set of persons who are not eligible for being a resolution applicant; (b) the Resolution Professional is given the power to distinguish the goods and services which will not be terminated during the moratorium period; (c) the government of India recently brought in force the provisions relating to insolvency and bankruptcy of financial service providers, and (d) the IBC (Amendment) Act 2019 increased the duration of the insolvency procedure from 180 days (which is extendable up to 270 days) to a maximum of 330 days (extendable up to 420 days).

The impact of COVID-19 has been incorporated into the IBC, and the following measures were undertaken. The Government increased the default threshold amount for initiating insolvency proceedings from Rupees (Rs.) 1 lakh to Rs. 1 crore at the end of March 2020, and the Insolvency and Bankruptcy (Amendment) Ordinance of 2020 inserted section 10A to suspend initiation of the CIRP of a corporate debtor under sections 7, 9, and 10 for any default arising on or after 25 March, 2020. Initially, the latter measure was to be in effect for six months but was further extended to 31 March 2021. Furthermore, various measures were undertaken by the judiciary and the regulator, including the Honourable Supreme Court of India, NCLT, and IBBI, wherein they noted that the lockdown period may not be counted for the purpose of a timeline for any activity that could not be completed due to lockdown.

Impact of IBC on Corporate Governance, Business Practices, and Capital Market

IBC has significantly transformed the corporate governance landscape by emphasising the role of creditors as that of a stakeholder. The IBC has put in place strong measures to prevent directors and promoters from taking loans or alienating assets at the first signs of stress. The IBC incorporates the concept of the twilight period, i.e. a look back at two years preceding the commencement of CIRP to prevent directors being resolution applicants if they did not take necessary actions or had conducted fraudulent activities in the event of foreseeing an upcoming loss. The IBC also imposes civil and criminal liabilities for the erring directors of the company and has barred the promoters from being resolution applicants.

The relevance of the IBC to business practices starts from the shift of power from the borrowers to the creditors, which has brought about discipline in borrowing practices. Corporates are being asked to bring in more equity and to show their sources. RBI stated that the purpose of bank loans has to be strictly met and monitored by the lenders. If a promoter diverts the funds granted to him, this is seen as wilful default, which may result in the promoters not getting loans in the future. Thus, the promoters are willing to pay off debts before going into the mechanism. The IBC played a significant role in bringing about behavioural change in the creditors, too. The circular by the RBI on the Prudential Framework for Resolution of Stressed Assets makes it mandatory for lenders to recognise incipient signs of stress in loan accounts immediately on default by classifying such assets as Special Mention Accounts (SMAs) (RBI 2019). Owing to the implementation of such stringent measures of the IBC, the borrowers are now more careful in maintaining their accounts, and the creditors are now more cooperative, thanks to the framework of the Committee of Creditors (CoC).

The increase in the recovery rates has increased investor confidence in capital markets. A recent study using the World Bank's Doing Business data showed that lack of insolvency resolution is one of the main drivers behind 'missing' corporate bond markets. There is a positive correlation between the recovery rate, recovery timeline, and corporate bonds-to-GDP ratio. However, it is estimated that it takes 5 to 10 years for the effect of bankruptcy laws to be reflected in the bond market. The pre-IBC five-year average of India's corporate bonds-to-GDP ratio in 2016 was 17.9% (CRISIL 2019) and the same is 18.3% as of the end of March 2021. The details of the impact of the IBC on the bond market in India over five years are yet to be seen.

Effectiveness of the IBC 2016: Empirical Analysis

The resolution of stressed assets requires a coordinated approach of the government, the Central Bank, and the lending bank itself. In 2016, with this objective, the IBC was enacted, which seeks to achieve the resolution of distressed corporate debtors. This section empirically examines the effectiveness of IBC in meeting the objectives of the Code. Studies indicate that effective insolvency reforms are associated with a lower cost and lesser resolution time, improved creditor recovery, and the promotion of entrepreneurship for businesses, especially small enterprises. The analyses presented in this section are based on the publicly available data from the website of IBBI (www.ibbi.gov.in) and the Database on Indian Economy by RBI (https://dbie.rbi.org.in). The following discussion sheds light on the way the Code is meeting these objectives and includes the impact this law is having while working towards the stated objectives.

Summary of Cases Admitted Under IBC 2016

Since the inception of the Code, a total of 4,946 applications have been admitted as on 31 December 2021. Of these, 3,247 have been closed. Of the CIRPs closed, 714 cases have been closed on appeal or review or settled; 562 have been withdrawn after the commencement of the CIRP; 1,514 have ended in orders for liquidation, indicating that almost 50% have ended up in liquidation; and 457 have ended in approval of resolution plans which is categorised in Table 1 (IBBI 2021).

The data may provide a misinterpretation of the Code concerning liquidation. The high rate of liquidation arises from the fact that a large share of the cases undergoing the procedure had been brought in from the Board for Industrial and Financial Reconstruction (BIFR) regime, with most of the net worth being eroded by the time they entered CIRP. The ongoing CIRPs stand at 1,699 as per the latest available data. The consolidated trend in the CIRPs concerning admission, closure, and ongoing cases is shown in Figure 1.

The distribution of stakeholder initiation of CIRP is presented in Figure 2. The data indicate that there was a huge rise in direct stakeholders (meaning creditors and debtors) approaching the IBC mechanism for insolvency procedure. From a total of just 37 CIRPs in March 2017, the number recently reached a total of 4,946 accumulated CIRPs, on 31 December 2021. From IBBI (2021), as of the end of December 2021, operational creditors triggered 51.13% of the CIRPs, followed by about 42.72% by financial creditors, and the remaining were initiated by the corporate debtors. However, about 80% of CIRPs having an

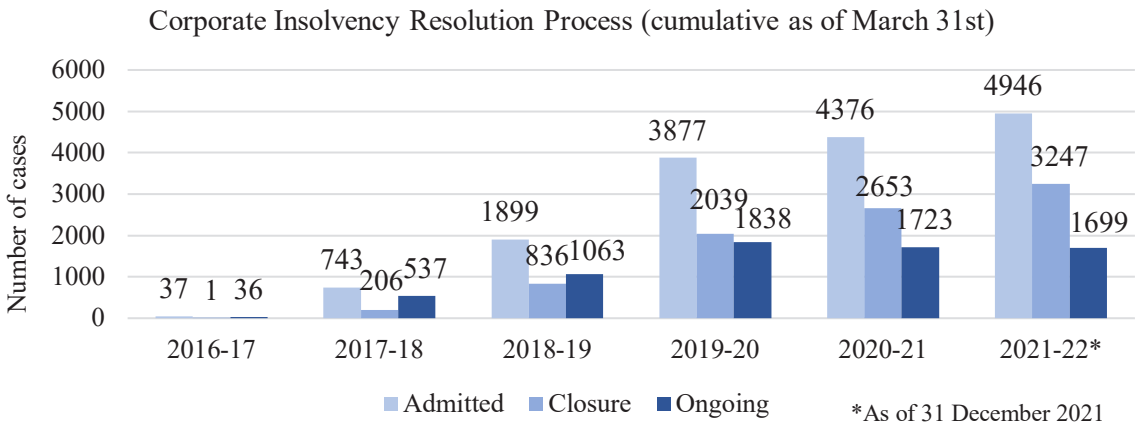


Figure 1. Trend in Corporate Insolvency Resolution Process.

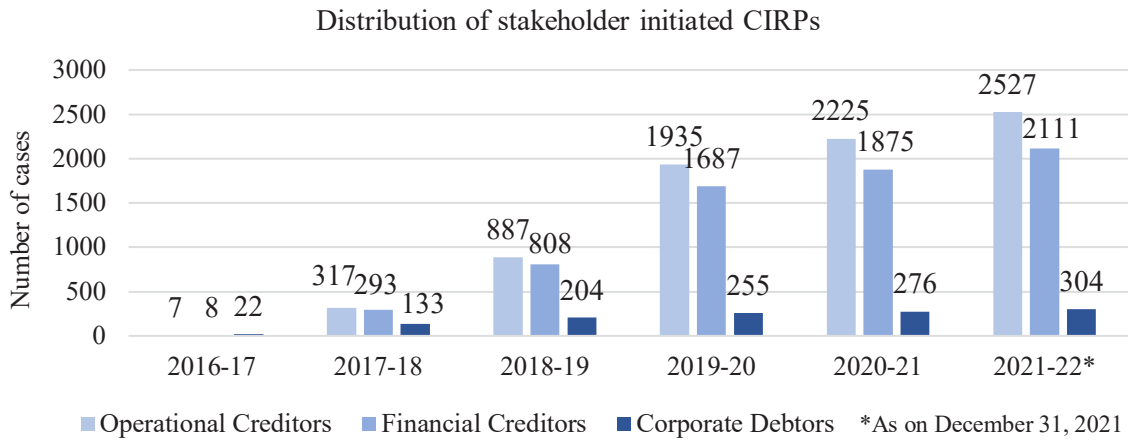


Figure 2. Distribution of stakeholder initiated CIRPs.

Table 1. Status of CIRPs since its inception (as of 31 December 2021).

Status of CIRPs	No. of CIRPs
Admitted	4,946
Closed on Appeal / Review / Settled	714
Closed by withdrawal under section 12A	562
Closed by resolution	457
Closed by liquidation	1,514
Ongoing CIRP	1,699
Timeline of ongoing CIRPs	
> 270 days	1,241
> 180 days ≤ 270 days	114
> 90 days ≤ 180 days	161
≤ 90 days	183

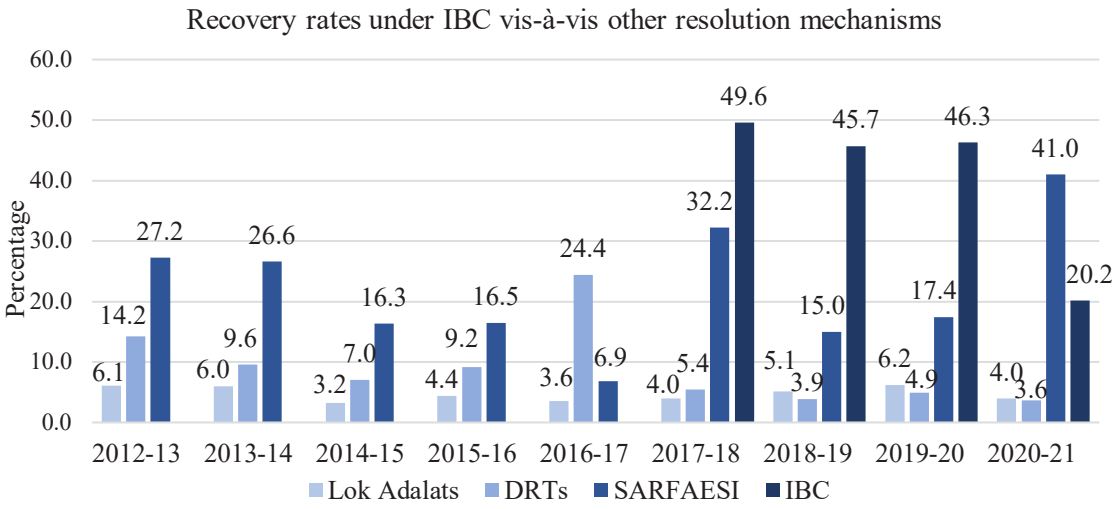


Figure 3. Recovery rates of different resolution mechanisms.

underlying default of less than Rs. 1 crore were initiated on applications by operational creditors, and about 80% of CIRPs having an underlying default of more than Rs. 10 crores were initiated on applications by financial creditors. The share of CIRPs initiated by corporate debtors is declining over time owing to the stringent measures imposed by the Code on account of the attempt by corporate debtors to evade the law.

Recovery Rates Under IBC vis-à-vis Other Resolution Mechanisms

Recovery rates from a corporate or individual resolution process in India were, as reported by the BLRC, among the lowest in the world, with lenders recovering only 20% of the value of debt on a Net Present Value basis. There had been a shortfall of the recovery rates during the 2010s, resulting from the global financial crisis and the inefficacy of the methods, under the then-followed mechanisms of Lok Adalat, SARFAESI, and DRT as compared with the previous decade, which reflected the dire need for an effective solvency system on Indian ground. The IBC remained the dominant mode of recovery, under which recovery is incidental to the rescue of companies. However, the SARFAESI channel also emerged as a major mode of recovery in terms of the amount recovered as well as the recovery rate. With the applicability of the SARFAESI Act extended to cooperative banks, recovery through this channel is expected to gain further traction. The suspension of fresh initiation of insolvency proceedings with respect to defaults arising during one year commencing 25 March 2020, to shield companies impacted by COVID-19 has created a sudden dependence on the SARFAESI. Apart from recovery through various resolution mechanisms, banks also clean up balance sheets through the sale of NPAs to ARCs for a quick exit. Figure 3 compares the recovery rates, the amount recovered as a percentage of the amount involved in the resolution process, of different resolution mechanisms. Since 2017–18, IBC has been the dominant mode of recovery in terms of recovery rates except for 2020–21. The recovery rate was above 40% for the IBC from 2017–18 to 2019–20, and in 2020–21, the recovery rate of the IBC declined owing to COVID-19-related measures on resolution mechanisms. A similar result is seen in the work of Gupta and Singh (2020), pointing out that the channel of recovery saw a shift of dependence on IBC from its predecessors in the early years of its inception.

Adherence to IBC Timelines

At the end of December 2021, the average resolution time for the 457 CIRPs that had yielded resolution plans was 441 days. Similarly, the 1,514 CIRPs, which ended up in orders for liquidation, took, on average, 391 days for the conclusion. Furthermore, 292 liquidation processes, which closed by submission of final reports by 31 December 2021, took on average 431 days for closure. Similarly, 546 voluntary liquidation processes, which have closed by submission of final reports, took on average 411 days for closure. In fact, as of 31 December 2021, the outstanding cases under CIRP were 1,699, of which resolution for 1,241 cases (73% of cases) is pending for more than 270 days, which is substantial in number (Figure 4).

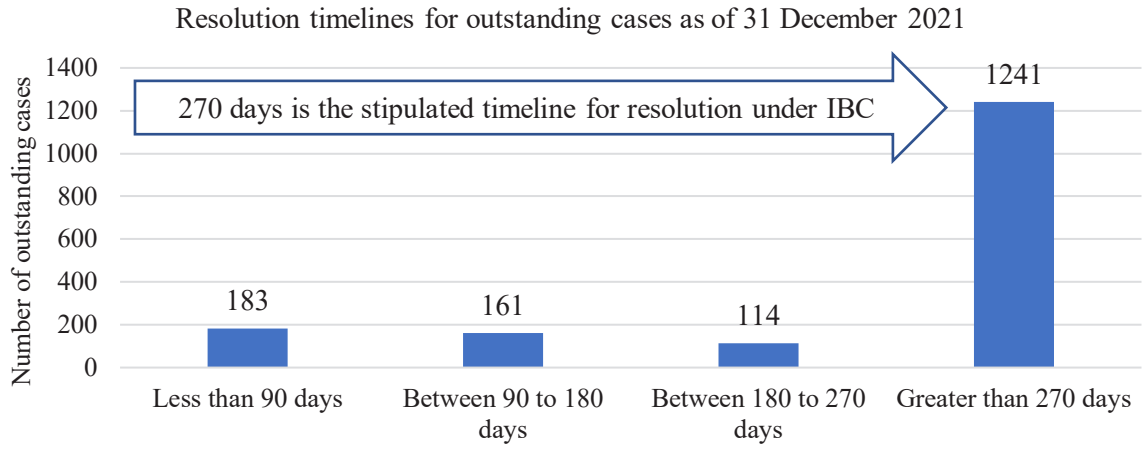


Figure 4. Resolution timelines for outstanding CIRPs.

Resolution Cost

The efficient resolution of insolvency depends on the ability to resolve viable firms and to liquidate the unviable ones at a low cost. Costs of the process can be included upfront or at the end of the process. The IBC has been successful in lowering the total costs of a CIRP compared with the erstwhile regime wherein the total cost was as high as 9% of the estate value of the company as per World Bank's Doing Business Report 2020 (World Bank 2020). The cost of insolvency in the United States is 10% of the estate, the United Kingdom imposes 6% cost, and China 22% in World Bank's Doing Business 2020 rankings. The cost incurred in the insolvency proceedings is important to analyse on the grounds that a costly procedure of insolvency will be less preferred by the initiator. So countries must strive to keep the cost of their proceedings down.

Resolution of NPAs

Asset quality concerns in the Indian banking sector peaked in the past few years with the sharp rise in NPAs. The rapid credit growth from 2005 to 2012, coupled with the absence of strong credit appraisal and monitoring standards, as well as wilful defaults, is responsible for sizeable NPAs in subsequent years. The increase in the sum of this unpaid debt reached its peak in the financial year 2017–18 and has followed a downward path ever since. In the Indian banking system, the public sector banks have more NPAs owing to their liberal credit policies, loose terms, and conditions on loans. The private sector banks with rather rigorous policies on credit reimbursement are approached significantly less on loans and this twin phenomenon causes the share of private sector banks on NPAs lesser than that of the public sector banks. Since the global financial crisis of 2008, there has been a major shift in the lending policy of the foreign banks in India from retail lending to institutional business, and this has been reflected in their lending rate, resulting in comparatively lower NPAs. The small finance banks in India started their operations just in 2016, bringing new blood to the lending institution needing it to take time for the credentials. Table 2 gives the trend in gross NPAs and gross NPAs to gross advances ratio in the Indian banking system.

The gross NPA of scheduled commercial banks (SCBs) in India stood at Rs. 8,998.03 billion as of the end of March 2020, which was further reduced to Rs. 8,377.71 billion as of the end of March 2021. The gross NPA of public sector banks stood at Rs. 6,166.16 billion, private sector banks at Rs. 2,001.41 billion, foreign banks at Rs. 150.44 billion, and small finance banks at 59.71 billion as of end-March 2021 (RBI 2021).

The gross NPA (GNPA) ratio or the GNPAs to gross advances indicates how many of the total advances are not recoverable. Corresponding to the growth in gross NPA, the GNPA ratio saw a booming trend over the years 2016–18 and a subsequent drop, after having risen for consecutive years. With the growth in bank credit, there has also been an increase in NPAs, both in absolute and relative terms, which has been a cause of concern for the Indian banking system. The gross NPA ratio of SCBs stood at 7.3% in March 2021, lower than 8.2% in March 2020, in view of the comprehensive measures taken by the government of India to address the menace of growing NPAs. The growth rate of gross bank credit by SCBs decreased from 6.0% in 2019–20 to 5.4% in 2020–21. Figure 5 depicts gross NPAs as a percentage of gross advances, rate of growth of bank credit and GDP growth since 2015–16.

Table 2. Gross NPAs as a percentage of gross advances in the Indian banking system.

As on 31 March	Gross NPA (in Rs. Billion)	Gross NPAs to Gross Advances Ratio (in %)				
		Scheduled commercial banks	Public sector banks	Private sector banks	Foreign banks	Small finance banks
2010	846.98	2.5	2.3	3.0	4.4	-
2011	979.73	2.4	2.3	2.5	2.6	-
2012	1,429.03	2.9	3.2	2.1	2.8	-
2013	1,940.53	3.2	3.6	1.8	3.0	-
2014	2,633.62	3.8	4.4	1.8	3.9	-
2015	3,233.35	4.3	5.0	2.1	3.2	-
2016	6,119.47	7.5	9.3	2.8	4.2	-
2017	7,917.91	9.3	11.7	4.1	4.0	-
2018	10,396.79	11.2	14.6	4.6	3.8	2.5
2019	9,364.74	9.1	11.6	5.3	3.0	1.8
2020	8,998.03	8.2	10.3	5.5	2.3	1.9
2021	8,377.71	7.3	9.1	4.9	2.4	5.4

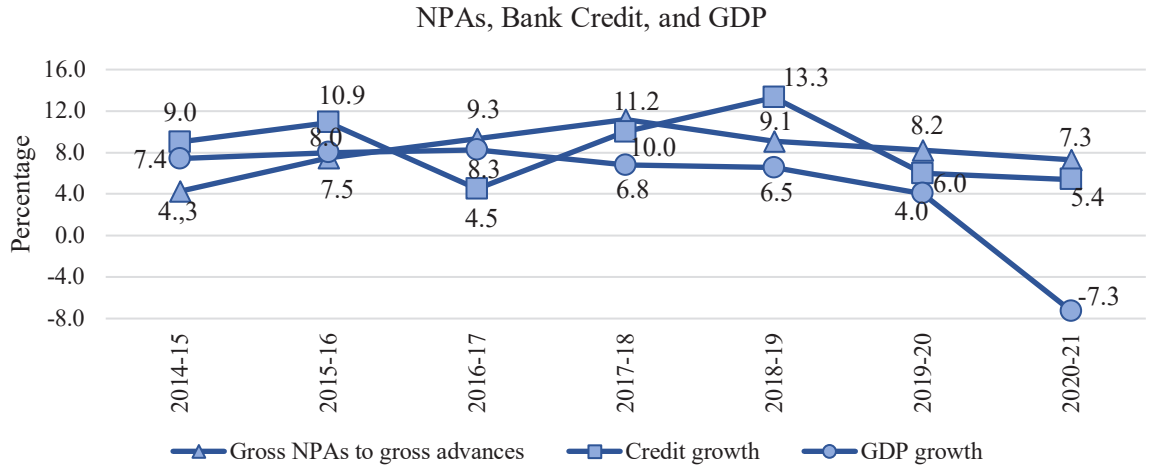


Figure 5. Gross NPAs to gross advances ratio, credit growth, and GDP growth.

Figure 6 gives the chart of gross NPA trajectory evolved with gross NPA ratio. The figure points out the growth of gross NPA up until the year 2018 and subsequent decrease evolved from the embedding of the Code in the Indian economy. The corresponding change in the gross NPA to gross advances ratio also shows the same trend, indicating the efficacy of the Code. Kattadiyil and Islamov (2021), in their analysis of the rate of GNPAs to the total, revealed an identical trajectory of GNPAs in the Indian banking sector as well.

Slippages are fresh accretion to NPAs during a period. Slippage Ratio = Fresh NPAs/Standard Advances at the beginning of the period. The reduction in slippages indicates the reduction of the rate of performing assets to slip into the NPA category. In the year 2019, the decline in gross NPAs and fresh slippages, improved profitability, and restriction on dividend pay-out by banks contributed to the strengthening of the capital position of banks. The slippages are seen to be following a downward trend from 2018, with a sharp decrease to 4.0 in 2019 from 7.6 in 2018. The 2021 data show further contraction to 2.8% from 3.8% in 2020 (Figure 7).

Table 3 gives the NPAs of SCBs recovered through various resolution mechanisms. The data indicate that the amount recovered by SCBs under IBC was the highest since 2018–19 as compared with the recovery under other modes and legislation. The considerable reduction in the number of cases referred to the recovery through DRTs and SARFAESI is, without doubt, due to the lenience of the initiators towards the IBC framework. During 2020–21, all the recovery channels, most notably Lok Adalats,

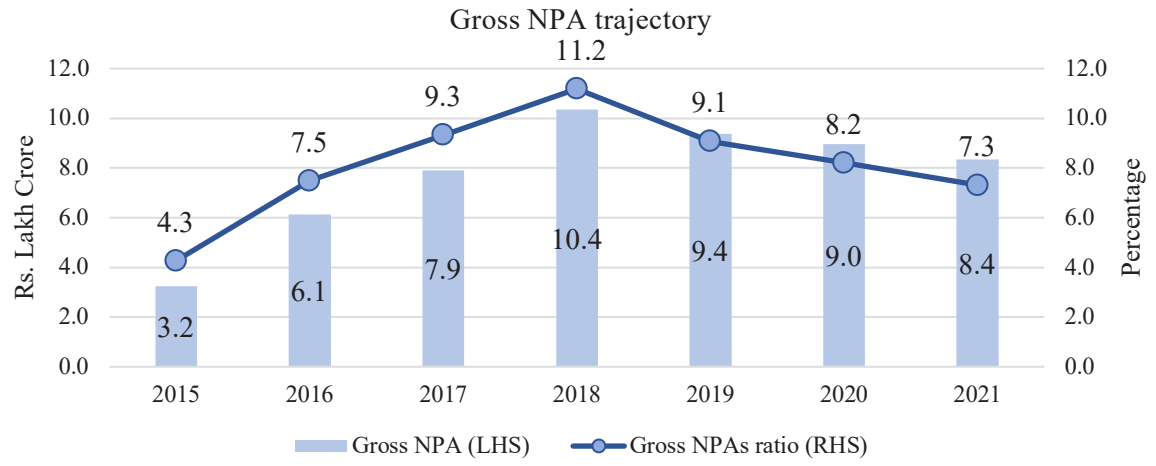


Figure 6. Trajectory of gross NPAs.

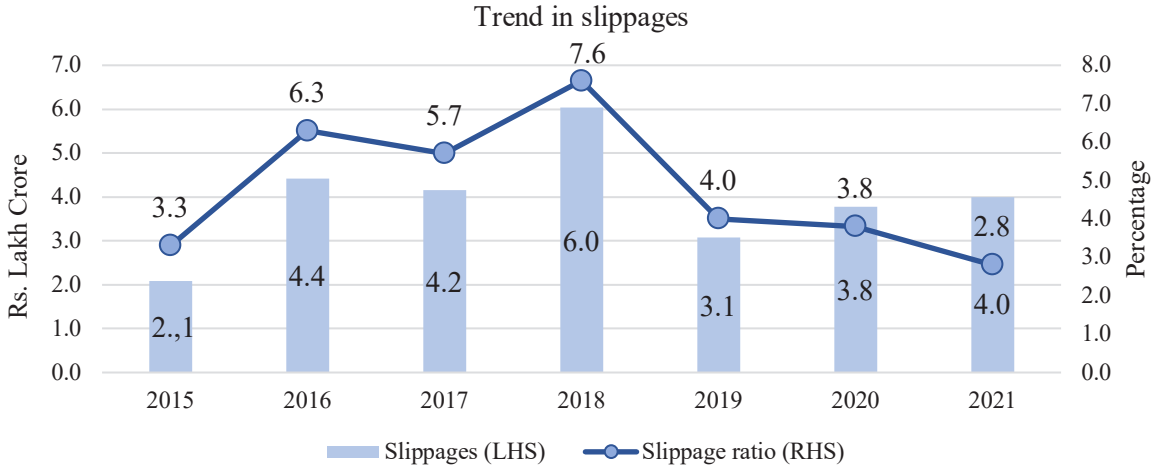


Figure 7. Trend in NPA slippages.

witnessed a sizeable decline in the cases referred for resolution. Even though the initiation of fresh insolvency proceedings under the IBC of India was suspended for a year until March 2021 and COVID-19 related debt was excluded from the definition of default, it constituted one of the major modes of recoveries in terms of the amount recovered. The table depicts that the IBC is helping in the resolution of NPAs and contributing to the decline thereof.

Status of Twelve Large Accounts

RBI identified 12 big accounts constituting 25% of the total of non-performing assets in the country for immediate resolution under the IBC and called them the 'Dirty Dozen'. Since a few cases accounted for a large proportion of money involved in the resolution process, the resolution process of 12 large accounts was initiated by banks, as directed by RBI in June 2017. Of 12 accounts, eight had been closed for resolution, and four are still under process, with two under CIRP and two undergoing liquidations. The detailed status of the largest NPA accounts as of 31 December 2021, is given in Table 4.

Insolvency Scores Pre and Post IBC

World Bank's Doing Business is the ranking system that covers 12 areas of business regulation, such as starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, resolving insolvency, employing workers, and contracting with the

Table 3. NPAs of SCBs recovered through various channels (amounts in Rs. Billion).

Year	Recovery Channel	Lok Adalats	DRTs	SARFAESI Act	IBC	Total
2016–17	No. of cases referred	21,52,895	28,902	80,076	37	22,61,873
	Amount involved	1,057.87	670.89	1,131.00	-	2,859.76
	Amount recovered	38.03	163.93	77.58	-	279.54
	3 as percentage of 2	3.6	24.4	6.9	-	9.8
2017–18	No. of cases referred	33,17,897	29,345	91,330	704	34,39,276
	Amount involved	457.28	1,330.95	818.79	99.29	2,706.31
	Amount recovered	18.11	72.35	263.80	49.26	403.52
	3 as percentage of 2	4.0	5.4	32.2	49.6	14.9
2018–19	No. of cases referred	40,87,555	51,679	2,35,437	1,152	43,75,823
	Amount involved	534.84	2,684.13	2,586.42	1,454.57	7,259.96
	Amount recovered	27.50	105.52	389.05	664.40	1,186.47
	3 as percentage of 2	5.1	3.9	15.0	45.7	16.3
2019–20	No. of cases referred	59,86,790	33,139	1,05,523	1,986	61,27,438
	Amount involved	678.01	2,050.32	1,965.82	2,249.35	6,943.50
	Amount recovered	42.11	99.86	342.83	1,041.17	1,525.97
	3 as percentage of 2	6.2	4.9	17.4	46.3	22.0
2020–21	No. of cases referred	19,49,249	28,182	57,331	537	20,35,299
	Amount involved	280.84	2,253.61	675.10	1,351.39	4,560.94
	Amount recovered	11.19	81.13	276.86	273.11	642.28
	3 as percentage of 2	4.0	3.6	41.0	20.2	14.1

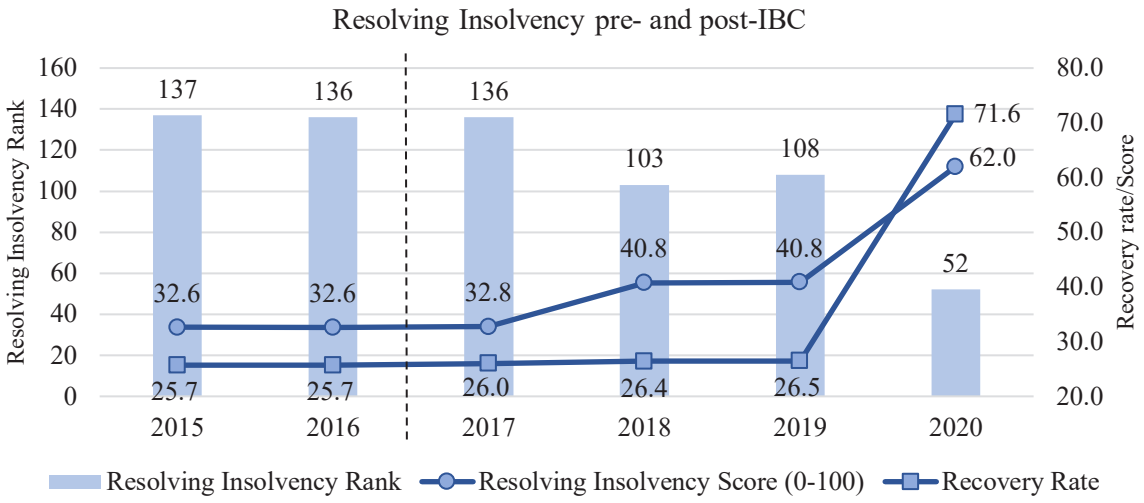


Figure 8. Performance of India in Resolving Insolvency as per the World Bank's Ease of Doing Business Rankings.

government. Ten of these areas, except the last two, are included in the ease of doing business score and ease of doing business ranking. The resolving insolvency measure is based on the time taken for the conclusion of the process, the cost incurred in the procedure as a percentage of the estate and the recovery rate. India is now the best performer in South Asia on resolving insolvency and does better than average for high-income OECD economies in terms of the recovery rate, time taken, and cost of proceedings. The changes in the recovery rate is the most important indicator for resolving the insolvency score. Figure 8 depicts India's resolving insolvency scores, ranks, and recovery rate pre- and post-introduction of IBC.

Table 4. Status of 12 large accounts (amounts in Rs. Billion).

S. No.	Name of CD	Claims of FCs dealt under resolution			Realisation by claimants as a % of liquidation value	Successful resolution applicant
		Amount admitted	Amount realised	Realisation as % of claims		
				Completed		
1	Electrosteel Steels Limited	131.75	53.2	40.38	183.45	Vedanta Ltd.
2	Bhushan Steel Limited	560.22	355.71	63.5	252.88	Bamnipal Steel Ltd.
3	Monnet Ispat & Energy Limited	110.15	28.92	26.26	123.35	Consortium of JSW and AION Investments Pvt. Ltd.
4	Essar Steel India Limited	494.73	410.18	82.91	266.65	Arcelor Mittal India Pvt. Ltd.
5	Alok Industries Limited	295.23	50.52	17.11	115.39	Reliance Industries Ltd, JM Financial Asset Reconstruction Company Ltd., JMFARC- March 2018 Trust
6	Jyoti Structures Limited	73.65	36.91	50.12	387.44	Group of HNIs led by Mr Sharad Sanghi
7	Bhushan Power & Steel Limited	471.58	193.5	41.03	209.12	JSW Limited
8	Amtek Auto Limited	126.41	26.15	20.68	169.65	Deccan Value Investors L.P. and DVI PE (Mauritius) Ltd.
				Under Process		
9	Era Infra Engineering Limited				Under CIRP	
10	Jaypee Infratech Limited				Under CIRP	
11	Lanco Infratech Limited				Under Liquidation	
12	ABG Shipyard Limited				Under Liquidation	

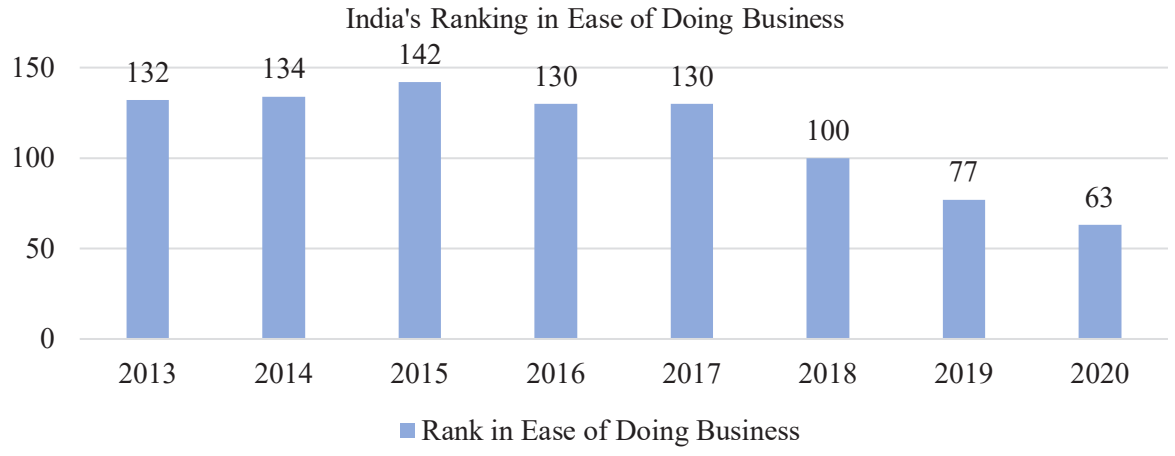


Figure 9. India's ranking in the World Bank's Ease of Doing Business Index.

India ranks 52nd in resolving insolvency with a score of 62, which is a jump from the previous year's resolving insolvency rank of 108 and a score of 40.8. It is evident from the ranking that pre-IBC saw a monotonous rate in the recovery, reflected in the score. After the introduction of the IBC, the score and then ranking began to improve, and with the leap in recovery rate from 26.5 to 71.6, India's score improved, resulting in a tremendous improvement in India's ranking.

The IBC contributes to the elevation of the business environment of the Indian economy as well, making the success story of the law visible in the historic jump of the country in the World Bank's Ease of Doing Business Index, wherein India has ranked

63rd among 190 countries in 2020. The World Bank statistics essentially state that 2016 was a turnabout year for India's business environment, the landmark event being the introduction of the IBC.

Conclusions and Recommendations

The insolvency procedure in India was scattered under a wide variety of legislation before the introduction of the IBC 2016, and the Code has managed to bring these differences under control by implementing differentiated duties of commercial and legislative perspectives. The Code takes into its major objective to balance the interest of its stakeholders, creditors and debtors and enable a timely resolution. The challenges before the efficient implementation of the Code are basically due to the lack of facilities in the nation, arising from various political, regional, and objective differences in different parts of the country. The legislation is, as a whole, perfected by a strong trunk and various branches of amendments bearing the fruit of resolution or liquidation, as the case may be.

This paper has discussed the history of the insolvency frameworks that existed in India, a detailed overview of the Code, and the empirical analysis of the effectiveness of the IBC. The second section highlights the landscape of the insolvency resolution mechanism that existed in various time periods on the Indian subcontinent comprising the Ancient era; the period of British colonialism; the period after attaining freedom, which is divided into pre- and post-reform periods; and a a brief introduction to the Code. The third section gives a detailed analysis of the Code in the Indian legal system with a focus on its background, overview, stakeholders, institutional changes undertaken to adapt to the new regulations of the Code, legal frameworks constructed for its effective implementation, recent legal developments, and the impact of COVID-19 on the Code. The fourth section briefly analyses the impact of the Code on corporate governance, business practices, and the capital market so as to understand the changes brought about by the Code. The fifth section comprises the empirical results on the summary of cases under IBC, a comparison of the recovery rates under the IBC and the pre-existing mechanisms, an analysis of the timeline of the cases, resolution costs, resolution of NPAs, the status of twelve large accounts, and insolvency scores.

The overall figures show that the implementation of the IBC could solve the problem of increasing NPAs in our economy over the past five years, evident from the results listed as follows. The increased number of cases referred under the Code has ensured that the NPAs should be serviced, resulting in reduced figures. Owing to the better systematisation of the procedures, the system shows a three times higher recovery rate than the other systems on the average of the past three years. The World Bank index also shows the positive impact of the Code when India's recovery rate jumped from 26.5 in 2019 to 71.6 in 2020.

With respect to the issues and challenges under the IBC regime, several fields require immediate attention. (1) As per the Economic Survey of 2021–22 by the government of India, as of January 2022, 9,768 applications were pending consideration under the Code (GoI 2022). This is due to the twin phenomenon of the lack of sufficient benches of the Adjudicating Authority and the increase in cases under the IBC. There are only 16 NCLT benches and 39 DRTs in the country. (2) Undoubtedly, the IBC has been effective to a great extent so far; however, compliance with timelines remains an issue. The earlier envisaged timeframe of 180 days (+90 days extension) was increased to 330 days for resolving issues. Despite the extension, resolution plans continue to cross the deadline. (3) Under group insolvency, companies are widely distributed across different areas, and this case calls for the unified working of the various jurisdictions with a combined resolution strategy rather than wasting double efforts on the procedure in different jurisdictions.

The policy recommendations that could be beneficial for the overall working of the system are pooled in this paragraph. (1) Currently, the power of the RBI to initiate insolvency proceedings is dependent on the authorisation of the government. Being the apex monetary regulator, the RBI should be granted full power to issue directions to the banks to initiate insolvency proceedings as and when required. (2) Information utilities are crucial in providing evidence and information on defaults. There is a need for more than one information utility that would promote data integrity in the nation. (3) When the Code was structured, there were hopes pertaining to the cross-border insolvency legislation, but it proved dismal. IBC does not provide the required attention for this. The Code now has only two sections that speak about the resolution across the border: section 234 and section 235. (4) Inspired by the COVID-19 lifestyle, online modes of resolution should be adopted right from the formation of the Committee of Creditors. The Code doesn't necessarily require the physical mode of meeting, and this clause could be made advantageous. This mode will be less time-consuming and will add the benefit of easier access to resolution.

Insolvency law during COVID-19 has formed its theoretical base as it illustrates what are the measures undertook to support the people in the crisis. The result of the relaxed regulations and the changes implemented is yet to be seen. An analytical study of the effect of pre- and post-pandemic scenarios on IBC could be done to state the differences in the policy and results. The IBBI ordinance on 4 April 2021, introduces the Pre-packaged Insolvency Resolution Process for Micro, Small and

Medium Enterprises (MSMEs). This informal method is expected to be a better performer than the existing norms. MSMEs, with respect to pre-packaged insolvency, are, supposedly, a game-changer, and the area could be used for further research. The stakeholders of the IBC are the building blocks of the system, and their behavioural changes are to be observed and measured to understand the implication the Code has on the Indian soil. Primary data analysis of the changes incurred with the stakeholders combined with the data of the archives could enable researchers to predict future changes, thereby enabling systematic policy changes. We are unable to discuss these issues now but hope to address them in future work.

This study suffers from the limitation of early case investigation. The Code is relatively new, and the effects are only just rippling through the economy, so a critical analysis is still out of scope. Within this limitation, we conclude that the results of the paper are relevant to the current academic and policy debates on the effectiveness of the IBC 2016. In summary, the resolution outcome and the resolution timeline are discomforting. It is time to fill the vacancies in various benches, streamline processes for timely disposal, put greater emphasis on the pre-packaged resolution, and thrust on enforcement of guarantee for optimal value maximisation of distressed assets.

Disclaimer

The views expressed in this paper are those of the authors and not the institutions to which they belong.

Acknowledgements

The authors would like to thank the Editor-in-Chief and anonymous reviewers for their insightful suggestions, comments, and careful reading of the manuscript.

References

Aghion, P., Hart, O. D., and Moore, J. “The Economics of Bankruptcy Reform.” Journal of Law, Economics, & Organization, no. 3/8 (1992): 523–546.

Alarifi, F. “The Bankruptcy Law of Saudi Arabia: Policy, Operation and Comparison.” PSU Research Review. (2021). https://doi.org/10.1108/PRR-02-2021-0011.

Altman, E. I. “Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy.” The Journal of Finance, no. 4/23 (1968): 589–609.

Araujo, A. P., Ferreira, R. V., and Funchal, B. “The Brazilian Bankruptcy Law Experience.” Journal of Corporate Finance, no 18/4 (2012): 994–1004.

Arltová, M., Smrčka, L., Louda, L., and Mateos-Planas, X. “An Attempt to Compare the Efficiency of Insolvency Proceedings in Various Countries in the World.” Journal of International Studies, no. 9/2 (2016): 25–47.

Bose, U., Filomeni, S., and Mallick, S. “Does Bankruptcy Law Improve the Fate of Distressed Firms? The Role of Credit Channels.” Journal of Corporate Finance, no. 68 (2021): 101836.

Branch, B., and Khizer, A. “Bankruptcy Practice in India.” International Review of Financial Analysis, no. 47 (2016): 1–6.

Camacho-Miñano, M. D. M., Pascual-Ezama, D., and Urquía-Grande, E. “On the Efficiency of Bankruptcy Law: Empirical Evidence in Spain.” International Insolvency Review, no. 22/3 (2013): 171–187.

Chatterjee, S., Shaikh, G., and Zaveri, B. “An Empirical Analysis of the Early Days of the Insolvency and Bankruptcy Code, 2016.” National Law School of India Review, no. 30/2 (2018): 89–110.

Chemin, M. “The Impact of the Judiciary on Entrepreneurship: Evaluation of Pakistan’s ‘Access to Justice Programme’.” Journal of Public Economics, no. 93/1–2 (2009a): 114–125.

Chemin, M. “Do Judiciaries Matter for Development? Evidence from India.” Journal of Comparative Economics, no. 37/2 (2009b): 230–250.

Claessens, S., and Klapper, L. F. “Bankruptcy Around the World: Explanations of Its Relative Use.” American Law and Economics Review, no. 7/1 (2005): 253–283.

CRISIL. “Strengthening the Code.” crisil.com. (May 2019). Available at: https://www.crisil.com/content/dam/crisil/our-analysis/reports/Ratings/documents/2019/april/ strengthening-the-Code.pdf.

Das, A., Agarwal, A. K., Jacob, J., Mohapatra, S., Hishikar, S., Bangar, S., Parekh, S., Basu S. and Sinha, U. K. "Insolvency and Bankruptcy Reforms: The Way Forward." Vikalpa, no. 45/2 (2020): 115–131.

Das, I. "The Need for Implementing a Cross-Border Insolvency Regime within the Insolvency and Bankruptcy Code, 2016." Vikalpa, no. 45/2 (2020): 104–114.

Djankov, S., Hart, O., McLiesh, C., and Shleifer, A. "Debt Enforcement Around the World." Journal of Political Economy, no. 116/6 (2008): 1105–1149.

Franks, J. R., Nyborg, K. G., and Torous, W. N. A. "Comparison of US, UK, and German Insolvency Codes." Financial Management, no. 25/3 (1996): 86–101.

Gupta, M. S., and Singh, J. B. "Insolvency and Bankruptcy Code (IBC) in India: Impact on Recovery of NPAs by Banks." Bihar Journal of Public Administration, no. 17/2 (2020): 606–614.

Gopalakrishnan, B., and Mohapatra, S. "Insolvency Regimes and Firms' Default Risk under Economic Uncertainty and Shocks." Economic Modelling, no. 91 (2020): 180–197.

GoI. "Economic Survey 2021–22, Chapter 4 (p. 155)." Government of India. (2022). Available at: https://www.indiabudget.gov.in/economicsurvey/doc/eschapter/echap04.pdf.

Gupta, A. "Insolvency and Bankruptcy Code, 2016: A Paradigm Shift within Insolvency Laws in India." The Copenhagen Journal of Asian Studies, no. 36/2 (2018): 75–99.

Handa, A. "An Analysis of the Corporate Insolvency Resolution Process as a Route for Acquisitions in India." International Insolvency Review, no. 29/2 (2020): 234–253.

IBC. "Insolvency and Bankruptcy Code, 2016." Ministry of Corporate Affairs, Government of India (May 28, 2016). Available at: https://www.mca.gov.in/Ministry/pdf/TheInsolvencyandBankruptcyofIndia.pdf.

IBBI Quarterly Newsletter for October–December 2021, Insolvency and Bankruptcy Board of India, Government of India. (2021): Available at: https://www.ibbi.gov.in/uploads/publication/baf0cb30077ec01083d862d44a98ef73.pdf.

Jappelli, T., Pagano, M., and Bianco, M. "Courts and Banks: Effects of Judicial Enforcement on Credit Markets." Journal of Money, Credit and Banking. (2005): 223–244.

Kattadiyil, C. D. B. J., and Islamov, B. A. "Analysis of Outcomes of IBC on Managing the Economic Development of India." International Journal of Management, no. 12/7 (2021): 23–33.

Modigliani, F., and Miller, M. H. "The Cost of Capital, Corporation Finance and the Theory of Investment." The American Economic Review, no. 48/3 (1958): 261–297.

Neira, J. "Bankruptcy and Cross-Country Differences in Productivity." Journal of Economic Behavior & Organization, no. 157 (2019): 359–381.

Ponticelli, J., and Alencar, L. S. "Court Enforcement, Bank Loans, and Firm Investment: Evidence from a Bankruptcy Reform in Brazil." The Quarterly Journal of Economics, no. 131/3 (2016): 1365–1413.

Prasad, R., Gupta, G., and Mathur, Y. B. "A Game Theoretic Analysis of the Relative Payouts to Operational Creditors and Financial Creditors from Bankruptcy Resolution in India." Asian Journal of Law and Economics, no. 11/2 (2020): 20200017.

RBI Prudential Framework for Resolution of Stressed Assets. (June 9, 2019). Available at: https://www.rbi.org.in/Scripts/NotificationUser.aspx?Id=11580.

RBI Report on Trend and Progress of Banking in India 2020–21, Chapter 4). Reserve Bank of India. (2021): 59–61. Available at: https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/ 0RTP2020CF9C9E7D1DE44B1686906D7E3EF36F13.PDF.

Singh, R., and Thakkar, H. "Settlements and Resolutions Under the Insolvency and Bankruptcy Code: Assessing the Impact of Covid-19." The Indian Economic Journal, no. 69/3 (2021): 568–583.

Staszkiewicz, P., and Morawska, S. "The Efficiency of Bankruptcy Law: Evidence of Creditor Protection in Poland." European Journal of Law and Economics, no. 48/3 (2019): 365–383.

Stef, N., and Dimelis, S. "Bankruptcy Regime and the Banking System." Economic Modelling, no. 87 (2020): 480–495.

Succurro, M. "Bankruptcy Systems and Economic Performance across Countries: Some Empirical Evidence." European Journal of Law and Economics, no. 33/1 (2012): 101–126.

Visaria, S. "Legal Reform and Loan Repayment: The Microeconomic Impact of Debt Recovery Tribunals in India." American Economic Journal: Applied Economics, no. 1/3 (2009): 59–81.

Warner, J. B. "Bankruptcy Costs: Some Evidence." The Journal of Finance, no. 32/2 (1977): 337–347.

World Bank. "Doing Business 2020: Comparing Business Regulation in 190 Countries." World Bank Group. (2020).

Zoričák, M., Gnip, P., Drotár, P., and Gazda, V. "Bankruptcy Prediction for Small-and Medium-Sized Companies Using Severely Imbalanced Datasets." Economic Modelling, no. 84 (2020): 165–176.