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# Bankruptcy Law Reform and Its Impact on Firms' Borrowing: A South Asian Experience

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## Abstract

With the enactment of the Insolvency and Bankruptcy Code (IBC) in 2016, India reformed and unified its fragmented insolvency frameworks into a single comprehensive law designed to prioritize asset maximization and ensure time-bound resolutions. Through a quasi-experimental setting, we examine the impact of the IBC reform on the corporate borrowings of publicly listed Indian firms against comparable companies in the neighboring South Asia countries (Pakistan, Sri Lanka and Bangladesh). With a panel dataset of Indian and non-Indian firms from 2011–2020, we observe an increase in firms' overall borrowing in India, along with lowered borrowing costs. The results from our difference-in-differences cross-country setting were also shown to be robust through a placebo test. We report that it was not only financially distressed firms that particularly benefited from the reform. In fact, Indian companies with relatively low leverage and high growth harnessed access to more credit at lower costs even more than their counterparts. Our results highlight the boost of the overall credit supply at the country level as a result of improved bankruptcy laws.

**Keywords:** bankruptcy law; policy analysis; debt financing; capital markets; capital structure; firm performance

## 1. Introduction

The complexity and lack of clarity in bankruptcy procedures represent additional hidden costs in lending that creditors need to pass on to borrowers. Recognizing this threatening barrier to the growth of its corporate sector, the Indian Government issued the Insolvency and Bankruptcy Code (IBC) in 2016. It is a landmark reform in the Indian financial system, providing a unified framework that addresses insolvency and bankruptcy for corporates, partnership firms, and individuals. The key objectives of the IBC reform are to ensure the smooth functioning of the credit market, enable prompt debt resolution, and foster a business-friendly environment for both local and foreign companies by providing an effective exit mechanism. The IBC introduced a time-bound resolution process, reassuring creditors about their financial recovery ([Insolvency and Bankruptcy Board of India, n.d.](#)).

Given the potential of IBC reform to boost creditors' confidence in supplying credit to Indian corporations, we investigate its shifting impact on Indian firms' debt financing activities in comparison to comparable enterprises of the neighbor countries without



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bankruptcy law reform. In the same spirit as the study conducted by [Araujo et al. \(2012\)](#) on the impact of Brazilian Bankruptcy 2005 Reform, we employ the difference-in-difference (hereafter DID) method in relation to various debt financing measures of Indian versus surrounding countries' comparable firms (including Pakistan, Sri Lanka and Bangladesh) before and after the reform (covering the period from 2011 to 2020). Consistent with the Brazilian experience, our quasi-experiments point to an overall decrease in debt financing costs and thus a boost in financial leverage among Indian firms since the IBC reform. We find that there is a greater increase in long-term debt than short-term debt in the Indian firms. This indicates that the reform has particularly benefited long-term creditors by enhancing their legal protections under the IBC framework, increasing their confidence and willingness to lend. The rise in long-term debt reflects stronger creditor rights, as the improved insolvency framework increases the likelihood of debt recovery in case of default, aligning with established theoretical literature on credit markets ([Bose et al., 2021](#); [Hart & Moore, 1994](#); [Townsend, 1979](#)). This indicates that the reform has had a positive impact on the supply of credit ([Qian & Strahan, 2007](#); [Bae & Goyal, 2009](#)).

The results of our study complement the findings of [Bose et al. \(2021\)](#), who observe that the IBC law enhanced the "credit channels" for financially distressed firms in India, leading to an increase in the supply of credit and a significant decrease in the cost of debt compared to non-distressed firms. Using a DID method, [Bose et al. \(2021\)](#) examined the influence of the IBC reform on the credit channels of distressed firms as compared to non-distressed firms. However, to a lesser extent, non-distressed firms are also affected by the IBC reform. For example, policy spillovers associated with indirect exposure to the policy shock may affect their control firms.

To address this concern, we adopt a different DID setting in this study, with Indian publicly listed companies as the treatment group and publicly listed firms from Pakistan, Sri Lanka and Bangladesh as the control group. Our empirical design offers a cleaner and more robust setting, as the control firms represent entities that are not subject to the IBC reform entirely. In addition, these control countries share significant geographic and economic similarities with India, providing an appropriate basis for comparative analysis ([Qian & Strahan, 2007](#)). Since the control group comprises countries that did not implement similar insolvency reforms at the same time, the analysis avoids potential confounding effects from parallel policy changes ([Berkowitz et al., 2003](#)). Our results are therefore based on a completely different sample. However, due to data availability constraints, the baseline specification does not incorporate macroeconomic variables such as GDP growth and inflation, which can differ across countries and affect the results. In addition, treatment and control firms might have limited overlap, which is common in policy-based difference-in-differences settings. These factors are acknowledged as limitations of the study.

To better understand how the IBC reform's effects vary across different types of firms, we conduct a heterogeneity analysis. Research shows that industries with more intangible assets have lower leverage levels because intangible assets are difficult to value, making creditors perceive them as riskier industries ([Lee & Lee, 2019](#)). As a result, manufacturing, construction, and transportation firms, which invest heavily in plant, property, and equipment, typically have higher leverage, while non-financial services firms—such as IT services, consulting, media, education, and healthcare—face borrowing constraints. Against this backdrop, our analysis of manufacturing and non-financial services industries shows a particularly notable surge in total debt, long-term debt and trade credit to non-financial services industries after the IBC reform. The findings further underscore the positive impact of the IBC on improving credit access, particularly for firms lacking tangible collateral to secure loans. Furthermore, we examine the impact of the IBC reform on debt financing across various sub-samples, segmented by size, leverage, growth, and

riskiness. Specifically, we find a greater increase in total debt for small, low-leverage and high-growing Indian firms. In addition, we observe a rise in trade credit for higher-risk firms after the implementation of the IBC policy.

Next, we replicate our empirical analysis for robustness using a placebo test by assuming that the reform occurred in 2014 and 2015 rather than 2016. If the coefficients from these placebo tests are significant, it would imply that the previously observed results could be driven by other macroeconomic factors, rather than the IBC reform. However, robustness tests using placebo test show no significant results, confirming that the observed impacts are attributable to the IBC reform and not to external macroeconomic influences.

Our study contributes to the literature on bankruptcy law by emphasizing the significance of the IBC law on creditor protection and improving debt enforcement—factors crucial for the development of credit markets (Djankov et al., 2008; Jappelli & Pagano, 2002; Pagano & Jappelli, 1993). Unlike prior research that predominantly focuses on developed economies, we examine the IBC's impact in India, a rapidly growing economy with diverse firm characteristics and a legacy of weak insolvency mechanisms. Our findings demonstrate that, after the IBC reform, stronger creditor protection leads to increased lending to riskier firms, thereby facilitating investment and growth.

Importantly, the IBC offers a replicable model for other developing countries, which often face similar systemic constraints such as corruption and bureaucratic inefficiencies (Jappelli & Pagano, 2002). Given the distinct political, economic, and social contexts of developing countries compared to developed nations, this study offers a fresh perspective for policymakers seeking to understand the impact of efficient reforms and laws in developing economies. For economies with underdeveloped insolvency regimes—such as Pakistan, Sri Lanka, and Bangladesh—our results highlight the potential of well-designed laws to expand credit access and build economic resilience. Our study enriches academic literature and delivers practical insights for policymakers in developing countries navigating similar institutional and economic challenges.

## 2. Literature Review

### 2.1. Impact of Insolvency Laws on Creditors' Protection and Supply of Credit

Porta et al. (1997) stress the importance of financial systems and legal environments, such as bankruptcy law, which lead to the development of credit markets while promoting financial growth. In the past, most studies on creditors' rights have been predicated on the idea of a creditors protection index as proposed by La Porta et al. (1999). They emphasize the importance of creditor protection and the efficiency of debt enforcement in supporting credit markets and suggest that better creditor protection increases debt supply. Djankov et al. (2008) support the study by La Porta et al. (1999) and further investigate the effect of information on credit markets. They conclude that more substantial and improved creditor rights are correlated with a higher level of private credit. In another study, Djankov et al. (2008) examine legal systems in 88 countries and report an increase in debt recovery across different countries when there is an efficient approach to debt enforcement, measured by time, cash flow, and asset disposition. However, the authors observe that insolvency regulatory institutions in developing countries underperform due to two reasons. First, bankruptcy court procedures are often inefficient (i.e., expensive and too lengthy), and, second, secured creditors' rights are rarely protected. Davydenko and Franks (2008) conclude that the insufficient legal protection of creditors results in lower rates of recovery for creditors.

Furthermore, Acharya et al. (2011) compare firms' leverage in countries with stronger creditor rights with those with weaker creditor rights. The researchers find that firms in countries with stronger creditors rights use lower leverage to reduce the risk of inefficient

liquidation. It is plausible to assert that the IBC reform would strengthen creditor rights, promote creditor protection, and enhance credit availability in the Indian market.

On a micro level, there is evidence of the formalization of power theories of creditors and information theories about the borrower. The power theory suggests that the power of creditors and lending information are the two main determinants of how much credit a financial institution would extend to individuals and firms (Aghion & Bolton, 1992; Townsend, 1979). In markets with strong creditors' rights, where they can force repayment, grab collateral or take control of the firm, they are more willing to extend credit (Hart & Moore, 1994; Hart & Moore, 1998). Along the same lines, when the creditors have information about the borrowers, credit history or other lenders, they extend more credit. Several studies formalize these information theories of credit (Jaffee & Russell, 1976; Stiglitz & Weiss, 1981). Additionally, Jappelli and Pagano (2002) and Sapienza (2002) state that credit registries, which include information on the credit histories and credit indebtedness of firms, can influence credit availability. Several studies suggest that establishing laws leads to credit protection and increases credit availability. Building on the above studies, we assume that the IBC law enforcement will contribute to an increase in debt supply in Indian firms. Therefore, we hypothesize that:

**H1:** *The amount of total debt increases after the establishment of the IBC reform in Indian firms as compared to South Asian firms.*

## 2.2. Impact of Insolvency Laws on Debt Financing

Bianco et al. (2005) note that differences in judicial efficiency and legal protection affect the amount of lending, credit constraints and loan terms. Esty (2004) investigated the relationship between legal risk and debt structure based on an internationally syndicated project loan sample. They found that lenders create a concentration of lending syndicates in countries with creditor rights protection and law enforcement. Davydenko and Franks (2008) examine small firms in France, Germany, and the United Kingdom to assess the differences in creditors' rights and banks' lending practices. The authors note that banks adapt their reorganization and lending practices to mitigate the effects of bankruptcy law, which decreases costs. Giannetti (2003) reinforces these findings by using a database of unlisted companies from Europe and concludes that firms in countries with good creditor rights have better, more accessible access to loans to finance investments and much easier for firms that invest in intangible assets (research and development). Tirole and Bénabou (2010) suggest that strengthening creditors' rights increases the firm's liquidation value. Additionally, in their study covering Central and Eastern European economies, Haselmann et al. (2010) show that banks increase loan supply when there is an improvement in creditors' rights. Their empirical studies demonstrate that insolvency reforms increase creditor protection and debt enforcement, positively influencing the debt market's size. Additionally, creditor rights protection ensures firms' access to long-term debt. Vig (2013) report that reducing creditors' enforcement costs leads to firms increasing long-term debt and decreasing their short-term debt proportions. Beck et al. (2010) examined the causal link between small- and middle-scale enterprises (SMEs) and economic development; they found that institutional developments facilitated SMEs' access to finance and alleviated their growth constraints. Giannetti (2003) states that it is easier for firms investing in intangible assets to obtain loans in countries with good creditor protection. In addition, maturity and lender number are related to creditors' ability to enforce repayment (Bolton & Scharfstein, 1996; Gertner & Scharfstein, 1991).

Studies conducted by Qian and Strahan (2007) and Bae and Goyal (2009) examine the effect of creditor rights on loan contract characteristics (such as price, size, maturity, and interest rates). The findings indicate that better creditor protection reduces spreads,

with loans having longer maturities and lower interest rates. Improvements in law may encourage firms to shift away from short-term debt arrangements from multiple lenders and towards long-term debt arrangements with fewer lenders. The short-term debt-from-multiple-lender solution may have costs, such as restricting the firm's ability to renegotiate better terms when its credit quality improves (Roberts & Sufi, 2008) or exposing the firm to rollover risk. According to He and Xiong (2012), a decrease in enforcement costs leads firms to increase (decrease) the amount of long-term (short-term) debt in their financing mix and reduce the number of lenders.

To summarize the relevant discussions, creditor protection laws play a vital role in firms' debt financing. Developed economies typically have strong legal systems that clearly define creditor rights and provide effective avenues for redress. In contrast, many developing economies, particularly in Asia and Africa, have weaker creditor protection reforms. An effective insolvency regime and robust legal framework such as the IBC law fosters both foreign and domestic investment, boosts investor confidence, and facilitates greater access to credit. Thus, we anticipate that the Indian credit market will experience improvements in both creditor protection and credit supply following the IBC reform, and we propose the following hypotheses:

**H2:** *The amount of long-term debt increases after the establishment of the IBC reform in Indian firms as compared to South Asian firms.*

**H3:** *The amount of short-term debt increases after the establishment of the IBC reform in Indian firms as compared to South Asian firms.*

**H4:** *The amount of trade credit increases after the establishment of the IBC reform in Indian firms as compared to South Asian firms.*

### 2.3. Impact of Insolvency Reforms on Lending Costs

Furthermore, we investigate the impact of the IBC reform on firms' borrowing costs. Studies show that insolvency reform reduces the indirect cost of bankruptcy (Sautner & Vladimirov, 2018), affects how debt is distributed (Vig, 2013), and reduces the cost of borrowing (Scott & Smith, 1986). These results agree with past theoretical observations about creditor protection increasing ex-ante efficiency (Rajan & Zingales, 1995) and thus higher firm financial leverage (Kraus & Litzenberger, 1973), as it reduces agency costs of debt and debt inequalities (Jensen & Meckling, 1976). Additionally, Vig (2013) state that reforms lead to better lending procedures, reducing the cost of borrowing. To summarize the discussion so far, we expect a reduction in the cost of borrowing following the implementation of the IBC reform, and we propose the following hypothesis.

**H5:** *There was a decrease in cost of debt after the establishment of the IBC reform in Indian firms compared to South Asian firms.*

### 2.4. Trade-Off and Pecking Order Theory

Next, we discuss capital structure theories to understand how institutional changes, such as bankruptcy reform, affect financing decisions for firms and why firms choose to have debt in their capital structure. Modigliani and Miller's (1958) irrelevance theory states that, in perfect markets, the capital structure of a company does not matter because the value of the company depends on its earnings power and its underlying assets. This theory makes two propositions: proposition one asserts that, when there are no taxes, capital structure has no bearing on financing used to finance the assets. A firm's value is determined by its expected earnings in the future.

However, in 1963, Modigliani and Miller revised the irrelevance theory. The second proposition claims that, when taxes exist, financial leverage boosts a firm's value while reducing its overall cost of capital (Modigliani & Miller, 1963). They further identify the benefits of debt in the capital structure, including tax shields (savings) resulting from the deduction of interest expenses from a firm's pre-tax income and the reduction of agency costs in the event of a liquidation, leading to losses in areas such as salary, reputation, and perquisites for managers, as well as a need to generate cash flow to pay interest.

The static trade-off theory builds on the Modigliani and Miller (M&M) theory. This theory posits that a firm must assess the benefits and costs of debt financing to achieve optimal capital structure, keeping its assets and investment plans constant (Myers & Majluf, 1984). It emphasizes minimizing the cost of capital by having an appropriate mix of debt and equity financing. Companies finance their operations through a mix of debt and equity. While debt financing offers tax advantages, its main drawback is the cost of debt, typically in the form of interest payments. As debt levels increase, the overall cost of capital initially decreases due to the tax advantages of debt. However, beyond a certain point, the rising cost and risk associated with additional debt outweigh the benefits, making further debt ineffective in reducing the overall cost of capital. Consequently, higher leverage increases the risk to creditors, leading them to demand a higher required return, which raises the overall cost of capital. A higher level of debt also puts investors' and shareholders' financial positions at risk. This theory asserts that companies balance the benefits of debt achieved through tax savings and the reduction of managerial agency costs when searching for the optimal capital structure (Bradley et al., 1984; Kraus & Litzenberger, 1973; Myers, 1977). In conclusion, the trade-off theory proposes that firms strive to balance debt and equity to achieve an optimal capital structure. In the wake of the IBC code, there is a legal process for resolving financial distress, so firms may feel more comfortable using debt as part of their capital structure, leading to an optimal level of debt in the capital structure.

In contrast, the pecking order theory, proposed by Myers and Majluf (1984), presents an alternative perspective that challenges the static trade-off theory. It suggests that firms do not aim for a specific debt-to-equity ratio. Instead, firms make financing choices based on the path of least resistance and lowest cost, primarily driven by concerns about information asymmetry and control. Thus, managers prefer to fund new investments through internal sources (retained earnings) first, external sources (debt), and, finally, equity.

In conclusion, one of the most important determinants of capital structure in companies is the trade-off between return and risk. With reduced bankruptcy costs and a clear resolution process after the IBC reform, debt may contribute more to capital structure than equity. After the IBC reform, we expect that firms will take on more debt to maintain an optimal capital structure.

### 3. Research Design

#### 3.1. Data

The sample includes publicly listed Indian and South Asian companies from 2011 to 2020, excluding financial firms due to their distinct financial structures. Indian companies form the treatment group, while firms from Pakistan, Sri Lanka and Bangladesh serve as the control group. Financial data for Indian firms are sourced from the CMIE Prowess database, and data for other countries are taken from DataStream. After data cleaning and removing missing values, the final sample consists of 1924 firms: 1736 from India, 51 from Pakistan, 95 from Sri Lanka, and 42 from Bangladesh. All continuous variables are winsorized at the 5% level.

The control countries included—Pakistan, Sri Lanka, and Bangladesh—share key emerging market characteristics such as comparable GDP per capita, colonial legal origins,

industrial composition, market structure, and underdeveloped insolvency frameworks prior to 2016. This selection minimizes baseline differences and effectively controls for regional economic trends. Moreover, since the control group was not directly influenced by the same legal reform, it strengthens the internal validity and clarity of the policy shock.

We rely on difference-in-differences (DID) as our main methodology. It is appropriate for our research as both the control and treatment groups had similar credit environments and common macro-trends before bankruptcy reform. The DID approach eliminates common time trends and factors that may affect both groups. In other words, any observed difference in outcome can be attributed more confidently to the legal reform and not to external factors. Our empirical specification further incorporates year-fixed effects that absorb common global and regional shocks.

Moreover, using 2014 and 2015 as pseudo-reform years (Section 4.4), we conduct placebo tests to strengthen causal identification. The placebo estimates are uniformly insignificant across all borrowing measures, suggesting that the documented post-2016 changes are not a result of concurrent macroeconomic shocks, but rather a direct consequence of the IBC reform on firms' borrowing behavior. The inclusion of firm- and year-fixed effects, difference-in-differences design, and placebo tests collectively addresses selection bias and residual endogeneity.

### 3.2. Empirical Methodology

Following the methodology described by [Araujo et al. \(2012\)](#), we investigate the effect of the IBC reform on debt financing by Indian companies, using a fixed-effects difference-in-difference model. Specifically, we test the effect on debt financing before and after the IBC reform for the treatment and control group using the following equation:

$$Y_{it} = b_0 + b_1DID_{it} + b_2Post_t + b_3Treat_i + b_4controls_{it} + \text{Firm FE} + \text{Year FE} + e_{it} \quad (1)$$

The  $DID_{it}$  interaction term is equal to  $Post_t \times Treat_i$ .  $Post_t$  is assigned a value of one for the five years after the implementation of the IBC reform (FY 2016–2020) and zero for the five years before the enactment of the IBC reform (FY 2011–2015).  $Treat_i$  is a dummy variable equal to one for firms in the treatment group affected by the IBC reform, and zero for firms in the control group which are not affected by the IBC reform. Indian companies are in the treatment group, while companies from Pakistan, Sri Lanka and Bangladesh constitute the control group. The parallel trend assumption is critical to ensuring the internal validity of DID models. It requires that, in the absence of treatment, the difference between the 'treatment' and 'control' groups is constant over time. To verify the parallel trend assumption, we follow [Beck et al. \(2010\)](#) and examine the dynamics of the relation between IBC law and debt financing measures (see Figure A1 in Appendix A). Our results support the parallel trends assumption, suggesting that, in the absence of the reform, both groups exhibit similar patterns in debt financing.

Following [Araujo et al. \(2012\)](#), we include several control variables in our analysis: firm size (total assets), earnings before interest and taxes (EBIT), tax intensity (taxes/total revenue), return on assets (ROA), market to book ratio (price to book ratio), tangibility (PP&E) and liquidity bankruptcy (liquidity default likelihood). The size of the firm has been widely used as a proxy for credit access and debt capacity, as larger firms benefit from economies of scale and more favorable financing terms ([Rajan & Zingales, 1995](#)). According to [Fama and French \(2002\)](#), the market to book ratio serves as an indicator of investor sentiment, reflecting investor confidence and influencing capital structure decisions. As highlighted by [Titman and Wessels \(1988\)](#), return on assets and earnings before interest and tax assists in determining a firm's ability to service debt. Furthermore, tangible assets are considered valuable collateral and have a significant impact on the terms of debt and

creditor recovery (Vig, 2013). According to Bose et al. (2021), tax burdens influence debt financing decisions, especially when changes in creditor priorities have an impact on tax claim recovery. It is expected that a new bankruptcy law reform will benefit companies that pay more taxes, since it grants secured creditors priority over tax claims. According to Asquith et al. (1994), we employ twelve-month variation of interest coverage ratios (EBIT divided by financial expenses) as a measure of risk of liquidity bankruptcy. We expect that the IBC code should benefit firms that are more vulnerable to liquidity-related distress as it improves creditors' recovery prospects. Appendix A.3 provides descriptive statistics for all variables.

## 4. Empirical Analysis

### 4.1. Baseline Results

The results in Table 1 indicate that after the IBC reform there is an increase in total debt by 8.4% in Indian firms compared to South Asian firms. This indicates a robust positive effect of the IBC on total debt. It further suggests that the IBC reform positively impacts the supply of credit. Under a proper framework, creditors have a better chance of recovering their loans when firms become insolvent. Hence, they are willing to lend. There is considerable evidence that stronger credit rights positively affect credit supply. The results are consistent with the theoretical literature on credit (Aghion & Bolton, 1992; Hart & Moore, 1994, 1998; Scott & Smith, 1986; Townsend, 1979). Hence, we accept hypothesis 1, which states that the total debt in Indian firms increases after the establishment of the IBC reform.

**Table 1.** Baseline regression.

Variables	(1) Total Debt	(2) Long Term	(3) Short Term	(4) Trade Credit	(5) Cost of Debt
DID	0.084 *** (0.020)	0.119 ** (0.049)	0.064 * (0.035)	0.091 *** (0.030)	−0.078 *** (0.028)
Taxes/total revenue	−0.161 *** (0.046)	0.344 *** (0.111)	−0.221 *** (0.080)	1.517 *** (0.066)	−0.269 *** (0.064)
PP&E	0.241 *** (0.040)	2.226 *** (0.096)	−0.275 *** (0.069)	−0.019 (0.057)	−1.054 *** (0.055)
Likelihood of liquidity defaults	−0.007 *** (0.000)	−0.013 *** (0.000)	−0.013 *** (0.000)	0.006 *** (0.000)	0.001 ** (0.000)
Total Assets	−0.217 *** (0.008)	−0.002 (0.020)	0.022 (0.014)	−0.414 *** (0.012)	0.160 *** (0.011)
EBIT	0.729 *** (0.004)	0.754 *** (0.011)	0.681 *** (0.008)	0.752 *** (0.007)	−0.025 *** (0.006)
Return on Assets	−0.100 *** (0.001)	−0.107 *** (0.003)	−0.108 *** (0.002)	−0.094 *** (0.002)	0.006 *** (0.002)
Price to book ratio	0.022 *** (0.006)	0.021 (0.016)	0.040 *** (0.011)	0.0086 (0.00966)	−0.002 (0.009)
Constant	12.18 *** (0.204)	4.196 *** (0.490)	6.253 *** (0.353)	15.14 *** (0.294)	−2.412 *** (0.282)
R-squared	0.596	0.255	0.333	0.440	0.036
Observations	18,597	18,597	18,597	18,597	18,597
Number of ids	3598	3598	3598	3598	3598
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

Note: This table presents the results of the difference-in-differences panel regressions for five different outcome variables: total debt, short-term debt, trade credit, long-term debt, and cost of debt. The first four of them are in logarithms. The regression specification controls for firm- and year-fixed effects. All variables (except for the dummy variable) are winsorized at 5%. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

Secondly, the empirical results indicate a positive impact of the IBC policy on long-term corporate borrowings, short-term borrowings and trade credit. The DID coefficient shows an increase in long-term debt by 11.9%, short-term borrowings by 6.4% and trade credit by 9.1% in the treatment group after the IBC law, relative to the control group. The results corroborate studies conducted by Vig (2013), who document that reducing creditors' enforcement costs leads to firms increasing long-term debt (Qian & Strahan, 2007; Bae & Goyal, 2009). The bankruptcy reform facilitates lenders to participate in their borrowers' bankruptcy, eliminating the requirement to extend only short-term debt as a discipline mechanism, resulting in a debt with longer maturities. Overall, the findings demonstrate the positive effect of Indian bankruptcy and insolvency reform on credit markets (La Porta et al., 1999) and the relevance of creditor protection in increasing credit supply to Indian firms (Djankov et al., 2008). Our findings confirm Hypotheses 2, 3 and 4, indicating that, after the IBC reform, there is an increase in long-term debt, short-term debt and trade credit in the treatment firms comprising Indian firms than South Asian firms.

Finally, the DID coefficient results indicate a reduction in the cost of debt. There is a reduction in the cost of debt financing by approximately 7.8% post-IBC in Indian firms as compared to South Asian firms, which is comparable to the findings of Araujo et al. (2012) and Rodano et al. (2016), which suggest that bankruptcy reforms promote credit markets by strengthening the rights of creditors, lowering the costs of debt, and improving the availability of credit and investment. Therefore, if creditors expect to receive their money in bankruptcy, it lowers the cost of debt. These findings align with hypothesis H5, which states a decrease in cost of borrowing in Indian firms after establishing the IBC reform. The lower cost of debt encourages firms to increase the level of debt for financing. The findings show that bankruptcy procedures improve lending and suggest active participation by firms in lending mechanisms. Thus, when bankruptcy procedures are efficient, creditors are more likely to recover their funds in case of borrower default, which increases their confidence in lending. As a result, these improved procedures encourage financial institutions and investors to provide loans or capital, facilitating greater access to credit for businesses and promoting lending activity.

The estimated coefficients for the control variables in our baseline regression are largely in line with theoretical expectations. Specifically, firms with a higher tangibility have significantly greater long-term debt and a lower cost of debt, supporting the conclusion in the literature that tangible assets serve as better collateral (Rajan & Zingales, 1995). Firms with a higher liquidity default risk tend to have lower debt levels across all debt types, except for cost of debt, which is consistent with lenders requiring higher interest rates from riskier firms (Asquith et al., 1994). Price-to-book ratios exhibit a positive relationship with short-term debt, which supports the literature, suggesting that growth firms prefer short-term, more flexible financing options (Myers, 1977; Barclay & Smith, 1995). A consistent pattern across controls suggests that our identification strategy is robust. Appendix A.3 provides description of all variables.

#### 4.2. Manufacturing vs. Non-Financial Services Companies

Next, we examine the literature concerning debt supply in companies with tangible and intangible assets. Additionally, we examine the existing literature on the relationship between firm-specific variables, such as size, growth, risk, and liquidity. Numerous factors contribute to the variation in debt structures across a wide range of industries, such as the type of business, the capital-intensive nature of the industry, and the economy. Empirical studies consider industry classification a prominent factor influencing capital structure (Stonehill & Stitzel, 1969). Rajan and Zingales (1995) demonstrate that leverage positively correlates with asset tangibility, suggesting that firms with a higher proportion of tangible

assets are more likely to have higher debt financing. As Myers and Majluf (1984) and Scott and Smith (1986) argue, fixed assets serve as collateral, reducing the conflict between shareholders and creditors. Tangible assets can be used as collaterals (thus lowering the creditor's risk of suffering such agency costs of debt), a high fraction of tangible assets allows firms to obtain external finance quickly, resulting in high leverage (Titman & Wessels, 1988). Furthermore, the companies have lower financial distress costs, as tangible assets can serve as collateral in the event of bankruptcy. In the same line of arguments, Jensen and Meckling (1976) affirm that, if firms do not have collaterals for their debt, moral hazard and agency costs of debt increase. Several studies provide evidence that a company's fixed asset levels positively correlate with its debt level (Antoniou et al., 2008; Frank & Goyal, 2007; Marsh, 1982; Munro, 1996; Rajan & Zingales, 1995; Titman & Wessels, 1988). Moreover, the use of collateral plays a more important role in countries where creditor protection is relatively weak, and emerging countries are widely recognized under weak creditor protection group (La Porta et al., 1999).

According to (Lee & Lee, 2019), industries with more intangible assets have lower leverage levels. Creditors view them as riskier because intangible assets are difficult to value. Manufacturers, construction companies, and transportation firms, which primarily invest in plant, property, and equipment, typically have higher leverage levels because the collateral value of their tangible assets guarantees loans. As a result, defaulting companies are less likely to face bankruptcy, as creditors can instead seize and liquidate their assets. Van Der Wijst (1989) and Welsh et al. (1982) note that the manufacturing industry is capital intensive and has significant investments in fixed assets made with debt and equity. On the contrary, it might not be easy to procure credit for non-financial service industries, which includes companies in information technology, energy, education, logistics, export and import, media, health care, telecommunication, storage and communication, hotel industries, legal and reform industries, and business services. However, we expect an increase in confidence among creditors after the IBC reform, leading them to extend credit to industries beyond manufacturing. To examine this impact, we conduct our analysis using DID by establishing two groups: a treatment group comprising companies in the non-financial services sector and a control group comprising manufacturing companies. We predict that, after the IBC reform, there will be an increase in debt in non-financial services Indian firms as compared to Indian manufacturing firms.

We present the results in Table 2. The empirical findings in Table 2 indicate that following the implementation of the IBC, debt utilization within non-financial services industries has increased significantly. Total debt in non-financial services firms has risen by 12.8%, long-term debt by 22.2%, and trade credit by 16.2% compared to manufacturing firms, suggesting a more favorable borrowing environment post-IBC reform (Rodano et al., 2016).

With greater access to credit, companies can support their operations and expand. The rise in confidence among creditors towards non-financial services industries is a positive sign. It implies that creditors are becoming more confident about lending to non-financial services industries despite their traditionally higher credit risk. There is a plausible explanation for this shift in creditor behavior. The IBC reform guarantees that creditors can recover funds when a company goes bankrupt. This assurance mitigates the perceived risk of lending to non-financial companies. These findings align with previous research studies (Djankov et al., 2008; Neira, 2019; La Porta et al., 1999; Ponticelli & Alencar, 2016; Porta et al., 1997). These results support earlier research suggesting that the IBC reform plays a crucial role in creating a trusting environment for businesses and creditors. Consequently, the findings reaffirm the IBC reform's effectiveness in fostering a more robust and resilient financial ecosystem by facilitating credit lending.

**Table 2.** Manufacturing vs. Non-financial services companies.

Variables	(1) Total Debt	(2) Long Term	(3) Short Term	(4) Trade Credit	(5) Cost of Debt
DID	0.128 *** (0.032)	0.222 ** (0.102)	−0.034 (0.073)	0.162 *** (0.060)	0.001 (0.000)
Taxes/total revenue	0.533 *** (0.059)	3.838 *** (0.183)	0.002 (0.132)	−4.149 *** (0.109)	0.0267 *** (0.001)
PP&E	−0.035 * (0.019)	2.610 *** (0.061)	−0.715 *** (0.044)	−0.833 *** (0.036)	−0.012 *** (0.000)
Likelihood of liquidity defaults	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)
Total Assets	0.776 *** (0.006)	0.669 *** (0.019)	0.599 *** (0.014)	0.806 *** (0.011)	0.000 *** (0.000)
EBIT	0.151 *** (0.005)	0.204 *** (0.018)	0.295 *** (0.013)	0.176 *** (0.011)	0.000 *** (0.000)
Return on Assets	−3.798 *** (0.092)	−6.099 *** (0.287)	−6.053 *** (0.207)	−2.871 *** (0.170)	0.0458 *** (0.002)
Constant	0.948 *** (0.029)	−1.686 *** (0.090)	0.310 *** (0.065)	−0.866 *** (0.053)	0.00593 *** (0.000)
R-squared	0.844	0.395	0.503	0.640	0.185
Observations	34,386	34,386	34,386	34,386	34,386
Number of ids	10,896	10,896	10,896	10,896	10,896
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes

Note: This table reports regression estimates for subsample (manufacturing vs. non-financial services companies) for the dependent variables: total debt, long-term debt, short-term debt, trade credit and cost of debt. All regressions include firm and year fixed effects. We use the same set of control variables as in baseline regression. All variables (except for the dummy variable) are winsorized at 5%. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

#### 4.3. Heterogeneity Analysis

Next, we conduct a heterogeneity analysis of the impact of IBC reform on debt financing measures, based on various firm characteristics including size, growth and riskiness. For each year, we calculate the median value of these characteristics and construct subsamples accordingly.

According to [Barclay and Smith \(1995\)](#), a firm's size influences its capital structure because large firms benefit from economies of scale. Additionally, trade-off theory posits that size positively relates to leverage, as bigger firms have lower default rates, thereby reducing financial distress costs ([Rajan & Zingales, 1995](#); [Titman & Wessels, 1988](#); [Warner, 1977](#)). Due to better access to capital markets, large companies have more debt than small companies since they are considered "too big to fail". Similarly, [Antoniou et al. \(2008\)](#) validate these findings and conclude that leverage ratios positively correlate with firm size.

However, the pecking order theory offers a contrasting perspective, arguing that larger firms face lower levels of information asymmetry, making equity financing more attractive and accessible ([Fama & Jensen, 1983](#)). As a result, larger firms may rely more on internal financing or equity rather than debt, implying a negative relationship between size and leverage ([Fama & Jensen, 1983](#)). Small firms, despite the relatively low cost of debt compared to equity, often depend on debt financing due to limited internal resources ([Graham & Harvey, 2001](#)). However, they face challenges such as a lack of credit history and higher perceived risk, which restrict their access to formal credit channels ([Berger & Ofek, 1995](#)).

To summarize, the current literature suggests mixed evidence on how liquidity and leverage are related to debt financing. According to trade-off theory, firms with high liquidity may be more inclined to use debt to monitor and discipline managers, thereby mitigating agency problems. At the same time, some argue that firms may prefer to use

less debt to minimize agency costs between shareholders and bondholders, as shareholders can more easily expropriate liquid assets. Furthermore, the risk of financial distress is often negatively associated with leverage, particularly in firms with high earnings volatility (Bancel et al., 2004; Frank & Goyal, 2007; Harris & Raviv, 1991). Based on this, low-leveraged and high-risk firms—especially those with volatile earnings—are likely to avoid debt due to their heightened exposure to financial distress, leading to constrained access to credit and limited capacity to finance long-term investments.

Against the backdrop of the above literature, IBC law emerges as a critical reform influencing firms' borrowings. By providing a structured and reliable mechanism for debt resolution, the IBC can potentially enhance credit access for firms previously considered too risky or over leveraged. Improved legal protection and recovery mechanisms increase creditors' confidence, lowering borrowing costs and making debt more accessible. We present the results in Table 3.

Our results reveal that smaller firms experience a more pronounced impact of the reform on debt financing compared to larger firms. Post-IBC, small firms exhibit a significant increase in total debt (9.9%), long-term debt (17%), short-term debt (10.3%), and trade credit (13.4%), along with a notable reduction in the cost of debt (9.7%), suggesting improved credit access and stronger engagement in lending markets. Small firms typically have limited resources compared to large firms, making them appear riskier to creditors and investors due to their reduced ability to absorb financial shocks like bankruptcy. Post-IBC reform, there is an increase in trust in the financial markets, with creditors more willing to lend to small-sized firms. However, we did not find any significant results in large firms following the IBC reform.

Both low- and high-leverage firms benefit from the reform. Low-leverage firms report an increase in total debt (6.8%), short-term debt (11.2%), and trade credit (8.3%), coupled with a 10.2% decline in borrowing costs. High-leverage firms witness an increase in total debt (8.5%) and long-term debt (13.6%), along with a 7.1% decrease in debt costs. High-leverage firms are likely to take advantage of improved credit access to manage their existing debt burdens or fund expansion if the increase in debt supply is more pronounced among them. Alternatively, if low-leverage companies show greater debt growth, they could use it to capitalize on growth opportunities or benefit from favorable borrowing terms. The findings indicate that, following the IBC reform, there is an increase in the total supply of debt with a simultaneous increase in the amount of long-term and short-term debt in both high- and low-leveraged Indian firms.

Heterogeneity based on growth reveals that high-growth firms see a 22.3% increase in long-term debt and a 15% reduction in borrowing costs, while low-growth firms experience a 6.9% increase in total debt. The findings are consistent with the trade-off theory of capital structure, whereby firms aim to achieve the optimum capital structure (Rajan & Zingales, 1995). These firms adjust their capital structure for optimal debt levels, hoping to balance tax benefits and financial flexibility.

Finally, low-risk firms experience a significant decrease in borrowing costs (13.9%), while high-risk firms show an increase in trade credit by 8.8%. Suppliers and creditors can view this rise in trade credit as a strategic effort to mitigate the higher levels of risk associated with these companies. It suggests that creditors and suppliers maintain business relationships with these higher-risk firms by offering more trade credit. This difference in results between high-risk and low-risk Indian firms shows that the impact of the IBC reform varies depending on the company's risk profile. At the same time, low-risk Indian firms experience reduced borrowing costs, while high-risk firms increase trade credit as a risk management strategy after the IBC reform.

Overall, the findings suggest that the IBC reform has fostered active participation by both firms and creditors in credit markets. The enhanced legal and insolvency resolution

framework appears to have strengthened corporate borrowing and improved access to credit, particularly for smaller, low-leverage, and financially strong firms.

**Table 3.** Cross-sectional heterogeneity on firm size, leverage, growth and riskiness.

Panel A. Firm Size										
Variables	Small					Large				
	Total Debt	Long Term	Short Term	Trade Credit	Cost of Debt	Total Debt	Long Term	Short Term	Trade Credit	Cost of Debt
DID	0.099 *** (0.002)	0.170 ** (0.024)	0.103 * (0.062)	0.134 *** (0.002)	−0.097 ** (0.021)	0.002 (0.932)	−0.028 (0.698)	0.000 (0.998)	0.006 (0.89)	−0.051 (0.253)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9212	9212	9212	9212	9212	9344	9344	9344	9344	9344
R-squared	0.461	0.186	0.282	0.308	0.018	0.721	0.30	0.368	0.508	0.06
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B. Leverage										
Variables	Low					High				
	Total Debt	Long Term	Short Term	Trade Credit	Cost of Debt	Total Debt	Long Term	Short Term	Trade Credit	Cost of Debt
DID	0.068 ** (0.012)	0.078 (0.303)	0.112 ** (0.031)	0.083 * (0.80)	−0.102 ** (0.044)	0.085 *** (0.002)	0.136 * (0.068)	0.036 (0.505)	0.034 (0.26)	−0.071 * (0.067)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8787	8787	8787	8748	8748	8872	8872	8872	8872	8872
R-squared	0.557	0.184	0.274	0.244	0.244	0.442	0.204	0.239	0.352	0.024
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C. Growth										
Variables	Low					High				
	Total Debt	Long Term	Short Term	Trade Credit	Cost of Debt	Total Debt	Long Term	Short Term	Trade Credit	Cost of Debt
DID	0.069 ** (0.044)	−0.138 (0.152)	0.060 (0.363)	0.071 (0.187)	0.081 (0.145)	0.039 (0.181)	0.223 *** (0.001)	0.045 (0.357)	0.022 (0.591)	−0.150 *** (0.000)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9310	9310	9310	9310	9310	9329	9329	9329	9324	9329
R-squared	0.689	0.272	0.373	0.5	0.043	0.549	0.247	0.309	0.411	0.037
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel D. Riskiness										
Variables	Low					High				
	Total debt	Long Term	Short Term	Trade Credit	Cost of Debt	Total Debt	Long Term	Short Term	Trade Credit	Cost of Debt
DID	0.007 (0.815)	0.058 (0.397)	0.006 (0.896)	−0.031 (0.496)	−0.139 *** (0.001)	0.034 (0.214)	0.077 (0.331)	0.035 (0.555)	0.088 ** (0.031)	−0.058 (0.198)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9245	9245	9245	9245	9245	9379	9379	9379	9352	9379
R-squared	0.55	0.239	0.322	0.373	0.039	0.657	0.225	0.29	0.465	0.031
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports regression estimates for subsamples, where the dependent variables are total debt, long-term debt, short-term, debt, trade credit and cost of debt. The median value is calculated for each variable for each year, and samples are constructed based on size, leverage, market to book ratio and likelihood to default. We examine the impact of bankruptcy reform (DID) in each subset by running the baseline equation separately. All regressions include firm- and year-fixed effects. We use the same set of control variables as in baseline regression. All variables (except for the dummy variable) are winsorized at 5%. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

#### 4.4. Placebo Test

In addition, following Araujo et al. (2012), we conduct placebo tests to assess the robustness of our results. Here, we replicate the empirical exercise under the assumption that the reform was implemented in 2014 and 2015 instead of 2016. We introduce dummy

variables representing the policy implementation years as 2014 and 2015. If the policy is implemented in 2014, the dummy variable is assigned a value of 1 for the years 2014 to 2020 and 0 for all years prior to 2014. Similarly, if the policy is implemented in 2015, the dummy variable takes a value of 1 for the years 2015 to 2020 and 0 for all years before 2015.

We then run the same regression with all other settings remain unchanged. If the coefficients of the pseudo-event years are significant, then the results previously obtained could be artificial, they are not linked to the new bankruptcy reform, but to some other macroeconomic factor. The findings in Table 4 (Panel A and Panel B) present the results of these falsification tests, showing no statistical significance for any debt financing measures under the pseudo-event settings. The findings confirm the robustness of our main findings.

**Table 4.** Placebo tests.

<b>Panel A. Falsification Test When the Reform Is Passed in 2015</b>					
<b>Variables</b>	<b>Total Debt</b>	<b>Long Term</b>	<b>Short Term</b>	<b>Trade Credit</b>	<b>Cost of Debt</b>
1 if firm is Indian and the year is 2015	0.0769 (0.554)	0.155 (0.374)	0.0619 (0.641)	0.147 (0.397)	−0.113 (0.164)
Control Variables	yes	yes	yes	yes	yes
Firm fixed effects	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes
Constant	yes	yes	yes	yes	yes
<b>Panel B. Falsification test when the reform is passed in 2014</b>					
<b>Variables</b>	<b>Total Debt</b>	<b>Long Term</b>	<b>Short Term</b>	<b>Trade Credit</b>	<b>Cost of Debt</b>
1 if firm is Indian and the year is 2014	0.009 (0.796)	0.080 (0.368)	0.001 (0.979)	0.030 (0.569)	−0.08 (0.119)
Control Variables	yes	yes	yes	yes	yes
Firm fixed effects	yes	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes	yes
Constant	yes	yes	yes	yes	yes

Note: Panel A. This table presents a falsification test to assess the robustness of the IBC reform's effects by showing results under the assumption that the reform was implemented in 2015 instead of 2016. All variables except cost of debt are in logarithms and all continuous variables are winsorized at 5%. \*\*\*, \*\*, and \* represent 1%, 5%, and 10% significance levels, respectively. Panel B. This table presents a falsification test to assess the robustness of the IBC reform's effects by showing results under the assumption that the reform was implemented in 2014 instead of 2016. All variables except cost of debt are in logarithms and all continuous variables are winsorized at 5%. \*\*\*, \*\*, and \* represent 1%, 5%, and 10% significance levels, respectively.

## 5. Conclusions

This study investigates the impact of India's Insolvency and Bankruptcy Code (IBC) reform on debt financing and cost of debt. Using a dataset of 1924 firms (1736 from India, 51 from Pakistan, 95 from Sri Lanka, and 42 from Bangladesh) across pre-IBC (2011–2015) and post-IBC (2016–2020) periods, we assess the reform's impact on Indian and South Asian firms.

Our empirical findings reveal that the IBC law significantly enhances long-term borrowings, short-term borrowings and trade credit at a lower cost of borrowing, enabling firms to address funding gaps and sustain operations. The reform's structured debt resolution framework improves credit accessibility and affordability, especially for firms previously constrained by high risk or leverage. The heterogeneity analysis further shows that smaller, riskier, or highly leveraged firms experience substantial improvements in credit access post-reform, as creditors gain confidence from stronger legal protections, leading to reduced borrowing costs. Stronger debt recovery mechanisms have built lender confidence, fostering business expansion and investment.

These findings align with the trade-off theory, which suggests firms optimize capital structure by balancing debt and equity to maximize value. The IBC's efficient, transparent

debt resolution process reduces lending risks, allowing creditors to offer larger loans at more favorable terms. This fosters higher debt utilization and enhances capital structure efficiency across firms of varying sizes, leverage levels, growth, and risk profiles.

The IBC also serves as a replicable model for other developing economies, such as Pakistan, Sri Lanka, and Bangladesh, which face similar challenges. By establishing a predictable and enforceable debt recovery framework, the IBC not only strengthens creditor rights but also stimulates credit market activity, promoting economic resilience. Our study provides practical insights for policymakers, highlighting the differential impact of insolvency reforms across sectors and firm types. These findings underscore the importance of robust legal frameworks in fostering trust in lending systems and improving credit market efficiency.

Although this study makes important contributions, it has several limitations. First, a difference-in-difference analysis of control countries facilitates cross-country comparisons, but it cannot completely eliminate concerns regarding unobserved country-specific shocks. The absence of explicit macroeconomic controls, such as GDP growth and inflation, may vary across sample countries and correlate with the treatment. Consequently, the estimated effects may partially reflect these unobserved macroeconomic trends rather than the treatment effects alone. Second, although our DiD framework follows Beck et al. (2010), which is specifically designed for dynamic panel setting and is validated by the parallel trend tests, further diagnostic tests using entropy balancing (unreported due to page limit) indicate a risk of limited overlap between treated and control firms in our data structure. This suggests that our findings should be interpreted with caution, as the estimates may be specific to this sample's distribution and the control group may not serve as a perfect baseline for comparison. Third, the analysis is confined to publicly listed firms, and the findings may not apply to smaller, privately held companies with different financing constraints. Fourth, observations during the pandemic period may have contributed to an increase in borrowing volatility.

Future research should address these limitations. While firm- and year-fixed effects mitigate observable heterogeneity, future research could incorporate macroeconomic controls to improve model specification. Although standard diagnostics and parallel trend tests support the current empirical strategy, future studies may employ covariate-balancing technique, such as entropy balancing, depending on data availability. Such approaches would further enhance the comparability between the treatment and control groups and address potential concerns regarding limited overlap. Further studies could assess whether insolvency reforms equally affect credit access for privately owned and smaller firms. A deeper investigation of bankruptcy reforms' impact on creditor behavior would be possible with access to loan-level data, such as pricing, maturity, and covenant structure. Finally, comparative studies among emerging economies with varying enforcement quality and institutional capacity could shed more light on effective insolvency reforms.

Overall, our research contributes to the literature on the positive impact of bankruptcy reform on the development of credit markets and credit financing in an emerging economy. Strengthening creditors' rights is a core element of such reforms. A well-established legal framework enhances lender confidence, encouraging lending and expanding firms' access to credit. Beyond safeguarding creditor interests, bankruptcy reforms such as the IBC stimulate credit market activity by creating a more predictable and enforceable debt recovery process. While most countries have experienced bankruptcy reforms of some form/degree in the history of their financial markets, our findings serve as a reminder for policymakers around the globe to keep monitoring and updating their policies regarding bankruptcy laws and procedures in place. Ongoing maintenance (of trust) could be more cost-effective than repairing.

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**Conflicts of Interest:** The authors declare no conflicts of interest.

## Appendix A

### Appendix A.1. Parallel Trend Test

We follow Beck et al. (2010) in examining the dynamics of the relation between IBC law and debt financing using event-study estimates for treated and control firms. The methodology includes a series of dummy variables in the baseline regression to trace the year-by-year effects, plotting the dynamic effects of the Insolvency and Bankruptcy Code (IBC). Specifically, this event-study approach allows us to visualize and test the dynamic impact of the IBC on firms' debt structure while assessing the validity of the parallel trends assumption. Each panel reports coefficients from the following regression specification estimated over a ten-year window, spanning five years before and four years after the implementation of the IBC.

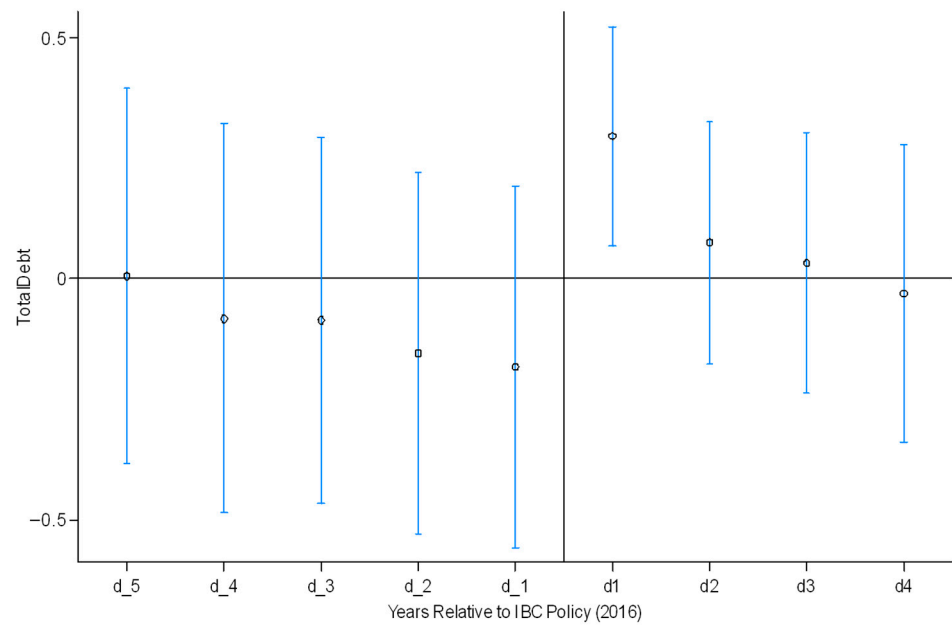
$$Y_{it} = \alpha + \beta_1 \text{DiD}_{it}^{-5} + \beta_2 \text{DiD}_{it}^{-4} + \dots + \beta_9 \text{DiD}_{it}^{+1} + \beta_{10} \text{controls}_{it} + \text{Firm FE} + \text{Year FE} + \varepsilon_{it}$$

where  $Y_{it}$  represents the dependent variable (total debt, long-term debt, trade credit, or short-term debt).  $\text{DiD}_{it}^{-j}$  equals one in the  $j$ th year for firms before the IBC law, while  $\text{DiD}_{it}^{+j}$  equals one for firms in the  $j$ th year after the IBC law. At the end points,  $\text{DiD}_{it}^{-5}$  equals one for all years that are five or more years before the IBC law, while  $\text{DiD}_{it}^{+1}$  equals one for all years that are 1 or more years after the IBC law.

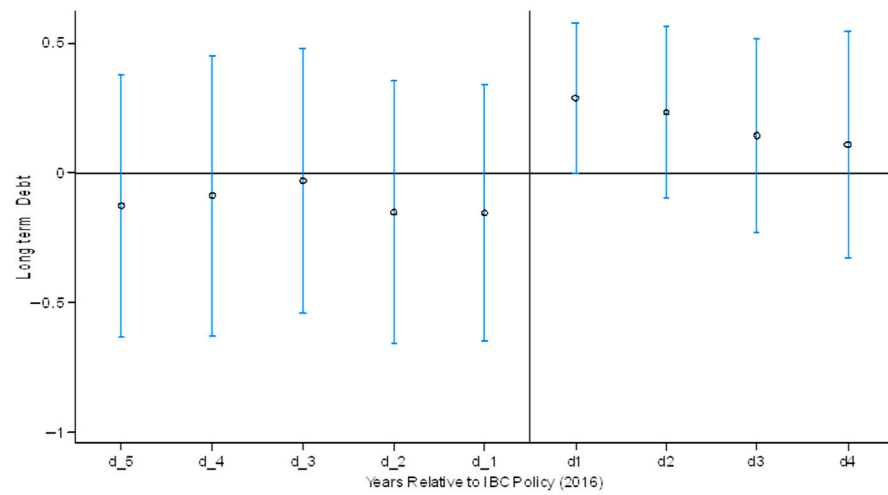
We exclude the year of the IBC law. This setting allows us to estimate the dynamic effect of the IBC law to debt financing measures relative to the year the law was passed (year 0). The figure below plots the results and the 95% confidence intervals after detrending and centering the estimates on the year of IBC law. The vertical axis shows the estimated coefficients  $\beta_k$ , while the dashed lines represent 95% confidence intervals clustered at the firm level. Each panel represents a different measure of debt financing for firms. Confidence intervals are used to infer statistical significance, along with suggested interpretations to aid readability.

Panel A (Total Debt). In Panel A, the Y-axis ranges from  $-0.5$  to  $0.5$ . Pre-policy ( $d_{-5}$  to  $d_{-1}$ ), total debt levels remain flat around zero, indicating no divergence between treated and control groups. Post-policy ( $d_1$  to  $d_4$ ), total debt increases modestly, reaching approximately  $0.2$  to  $0.3$  by  $d_4$ . The IBC policy led to a moderate rise in total debt for treated firms, suggesting that firms took on additional debt to manage financial distress, comply with insolvency proceedings, or restructure capital under the new regulatory environment. The moderate magnitude indicates that while the policy affected borrowing behavior, overall debt levels remained contained, possibly due to cautious creditor behavior or limited access to financing. The moderate magnitude indicates that borrowing behavior was adjusted after the reform, but, overall, leverage remained under control.

Panel A



Panel B



Panel C

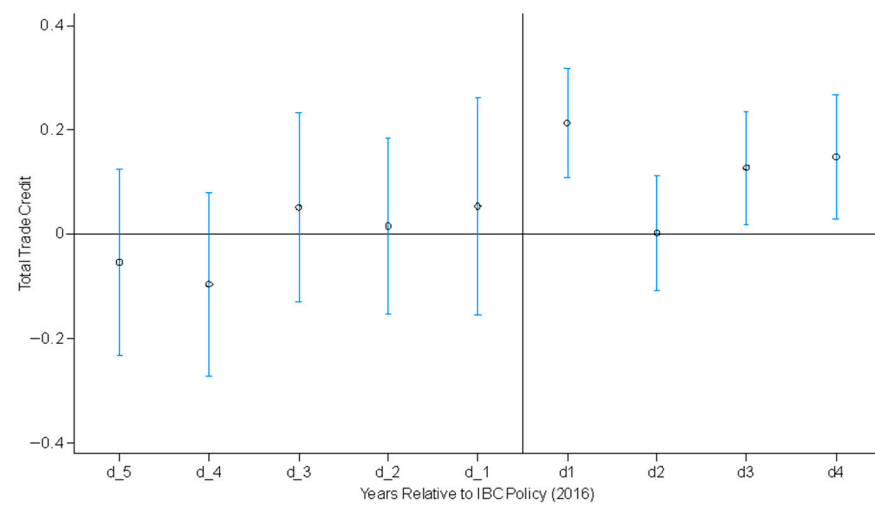
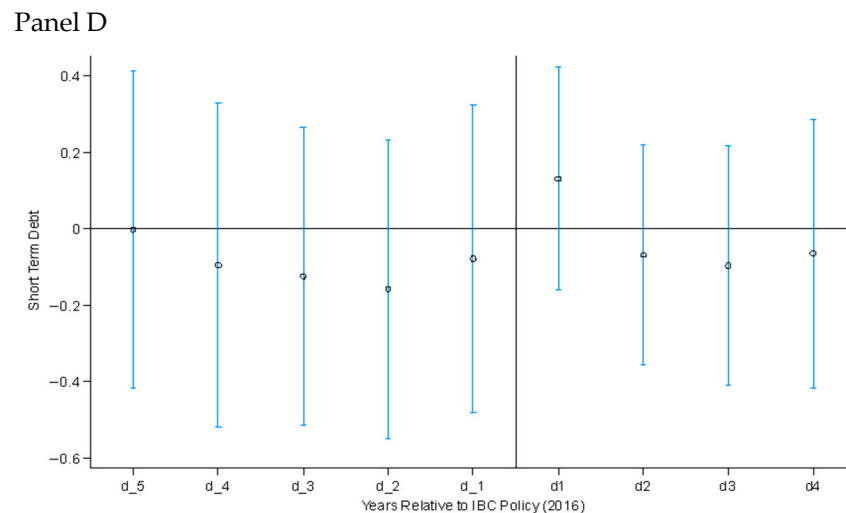


Figure A1. Cont.



**Figure A1.** Parallel trend assumption: Panel A (Total debt), Panel B (Long-term debt), Panel C (Trade credit), Panel D (Short-Term debt).

**Panel B (Long-term Debt).** Panel B shows axis ranges from  $-1$  to  $0.5$ . Before the IBC ( $d_{-5}$  to  $d_{-1}$ ), long-term debt is stable around zero. After implementation ( $d_1$  to  $d_4$ ), long-term debt increases steadily, reaching about  $0.3$  to  $0.5$  by  $d_4$ . Under the new insolvency framework, firms have shifted toward longer-term financing consistent with improved resolution mechanisms and enhanced creditor confidence, leading to a noticeable increase in long-term borrowing.

**Panel C (Trade Credit).** Panel C demonstrates that the Y-axis ranges from  $-0.4$  to  $0.4$ . Before the IBC policy ( $d_{-5}$  to  $d_{-1}$ ), total trade credit fluctuates slightly around zero with overlapping confidence intervals, suggesting no significant pre-trend differences between treated and control firms. This supports the parallel trends assumption. After the implementation of the IBC policy ( $d_1$  to  $d_4$ ), the coefficients become positive, reaching around  $0.2$  by  $d_1$  and remaining above zero through  $d_4$ . This indicates a moderate post-policy increase in trade credit for treated firms. The IBC policy led to a slight rise in trade credit usage among treated firms, indicating that delayed payments to suppliers became a more attractive short-term financing option during insolvency resolution, when access to formal credit may be temporarily constrained.

**Panel D (Short-Term Debt).** The Y-axis in Panel D ranges from  $-0.6$  to  $0.4$ . Pre-policy ( $d_{-5}$  to  $d_{-1}$ ), short-term debt is stable near zero. Following the IBC ( $d_1$  to  $d_4$ ), short-term debt increases slightly, reaching about  $0.2$  to  $0.3$  by  $d_4$ . The modest increase likely reflects firms' need for immediate liquidity to fund operations or restructuring activities post-IBC. The pattern suggests a gradual rather than abrupt adjustment in short-term financing.

Overall, Figure A1 confirms that treated firms and control firms followed parallel trends prior to the IBC implementation, validating the key identifying assumption. Post-policy treated firms exhibited moderate but consistent increases in total, long-term, and short-term debt and credit, reflecting adaptive financing responses to the new insolvency regime rather than excessive leverage expansion.

*Appendix A.2. Description of Variables*

Variables	Description
Total debt	Log of sum of balance sheet short-term and long-term debt, plus suppliers' accounts (also called trade credit)
Long term debt	Log of long-term debt
Short term debt	Log of short-term debt

Variables	Description
Trade Credit	Log of trade credit
Cost of debt	Total annual interest expenses divided by total debt
DID	Interaction term between Post and Treat (PostxTreat)
Post	Post is assigned a value of one for the five years after the implementation of the IBC reform (FY 2016–2020 post) and zero for the five years before the enactment of the IBC reform (FY 2011–2014).
Treat	Treat is a dummy variable which has a value of one for firms in the treatment group, while zero for firms outside the IBC threshold (control group firms).
PP&E	Ratio of PP&E (property, plant and equipment) and total assets.
Taxes/Total Revenue	Ratio of tax expenditures (EBIT minus Net Profit) and revenue.
Liquidity default likelihood	The twelve-month variation of interest coverage ratios (EBIT divided by financial expenses)
Total assets	Log of total assets
EBIT	Log of earnings before interest and tax
Return on assets	Ratio of firm's net income by the average of its total assets
Price to book ratio	Ratio of the market value of a company's shares (share price) over its book value of equity.
Leverage	Ratio of total debt to total assets
Size	Two sub samples (high and low) on median values of total assets
Leverage	Two sub samples (high and low) on median values of leverage
Growth	Two sub samples (high and low) on median values of price-to-book ratio
Riskiness	Two sub samples (high and low) on median values of liquidity default likelihood

### Appendix A.3. Descriptive Statistics

Variables	N	Mean	Std. Dev.	Min	Max	Median
Total Debt	18,597	20.09	2.47	4.70	23.53	20.33
Long Term	18,597	18.20	3.00	3.04	22.99	18.49
Short Term	18,597	18.81	2.56	5.13	22.76	19.12
Trade Credit	18,597	18.61	2.78	3.97	22.45	18.96
Cost of debt	18,597	0.68	1.00	0	4.74	0.26
Taxes/total revenue	18,597	0.09	0.16	−0.15	1.1	0.04
PP&E	18,597	0.31	0.25	0.00	1.91	0.27
Liquidity default likelihood	18,597	9.65	24.16	−6.63	313.37	2.75
Total assets	18,597	23.98	2.67	10.21	25.82	24.88
EBIT	18,597	18.51	2.54	6.05	22.29	18.69
Return on Assets	18,597	4.07	4.78	−17.99	25.20	3.14
PB ratio	18,597	1.43	1.68	−0.3	10.96	0.79

Note: This table provides summary statistics of the main variables, covering the full sample and including both treatment and control firms. Summary statistics include mean, standard deviation, median, minimum, and maximum values of all continuous variable.

## References

- Acharya, V. V., Sundaram, R. K., & John, K. (2011). Cross-country variations in capital structures: The role of bankruptcy codes. *Journal of Financial Intermediation*, 20(1), 25–54. [CrossRef]
- Aghion, P., & Bolton, P. (1992). An incomplete contracts approach to financial contracting. *The Review of Economic Studies*, 59(3), 473–494. [CrossRef]
- Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: Capital market-oriented versus bank-oriented institutions. *Journal of Financial and Quantitative Analysis*, 43(1), 59–92. [CrossRef]

- Araujo, A. P., Ferreira, R. V. X., & Funchal, B. (2012). The Brazilian bankruptcy reform experience. *Journal of Corporate Finance*, 18(4), 994–1004. [CrossRef]
- Asquith, P., Gertner, R., & Scharfstein, D. (1994). Anatomy of financial distress: An examination of junk-bond issuers. *The Quarterly Journal of Economics*, 109(3), 625–658. [CrossRef]
- Bae, K., & Goyal, V. K. (2009). Creditor rights, enforcement, and bank loans. *The Journal of Finance*, 64(2), 823–860. [CrossRef]
- Bancel, F., Mittoo, U. R., & Bhattacharyya, N. (2004). Cross-country determinants of payout policy: A survey of European firms. *Financial Management*, 33, 103–132. [CrossRef]
- Barclay, M. J., & Smith, C. W. (1995). The maturity structure of corporate debt. *The Journal of Finance*, 50(2), 609–631. [CrossRef]
- Beck, T., Levine, R., & Levkov, A. (2010). Big bad banks? The winners and losers from bank deregulation in the United States. *The Journal of Finance*, 65(5), 1637–1667. [CrossRef]
- Berger, P. G., & Ofek, E. (1995). Diversification's effect on firm value. *Journal of Financial Economics*, 37(1), 39–65. [CrossRef]
- Berkowitz, D., Pistor, K., & Richard, J.-F. (2003). Economic development, legality, and the transplant effect. *European Economic Review*, 47(1), 165–195. [CrossRef]
- Bianco, M., Jappelli, T., & Pagano, M. (2005). Courts and banks: Effects of judicial enforcement on credit markets. *Journal of Money, Credit, and Banking*, 37(2), 223–244. [CrossRef]
- Bolton, P., & Scharfstein, D. S. (1996). Optimal debt structure and the number of creditors. *Journal of Political Economy*, 104(1), 1–25. [CrossRef]
- Bose, U., Filomeni, S., & Mallick, S. (2021). Does bankruptcy reform improve the fate of distressed firms? The role of credit channels. *Journal of Corporate Finance*, 68, 101836. [CrossRef]
- Bradley, M., Jarrell, G. A., & Kim, E. H. (1984). On the existence of an optimal capital structure: Theory and evidence. *The Journal of Finance*, 39(3), 857–878. [CrossRef]
- Davydenko, S. A., & Franks, J. R. (2008). Do bankruptcy codes matter? A study of defaults in France, Germany, and the U.K. *The Journal of Finance*, 63(2), 565–608. [CrossRef]
- Djankov, S., Hart, O., McLiesh, C., & Shleifer, A. (2008). Debt enforcement around the world. *Journal of Political Economy*, 116(6), 1105–1149. [CrossRef]
- Esty, B. C. (2004). *When do foreign banks finance domestic projects? New evidence on the importance of legal and financial systems*. Available online: <https://ssrn.com/abstract=594526> (accessed on 10 October 2025).
- Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies*, 15(1), 1–33. [CrossRef]
- Fama, E. F., & Jensen, M. C. (1983). Agency problems and residual claims. *The Journal of Law and Economics*, 26(2), 327–349. [CrossRef]
- Frank, M. Z., & Goyal, V. K. (2007). Trade-off and pecking order theories of debt. In B. E. Eckbo (Ed.), *Handbook of corporate finance: Empirical corporate finance* (Vol. 2, Chapter 12). Elsevier. [CrossRef]
- Gertner, R., & Scharfstein, D. (1991). A Theory of workouts and the effects of reorganization reform. *The Journal of Finance*, 46(4), 1189–1222. [CrossRef]
- Giannetti, M. (2003). Do better institutions mitigate agency problems? Evidence from corporate finance choices. *The Journal of Financial and Quantitative Analysis*, 38(1), 185. [CrossRef]
- Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 60(2–3), 187–243. [CrossRef]
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, 46(1), 297–355. [CrossRef]
- Hart, O., & Moore, J. (1994). A theory of debt based on the inalienability of human capital. *The Quarterly Journal of Economics*, 109(4), 841–879. [CrossRef]
- Hart, O., & Moore, J. (1998). Default and renegotiation: A dynamic model of debt. *The Quarterly Journal of Economics*, 113(1), 1–41. [CrossRef]
- Haselmann, R., Pistor, K., & Vig, V. (2010). How reform affects lending. *Review of Financial Studies*, 23(2), 549–580. [CrossRef]
- He, Z., & Xiong, W. (2012). Rollover risk and credit risk. *The Journal of Finance*, 67(2), 391–430. [CrossRef]
- Insolvency and Bankruptcy Board of India. (n.d.). *Insolvency and bankruptcy code (IBC)*. Available online: <https://ibbi.gov.in/legal-framework/act> (accessed on 10 October 2025).
- Jaffee, D. M., & Russell, T. (1976). Imperfect information, uncertainty, and credit rationing. *The Quarterly Journal of Economics*, 90(4), 651. [CrossRef]
- Jappelli, T., & Pagano, M. (2002). Information sharing, lending and defaults: Cross-country evidence. *Journal of Banking & Finance*, 26(10), 2017–2045. [CrossRef]
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360. [CrossRef]
- Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911. [CrossRef]

- La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance*, 54(2), 471–517. [[CrossRef](#)]
- Lee, N., & Lee, J. (2019). External financing, R&D intensity, and firm value in biotechnology companies. *Sustainability*, 11(15), 4141. [[CrossRef](#)]
- Marsh, P. (1982). The choice between equity and debt: An empirical study. *The Journal of Finance*, 37(1), 121–144. [[CrossRef](#)]
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261–297.
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review*, 53, 433–443.
- Munro, J. W. (1996). Convertible debt financing: An empirical analysis. *Journal of Business Finance & Accounting*, 23(2), 319–334. [[CrossRef](#)]
- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5(2), 147–175. [[CrossRef](#)]
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187–221. [[CrossRef](#)]
- Neira, J. (2019). Bankruptcy and cross-country differences in productivity. *Journal of Economic Behavior & Organization*, 157, 359–381. [[CrossRef](#)]
- Pagano, M., & Jappelli, T. (1993). Information sharing in credit markets. *The Journal of Finance*, 48(5), 1693–1718. [[CrossRef](#)]
- Ponticelli, J., & Alencar, L. S. (2016). Court enforcement, bank loans, and firm investment: Evidence from a bankruptcy reform in Brazil. *The Quarterly Journal of Economics*, 131(3), 1365–1413. [[CrossRef](#)]
- Porta, R. L., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external Finance. *The Journal of Finance*, 52(3), 1131–1150. [[CrossRef](#)]
- Qian, J., & Strahan, P. E. (2007). How laws and institutions shape financial contracts: The case of bank loans. *The Journal of Finance*, 62(6), 2803–2834. [[CrossRef](#)]
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50(5), 1421–1460. [[CrossRef](#)]
- Roberts, M. R., & Sufi, A. (2008). Renegotiation of financial contracts: Evidence from private credit agreements. *Journal of Financial Economics*, 93(2), 159–184. [[CrossRef](#)]
- Rodano, G., Serrano-Velarde, N., & Tarantino, E. (2016). Bankruptcy law and bank financing. *Journal of Financial Economics*, 120(2), 363–382. [[CrossRef](#)]
- Sapienza, P. (2002). The effects of banking mergers on loan contracts. *The Journal of Finance*, 57(1), 329–367. [[CrossRef](#)]
- Sautner, Z., & Vladimirov, V. (2018). Indirect costs of financial distress and bankruptcy reform: Evidence from trade credit and sales. *Review of Finance*, 22(5), 1667–1704. [[CrossRef](#)]
- Scott, J. A., & Smith, T. C. (1986). The effect of the Bankruptcy Reform Act of 1978 on small business loan pricing. *Journal of Financial Economics*, 16(1), 119–140. [[CrossRef](#)]
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393–410.
- Stonehill, A., & Stitzel, T. (1969). Financial structure and multinational corporations. *California Management Review*, 12, 91–99. [[CrossRef](#)]
- Tirole, J., & Bénabou, R. (2010). Individual and corporate social responsibility. *Economica*, 77(305), 1–19. [[CrossRef](#)]
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, 43(1), 1–19. [[CrossRef](#)]
- Townsend, R. M. (1979). Optimal contracts and competitive markets with costly state verification. *Journal of Economic Theory*, 21(2), 265–293. [[CrossRef](#)]
- Van Der Wijst, D. (1989). *Financial structure in small business* (Vol. 320). Springer. [[CrossRef](#)]
- Vig, V. (2013). Access to collateral and corporate debt structure: Evidence from a natural experiment. *The Journal of Finance*, 68(3), 881–928. [[CrossRef](#)]
- Warner, J. B. (1977). Bankruptcy costs: Some evidence. *The Journal of Finance*, 32(2), 337. [[CrossRef](#)]
- Welsh, J. A., White, J. F., & Dowell, P. (1982). A small business is not a little big business. *European Small Business Journal*, 1(1), 95–98. [[CrossRef](#)]

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