Personal Bankruptcy Reforms and Credit Market: Cross-Country Evidence on Filing Behavior and Credit Tightening[1]

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Abstract

Personal bankruptcy regulation embodies a core trade-off between offering debtors a "fresh start" and preserving household credit supply. This study examines how reforms in personal bankruptcy law affected bankruptcy filings and household credit markets in 13 European countries and Israel between 2001 and 2020. We measure debtor-friendliness through a composite Leniency Index and apply Local Projection models to capture dynamic effects over horizons up to seven years including pre-implementation adjustment. Our findings show that more lenient legislation increases bankruptcy filings in the short-to-medium term, peaking after three to four years, but the effect fades within six to seven years. In contrast, leniency exerts persistent negative effects on household credit growth, with lenders tightening credit supply. Effects are dimension-specific: stigma and procedural complexity primarily drive filing behavior, while discharge conditions and procedural features significantly affect credit supply. These results underscore that debtor-friendly reforms improve individual rehabilitation but may trigger persistent credit tightening, implying that bankruptcy design must balance social protection against the risk of credit rationing and that reforming different legal dimensions can affect debtors and credit markets in fundamentally different ways.

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1. Introduction

Personal bankruptcy law constitutes the institutional framework through which the debts of insolvent individuals, households, and self-employed business proprietors are adjudicated and resolved. The design of bankruptcy systems has emerged as a critical policy issue in modern economies, as governments seek to balance the competing objectives of debtor rehabilitation and creditor protection. The development of personal bankruptcy systems has received increasing attention; of the 27 EU countries, altogether 25 had enacted specific personal bankruptcy regimes by 2020, 16 member states over the past two to three decades, and almost twenty major reforms have been implemented. These reforms moved predominantly toward more lenient approaches that facilitate faster economic rehabilitation for distressed debtors, reflecting a growing recognition that overly punitive bankruptcy systems may hinder economic recovery and entrepreneurship, while also acknowledging the need to maintain credit market functionality and financial discipline. We study how these reforms in debtor protection across 13 EU countries and Israel shape the evolution of bankruptcy filings and, in response by lenders, the supply of household credit over subsequent years.

The theoretical foundation (e.g. Athreya, 2006; Spooner, 2017) for these reforms rests on the premise that efficient bankruptcy systems should provide a certain degree of a "fresh start" for debtors in financial distress, while preserving appropriate incentives for responsible borrowing and lending behavior. However, this conceptual framework masks a fundamental tension: the potential trade-off between increasing leniency toward debtors and the corresponding effects on credit market dynamics. As bankruptcy laws become more lenient toward debtors, creditors may respond by tightening lending standards and reducing credit availability to compensate for heightened default risks, reduced recovery prospects, and higher expected losses. Yet, debtor and creditor responses are not free from tension. Which dimensions of legislative change induce debtors to file for this safety net, and how persistent the resulting change in filing volumes is, are non-trivial questions. Furthermore, lenders' responses can operate through pricing, rationing, or contract redesign, and may arise both after and in anticipation of reforms; whether the resulting effects on the loan market are short-lived or persistent is therefore an empirical question.

Existing empirical research on bankruptcy reforms has predominantly focused on either (1) single-country analyses, examining the direct effects of specific legislative changes on bankruptcy filing rates, debtor outcomes, entrepreneurial activity, and on creditors' reaction in the lending market, or the consequences of differences in bankruptcy laws across U.S. states. However, these two dominant empirical settings in the literature on filing dynamics and lender reactions are typically both U.S.-based.

Single-country analyses have predominantly focused on the creditor-friendly 2005 U.S. BAPCPA (Bankruptcy Abuse Prevention and Consumer Protection Act) reform. They showed that the number of filings declined after the reform, confirming the association between bankruptcy filing dynamics and lenders' reactions: higher creditor protection was associated with lower interest rates (White, 2007a; Gross et al., 2021). The second setting typically analyzed the development of filings and credit market based on the cross-state variation in homestead exemptions across the U.S. These studies generally reached similar conclusions. More generous, higher exemption limits led to higher filing rates (e.g., Gropp et al., 1997; Athreya, 2006; Pattison and Hynes, 2020) and the level of homestead exemptions was associated with credit rationing (Lin and White, 2001) or with the level of unsecured credit (Indarte, 2022). Empirical evidence outside the United States remains limited and largely case-based, especially regarding credit-market responses to personal bankruptcy reforms.

In summary, prior literature converges on the view that debtor- or creditor-friendly changes and cross-state differences affect bankruptcy filing volumes. However, the literature is subject to a common limitation: in addition to its exclusive focus on the United States, existing studies either examine a single reform episode or capture leniency through only one specific indicator, namely the level of homestead exemptions. These features limit the external validity of the findings, as they do not account for cross-country institutional differences or temporal variation that may shape the relationship between leniency reforms and economic or social outcomes. While these studies have provided valuable insights into the immediate consequences of a specific reform or into cross-sectional differences in selected elements of bankruptcy systems, they have not systematically explored the role of key legislative elements in debtors' and creditors' responses, the dynamics of these responses, or the broader equilibrium effects on credit markets across different institutional and economic contexts.

Therefore, to our knowledge, we provide the first comprehensive cross-country panel analysis of how personal bankruptcy reform measures that alter different dimensions of the legal framework and its overall leniency affect both personal bankruptcy filing patterns and household credit supply.

We examine 14 countries (13 EU countries and Israel) using a comparative dataset to analyze the long-term effects of legal reforms from 2001 to 2020 on the development of bankruptcy filings and household credit supply. As reforms are legislative processes rather than instantaneous shocks we therefore allow for anticipatory and dynamic responses around reform implementations. Using panel data and employing a Local Projections model (Jordà and Taylor, 2025) to extract the dynamic impact, we examine the effect of reforms that modified the complex leniency level of the regimes on both

the number of bankruptcy filings and the household credit supply extended by the financial system.

We use the "Leniency Index," introduced by Walter and Krenchel (2021) and later adapted by Walter et al. (2022) to analyze the relationship between leniency changes and entrepreneurship trends in EU countries, as well as by Ofir et al. (2023) and Berzani and Stein (2023) to examine personal bankruptcy developments in Israel. This composite index evaluates personal bankruptcy laws across seven dimensions and 35 indicators, based on the literature on comparative personal bankruptcy analyses (White, 2007a; Graziano et al., eds., 2019; Armour and Cumming, 2008): accessibility, eligibility, costs, complexity, process, discharge conditions, and stigma.

We expect that greater leniency is associated with a significant increase in the number of bankruptcy filings, particularly in the short run, and with a decrease in credit availability and credit supply.

Our results show that changes in the Leniency Index exert a positive and statistically significant cumulative effect on bankruptcy filings over an extended four-year period following the initial policy shock, peaking in the fourth year. On the other hand, lenient regulatory shocks have a more persistent negative effect on credit growth rates across a five-year horizon. Whereas filings return to prereform levels over time, the effect on credit growth rates remains even in the long run, suggesting that such reforms lead to temporary changes in the dynamics of filings, but result in persistent shifts in credit market dynamics rather than short-term adjustments. We also show that, when decomposing the index, not all legislative dimensions are relevant for debtors and creditors. These conclusions carry important policy implications, suggesting that policymakers face a fundamental tension when designing personal bankruptcy systems.

Previous studies typically examined static relationships or focused on immediate post-reform effects in one country. Our analysis contributes by showing how debtor-friendly bankruptcy reforms in different legal systems translate into dynamic filing responses and an equilibrium tightening of household credit supply. This examination allows us to estimate whether more individual debtors pursue debt restructuring and fresh start while overall credit supply simultaneously becomes constrained as financial institutions adjust their lending in response to altered risk-return profiles. Our study provides a novel empirical analysis by combining multidimensional measures of debtor protection with dynamic modeling of filings and credit responses.

Our contributions are thus multifaceted: (i) we provide the first dynamic cross-country evidence linking leniency to both filings and credit supply; (ii) we identify credit market responses based on alternative reform timing (parliamentary approval vs. implementation); (iii) we document credit market equilibrium responses beyond debtor behavior; (iv) we distinguish reform magnitude from mere occurrences; and

(v) we decompose leniency effects by dimension, revealing differential impacts on filing decisions versus credit supply.

The remainder of the paper is structured as follows. In Section 2, we outline the relevant literature and develop our hypotheses. In Section 3, we then introduce the data and present descriptive statistics. Section 4 describes the methodology applied, followed by the results of the multivariate analyses in Section 5 and robustness checks in Section 6. In Section 7, we discuss our findings, draw conclusions, and formulate policy recommendations.

2. Literature review and hypothesis development

According to White's (2007b) conceptualization, personal bankruptcy law refers to the legal framework designed to settle the debts of individuals and small business owners who have become insolvent. Despite cross-country procedural differences, personal bankruptcy typically involves an eligibility-based access to a structured repayment plan funded by nonexempt income and assets, followed by a discharge of residual debts and a financial "fresh start".

As this legislation provides over-indebted individuals with a safety net, personal bankruptcy laws have been framed as a form of social insurance (e.g. Spooner, 2017; Feibelman, 2005). Such laws provide debt relief to over-indebted individuals when traditional safety nets have proven inadequate. This system functions as compulsory, state-governed insurance, in which certain risks and costs are shifted from debtors to creditors. While this transfer may be welfare enhancing for individuals by insuring them against costly adverse events, it simultaneously imposes costs on creditors, which increase in tandem with the leniency of the legislation.

Leniency denotes the debtor-friendly orientation of personal bankruptcy law. Narrowly, it concerns the terms of restructuring and relief, the availability of discharge, and the prospect of a fresh start, including measures such as payment deferrals, reduced debt service, and partial or full discharge. More broadly, it captures how the system treats defaulting debtors and unlimited-liability entrepreneurs, how accessible a fresh start is in practice, and the severity of any residual post-bankruptcy stigma.

The literature has also examined the behavioral and financial implications of system changes for both debtors and creditors. The introduction of a new system or a more lenient reform within a country may trigger multiple, potentially opposing effects through complex transmission mechanisms. Moreover, the responses of debtors and creditors do not necessarily occur simultaneously or with the same intensity. These reactions can be analyzed from both the debtor's and the creditor's perspective. From the creditor's standpoint, the literature substantiates the intuitive proposition underlying this mechanism: debtor-friendly legal changes raise actual or expected

credit losses, thereby prompting lenders to adopt compensatory, more restrictive responses. It must be noted that, to our knowledge, there is no integrated framework in the personal bankruptcy literature that jointly models the timing of debtor responses and the feedback effects of creditor anticipation.

Focusing first on the channels through which lenient policy measures increase actual and expected creditor losses, Angel and Warum (2024) pointed out three mechanisms.

First, when filing became easier and more accessible, borrowers appeared more willing to take higher risks and accumulate greater debt, leading to moral hazard and higher expected creditor losses. Findings in the household bankruptcy literature were mixed. Early studies linked debtor-friendly bankruptcy to strategic filing and higher creditor losses (White, 1998; Wang and White, 2000; Feibelman, 2005; Pottow, 2007), but newer evidence emphasized heterogeneity and often small effects (Li et al., 2022; Indarte, 2023). Extending bankruptcy protection to entrepreneurs revealed further dynamics: debtor-friendly changes tended to boost entry (Fan and White, 2003; Agarwal et al., 2005; Landier, 2005; Armour and Cumming, 2008; Walter et al., 2022).

Second, there was a redistribution of value and recoveries between creditors and debtors due to legislative changes. In the case of lenient reforms, this typically resulted in higher actual losses to creditors because of lower recovery rates and higher transaction costs. This phenomenon was thoroughly analyzed in the comparative studies mentioned in Section 1.

Third, and central to our study, more generous debt relief prompted more debtors to file for bankruptcy. As discussed in Section 1, the most relevant studies in this field clustered around two focal themes: the effects of the 2005 BAPCPA reform, where creditor-friendly reforms were associated with a decrease in filings (White, 2007a; Athreya et al., 2015; Mitman, 2016; Gross et al., 2021; Albanesi and Nosal, 2025), and evaluations of state-level asset exemption provisions in the United States, where the homestead exemption level was associated with filing rates (Gropp et al., 1997; Athreya, 2006; Pattison and Hynes, 2020; Li et al., 2022).

Empirical studies focusing on non-U.S. contexts are scarce. In Austria, the debtor-friendly 2017 reform was associated with a short-run rise in filings followed by a correction (Angel and Warum, 2024). In Canada, higher procedural costs after the 2009 reform were correlated with fewer filings, though these costs were proxied by a single cost indicator (Allen and Basiri, 2016). No cross-country studies were identified, leaving external validity across institutional contexts unresolved. This lack of broader evidence leaves open important questions about whether similar patterns held in other institutional and economic contexts. Since most existing evidence was confined to short post-reform windows, it remained unclear whether filing responses persisted or faded over longer horizons. Therefore, we propose the following hypothesis:

H1. Lenient, debtor-friendly measures are associated with a positive long-horizon cumulative effect on bankruptcy filings.

The expectation of higher credit losses arising from the three potential risk factors and channels detailed above incentivizes lenders to take opposing actions to protect their interests. These actions could include credit rationing, raising interest rates, reducing the supply of credit, and lowering equilibrium lending. [2]

While the reactions of credit markets to changes in creditors' rights in the corporate loan market were well documented in the literature (Qian and Strahan, 2007; Davydenko and Franks, 2008; Haselmann et al., 2010), the reactions of consumer loan markets and banks to changes in personal bankruptcy regulation have not been analyzed as comprehensively.

As discussed above, personal bankruptcy studies were also largely limited to the effects of the BAPCPA reform and cross-state differences in homestead exemptions. BAPCPA reform analyses generally found that the creditor-friendly reform was associated with lower interest rates (White, 2007a; Gross et al., 2021). Studies based on differences in homestead exemptions among U.S. states reached similar conclusions. Different exemption levels were associated with credit redistribution (Gropp et al., 1997) and mortgage credit rationing (Lin and White, 2001). Indarte (2022) interpreted these patterns as an equilibrium mechanism in which credit-supply responses could offset filing incentives.

Outside the United States, evidence on creditor-side responses to personal bankruptcy reforms is scarce. To our knowledge, Fossen (2014) provided one of the few non-U.S. studies, showing in the German context that stronger debtor protection could affect borrowing costs (interest rates).

Taken together, these studies suggested that credit terms adjusted to bankruptcy reforms or to legal differences. Many studies presented filing outcomes alongside credit-market measures; however, the two sides were not integrated into a unified empirical framework that traced their dynamic interaction. Complementary evidence from Dick and Lehnert (2010) suggested that credit-supply shifts could feed back into filing behavior: banking deregulation-driven credit expansion was accompanied by higher personal bankruptcy rates across U.S. states in the 1980s and 1990s.

Based on prior findings, we formulate the second hypothesis as follows:

H2. Lenient, debtor-friendly changes in personal bankruptcy regulation are negatively associated with the growth rate of household credit in the long term, reflecting banks' credit-tightening response.

[2] Within this framework, borrowers – the beneficiaries of the stricter conditions – effectively bear the cost of the special debtor protection.

3. Data and research design

3.1. Data

This study employs a comprehensive panel dataset spanning multiple countries and years. Our dataset incorporates three key variables of interest: the Leniency Index, which captures the degree of debtor-friendliness in personal bankruptcy legislation; the number of filings initiated annually, reflecting the intensity of using the legal protection; and household credit trends, measured as the three- and one-year growth rates of the credit to GDP ratio, to capture dynamic credit expansion patterns. To control for macroeconomic conditions that may influence both regulatory behavior and credit markets, we include standard economic indicators such as GDP growth rate, inflation, unemployment, stock returns[3], population size, and short-term interest rates. In selecting these variables, we reference panel regression studies on leniency effects on entrepreneurship by Parker and Robson (2004), Armour and Cumming (2008), and Walter et al. (2022). This comprehensive data structure helps us isolate the specific effects of regulatory leniency while accounting for broader economic cycles and structural factors that typically drive credit market dynamics.

Our dataset encompasses 14 countries spanning the period 2001–2020, with all countries experiencing at least one major reform and change in the Leniency Index4 during the observation period. It reveals considerable heterogeneity in the timing and frequency of leniency adjustments across jurisdictions. The Czech Republic exhibits four distinct changes in regulatory policy that affected the leniency level, occurring in 2008, 2014, 2017, and 2019, while other countries demonstrate one or two notable policy shifts. Notably, 2015 emerges as a pivotal year with four countries (Greece, Ireland, Poland, and Sweden) implementing leniency modifications, followed by 2017 when three countries (Austria, Czech Republic, and Latvia) adjusted their regulatory stance.

The Leniency Index values for European countries were obtained from calculations conducted in Walter and Krenchel's (2021) study, which computed and published the index for the period 2000–2020. This Leniency Index, as a composite index, comprises seven main dimensions of personal bankruptcy legislation[5]: (1) accessibility, including the existence of straight bankruptcy; (2) eligibility; (3) costs; (4) complexity; (5)

[3] Detailed information regarding the specific stock market indices selected for each country is presented in Appendix B.

[4] We define a major change and reform in the regulation as one in which there was a change in at least one underlying indicator in the Leniency Index.

[5] The index is calculated based on the legislation, but the data reflect the implementation of the legislation. This means that, for example, when a change in legislation alters the index, we record the change in the year the law is actually implemented.

process; (6) conditions for discharge in debt restructuring; and (7) stigma. These dimensions are further broken down into 35 specific indicators. The index scores range from 0.0 to 2.0, representing the balance of the seven leniency dimensions. A score of 0.0 indicates that no specific personal bankruptcy system exists in the country that allows discharge of debt or a fresh start for individual debtors, while higher scores reflect the existence of such legislation with varying degrees of leniency. A higher score indicates a greater overall level of leniency, weighting the different indicators and dimensions. Years of introductions and reforms for each country can be seen in Table 1.[6]

Table 1.
Timeline of the Implementation of Personal Bankruptcy Law Reforms by Country (2001–2020)

Country	**Years of Leniency Index changes, introductions (i) and reforms (r)**
Austria	2017(r)
Czech Republic	2008(i), 2014(r), 2017(r), 2019(r)
Denmark	2005(r)
France	2003(r), 2010(r)
Germany	2013(r)
Greece	2010(i), 2015(r)
Ireland	2013(i), 2015(r)
Israel	2019(r)
Latvia	2008(i), 2017(r)
Netherlands	2008(r)
Poland	2009(i), 2015(r)
Romania	2018(i)
Spain	2004(i), 2013(r)
Sweden	2006(r), 2016(r)

The table reports the year in which the legislation entered into force.
Source: Walter and Krenchel (2021); Berzani and Stein (2023)

Fig. 1 shows that the average regulatory Leniency Index demonstrates a clear upward trajectory from 2001 to 2020, increasing from 0.497 to 1.215 (a 144% increase over

[6] For Israel's data, index values before 2019 are calculated based on the methodology of Walter and Krenchel (2021). We use the leniency index values for 2019–2020 after the reform from Berzani and Stein (2023).

the 20-year period). The standard deviation was stable at 0.6 in 2006–2007, indicating substantial cross-country differences in regulatory approaches. However, the standard deviation declined markedly from 2008 onwards, falling to 0.2 by 2020, suggesting regulatory convergence among countries.

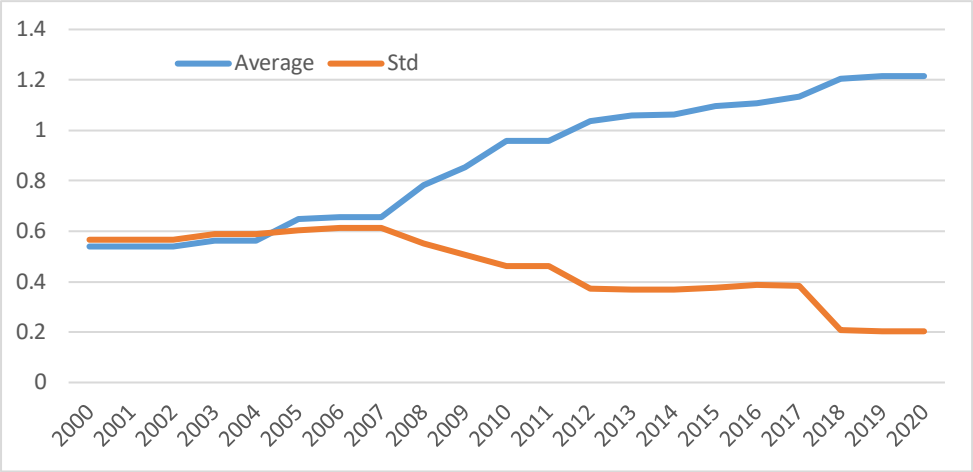


Fig. 1. Average Leniency Index, 2000–2020. *The figure shows the average Leniency Index and its cross-country standard deviation for the period 2000–2020. The sample includes European countries and Israel. Higher index values indicate more debtor-friendly bankruptcy legislation. (Source: Walter and Krenchel, 2021; Berzani and Stein, 2023)*

Table 2 presents the distribution of reforms across the seven dimensions of bankruptcy law for our 14-country sample, showing which specific aspects of legislation changed in each country. The results reveal substantial reform activity across most dimensions. The most frequently reformed dimensions of the composite index are "conditions of discharge" and "process", each of which was changed in 12 countries (86% of the sample), followed closely by "stigma" reduction and "eligibility" reforms (11 countries each). Even the least frequently reformed dimension, "cost", was implemented in 7 countries, representing half of our sample.

The average number of dimensions reformed per country exceeds 5, indicating broad-based legislative changes rather than narrow technical adjustments. Notably, only two countries – Germany and the Netherlands – implemented reforms in fewer than four dimensions, each with a single-dimension change.

These findings have important implications for our study. First, the widespread nature of reforms across multiple dimensions suggests that the Leniency Index effects we estimate capture comprehensive policy changes rather than single-aspect modifications. Second, the variation in reform intensity – from single-dimension changes to complete overhauls – provides rich variation for identifying the impacts of bankruptcy leniency.

Table 2
Changes in dimensions across countries

Country	Dimension change number	Stigma	Cond. Disch.	Pro-cess	Comp-lexity	Cost	Eligi-bility	Str. bank.
Austria	**4**	✓	✓	✓	✓	-	-	-
Czech Rep.	**7**	✓	✓	✓	✓	✓	✓	✓
Denmark	**5**	-	✓	✓	✓	-	✓	✓
France	**5**	✓	✓	✓	✓	-	-	✓
Germany	**1**	-	✓	-	-	-	-	-
Greece	**7**	✓	✓	✓	✓	✓	✓	✓
Ireland	**7**	✓	✓	✓	✓	✓	✓	✓
Israel	**6**	✓	✓	✓	-	✓	✓	✓
Latvia	**6**	✓	✓	✓	✓	✓	✓	-
Netherlands	**1**	-	-	-	-	-	✓	-
Poland	**7**	✓	✓	✓	✓	✓	✓	✓
Romania	**7**	✓	✓	✓	✓	✓	✓	✓
Spain	**7**	✓	✓	✓	✓	✓	✓	✓
Sweden	**4**	✓	-	✓	✓	-	✓	-
Number of countries with change in the dimension		**11**	**12**	**12**	**11**	**8**	**11**	**9**

The personal bankruptcy filings data across different countries were compiled from multiple sources, including central banks, reports and publications of insolvency and bankruptcy registries, Central Bureau of Statistics, parliamentary reports, and academic papers. Detailed information regarding the specific data sources for each country's insolvency statistics is provided in Appendix A.[7]

The remaining data, including household debt and control variables, were obtained from consistent sources across almost all sample countries. Household credit data (as a percentage of GDP) were sourced from Eurostat for European Union countries and from the Bank of Israel for Israeli data. Additional control variables – Short-term interest rates[8], unemployment rate, Consumer Price Index, and GDP growth rate – were obtained from the OECD database for all countries in the sample.

The variation of the Leniency Index in countries with different legal origin aligns with the findings of La Porta et al. (1998), who argue that legal systems play a crucial role in shaping creditor protection. Their study of 49 countries finds that common law countries provide the strongest creditor rights, while French civil law countries offer the weakest. This correlates with our index, which shows that countries with more

[7]It is important to notice the substantial heterogeneity that exists across countries in reporting methodologies of a number of annual filings. Additional details are provided in the discussion section.
[8] Representing the rates at which financial institutions borrow, or short-term government paper is issued or traded.

conservative creditor protection laws (such as those in common law systems) tend to have lower Leniency Index scores, reflecting weaker protection for debtors. Conversely, in French civil law countries, where creditor protection is weaker, the Leniency Index tends to be higher, indicating a greater focus on debtor protection.

Table 3
Descriptive Statistics (2001-2020, 14 Countries)

	Average	**Min**	**Max**
	Average	**Min**	**Max**
Leniency	0.9	0.0	1.6
Bankruptcy filings (number)	39,970	-	230,000
Bankruptcy filings rate	0.076	0	0.352
Household Credit-to-GDP (three year rate of change)	0.15	-0.44	2.85
Household Credit-to-GDP (annual rate of change)	0.052	-0.28	1.55
GDP growth rate	0.021	-0.15	0.25
Inflation rate	0.019	-0.03	0.14
Unemployment rate	0.081	0.02	0.28
Annual Return on stocks	0.062	-0.65	0.69

Bankruptcy filings rate is per 1,000 population.

Table 3 presents descriptive statistics for all variables in our analysis. The substantial heterogeneity across countries and time periods reflects diverse economic and regulatory environments, with our sample encompassing major economic cycles including the 2008 financial crisis, the subsequent unconventional monetary policy era (reflected in negative interest rates), and varying credit market conditions across jurisdictions.

3.2. Methodology

Our empirical strategy examines the association between debtor-favorable or restrictive legislative changes and two central outcome variables: (1) bankruptcy filing rate and (2) household credit. Bankruptcy filing rate is measured as the annual number of cases opened in each country, normalized by population size to account for differences in country size and demographic structure. Household credit encompasses consumer borrowing and credit market aggregates reported at the country level.

Considering only filings would reveal how households respond directly to changes in the expected costs or benefits of entering personal insolvency procedures, but this measure alone does not capture how lenders adjust credit supply in reaction to expected changes in recovery or risk. Conversely, analyzing only credit aggregates would show developments on the supply side but would not clarify whether lenders' adjustments were triggered by shifts in debtor behavior. Examining both outcomes together enables us to describe the transmission from legislative reform to credit

market outcomes more fully. This integrated design also aligns with the conceptual trade-off between social protection and credit availability: reforms intended to ease the burden on debtors may simultaneously affect lenders' willingness to extend credit. Our empirical specification is therefore structured to capture both dimensions without overstating either channel.

Although legislative reforms originate in the political arena and are often seen as independent of short-term economic fluctuations, identifying their effects requires considering the extended, sometimes multi-year legislative process. This process typically involves several stages, including drafting, committee discussions, public consultation, and parliamentary approval, all before the reform takes effect. As a result, behavioral responses may occur before formal implementation, especially when the content of the reform becomes known in advance.

Such anticipation dynamics are important because once legislative changes are announced, households may delay filing if they expect more favorable conditions under the new law, while lenders anticipating increased recovery risks may preemptively tighten lending standards. The 2019 Israeli personal bankruptcy reform provides an example. Ofir et al. (2023) showed a decline in filings as the implementation date approached, with debtors postponing proceedings until the more favorable law was implemented. Following a brief adjustment period, filing rates increased rapidly, demonstrating that these legislative changes cannot be considered exogenous shocks at the time of their implementation.

Beyond this central identification challenge, our analysis faces several additional empirical challenges. First, we lack comprehensive data on the total number of debtors, which limits our ability to estimate how lenient legislation specifically affected individuals already in financial distress. Second, the 2008 financial crisis represents a confounder because it may simultaneously affect (a) household decisions regarding credit use or bankruptcy, and (b) policymakers' decisions to adopt legislative changes. We address this concern by including macroeconomic controls, particularly GDP, to capture the effects related to the crisis.

Moreover, the financial crisis generated substantial variation in credit variables, particularly in countries most affected by the debt crisis such as Greece and Ireland. Such extreme fluctuations risk biasing overall results if sharp changes in one or two countries disproportionately drive the findings. To mitigate this, we normalize credit variables within each country by measuring deviations from country-specific means. This approach isolates the impact of legislative changes while minimizing the influence of temporary, crisis-driven fluctuations in individual countries.

To examine the dynamic evolution of bankruptcy filings and household credit following legislative changes, we employ Local Projection (LP) analysis with a fixed effects framework. This approach controls for unobserved heterogeneity across

countries and time periods while estimating dynamic responses of bankruptcy filings and consumer credit to legislative changes across multiple horizons. The LP framework offers several advantages for our analysis. It avoids restrictive assumptions about response timing or structure, allowing the data to reveal the dynamic pattern of effects. Second, Local Projections are particularly suited to capturing both the immediate behavioral responses of debtors and the longer-term equilibrium adjustments in credit markets.

An additional methodological consideration concerns the varying scale of cases across countries due to different regulatory regimes and population sizes. We address this heterogeneity in two ways. First, we normalize the number of filings by population size, calculating per capita filing rates to ensure comparability across countries with different demographic profiles. Second, our fixed effects specification controls for time-invariant cross-country differences while allowing us to estimate country-specific trends and responses to leniency changes.

4. Results

4.1. Results on Leniency Index changes

Building on these on this empirical framework, we examine dynamic effects over time using Local Projection methods for all 14 countries.[9] This estimation requires that particular attention be given to specific methodological considerations for cross-country heterogeneity and temporal dynamics.

The primary econometric concern shifts from cross-sectional dependence to within-country serial correlation over time. When a country changes its bankruptcy law, the effects are likely to persist and potentially evolve over several years, creating correlation in the error terms within each country across different time periods. To address this issue, we implement robust standard errors with clustering at the country level, using the Eicker-Huber-White heteroskedasticity-consistent covariance matrix estimator with country-level clustering[10] (see Appendix C). This approach accounts for arbitrary patterns of correlation within each country's time series while maintaining the assumption of independence across countries. Our results show that robust standard errors are substantially larger than conventional standard errors (increasing by 50–97% across different horizons), indicating that conventional methods would

[9] Note: These equations were estimated using the entire sample, including countries with missing data and those that do not align with the economic interpretation. However, even when the equation is applied to the restricted sample, the results remain remarkably similar. The full list of countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Romania, Spain, Sweden, and Israel.

[10] To ensure the robustness of our findings, we also estimated the LP models for both the filing rate and credit using the wild bootstrap cluster method. The results remain significant (see the section 4.1.).

indeed lead to overconfident inference. Despite this correction, our main findings remain statistically significant, suggesting robust policy effects.

In the first part of our LP analysis, we focus on bankruptcy filing dynamics after implementation. We examine the dynamic impact of Leniency Index changes over a five-year horizon following policy shifts. Our approach utilizes long difference measurement to capture cumulative effects from the shock period to each subsequent time point. Specifically, for each horizon *h*, we estimate the total change in filing rate relative to the initial shock period, providing a comprehensive view of policy transmission dynamics.

The long difference specification measures cumulative effects as:

$$\Delta Y_{t+h} = Y_{t+h} - Y_t \qquad (1)$$

where ΔY_{t+h} represents the cumulative change in the normalized Filing Rate (Z-score) from shock period t to horizon h, Y_{t+h} is the outcome variable at time $t+h$, and Y_t is the baseline value at the shock period.

The local projection estimation equation for the bankruptcy filings model is:

$$\Delta Y_{t+h} = \alpha_h + \beta_h \cdot leniency_Z_t + \gamma_h \cdot X_t + \delta_i + \lambda_t + \varepsilon_{i,t+h} \qquad (2)$$

where $leniency_Z_t$ is the normalized Leniency Index (Z- score), X_t includes control variables: GDP growth rate, short-term interest rate, annualized one-year rate of change of total household credit-to-GDP (Z score), annual rate change of the Consumer Price Index, and annual stock index return with δ_i and λ_t representing country and time fixed effects, respectively.

The long difference estimation (Fig. 2) reveals that Leniency Index changes exert a positive and statistically significant cumulative effect on the volume of bankruptcy filings over an extended four-year period following the initial policy shock. The cumulative impact exhibits a clear temporal pattern, with the magnitude of the effect progressively intensifying, reaching its peak in the third and fourth years following the shock. By the fifth year, the cumulative effect begins to moderate, remaining positive but becoming statistically insignificant. The increasing magnitude of the effect through year four indicates that the full impact of leniency changes materializes gradually, possibly reflecting the time required to influence the behavior of individual debtors to incentivize them to access bankruptcy proceedings. In terms of the magnitude of the effect, an increase of one standard deviation in the Leniency Index is associated with a maximum increase of 0.16 in the filing rate.

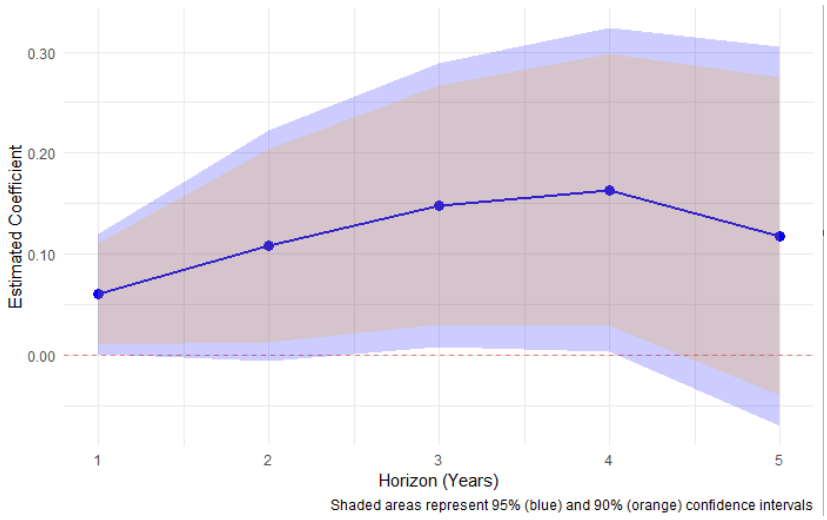


Fig. 2. Local Projections of Leniency Shock on Bankruptcy Filing Rates
This figure presents Local Projection estimates of the cumulative impact of regulatory leniency shocks on normalized bankruptcy filing rates over a five-year horizon. The analysis employs a long difference measurement methodology using panel data from 14 countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Romania, Spain, Sweden, and Israel. Standard errors are clustered at the country level to account for within-country correlation.

We also estimate the impulse response of Leniency Index changes on consumer credit dynamics over a five-year horizon. Unlike the bankruptcy filings model, we employ a level specification for credit growth rather than long differences, as our dependent variable already captures a three-year change rate. The estimation equation follows the standard local projection format:

$$CG3_Z_{i,t+h} = \alpha_h + \beta_h \cdot leniency_Z_{i,t} + \gamma_h \cdot X_{i,t} + \delta_i + \lambda_t + \varepsilon_{i,t+h} \qquad (3)$$

where $leniency_Z_t$ is the normalized Leniency Index (Z-score), $X_{i,t}$ includes contemporaneous controls: GDP growth rate, short-term interest rate, CPI, index return, and unemployment, with δ_i and λ_t representing country and time fixed effects.

As Fig. 3 shows, the impulse response reveals that regulatory shock has a persistent negative effect on credit growth rates across the entire five-year horizon. The effect reaches its peak magnitude at the two-year horizon and remains statistically significant and negative throughout the remaining periods, suggesting that while the maximum impact of leniency changes on credit occurs in the medium term, the underlying market discipline mechanism persists over the long run. In terms of the magnitude of the effect, the results show that an increase of one standard deviation in the Leniency Index is associated with a decrease of up to 0.33 standard deviation in the three-year credit-to-GDP growth rate. This finding suggests that the effect of changes in the Leniency Index is nearly twice the magnitude of its impact on the filing rate. The economic interpretation reveals that when personal bankruptcy legislation becomes more lenient, credit providers become more conservative in their lending

practices. Banks may compensate for less creditor-friendly legislation by tightening their credit supply.

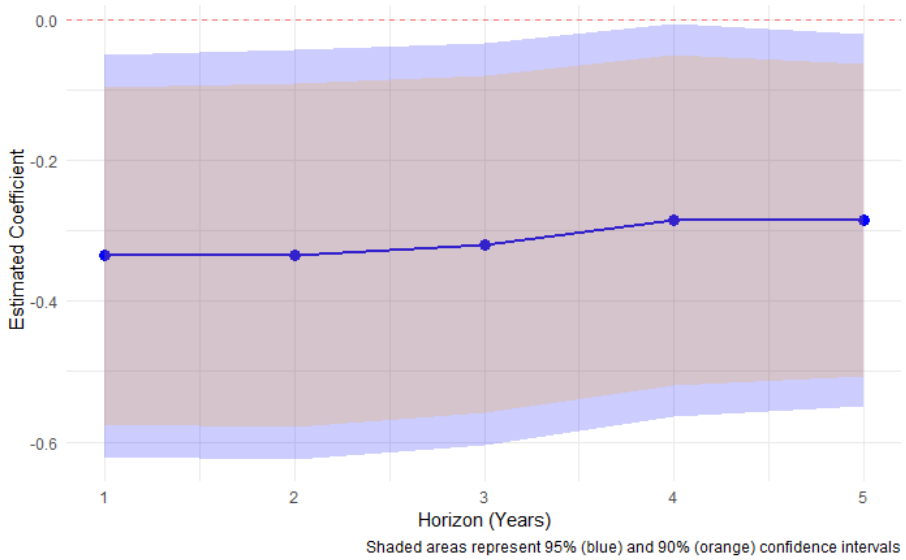


Fig. 3. Local Projections of Leniency Shock on Credit Growth
This figure presents local projection estimates of the impact of regulatory leniency shocks on consumer credit three-year change rates over a five-year horizon. The analysis uses panel data from 14 countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Romania, Spain, Sweden, and Israel. Standard errors are clustered at the country level to account for within-country correlation.

4.2. Results on Decomposing the Leniency Effect

The Leniency Index employed in this study comprises seven dimensions. Changes in the index may be due to variation in a single dimension or any number of dimensions simultaneously. Most legislative reforms across countries indeed target specific dimensions rather than comprehensively revising all aspects of bankruptcy law. Understanding the heterogeneous effects of individual dimensions is essential, both for theoretical purposes and for policymakers seeking to identify which legislative aspects most significantly influence filing behavior and credit supply. Table 3 in Section 3 presents the distribution of reforms across seven dimensions of bankruptcy law for our 14-country sample.

Estimating the effect of individual dimensions presents a methodological challenge, in that not all countries reformed the same dimensions. When countries reformed their bankruptcy laws, they typically changed multiple dimensions simultaneously, but different countries changed different combinations of dimensions at different times. This heterogeneity in reform patterns makes direct cross-country comparison of individual dimension effects problematic, as differences in outcomes could reflect

either the true effect of a specific dimension or unobserved differences between countries that reformed different sets of dimensions.

To address this challenge, we focus on five dimensions that were reformed in most countries: stigma, conditions of discharge, process, complexity, and eligibility. We then construct country-dimension combinations in which all countries within each combination reformed the same dimensions. This ensures that when comparing the magnitude of effects across dimensions within a given combination, we are comparing countries that experienced identical reform patterns, isolating the differential impact of each dimension.

This approach involves a trade-off. As we include more countries in a combination, we must restrict the analysis to fewer dimensions (since fewer countries reformed all dimensions). Conversely, analyzing more dimensions requires limiting the sample to fewer countries. We therefore estimate three different combinations, varying in the number of countries and dimensions included. By examining whether the relative effects of dimensions remain consistent across these different combinations, we can verify that our findings are robust and not driven by the specific sample composition.

We then estimate fixed effects regressions for each dimension within that country group, using the specification of the LP models but replacing the aggregate Leniency Index with dimension-specific indicators (lagged one period).

For filing rates:

$$Y_t = \alpha_h + \beta_h \cdot dimension_Z_{t-1} + \gamma_h \cdot X_t + \delta_i + \lambda_t + \varepsilon_{i,t} \qquad (4)$$

For credit growth rate:

$$CG3_Z_{i,t} = \alpha_h + \beta_h \cdot dimension_Z_{i,t-1} + \gamma_h \cdot X_{i,t} + \delta_i + \lambda_t + \varepsilon_{i,t} \qquad (5)$$

The results show that, with respect to bankruptcy filings, stigma and procedural complexity have the strongest effect on individuals' decisions to file. These dimensions are the only significant factors in the first combination and remain the most influential in terms of both statistical significance and explanatory power (R^2) across all combinations.

With regard to the credit market, the results indicate that conditions for discharge and the process have the strongest negative effect on consumer credit growth, with the largest coefficients, highest significance levels, and greatest explanatory power. The dimensions capturing debtor relief, restrictions, settlement options, asset liquidation, enforcement mechanisms, and discharge conditions are the aspects most relevant to credit providers' risk assessments. The findings suggest that reforms favoring debtors in these areas increase perceived risk for lenders.

Table 4. Dimension-Specific Effects on Bankruptcy Filings and Credit Markets

Variable (t-1)	Complexity	Process	Cond. Disch.	Stigma	Eligibility
Combination 1[11] : 8 Countries N=155, n=8					
Bankruptcy Filings	0.3***	0.069	-0.063	0.125	-0.001
Credit Growth	-0.19*	-0.29	-0.48***	-0.13	-0.18*
R^2 (Filings)	0.194	0.077	0.075	0.097	0.07
R^2 (Credit)	0.088	0.125	0.206	0.076	0.08
Adj. R^2 (Filings)	-0.018	-0.165	-0.168	-0.14	-0.17
Adj. R^2 (Credit)	-0.14	-0.096	0.006	-0.157	-0.15
Combination 2[12]: 10 Countries N=195, n=10					
Bankruptcy Filings	0.29***	0.14*	0.092	0.14*	
Credit Growth	-0.145	-0.26**	-0.3***	-0.017	
R^2 (Filings)	0.172	0.079	0.065	0.08	
R^2 (Credit)	0.051	0.082	0.1	0.06	
Adj. R^2 (Filings)	-0.005	-0.116	-0.133	-0.11	
Adj. R^2 (Credit)	-0.143	-0.106	-0.085	-0.13	
Combination 3[13]: 12 Countries N=235, n=12					
Bankruptcy Filings	0.26***	0.15*	0.097		
Credit Growth	-0.122	-0.21*	-0.22**		
R^2 (Filings)	0.14	0.076	0.06		
R^2 (Credit)	0.05	0.068	0.07		
Adj. R^2 (Filings)	-0.013	-0.091	-0.11		
Adj. R^2 (Credit)	-0.12	-0.096	-0.088		

5. Robustness tests

To validate the reliability of our main findings, we conduct several robustness tests. Our analysis employs alternative specifications and varying time periods to ensure the stability of our results.

5.1. Alternative Reform Dating: Parliamentary Approval vs. Implementation

We begin our robustness analysis by examining reform effects during periods preceding implementation. This pretreatment analysis serves two objectives:

[11] Combination 1: The 8 countries with changes in all five dimensions are: Czech Republic, Greece, Poland, Romania, Spain, Israel, Latvia, Ireland.

[12] Combination 2: The 10 countries with changes in all four dimensions are: Austria, Czech Republic, France, Greece, Poland, Romania, Spain, Israel, Latvia, Ireland.

[13] Combination 3: The 12 countries with changes in all three dimensions are: Austria, Czech Republic, Denmark, France, Greece, Poland, Romania, Spain, Sweden, Israel, Latvia, Ireland.

understanding the timing of reform effects and identifying behavioral responses that occur before legislation takes effect.

We test whether alternative reform timing – parliamentary approval rather than implementation – affects our results. Parliamentary approval typically precedes implementation by 0–3 years (average: one year). This alternative dating captures credit suppliers' responses to legislative certainty rather than to actual enforcement. Conducting this analysis for bankruptcy filing rates is problematic because many countries, particularly in Eastern Europe, recorded zero on the Leniency Index for extended periods due to the complete absence of bankruptcy legislation. This creates a fundamental identification problem: For reforms in these jurisdictions, prereform filing volumes were consistently zero, making it impossible to conduct this alternative dating analysis. We therefore restrict this analysis to the credit growth rate estimation.

For this analysis, we date reforms to parliamentary approval rather than implementation. Using the same local projection specification as in Eqs. 3, Fig. 4 shows that effects begin one year after parliamentary approval and increase over time, reaching their maximum at year three. These findings demonstrate that credit suppliers respond to leniency changes immediately following parliamentary approval rather than waiting for official implementation. Notably, when we estimate the model based on the timing of initial parliamentary discussions, we find no significant effects until three years after the shock. This suggests that credit providers begin adjusting their behavior only after legislation passes parliament, and that mere discussion without approval has no significant effect on credit provision.

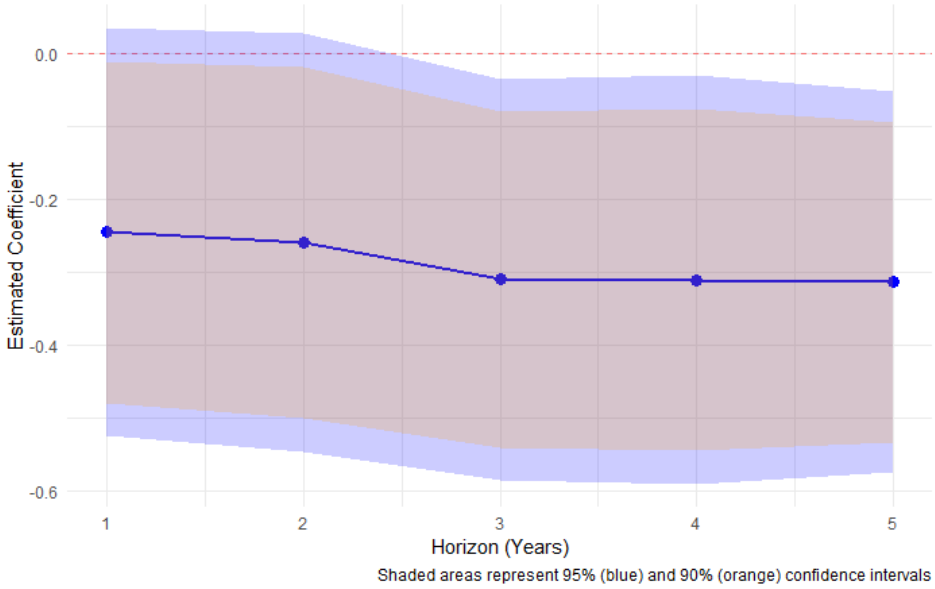


Fig. 4. Local Projections of Leniency Shock on Credit Growth (reform dated to parliamentary approval). This figure shows local projection estimates of leniency reform effects on three-year household credit-to-GDP change rates, from 1 year to 5 years after parliamentary approval. The analysis uses panel data from 14 countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia,

Netherlands, Poland, Romania, Spain, Sweden, and Israel. Standard errors are clustered at the country level to account for within-country correlation.

5.2. Estimation of the long-term effect (7 years)

A critical question this study aims to address is whether leniency reforms create permanent changes in bankruptcy filing patterns or merely temporary effects that dissipate over time.

Fig. 5 presents the long-term difference impulse response function for bankruptcy filings following a leniency shock over a seven-year horizon (Eqs. 4). The results reveal an intriguing pattern: While the initial years show the expected positive response to reform, the effect begins to diminish by years six and seven. Notably, filing rates in these later periods decline to levels slightly below their pre-reform baseline, though these coefficients are not statistically significant.

These findings suggest that leniency shocks generate transitory rather than permanent effects on bankruptcy behavior. The apparent convergence toward prereform levels after seven years indicates that legislative changes may not fundamentally alter the underlying economic equilibrium but rather create a temporary adjustment period before filing rates stabilize at levels consistent with long-term economic fundamentals.

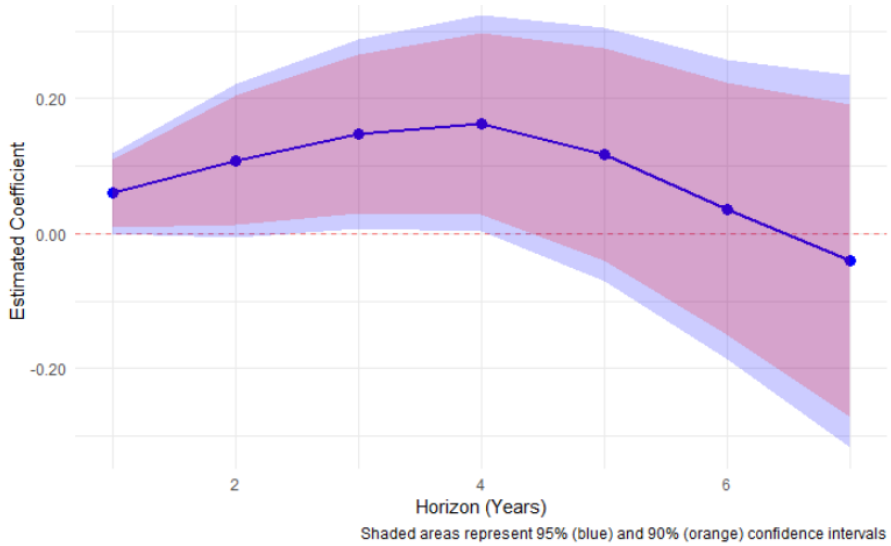


Fig. 5. Local Projections of Leniency Shock on Filing Rates in the Long Term.
This figure presents Local Projection estimates of the cumulative impact of regulatory leniency shocks on normalized bankruptcy filing rates over a seven-year horizon. The analysis employs a long difference measurement methodology using panel data from 14 countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Romania, Spain, Sweden, and Israel. Standard errors are clustered at the country level to account for within-country correlation.

The dynamic effects on consumer credit exhibit a strikingly different pattern from bankruptcy filings, underscoring the persistent nature of leniency reform impacts on

credit markets. Fig. 6 demonstrates that the credit contraction reaches its peak magnitude within 1–2 years following the shock, with the three-year rate of change declining. However, unlike the bankruptcy filing response, this negative effect on credit persists over time, remaining negative and statistically significant without returning to pre-shock levels. While the temporary disruption in bankruptcy filings fully dissipates by years six and seven, the credit contraction exhibits lasting characteristics, with growth rates remaining subdued even after six to seven years. This divergent temporal pattern – temporary for filings but persistent for credit – provides compelling evidence that leniency shocks generate asymmetric effects. While debtor filing behavior normalizes over the medium term, the credit supply response exhibits more permanent features, suggesting structural changes in lender risk assessment and underwriting practices following the reform.

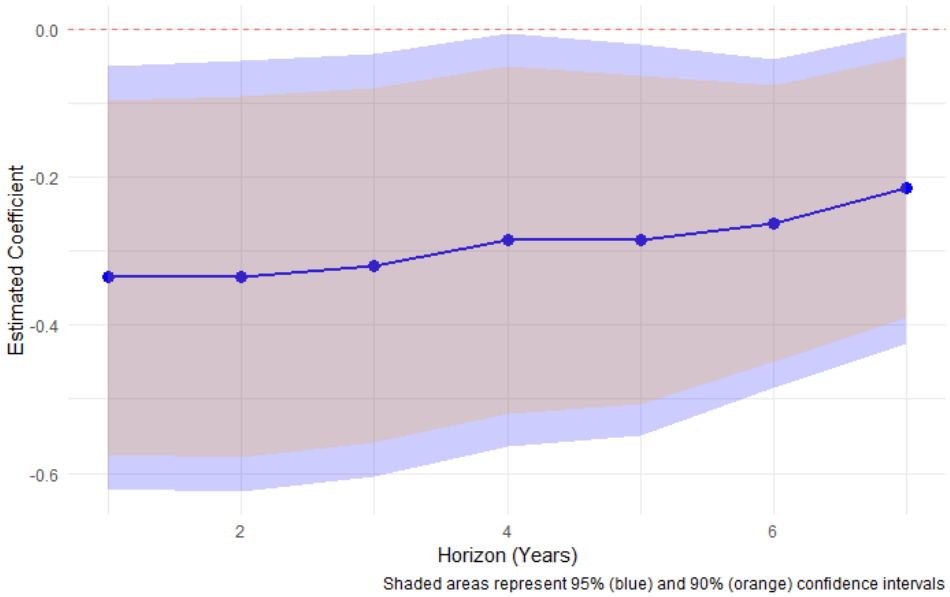


Fig. 6. Local Projections of Leniency Shock on the CG3 Rate in the Long Term.
This figure presents local projection estimates of the impact of regulatory leniency shocks on consumer credit three-year change rates over a seven-year horizon. The analysis uses panel data from 14 countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Romania, Spain, Sweden, and Israel. Standard errors are clustered at the country level to account for within-country correlation.

5.3. Measuring Reform-Specific Effects Excluding Initial Legislative Impact

Our main LP estimation presented in this paper uses all countries across the full sample period. During this period, some countries enacted their first bankruptcy legislation, meaning that for part of the duration, both the Leniency Index and bankruptcy filing values are zero. Other countries maintained existing legislation throughout the entire period, with changes occurring only through reforms over time.

Consequently, our estimation captures both the effects of reforms on existing legislation and the effects of initial legislation implementation.

In this section, we aim to isolate the specific effects of reforms on existing bankruptcy legislation. To do so, we estimate the LP models (Eqs. 2 and 3) on a subsample covering the period 2009–2020, excluding Romania and Ireland.[14]

Fig. 7 and Fig. 8 present the dynamic effects of leniency shocks on the normalized number of bankruptcy cases and the 3-year credit rate of change, respectively. For bankruptcy filings, only the first-year coefficient, one year after the leniency shock, is positive and statistically significant. Although coefficients remain positive through year four, they lack statistical significance beyond the initial year. These findings indicate that while leniency shocks affect existing legislation reforms, the magnitude is substantially smaller than in our baseline results.

The credit market response mirrors the full sample pattern but with diminished strength and robustness. While we observe the maximum effect at year three, followed by an upward reversal, statistical significance is confined to year 3 post-shock. As anticipated, the impact in countries reforming existing legislation is lower than in the full sample, which includes countries introducing bankruptcy frameworks.

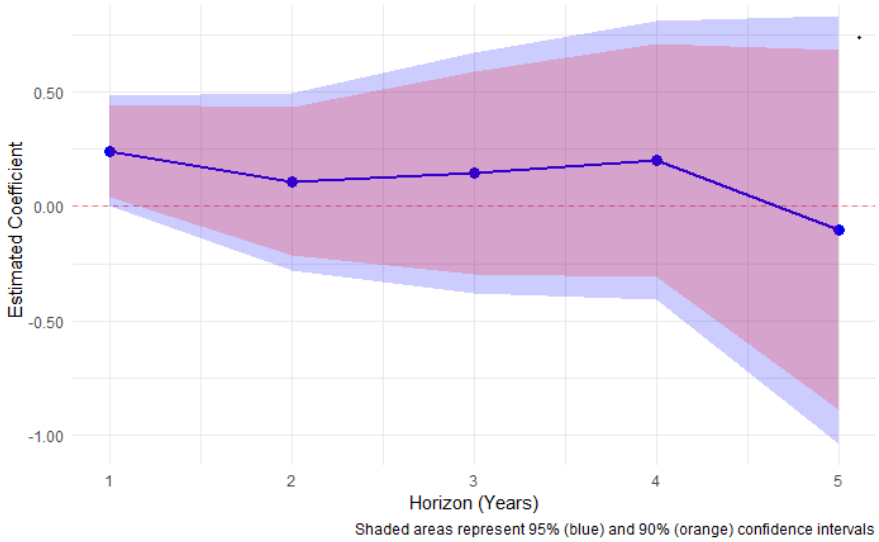


Fig. 7. Local Projections of Leniency Shock on Existing Legislation: Impact on Filing Rates.
This figure presents Local Projection estimates of the cumulative impact of regulatory leniency shocks on normalized bankruptcy filing rates over a five-year horizon. The analysis employs a long difference measurement methodology subsample covering the years 2009–2020 and includes all countries except Ireland and Romania. Standard errors are clustered at the country level to account for within-country correlation.

[14] The year 2009 was chosen as the baseline to maximize the number of countries with existing personal bankruptcy legislation and to capture the majority of relevant reforms during the observation period. Romania and Ireland were excluded from this analysis because they introduced their first personal bankruptcy legislation only after 2009.

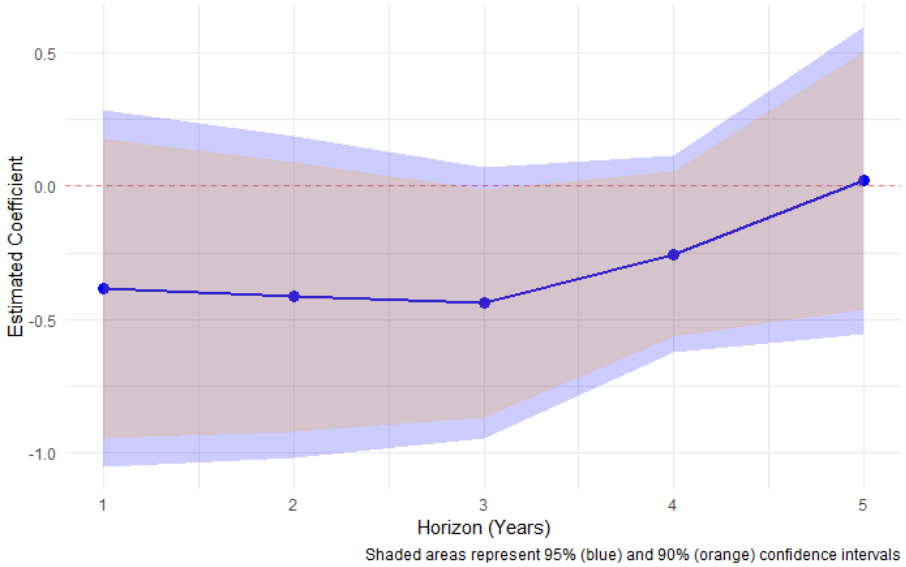


Fig. 8. Local Projections of Leniency Shock on Existing Legislation: Impact on 3-Year Credit Growth Rate. This figure presents local projection estimates of the impact of regulatory leniency shocks on consumer credit three-year change rates over a five-year horizon. The analysis is based on a subsample covering the years 2009–2020 and includes all countries except Ireland and Romania. Standard errors are clustered at the country level to account for within-country correlation.

5.4. Wild cluster bootstrap analysis

Fixed Effects models with panel data from multiple countries often face a challenge when each country has limited observations. Standard error estimation may fail to account for within-country dependencies and cross-country residual correlation, leading to biased inference. Wild Cluster Bootstrap (Cameron et al., 2008) addresses this problem through a resampling technique, in which residuals from the fitted model are randomly sign-flipped (multiplied by +1 or −1), added back to fitted values to create simulated datasets. This process is repeated (1,000 iterations) to generate robust standard errors. This method accounts for heteroskedasticity and autocorrelation across countries, improving inference reliability when countries share similar economic conditions.

Fig. 9 presents the Local Projection results for filing rates (Eqs. 2) using Wild Cluster Bootstrap. While significance decreases slightly compared to the baseline estimation, the results remain significant at the 90% level. Notably, the peak effect shifts from four years post-reform in the baseline to three years here, after which it declines.

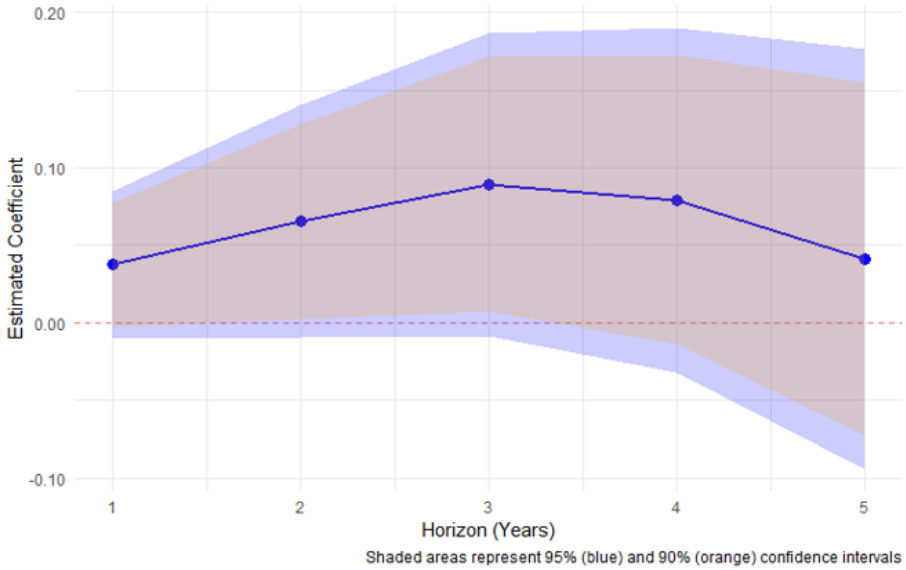


Fig. 9. Local Projections of Leniency Shock on Filing Rates with Wild Bootstrap Standard Errors

This figure presents Local Projection estimates of the cumulative impact of regulatory leniency shocks on normalized bankruptcy filing rates over a five-year horizon. The analysis employs a long difference measurement methodology using panel data from 14 countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Romania, Spain, Sweden, and Israel. Standard errors are clustered at the country level to account for within-country correlation and are estimated using a wild cluster bootstrap method.

Fig. 10 shows the credit growth estimation (Eqs. 3) with this method. The results maintain baseline significance levels and coefficient trends, with maximum effect observed one year post-reform, and are followed by gradual decline. These findings confirm the robustness of our main estimations.

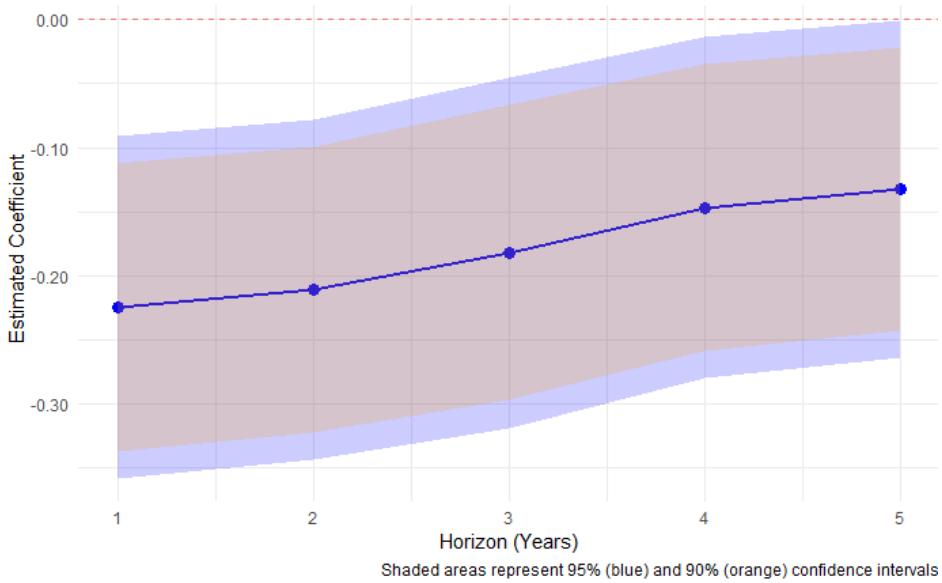


Fig. 10. Local Projections of Leniency Shock on 3-Year Credit Growth Rate with Wild Bootstrap Standard Errors

This figure presents local projection estimates of the impact of regulatory leniency shocks on consumer credit three-year change rates over a five-year horizon. The analysis uses panel data from 14 countries: Austria, Czech Republic, Denmark, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Romania, Spain, Sweden, and Israel. Standard errors are clustered at the country level to account for within-country correlation. Standard errors are clustered at the country level to account for within-country correlation and are estimated using a wild cluster bootstrap method.

5.5. Jackknife Sensitivity Analysis

To ensure the robustness of our findings and verify that the estimated effects are not driven by any single country in the sample, we conduct a Jackknife robustness test. This procedure involves systematically re-estimating our models while excluding one country at a time from the sample.

For each subsample (excluding country *j*), we estimate two-way fixed effects models, which follow the same specification as the local projections model. However, in this case, the Leniency Index is measured with a one-period lag, focusing exclusively on shocks with a one-year horizon:

Filing rates:

$$Y_t = \alpha_h + \beta_h \cdot leniency_Z_{t-1} + \gamma_h \cdot X_t + \delta_i + \lambda_t + \varepsilon_{i,t} \qquad (6)$$

Credit growth rate:

$$CG3_Z_{i,t} = \alpha_h + \beta_h \cdot leniency_Z_{i,t-1} + \gamma_h \cdot X_{i,t} + \delta_i + \lambda_t + \varepsilon_{i,t} \qquad (7)$$

The results shown in Table 5 demonstrate remarkable stability in our main findings. When we systematically exclude each of the 14 countries from our sample, the coefficient on lagged leniency maintains its significance and direction in both models.

These results provide strong evidence that our findings are not artifacts of any single country's experience. The consistency of coefficient signs and significance levels across all sample compositions confirms that the identified effects – namely, increased bankruptcy filings and decreased consumer credit growth rate following leniency reforms – represent genuine systematic patterns across European bankruptcy systems rather than being driven by outliers or country-specific idiosyncrasies. While some variation in magnitudes is observed, particularly when excluding Germany or Israel from the credit market specification, the core findings remain robust.

Table 5.
Jackknife sensitivity of the leniency change effect on filing rates and consumer credit growth rate

Excluded Country	Bankruptcy Filings	Credit Change Rate
Austria	0.1502** (0.0455)	-0.3647*** (0.0801)
Denmark	0.1561*** (0.0451)	-0.3879*** (0.0787)
France	0.1237** (0.0434)	-0.3563*** (0.0755)
Germany	0.1857*** (0.0431)	-0.2699*** (0.0735)
Greece	0.1564*** (0.0440)	-0.4100*** (0.0860)
Netherlands	0.1444* (0.0566)	-0.3868*** (0.0812)
Romania	0.1516*** (0.0450)	-0.3624*** (0.0819)
Spain	0.1545*** (0.0446)	-0.3533*** (0.0815)
Sweden	0.1212** (0.0428)	-0.3540*** (0.0804)
Israel	0.1437** (0.0439)	-0.2169** (0.0680)
Czech Republic	0.0926** (0.0313)	-0.3329*** (0.0845)
Ireland	0.1394** (0.0455)	-0.3344*** (0.0879)
Poland	0.1617*** (0.0441)	-0.3439*** (0.0857)
Latvia	0.1310** (0.0436)	-0.3298*** (0.0791)

Note: This table reports coefficient estimates for the Leniency Index effect on both bankruptcy filing rates and credit change rates from two-way fixed effects regressions, each estimated after excluding one country from the sample. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6. Discussion and Conclusions

This paper examines the core trade-off in personal bankruptcy design between providing a fresh start and preserving household credit supply. In a panel of 14 countries, we document that increases in legal leniency are followed by a temporary rise in bankruptcy filings that peaks after three to four years and then dissipates. At the same time, leniency is associated with a persistent contraction in household credit growth, with lenders tightening credit supply already around the legislative change. These patterns imply that debtor-side responses are shorter-lived, whereas creditor-side adjustments are longer-lasting and potentially structural. Moreover, the relevant legal dimensions differ across margins: reforms targeting stigma and complexity matter most for filings, while process and discharge provisions matter most for credit supply.

Focusing on filing behavior, our findings confirm that lenient reforms in the legislation significantly increase bankruptcy filings. This finding is consistent with research that analyzed the effects of the U.S. BAPCPA reform and state exemption differences on bankruptcy filing volumes. This is in line with the results reported by Mitman (2016), Gross et al. (2021), and Albanesi and Nosal (2025) among others, although the U.S. literature primarily examined a creditor-friendly reform, with the opposite sign. Our results also align with studies such as Gropp et al. (1997), Athreya (2006), Pattison and Hynes (2020), and Li et al. (2022), which focused on state exemption differences in the United States and showed that more generous, higher exemption legislative

differences led to higher filing rates or higher probability of filings. Finally, our conclusion is also consistent with the only two non-U.S. country cases we found: the Austrian debtor-friendly reform, which led to higher filings (Angel and Warum, 2024), and the effect of the 2009 Canadian reform (Allen and Basiri, 2016).

As a new approach relative to these former studies, we extend our analysis to examine dynamic effects over time. We find that the leniency changes exert a positive and statistically significant cumulative effect on bankruptcy filings volumes over an extended four-year period following the initial policy shock, but the effect exhibits a clear temporal pattern. After a 3–4-year-long period of intensification, the cumulative effect begins to moderate and reverts back to the pre-shock level after 6-7 years. This temporary increase and the subsequent decline in the number of cumulative filings after a certain period clearly represent a novel finding, yet it is partly consistent with Indarte (2022), who found that greater leniency initially raised filing probabilities but later tightened credit supply, ultimately reducing filings.

Our dimension-specific analysis shows that reforms affecting complexity and stigma have the most significant impact on filings. This finding carries important regulatory implications indicating that the behavior of potential filers is materially shaped by which specific policy dimensions are relaxed or tightened over the course of reform.

These findings provide partial support for our filing prediction. While we confirm a statistically significant association between leniency measures and filing volumes, the effect of policy changes appears to diminish, or at least becomes statistically insignificant, in the long run.

With regard to the credit supply side, we find that the Leniency Index exerts a statistically significant negative influence on the consumer credit growth rate. This adverse relationship between debtor-friendly reforms and credit market supply reinforces the earlier findings of studies that analyzed the impact of the BAPCPA reform in the United States and documented negative effects on credit volume (White, 2007a), or on the cost of credit (Gross et al., 2021). The only partially diverging result is reported by Alexandrov and Jimenez (2017), who concluded that the BAPCPA reform had no significant effect on the pricing of student loans for borrowers with the lowest credit scores. Our results are also consistent with the substantial body of U.S.-based studies on exemption levels, which demonstrate that differences in exemption thresholds affect the redistribution of credit (Gropp et al., 1997), the availability of credit (Lin and White, 2001; Indarte, 2022). Finally, our results align with the only non-U.S. empirical evidence we identified, Fossen (2014), who documented a restrictive creditor-side response in the German context.

Compared with prior research, we incorporate additional dimensions. Besides our new approach of examining these effects across numerous countries, when we extend

our analysis to examine dynamic effects over time, before and after the leniency changes, we find important discoveries.

The negative effect of lenient legislative measures on the three-year credit-to-GDP rate of change becomes statistically significant starting at the time of legislation, showing that the credit market starts to prepare for the shock before its eventual implementation. Looking at the long-term effects, our results show that credit contraction reaches its peak magnitude within 1–2 years, with effects persisting beyond 6–7 years. This hints at structural shifts in credit market dynamics and not just temporary changes.

Notably, our dimension-specific analysis reveals that the credit market effects are primarily driven by different dimensions of the reforms than in the case of filings. The credit market is affected mostly by the bankruptcy process, the conditions of discharge, and repayment plan conditions, while changes of other dimensions – which were significant for filers – in exemption levels show more modest impacts. This offers an interesting scope for regulatory fine-tuning in the context of reform, depending on which side's behavior the regulator intends to influence more strongly. Overall, our credit-supply prediction is strongly supported.

Overall, our main conclusions for both filing behavior and lender responses are robust to alternative reform timing definitions, longer horizons, alternative groupings of legislative measures, and sensitivity checks that address small-sample inference and influential countries.

Identifying significant and robust dynamic associations on both the creditor and debtor sides yields substantial insight into market reactions and consequences. However, several limitations should be acknowledged. First, while we document strong associations between leniency reforms and both bankruptcy filings and credit markets, we do not establish causal links between creditor and debtor responses. Second, bankruptcy filing data vary considerably across countries in availability, reporting institutions, and definitions. We mitigate this by relying exclusively on new household filings from official sources, though some measurement error likely remains. Third, the absence of debtor-level data limits our ability to measure direct behavioral responses. Our reliance on macroeconomic variables may not fully capture the mechanisms through which reforms affect individual debtor decisions.

Our main findings reveal a fundamental tension in designing personal bankruptcy systems. While debtor-friendly reforms temporarily increase bankruptcy filings, they create persistent negative effects on credit markets that extend beyond five years, with banks beginning to tighten credit standards even at the outset of the change. This requires policymakers to balance debtor rehabilitation benefits against broader credit market effects that constrain access for the entire population.

These findings have important policy implications. First, the optimal timing of bankruptcy reforms depends critically on economic context. Countries with healthy credit markets may absorb debtor-friendly reforms better, while implementing such reforms during credit contractions could amplify rationing effects. Second, anticipation effects suggest that transparent reform processes may trigger premature credit tightening. Third, while filing rates eventually return toward baseline, credit market effects persist, indicating lasting structural changes in lending behavior. Ultimately, the social insurance benefits of debtor protection may come at a higher long-term cost to credit accessibility than previously understood.

We also find that the effects of bankruptcy reforms are strongly dimension-specific, which also carries important implications for regulatory design. Reforms targeting stigma reduction and procedural complexity primarily shape individual filing behavior, suggesting that policymakers aiming to influence access to bankruptcy and debtor participation should focus on simplifying procedures and reducing post-bankruptcy stigma. In contrast, reforms affecting discharge conditions and procedural features have a substantially stronger impact on household credit supply, indicating that changes in these dimensions are more relevant when the policy objective concerns credit market outcomes and lender behavior. Taken together, these results imply that bankruptcy regulation is not a one-dimensional policy tool. Different reform components affect debtors and credit markets through distinct channels, requiring regulators to carefully align specific legal changes with their intended policy objectives.

Appendix A – Insolvency case data – sources for each country

Country	***Source***
Austria	Kreditschutzverband von 1870 (KSV)
Czech Republic	Surveilligence
Denmark	Paper - "The Long-Run Effects of Individual Debt Relief"
France	Bank de France
Germany	Destatis – Statistisches Bundesam
Greece	Bank of Greece
Ireland	Insolvency Service of Ireland
Israel	The Insolvency and Economic Rehabilitation Commissioner
Latvia	Paper-" CONDITIONS FOR THE BANKRUPTCY OF NATURAL PERSONS: WHICH BALTIC STATE IS THE MOST ATTRACTIVE FOR BANKRUPTCY?"
Netherlands	Bureau Wsnp
Poland	Poland Central Economic Information Bureau
Romania	National Bank of Romania
Spain	College of Property and Commercial Registrars of Spain
Sweden	Enforcement Authority of Sweden

Appendix B – The stock market indices selected to calculate annual returns for each country

Country	***Index Name***	***Bloomberg code***
Austria	ATX (Austrian Traded Index)	ATX:IND
Czech Republic	PX Index	PX:IND
Denmark	OMX Copenhagen 20	OMXC25:IND
France	CAC 40	CAC:IND
Germany	DAX 40	DAX:IND
Greece	Athens General Index	ASE:IND
Ireland	ISEQ Overall Index	ISEQ:IND
Latvia	OMX Riga Index	OMXR:IND
Netherlands	AEX Index	AEX:IND
Poland	WIG20 (Warsaw General Index)	WIG:IND
Romania	BET Index	BET:IND
Spain	IBEX 35	IBEX:IND
Sweden	OMX Stockholm 30 (OMXS30)	OMXS30:IND
Israel	TA-35	TA-35:IND

Appendix C – Estimating Country-Specific Policy Shocks: Challenges and Recommendations

Almuzara and Sancibrián (2024) provide crucial insights into the estimation and inference challenges when implementing local projections with panel data, particularly when dealing with macro shocks that affect all units simultaneously. Their Federal Reserve Bank of New York staff report demonstrates that conventional panel regression models face significant issues when regressors of interest are aggregate shocks, as the regression scores exhibit strong cross-sectional dependence and limited serial correlation. The authors show that in such cases, standard errors computed using conventional methods severely underestimate uncertainty, leading to overconfident statistical inference. They recommend clustering standard errors at the time level rather than at the unit level, combined with lag augmentation and heteroskedasticity-robust inference. However, our research context differs fundamentally from the macro shock framework they analyze. In our study, we examine country-specific policy shocks rather than global shocks. Each country implements its own bankruptcy legislation at different times, creating variation in the leniency measure across both the cross-sectional (country) and time dimensions. Unlike pure macro shocks that simultaneously affect all units, our policy interventions are country-specific and do not exhibit the strong spatial dependence that characterizes aggregate economic shocks.

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