

Research Article

Data-Driven Regression Modelling of Insolvency Outcomes: Judicial Efficiency, Foreign Participation, and Recovery Trends

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Abstract

This paper provides an in-depth analysis of Albania's debt relief system over the period 1995–2020. The dataset comprises annual bankruptcy court caseloads, foreign-creditor participation rates, and asset-reclamation statistics, allowing an examination of long-term trends amid substantial fluctuations. Using segmented time-series regression, we identify significant structural turning points associated with two major legislative reforms in 2002 and 2016. Both the level and slope of annual bankruptcy filings increased markedly following these legal interventions. A fractional logistic model indicates that foreign-creditor involvement, consistently between 13% and 15%, increased notably after 2016, reflecting improved functionality of the international recognition system for cross-border operations. Asset-recovery rates, averaging 59%, were analysed using regression and Generalized Additive Models (GAMs), showing that recovery efficiency declines under heavier judicial caseloads but improves in years with greater foreign participation. Comparative analysis with Romania, Bulgaria, and Serbia demonstrates that Albania is approaching regional norms, though gaps remain between recovery performance and institutional capacity. Overall, the results highlight those judicial reforms, the use of statistical tools in administrative decision-making, and the combination of legal modernization, courtroom efficiency, and international integration are critical determinants of effective bankruptcy systems.

Keywords: Insolvency Law; Bankruptcy Proceedings; Judicial Efficiency; Asset Recovery; Foreign Creditor Participation; Descriptive Statistics; Segmented Trend Analysis; Linear Regression Modeling; Polynomial Curve Fitting; Time-Series Evaluation; Statistical Modelling; Empirical Legal Analysis

INTRODUCTION

With the collapse of the communist regime and the adoption of constitutional amendments under Law No. 7491, dated April 29, 1991, On the Main Constitutional Provisions [1], Albania's economic system underwent a fundamental transformation. The nation shifted from a centrally planned economy, founded on state ownership, to a market-oriented system grounded in private property rights. This transition was further reinforced by the enactment of Law No. 7512, dated August 10, 1991 [2], On the Sanctioning and Protection of Private Property, Free Initiative, Independent Private Activities, and Privatization, which laid the legal foundation for the establishment of private enterprise and the liberalization of economic activity.

The process of transforming the economy from state to private was accompanied by a deep crisis of profitability and administration of existing state-owned enterprises and escalating inflation. A large number of state-owned enterprises in areas such as mining, transport, heavy industry, light industry, and agricultural enterprises announced the closure of their activities and the entry into a long process of asset liquidation, a process that in itself was accompanied by serious socio-economic consequences such as unemployment, damage and loss of enterprise assets, thus marking the beginning of a long and extremely difficult transition for the Albanian economy and society.

In such a terrain, where private commercial organizations were extremely fragile and the banking system almost non-existent, the idea of a bankruptcy law seemed not only unnecessary but also premature.

Law No. 7631, dated 29.10.1992 [3] "On the bankruptcy of state-owned enterprises", which was adopted immediately after the adoption of Law No. 7512, dated 10.8.1991 [2] "On the sanctioning and protection of private property", remained within the framework of a legal attempt to resolve the consequences of the existing economic situation regarding the insolvency of state-owned enterprises, while private activity is not subject to its regulation. Despite the objectives of this law, no cases of implementation in practice have been identified and for loss-making entities, the closure of the activity by decision of the responsible state authority and the transition to the liquidation process were mostly applied where privatization and transformation could not operate. While for the creditors and debtors of these commercial entities, law no. 7512, dated 10.8.1991 [2] did not contain any special provisions other than the judicial route as a general way of resolving disputes. these provisions were followed by the provisions of the Civil Code approved by law No. 7850, dated July 29, 1994 which do not contain provisions on bankruptcy [4].

Approval of Law No. 8017, dated 25.10.1995 [5] "On bankruptcy procedures" constitutes the first legal and modern regulation after the collapse of the centralized political and economic system, regarding bankruptcy, but despite constituting a law according to the Western model (the German model), in the practice of the Albanian courts no case of its application is known. This reflects not only the fragile economic terrain and the lack of action of the rules on the one hand, but also the coherent legal mindset which

seemed to be oriented with difficulty towards new concepts for the time such as the bankruptcy of private entities [6-10].

In the case of the bankruptcy phenomenon of pyramid schemes in 1997, bankruptcy procedures were regulated by a special law, a legal solution imposed by a series of circumstances. The activity of some of these entities was camouflaged under the guise of non-profit organizations such as foundations or others, and the respective legislation prohibited these legal structures from carrying out economic activity with the aim of profit. and therefore, objectively could not determine that they could be subject to the action of bankruptcy law no. 8017, dated 25.10.1995 "On bankruptcy procedures" [5].

On the other hand, since some of these fraudulent pyramid schemes operated as commercial legal entities, or as individuals without being covered by any other legal form, the legal solution for regulating the economic consequences caused by the fraudulent activity was found in the element that united all these forms of illegal commercial activity, that of the creation of fraudulent schemes. The state of emergency in the country that was generated and imposed by serious conflicts as a cause of the consequences created by this illegal activity, required an urgent and effective intervention of the state authority. To what extent and how the assets of these entities were actually distributed to creditors is an issue that remains to be reassessed. The fact that the bankruptcy law in force failed to act on some of the organizations of fraudulent pyramid schemes, turns out to have served as the first premise for the need for a new and comprehensive legal regulation in the field of bankruptcy. On the other hand, referring to the fact that in Albanian courts no case has been dealt with where the bankruptcy law has been applied, Law No. 8017, dated 25.10.1995 "On bankruptcy procedures" made it necessary to review the legislation in this field [5].

The adoption of Law No. 8901 dated 23.05.2002 [5] "On Bankruptcy" marks a turning point in terms of the practical implementation of legislation in this field. Although in the first periods after its adoption, a kind of hesitation was observed among the entities tasked with its implementation, legal publications, commentaries and quality manuals by experts in the field contributed to the increase in the number of applications and the creation of the first judicial practices of bankruptcy.

Building an economy with a sustainable structure implies many internal and external regional and international factors that interact towards the exchange of material goods.

Among the internal factors, the existence of friendly legislation and legal structures for its proper implementation is essential, which constitutes the gateway for foreign capital investment, and in a reality like this of our country that has experienced extraordinary and prolonged economic and political isolation, it has an essential contribution in many aspects.

The interaction of economic factors is also associated with the need to find legal mechanisms to facilitate international economic cooperation, guarantee higher security for trade and investment, and protect the interests of creditors, regardless of the jurisdiction

they belong to, and the adoption of Law 110/2016 [7] constitutes a concretization of efforts in this direction.

The adoption of Law No. 110/2016 "On Bankruptcy" constitutes a qualitative step towards regulating the effects that accompany economic interaction between countries. Part Eight of this law (Articles 170 and following) regulates international bankruptcy procedures. Its aim is to establish effective mechanisms for cooperation between Albanian and foreign courts and authorities, ensure legal security for trade and investment, protect the interests of creditors, debtors, and other stakeholders, preserve and maximize debtor assets, and facilitate the rescue of financially distressed companies to safeguard investments and employment.

RELATED WORK

There is already an extensive literature on the relationship between financial architecture, legal institutions, and systemic stability, which is a strong theoretical platform for assessing the efficacy of bankruptcy systems and court performance. Indeed, other research also challenges the widely accepted idea that the use of leverage may necessarily enhance discipline in banking, and stresses instead how overborrowing increases fragility and undermines governance, thus raising the potential for distress to spill into insolvency regimes [11]. Evidence on the growing role of market-based finance is also consistent with this view, as activity in shadow banking can exacerbate systemic vulnerabilities and thus needs to be complemented by more robust institutional and legal safeguards. Evidence from the China Banking Survey also suggests that deficiencies in enforcement ability, and regulatory cooperation, may exacerbate financial stress — a conclusion that is even more pertinent in emerging economies like Albania where courts are increasingly called upon to rule on complex claims entailing cross-border issues and multi-jurisdictional dimension.

The macro-prudential literature also emphasizes the significance of strong legal and institutional safeguards. Evidence suggest that unregulated credit booms can exacerbate the degree of instability and emphasize the importance of enforcement mechanisms and orderly liquidation process in minimizing systemic damage in downside scenarios [14]. There is also supportive evidence that credit creation and monetary control both rely strongly on the legal infrastructure supporting financial contracts, such that insolvency efficiency not only depends on formal rules of behavior but also on whether courts can efficiently enforce promises [15-23]. In that sense, insolvency regimes belong to a larger framework of stability architecture as court effectiveness turns out to be one crucial institutional requirement.

Legal-accounting research also deepens understanding of how institutional norms influence fiscal survival [24-32]. Some of these give greater prominence to the need for treating credit capacity, interbank credit nexus and the liability system of government as rooted in broader sociometer structures: that form an enabling condition for understanding financial distress [33-41]. Related work generalizes this logic to explore digital and

networked versions of interbank credit and how the latter intersect with regulatory politics, arguing that in periods of distress when coordination failure or a vagabond famine of competing creditor claims is most severe even the machine of justice may have its uses [42]. It is a view akin to what insolvency courts face when dealing with nested disputes that implicate creditor priorities, debtor protections and institutional responsibility.

Accounting and money-governance literature similarly brings to the fore legal underpinnings of financial order. Critics of standard reporting systems suggest that normal accounting representations do not fully reflect fragility, and more general institutional features highlight both that monetary production and market governance rest upon a constitutional and legal system which enables credit mechanisms to operate [26-29]. These points all support the notion that there is no bankruptcy without the supporting institutional structure of trust in capital markets.

Core banking-theory contributions also find that institutional commitments and credible commitments are necessary to prevent inefficient breakup dynamics and destabilizing runs [30]. Related work also connects the creation of liquidity to financial fragility and demonstrates that, in various dimensions, credible contract enforcement including by means of courts and related institutions is central to both fostering confidence in the functioning of the financial system [31]. In combination, therefore, these theories justify the empirical attentiveness of this article/treatise to the insolvency system of Albania in terms its judiciary capacity, workload fluctuations over time, participation by foreign creditors and incidence level of recovery.

Table 1 shows the main empirical and institutional studies showing how courts, judges and insolvency actors influence bankruptcy outcomes and where this study sits relative to those. The results of the literature review broadly demonstrate that formal laws governing insolvency are not in themselves sufficient to produce good outcomes, with performance instead being driven by judicial culture and capacity, specialization in insolvency systems, and professional competencies. Furthermore, empirical evidence illustrates that reorganization success does seem to systematically vary with judge characteristics and, consequently strong indication that discretion (and decision-making styles) plays a role in case pathways and outcomes [33]. Finally, additional work highlights that the development of transition economy 'institutions and system design are important determinants in cross-country differences in bankruptcy efficiency a perspective with obvious implications for on-going insolvency reform debates in Albania.

The table also provides a snapshot of how insolvency systems work in practice. Indeed, trustee attributes and professional competence are found to have an impact on the efficiency of liquidation and recovery performance suggesting that outcome is a combined function of professional skill and institution's mechanisms for monitoring [35]. Further studies also find that congested courts delay restructuring ± shedding light on the fact that high working pressure may limit judicature efficiency regardless of well-drafted statutory rules [36]. From a reform perspective, it is empirically documented that strengthening enforcement increases firm productivity postreform, providing causal evidence that

judicial improvement might just pay off [37]. Relevant Related results also suggest that court specialization leads to better insolvency outcomes, providing policy rationales for specialized commercial or bankruptcy courts where possible [38].

Lastly, macro-economic research in Table 1 accounts for why insolvency pressures are initiated and strengthened. It has been proved that throughout the business cycles, market-based finance and credit-cycle fluctuations amplify systemic stress and stimulate insolvency demand that mostly crowds courts when their workload grows at an accelerating pace [39, 40]. More general system-wide views analyze covariation across systems via interbank networks and contagion mechanisms, providing a more robust framework to understand cross-border contagion and systemic solvency waves [41, 42]. Moreover, contributions on the juridical-institutional aspect evidences the need for legal certainty, enforceable coordination and institutional mandates as fundamental premises of well-functioning insolvency proceedings' in judicial administration [43-45].

Table 1. Central Empirical Work on the Role of the Judiciary in Insolvency and Consequences Therefrom.

Ref. Study	Country / Context	Method / Data	Judicial / Institutional Factor	Key Outcome(s)	Main Finding (What it shows)
[33]	France	Empirical/econometric analysis	Judge profile & discretion	Reorganization probability	The probability of reorganization varies systematically with bankruptcy judge characteristics, indicating meaningful judicial discretion effects.
[34]	Post-transition economies	Comparative legal-economic review	Procedure design & institutions	Procedure efficiency & outcomes	Bankruptcy performance differs across transition systems; institutional capacity and legal design drive outcome variation—highly relevant for Albania-style contexts.
[35]	Slovenia	Micro-level insolvency data	Trustee characteristics	Liquidation efficiency & recovery	Trustee quality/attributes influence liquidation performance and recovery outcomes, supporting the role of institutional actors beyond formal law.
[36]	USA	Causal econometric analysis	Court congestion & workload	Delays in restructuring	Crowded courts produce measurable delays and weaker restructuring efficiency, highlighting capacity constraints as a

					key judicial-performance channel.
[37]	Brazil	Reform evaluation (DiD-style)	Court enforcement reform	Productivity & firm outcomes	Strengthened court enforcement after reform improves firm performance, providing strong causal evidence that judicial efficiency reforms matter.
[38]	Multi-setting / comparative	Panel/econometric study	Court specialization	Insolvency outcomes	Specialized courts are associated with improved insolvency outcomes, supporting policy recommendations on specialization and capacity-building.
[39]	Global financial system	Macro-financial institutional analysis	Market-based finance	Systemic risk spillovers	Shadow banking amplifies systemic risk and can intensify insolvency spillovers, providing macro context for insolvency caseload surges.
[40]	Advanced economies	Macro/financial-cycle modeling	Credit cycle dynamics	System-wide stress	Credit-cycle amplification increases economic stress and institutional pressure, offering a macro explanation for higher insolvency demand and court load.
[41]	Public sector / institutions	Institutional-accounting analysis	Financial sustainability	Fiscal stability constraints	Sustainability of public finance is shaped by institutional accounting and governance, informing insolvency analysis where public liabilities interact with legal enforcement.
[42]	Banking networks	Systemic/interbank analysis	Interbank credit networks	Contagion & stability	Interbank credit links transmit distress; insolvency risk can propagate through networks, supporting systemic interpretations of cross-sector insolvency pressures.

[43]	Comparative contract law	Doctrinal legal analysis	Contract assignment clarity	Legal certainty	Clear rules on assignment and compatibility reduce disputes—relevant for insolvency where contract assignment/claims transfer affects creditor rights.
[44]	Institutional governance	Policy/institutional analysis	Role of organization.	Compliance & coordination	Highlights the role of institutions in enforcement and governance—useful when discussing coordination, access, and procedural functioning.
[45]	Professional contracts	Doctrinal legal analysis	Confidentiality obligations	Professional duties	Clarifies confidentiality duties that can analogically support discussion of trustee/administrator professional standards in insolvency practice.

INTERNATIONAL JURISDICTION OF ALBANIAN COURTS IN CROSS-BORDER INSOLVENCY

The provisions of Law No. 110/2016 “On Bankruptcy” focus on the procedural aspects of the international jurisdiction of the Albanian court regarding international bankruptcy. These cases are characterized by the presence of a foreign element, whereby any legal circumstance related to the subjects, content or object of the bankruptcy measure and which becomes a cause for interaction with a certain legal system should be understood.

Even within the EU, legislation on this matter remains unharmonized across member states. However, cross-border bankruptcies are governed by Regulation (EU) 2015/848 on insolvency proceedings, as amended on 26 June 2017, 26 July 2018, and 15 December 2021 [46]. Article 7, titled “Applicable Law,” provides that, unless otherwise stated, the law governing insolvency proceedings and their effects is that of the Member State where the proceedings are opened (“State of opening of proceedings”).

It should be noted that scholars in the field acknowledge that in the field of bankruptcy law there is a classic tendency for parliamentarians of all countries to be sensitive to the opinions of the electorate, especially in a moment of economic crisis, such as the case of a bankruptcy procedure, and are generally influenced by short-term solutions. Thus, parliamentarians in many countries have preferred to create privileges for employees over the assets of the employing firm, privileges that are considered in the bankruptcy system

in the highest (first) order of privilege than other guarantees such as mortgages, pledges, etc.

Transnational or international bankruptcy that implicates the jurisdiction of the Albanian bankruptcy court in accordance with Law 110/2016 mainly includes the following categories of judicial actions:

1. Access of foreign creditors to the Albanian bankruptcy procedure;
2. Direct access of the representative of the foreign procedure to the Albanian bankruptcy court;
3. Recognition of a foreign international bankruptcy procedure by the Albanian bankruptcy court and subsequent actions related to:
 - a. participation in an Albanian bankruptcy procedure;
 - b. providing assistance from the Albanian court, during and after the process of recognizing the foreign procedure;
 - c. the intervention of a foreign representative in an Albanian bankruptcy procedure with the same debtor;
 - d. taking measures to avoid and annul legal acts and actions that harm creditors;
 - e. the treatment of Albanian creditors in foreign proceedings, recognized by Albanian courts as main or secondary;
4. The request of the Albanian bankruptcy court for assistance, in relation to an Albanian bankruptcy procedure directed to a foreign state;
5. Direct cooperation of the Albanian bankruptcy court with foreign courts or representatives, as well as cooperation through the administrator,
6. Coordination of the Albanian bankruptcy procedure with the foreign procedure when they have a common debtor.

The provision in Law 110/2016 "On Bankruptcy" of the rules applicable in cases of international bankruptcy means that these issues (of international bankruptcy) do not fall within the scope of Law No. 10428, dated 2.6.2011 "On Private International Law" [8], which determines the general rules for the law applicable to civil-legal relations with foreign elements as well as the jurisdiction and procedural rules of Albanian courts for civil-legal relations with foreign elements.

The implementation of the provisions of Law 110/2016 "On Bankruptcy" refers to the provisions of the Code of Civil Procedure only for matters not provided for in this law, to the extent that they do not conflict with it. The amendments adopted in the Code of Civil The procedure under Law No. 38/2017 introduced international laws pendens in Albanian jurisdiction [9], reflecting the principles of EU Regulation No. 1215/2012 ("Brussels Regulation"). These amendments entered into force on 6 November 2017 and are subsequent to Law 110/2016 "On bankruptcy" which entered into force on 23 May 2016, which is related to the possibility of referring these legal amendments to bankruptcy cases with foreign elements, only for aspects not regulated by the bankruptcy law.

The examination of matters related to an international bankruptcy proceeding is within the competence of the bankruptcy court, which presupposes a judge of the court of first

instance with general jurisdiction. By “matter” in this case should be understood any form of act, action or application that involves the exercise of the functional competence of the bankruptcy court, including the recognition of a foreign bankruptcy proceeding and the judicial actions arising therefrom.

In the case where the case with foreign elements is related to a bankruptcy procedure initiated in the Republic of Albania (i.e. the commencement of bankruptcy was declared based on the decision of the Albanian bankruptcy court), the competent court to examine the application is the bankruptcy court that is examining the referring case, which examines all issues that arise from or are interrelated. With this procedure according to the provisions of Article 9 of Law 110/2016 “On Bankruptcy”. It is under the responsibility and attribute of the bankruptcy court, and therefore in its discretion, to assess whether the request/application with the presence of a foreign element submitted for consideration before it is related to the bankruptcy procedure that it is considering. Regulation No. 848/2015, which considers actions “related” when they are so closely connected that they must be heard together to avoid conflicting judgments, provides useful guidance for defining “related actions” in the absence of a legal definition.

Regardless of whether the Albanian bankruptcy court may find that it has jurisdiction to exercise its powers in international bankruptcy cases, the bankruptcy court has the right to refuse the action, the request for recognition or assistance within its framework, in application of the principle of the “public order clause” when it assesses that what is requested does not comply with the basic principles of Albanian legislation, as a fundamental principle of international law, also embodied in Article 175 of the Bankruptcy Law and in harmony with Article 7 of Law No. 10428, dated 02.6.2011 “On Private International Law”.

The application of this principle means that the Albanian court has the right to refuse to recognize bankruptcy proceedings opened in another state or to refuse to provide assistance thereto when the effects of such recognition or its implementation through the provision of assistance would be manifestly contrary to the internal legal order in the Republic of Albania and in particular to its fundamental principles or the constitutional rights and freedoms of the individual.

In addition to the above, the court has the right to refuse to provide assistance to a representative of a foreign procedure for a reason other than that of protecting public order, and this concerns the case when the court assesses that this assistance may be considered as interference or conflict with the administration of the main foreign procedure.

To assess such a circumstance, the Albanian court must carefully differentiate the nature of the action or measure of property insurance that the representative of the foreign procedure has submitted in the object of the request for assistance, taking into account the content of the foreign law.

Treatment of Foreign and Domestic Creditors in Cross-Border Insolvency Proceedings

The Albanian bankruptcy law not only provides for equal rights for foreign creditors and Albanian creditors, but goes further by defining special provisions that guarantee the effective implementation of these rights.

The legal provisions that ensure the rights of foreign creditors in the Albanian bankruptcy procedure refer to two essential moments: i) the provision of legal mechanisms for creating access to participate in the procedure through effective and direct notification of foreign creditors: and, ii) through the guarantee of a priority order that cannot be violated, i.e. it provides legal guarantees at a certain level of ranking of foreign creditors' claims.

Specifically, regarding the notification of foreign creditors, the law provides for mandatory provisions for their individual notification in all cases where, according to Albanian bankruptcy law, notification must be made to creditors in Albania; such notification must also be made to known creditors who do not have an address in Albania.

On the other hand, the right of foreign creditors to participate in a bankruptcy proceeding before the Albanian courts would be theoretical and ineffective if the ranking of their claims in settlement/benefit did not reflect or materialize these rights. For these reasons, the law established a security rule that states that just because a claim's holder is a foreign creditor, it shouldn't be given a lower priority than unsecured claims.

Through these provisions, the Albanian bankruptcy law offers some of the maximum guarantees for foreign creditors in terms of access to a bankruptcy procedure initiated by the Albanian courts but also regarding the effects of the recognition of a foreign bankruptcy procedure, recognized by a decision of the Albanian bankruptcy court. Such a regulation constitutes a clear and exemplary guarantee for foreign investments and has a positive impact on the promotion of foreign economic initiatives by providing the appropriate legal terrain in the case of resolving the economic consequences of these initiatives. This level of regulation guarantees also overlaps with the principle of reciprocity, recognized and accepted by our legal order.

As for Albanian creditors in a foreign proceeding, the decision of which has been recognized by the Albanian bankruptcy court, their status in the recognized proceeding is related to the legal force of the decision of recognition on the Albanian creditors of the debtor. The judicial decision of recognition of a foreign bankruptcy proceeding serves as the starting point for a series of legal consequences on the debtor who has assets in our country and on the Albanian creditors.

After the recognition of a foreign procedure, all decisions of the Albanian court that are given within the framework of the effects of recognition are conditioned by the determination of whether the rights of Albanian creditors have been adequately protected. Such a criterion does not imply that Albanian creditors are privileged, but it should be understood that Albanian courts have a legal obligation to guarantee that legal

proceedings involving the Albanian court in cases of international bankruptcy should not have the effect of worsening the positions of Albanian creditors towards the same debtor, compared to the case where Albanian courts do not act to provide assistance in the context of the recognition of a foreign decision.

To reach such a conclusion, the Albanian court must ensure that the position of Albanian creditors does not deteriorate and this requires an in-depth comparative analysis and if this comparison establishes a weaker position for the Albanian creditor than that under Law 110/2016 "On Bankruptcy", the court has the right to refuse to act or provide assistance to the representative of the foreign procedure.

5. Recognition of foreign bankruptcy proceedings, obligation to inform. Main foreign proceedings and secondary proceedings.

Albanian legislation provides for the recognition of a foreign bankruptcy procedure through special legal provisions under articles 184 et seq. of law 110/2016. The recognition of a foreign procedure does not constitute an end in itself, but it is the legal effects that follow such a process that are intended through the recognition decision.

When recognition of a foreign procedure is requested, the competent court is the bankruptcy court, which presupposes the judge of the bankruptcy section of the Court of First Instance of General Jurisdiction. In contrast to ordinary cases of general jurisdiction, in the case where the foreign bankruptcy procedure has been initiated based on a decision of a foreign court, the competent court for the recognition of the procedure is the bankruptcy court of first instance and not the court of appeal which, pursuant to Article 395 of the Civil Procedure Code, is determined as the court competent for the recognition of foreign decisions.

In the case of recognition of a foreign proceeding, whether main or secondary, the Albanian court does not enter into an analysis of the existence of the cause of bankruptcy, since when it determines the admissibility of the request/application for recognition, the bankruptcy court has the right to presume the facts as proven.

Only the foreign representative, who may be a person, bankruptcy body, or institution designated by a foreign bankruptcy proceeding to administer the reorganization or liquidation of the debtor's assets or activities, or who may serve as a representative in a foreign proceeding, has the authority to apply for recognition of a foreign proceeding. In accordance with the legal provisions, in any case, the concept of "foreign representative" refers to the existence of a current foreign bankruptcy procedure, initiated (opened) in a foreign country, regardless of whether it is a main or secondary procedure. The application shall be accompanied by the documentation specified in Article 184 of the Law and must be accompanied by a declaration identifying all the ongoing procedures of which the foreign representative is aware.

During the period of consideration of the request/application for recognition, the foreign representative has a legal obligation to inform the Albanian court examining the request of any legal fact that has an impact on the coherent status of the foreign procedure

as well as of any other new procedure initiated in relation to the same obligation that is sought to be recovered through the initiation of the Albanian court. Such information is directly related to the decision-making of the bankruptcy court, as e.g. if a foreign procedure has been discontinued for one of the reasons provided for by foreign law, this fact must be presented to the Albanian court immediately to be taken into consideration before the final decision-making.

The decision on the recognition of the foreign procedure is issued by the bankruptcy court within 15 days only if it passes the admissibility test under the conditions of articles 184 and 186 point 1 of the law.

The recognition of a foreign bankruptcy proceeding is regulated exclusively on the basis of Law 110/2016 "On Bankruptcy". Hague Convention dated February 1, 1971 "On the recognition and enforcement of foreign decisions in the civil commercial field ratified by our state with law no. 10194, dated 10.12.2009 excludes the case of recognition of foreign court decisions related to international bankruptcy proceedings. The Convention, although ratified by law by our state, still remains unenforceable in practice due to the non-ratification of additional agreements and protocols.

Foreign "Main" Procedure and the Foreign "Secondary" Procedure

Through the decision to recognize a foreign bankruptcy proceeding, regardless of whether it is recognized as "main" or "secondary", the implementation of the foreign bankruptcy proceeding on the debtor's assets that are under the territorial jurisdiction of the Albanian bankruptcy court is ensured.

In its recognition decision, the bankruptcy court must specify whether the foreign proceeding is classified as a main or secondary proceeding. The importance of determining whether a foreign proceeding is recognized as main or secondary is related to: i) the legal effects of the recognition decision and, ii) the manner in which the Albanian bankruptcy court exercises its responsibilities and powers. This process requires maximum understanding and clarity on the difference between these notions by the bankruptcy judge.

Based on the content of the legal provisions, it results that a foreign procedure is considered a "main procedure" when it takes place in the country where the foreign debtor has its "main centre of interest", which is considered to be the place where the debtor regularly administers his interests, and this circumstance is recognized as such by third parties or publicly. When the debtor is a trader or legal person, the place where the debtor is registered or has its headquarters is presumed to be the place where the debtor is registered or has its headquarters, unless proven otherwise.

Whereas for a foreign bankruptcy proceeding to be recognized by the Albanian bankruptcy court as a secondary proceeding within the meaning of this law, in contrast to the main proceeding which takes place in the country where the debtor has the "main centre of interest", the determining criterion is that it takes place in the decision/state where

the foreign debtor has an asset which implies that The legal consequences of this procedure fall on the debtor's assets placed under the jurisdiction of the Albanian bankruptcy court.

However, it is noted that the provisions of the bankruptcy law do not contain sufficient elements to understand the difference between a “main” and a “secondary” foreign procedure. “So, for a clearer treatment we turn to the content of Regulation No. 848/15, of the EU Parliament and the Council of the EU as the legal instrument from which the legal provisions for the main procedure and the secondary procedure seem to originate, namely its Article 3.

The notion of main bankruptcy procedure in both our law 110/2016 and Regulation no. 848/2015 is defined as a procedure opened by the courts of the state "within whose territory the centre of the debtor's main interests is located", which is similarly identified as the court of the place where the debtor regularly administers his interests and which is recognized as such by third parties.

While Regulation 845/2015 defines the concept of "secondary bankruptcy procedure" by taking into account two premises:

a) location of the property, - when it is opened in a foreign state in whose territory the debtor owns an enterprise or property, but the main centre of interest is under the jurisdiction of another state. This circumstance means that the effects of these procedures will only include the debtor's assets that are situated within the state where this secondary procedure is initiated.

b) the time of opening the procedure - when a main bankruptcy procedure has been opened and is in force against the debtor, any subsequent procedure in time is considered secondary, regardless of the country where the main centre of interest is located and regardless of whether the procedure is related to the location of the debtor's assets.

Such a criterion facilitates the categorization by the court of the foreign procedure, by linking the determination to an objective criterion, that of the subsequent time of the procedure, and thus avoiding possible clashes between courts in determining the main versus the secondary procedure.

Law No. 110/2016 provides that when the Albanian bankruptcy court recognizes the foreign procedure as a secondary procedure, it must determine in the relevant decision that the recognition relates to the property administered within the framework of the foreign secondary procedure.

In the content of the decision on recognition of the foreign secondary procedure, the court ensures to present a listing of the debtor's assets on which the foreign secondary procedure operates, or the data of these assets in order to make them easily identifiable. The same notes are made in the court decision even when the bankruptcy court accepts the request for assistance to a foreign representative in a secondary procedure.

Providing Assistance to the Foreign Representative

In the context of examining the request for recognition, for the needs of urgent protection of the debtor's assets, the foreign representative has the right to request the granting of temporary assistance.

Assistance to the foreign representative in the sense of the legal provisions means taking temporary measures by the bankruptcy court for the protection of the debtor's assets for the purposes of distribution to creditors. The provision of assistance may be requested while the court is examining the request/application for recognition of a foreign procedure (main or secondary) but also after the issuance of the recognition decision. For a secondary foreign proceeding, the bankruptcy court must ensure that any assistance pertains only to assets to be managed under the foreign secondary proceeding or to information sought in that procedure.

The interim measures imposed within the framework of the assistance are those aimed at preserving the debtor's assets and property in order for them to be administered by the bankruptcy procedure responsible, such as: prohibiting the alienation of the debtor's assets, suspending executions against the debtor's assets, placing the debtor's assets under administration by a foreign representative, or placing the debtor's assets or business under administration by a foreign representative or a temporary administrator appointed according to the criteria of Albanian bankruptcy law.

In the case where assistance is requested during the recognition procedure, the provision of assistance is conditional on the verification of these elements:

1. A request/application for recognition of a foreign "main" or "secondary" bankruptcy proceeding is pending before the Albanian court;
2. The Albanian court shall have international jurisdiction regarding the application for recognition of a foreign main or secondary procedure, pursuant to Law 110/2016 "On Bankruptcy";
3. The interim measure or specific action sought through assistance shall not constitute interference with the administration of a main procedure of the foreign state;
4. The request or action requested as a temporary measure must not conflict with the basic principles of Albanian legislation.

It is important to note that when the Albanian court decides to provide assistance to the foreign representative, whether during the examination of the case or after the recognition decision, the foreign representative, in all actions carried out in implementation of the decisions given within the framework of assistance, must apply Albanian legislation.

If the bankruptcy court finds that Albanian creditors' interests are adequately protected, it may, at the foreign representative's request, assign the distribution of all or part of the debtor's assets in Albania to the foreign representative or another person appointed by the court upon recognition of a foreign (main or secondary) proceeding.

Legal Effects of Recognition of Foreign Proceedings

In the case of recognition of a foreign procedure, main or secondary, responsible for the administration of the assets of the main debtor or of the debtor who has a location/asset in the territory of the Republic of Albania, it is the foreign procedure that operates in the Albanian territory through the Albanian court in the cases and manner provided for by law.

In these cases, the Albanian court provides assistance or cooperates with the foreign court or authority according to the law, taking care that its decisions and actions are not considered interference in the administration of the bankruptcy measure in the foreign procedure, as such would be completely outside its competence and jurisdiction.

This should be understood that in any case, the competent authority for the administration of the procedure and the debtor's assets remains the foreign court that initiated the bankruptcy procedure, which has the authority to decide on the fate of the procedure, the termination, continuation, reorganization or liquidation of the debtor's assets.

The recognition of a foreign main proceeding generally results in:

- a. suspension of all individual actions or procedures concerning the debtor's assets, rights, or obligations;
- b. suspension of enforcement measures against the debtor's property; and
- c. restriction on transferring, encumbering, or disposing of the debtor's assets outside the ordinary course of business.

After recognition, the foreign representative may request assistance and take measures to protect the debtor's property or creditors' interests as provided in Article 190. These include:

- prohibiting or suspending individual actions or executions against the debtor's property;
- restricting transfers or disposals of assets;
- gathering evidence or information on the debtor's affairs;
- placing all or part of the debtor's assets in Albania under administration; and
- seeking any additional assistance or prohibitions available under Albanian bankruptcy law.

Upon recognition of a foreign (main or secondary) proceeding, the bankruptcy court may, at the foreign representative's request, authorize that representative or appoint another person as administrator to distribute the debtor's assets in Albania, provided the court ensures that Albanian creditors' interests are duly protected.

If the court decides to reject the request for recognition of the foreign procedure, any preliminary decision issued in the context of assistance for securing the bankruptcy measure and the debtor's assets ceases to have legal effects.

The above provisions are issued by the court taking into account certain limitations imposed by other factors outside the recognition process, as follows:

1. If, during the application for recognition of a bankruptcy proceeding, the Albanian bankruptcy court (another judicial body) has decided to initiate bankruptcy proceedings for the same debtor, this does not prevent the relevant court of application from recognizing the foreign proceeding, but with the recognition decision, Article 189 of the Bankruptcy Law regarding the actions for securing the debtor's bankruptcy measure on behalf of the main foreign proceeding shall not apply. Such a determination is related to the fact that the Albanian court that has initiated bankruptcy proceedings for the debtor under Law 110/2016 "On Bankruptcy" is competent to impose measures for securing the debtor's bankruptcy measure on behalf of the Albanian bankruptcy proceeding that it examines. These measures are imposed, amended or lose their force depending on the specific case. The duplication of measures issued by different courts, for the same property, but on behalf of two different bankruptcy procedures, in addition to creating a clash between the decisions of courts of the same level and jurisdiction, would completely expose the interests of creditors, practically undoing the purpose of imposing these measures and undermining the progress of the debtor's bankruptcy as a whole.
2. If the bankruptcy procedure against the same debtor is opened by the Albanian court after the foreign representative has filed the request for recognition of the foreign procedure and within the framework of this application the Albanian court has approved the granting of assistance for one of the measures provided for in Article 188 of the LF, these measures are subject to review by the Albanian court that issued those decisions. This means that this court has the competence to decide also primarily the amendment of the measure granted or its termination if it conflicts with the Albanian bankruptcy procedure, which means that the procedure opened by the Albanian court has the legal responsibility regarding the provision of the bankruptcy measure.
3. Once the recognition of a foreign (main or secondary) procedure becomes final, the bankruptcy court may, at the foreign representative's request, appoint either an Albanian representative or the foreign representative to distribute the debtor's assets in Albania, ensuring the protection of Albanian creditors' interests.

Otherwise, the court may refuse to provide assistance to the foreign representative on the grounds that Albanian creditors are not adequately protected.

International Cooperation in Simultaneous Insolvency Proceedings

The opening of a foreign bankruptcy proceeding by a foreign court does not a priori condition the opening of a proceeding against the same debtor by the Albanian courts. This means that the existence of an international bankruptcy proceeding against a debtor, and further, its recognition as a main or secondary proceeding by the Albanian court, does not constitute a formal obstacle to the opening of a bankruptcy proceeding against the same debtor for whom the Albanian court has jurisdiction to examine a request/application for the opening of bankruptcy.

This kind of formal liberalism has no real meaning for the bankruptcy court, since according to Law 110/2016, upon the recognition of a foreign procedure as the main bankruptcy procedure, the Albanian court may initiate the procedure against the same debtor only if he has assets in Albania. The effects of the procedure opened in the Albanian courts in this case are limited to the debtor's assets located in Albania, to the extent necessary to cooperate and coordinate, pursuant to Articles 194, 195 and 196 of this Law, with the other assets of the debtor that must be administered in the bankruptcy procedure.

In this regard, the bankruptcy law offers a balance in the rights protected in the case where a foreign bankruptcy procedure is recognized as the main one, with the initiation of bankruptcy against the same debtor by the Albanian court, limiting the consequences through legal provisions that do not allow the advantage of one procedure over the other, with care not to create overlapping of decisions between courts of the same jurisdiction, given for the assets of the same debtor.

Even when there is more than one foreign proceeding against the same debtor, the Albanian court is obliged to seek cooperation and coordination under Articles 194, 195 and 196 of the Bankruptcy Law, and any assistance granted to a foreign representative under Albanian law must be consistent with the main foreign proceeding after its recognition by the court. The same rule applies where a main foreign proceeding and a secondary foreign proceeding are recognized simultaneously. In this case, the bankruptcy court shall review any assistance provided during or after the review of the recognition of the proceeding and shall proceed by amending or repealing all measures that are inconsistent with the main foreign proceeding.

Furthermore, through these legal powers, a kind of priority is given to the main procedure over the secondary bankruptcy procedure opened against the debtor, when both of these independent procedures are recognized as such by the Albanian court.

Whereas in the case where Albanian courts have recognized two secondary procedures against the same debtor, the bankruptcy court may grant, modify or terminate the assistance, in order to facilitate the coordination of the procedures.

In the above cases, the representatives of the two procedures cooperate with each other to the degree that this collaboration is suitable to make these procedures easier to administer, provided that this cooperation does not conflict with any of these procedures and does not conflict with the representative's interests.

The same legal principles apply to communication and cooperation between courts when insolvency proceedings involve two or more members of a company group. If a court initiates insolvency proceedings against a member of a company group, it must cooperate with any court handling proceedings for another group member, provided such cooperation complies with applicable rules, avoids conflicts of interest, and supports the efficient administration of the cases. Even in this case, the legal basis for cooperation and coordination are the provisions of Law 110/2016 "On Bankruptcy", articles 194-196 thereof.

DATA AND METHODOLOGY

Dataset

The empirical analysis conducted in this study is based on longitudinal data, first because the data sets are grouped in 5 or 10 years, respectively for the periods handled and second because the data sets are based on national judicial and institutional records related to the bankruptcy cases that occurred in the respective host country, in this case, Albania, from 1995 to 2020. This era covers the widest effort of transformation in the Albanian insolvency regulation, starting from the early post-transition legislation, such as Law No. 8017 (1995) including the major reforms provided by the Law No. 8901 (2002) and the complex Law No. 110/2016 [4-7]. The dataset used these legislative milestones as structural reference points in order to interpret the trend and composition of bankruptcy cases as having changed.

This data set contains annual observations of the entire number of bankruptcy proceedings, divided into domestic cases and cases with foreign creditors. This distinction is particularly relevant for the assessment of Albania's growing vulnerability to cross-border insolvency, taking into account that the international cooperation mechanisms were implemented by the Law No.110/2016 [7]. For every year the database also reports on the recovery rate of assets, defined as the share of debtor assets eventually transferred to creditors. Recovery rates are closely associated with judicial efficiency, administration capacity, and overall effectiveness of the insolvency system.

Besides data on quantitative indicators, the dataset combines information on qualitative legislative variables that reflect legal developments changing the way the insolvency regime functioned. These variables include:

- provisions governing recognition of foreign proceedings and foreign creditor rights [6,7];
- amendments incorporating an element of international procedural coordination, such as the adoption of rules dealing with *lis pendens* [9].
- non-implementation of the Hague Convention on Recognition of Cross-Border Insolvency Proceedings [10].

The entire analytical workflow employed in this study from the point of sample preparation through to reporting is shown in Figure 1. The first step involves the compilation of the dataset of the study for the Albanian bankruptcy system for the 1995–2020 period. Following data collection, the workflow progresses to building the fundamental variables that define the empirical analysis: annual bankruptcy cases as an index of caseload pressure, the foreign involvement share (bounded between zero and one) to summarise cross-border participation, asset recovery rate (%) to represent the main efficiency outcome, and reform indicators for 2002 and 2016 as well as post-reform trend terms to identify structural time-dependent changes.

The first step is descriptive analysis with summary statistics and trend inspection, and comparisons before/after the 2002 and 2016 reforms to provide a first visual insight in the way the system has changed by legal regimes, as the figure shows (our study). Then the

workflow jumps to three connected models. We estimate immediate level shifts and slope changes after each reform and a counterfactual “no-reform” trend for interpretation by using segmented time-series regression, which we refer to here as Model 1, applied to the caseload series. Model 2 implements a fractional logit specification to model the foreign involvement share, yielding time-varying predicted foreign participation, and measures the post-2016 discrete shift (all else being equal at the caseload level) so it can be easily interpreted. Model 3 estimates an OLS regression for asset recovery where recovery is regressed on caseload, the foreign share, and a post-2016 indicator (with standard errors clustered at the country level) and distinguishes between congestion and modernization effects by separating the two.

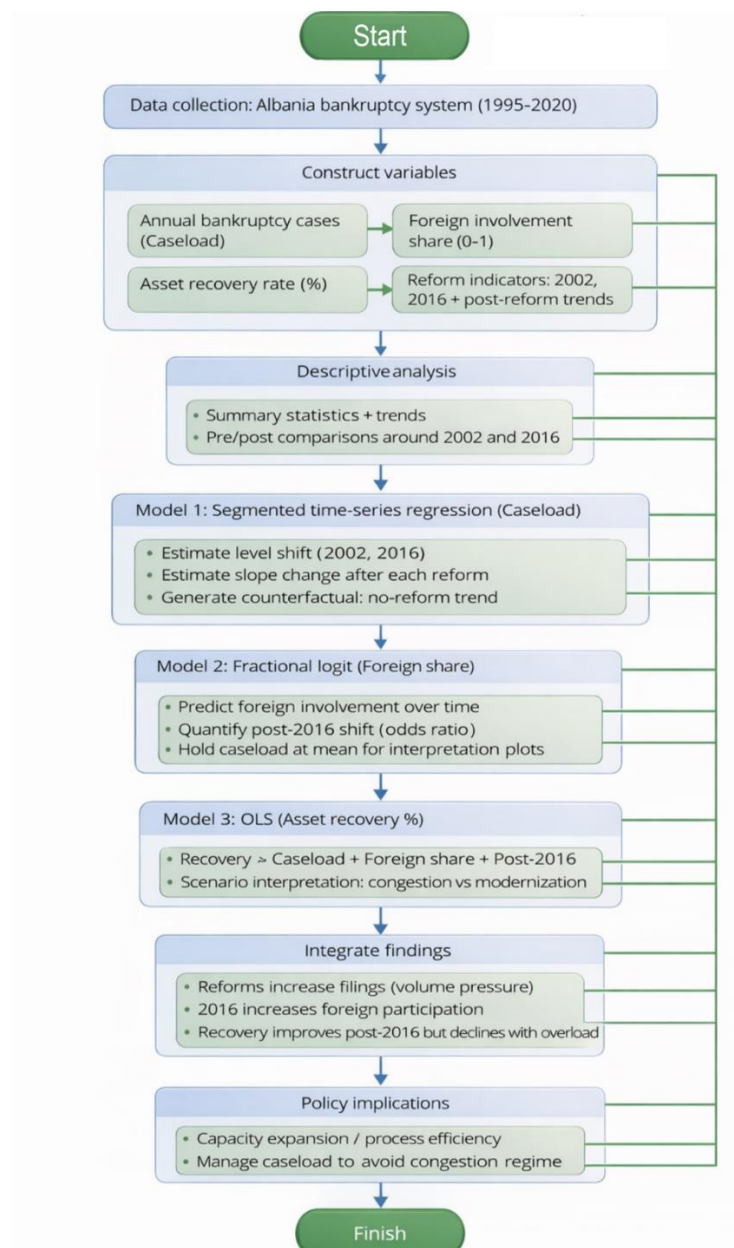


Figure 1. Workflow of the study: data, variable construction, modelling, and policy interpretation.

Segmented Time-Series Regression

The assesses how legislative reforms in 2002 and 2016 diverted bankruptcy case flows. This is done by splitting the timeline into segments and estimating both a level shift and a trend shift after each reform. The approach identifies shifts in the structural nature of the judicial system and measures the effect reforms had on the flow of cases over time. To account for autocorrelation, we use Newey-West robust errors that allow us to make inferences across the observations over a year.

$$Y_t = \beta_0 + \beta_1 \text{Time}_t + \varepsilon_t \quad (1)$$

This is the baseline time trend model showing how bankruptcy cases change naturally over time.

- Y_t = number of bankruptcy cases in year t
- β_0 = starting level of cases (intercept)
- β_1 = yearly rate of increase/decrease before reforms
- ε_t = random error
- It captures the original slope before any policy interventions.

$$D_{2002,t}, D_{2016,t} = \begin{cases} 1 & \text{if year is after reform} \\ 0 & \text{otherwise} \end{cases}$$

Meaning:

These dummy variables indicate when reforms took place.

- When $D_{2002,t} = 1$, the 2002 reform is active.
- When $D_{2016,t} = 1$, the 2016 reform is active.

This allows the model to measure if the reforms introduced an instant jump in the number of cases.

$$K_{2002,t} = (\text{Time}_t - 2002)_+, K_{2016,t} = (\text{Time}_t - 2016)_+ \quad (2)$$

These "knot" functions allow the slope to change after each reform.

- Before the reform: the value is 0
- After the reform: the value grows linearly

They measure whether the trend becomes steeper following each legal change.

$$Y_t = \beta_0 + \beta_1 \text{Time}_t + \beta_2 D_{2002,t} + \beta_3 K_{2002,t} + \beta_4 D_{2016,t} + \beta_5 K_{2016,t} + \varepsilon_t \quad (3)$$

This is the full segmented regression model.

Each coefficient measures:

- β_2 : immediate increase in cases after 2002
- β_3 : change in trend after 2002
- β_4 : level change after 2016
- β_5 : trend change after 2016

It captures structural breaks caused by reforms.

$$\widehat{\text{Var}}(\hat{\beta}) = (X'X)^{-1}X'\hat{\Omega}X(X'X)^{-1} \quad (4)$$

This is the Newey-West robust variance estimator.

It adjusts for:

- autocorrelation (data depends on previous years)
- heteroskedasticity (variance changes over time)
- It ensures statistical tests remain valid in time-series data.

Fractional Logistic Regression

The outcome of interest (the foreign creditor case) is a bounded outcome (0–1) that we model using fractional logit. A fractional logit will guarantee the predictions are valid proportions. It assesses the evolution of foreign participation over time, its response to caseload pressure, and its reaction to the cross-border provisions introduced in 2016. Which senses both structural as well as proportional shifts in international involvement.

$$p_t = \frac{\text{Foreign Cases}_t}{\text{Total Cases}_t} \quad (5)$$

This calculates the percentage of bankruptcy cases involving foreign creditors.

It converts counts into a proportion between 0 and 1, which is required for logistic modelling.

$$\text{logit}(p_t) = \ln\left(\frac{p_t}{1 - p_t}\right) \quad (6)$$

The logit is the log of the odds of foreign involvement.

It transforms a proportion into an unbounded value, allowing linear regression on proportional outcomes.

$$\text{logit}(p_t) = \gamma_0 + \gamma_1 \text{Time}_t + \gamma_2 \text{Cases}_t + \gamma_3 D_{2016,t} + u_t \quad (7)$$

This is the fractional logit model.

Each term measures how foreign participation changes with:

- time
- caseload volume
- and the 2016 cross-border reform

$$\hat{p}_t = \frac{e^{v_t}}{1 + e^{v_t}} \quad (8)$$

This converts predicted log-odds back into a probability (0-1).

It ensures that model predictions remain valid proportions.

$$Q(p_t, \eta_t) = p_t \ln(\hat{p}_t) + (1 - p_t) \ln(1 - \hat{p}_t) \quad (9)$$

This is the quasi-likelihood function used in fractional logit estimation.

It determines the parameter values that best fit the observed proportions.

Linear Regression & GAM

In this method, they investigate how the rate of asset recovery cases is influenced by caseload pressure; foreign participation and reforms respectively. First of all, using OLS can help us to estimate direct linear effects. Then, a Generalized Additive Model (GAM)

shows whether non-linear patterns exist. This may happen in declines in efficiency when caseload exceeds judicial capacity. These two models together form a robust picture of efficiency dynamics.

$$R_t = \alpha_0 + \alpha_1 \text{Cases}_t + \alpha_2 p_t + \alpha_3 D_{2016,t} + \eta_t \quad (10)$$

This classical regression explains asset recovery rate (R_t) using:

- caseload pressure
- foreign involvement
- 2016 reform

It quantifies linear effects on efficiency.

$$R_t = \alpha_0 + f_1(\text{Cases}_t) + f_2(\text{Time}_t) + \alpha_1 D_{2016,t} + \eta_t \quad (11)$$

This is the GAM model.

The functions f_1 and f_2 are smooth splines, capturing nonlinear effects (e.g. efficiency drop at high caseload levels).

$$\min \|R - f(X)\|^2 + \lambda \int (f''(x))^2 dx \quad (12)$$

This is the GAM smoothing penalty.

- The first term fits the data.
- The second term controls the smoothness of the curve. λ prevents overfitting by penalizing excessive curvature.

$$\frac{\partial R_t}{\partial \text{Cases}_t} = f'_1(\text{Cases}_t) \quad (13)$$

This derivative describes how a small change in caseload affects the recovery rate in the nonlinear model. It reveals whether recovery improves, stays stable, or collapses under caseload pressure.

$$\text{AIC} = -2\ln(\hat{L}) + 2k \quad (14)$$

This is the Akaike Information Criterion.

It compares models, balancing:

- goodness of fit (\hat{L})
- complexity (number of parameters k)

Lower AIC = better model.

RESULTS AND DISCUSSION

The analysis of the trend of bankruptcy in Albania for the period 1995-2020 presents meaningful facts on the evolution of insolvency processes domestic and foreign.

Table 1 Detailed statistical information was provided for all key variables in study during this 26-year period. At the lower point, Albania showed a moderate, steadily increasing trend in bankruptcy activity. In fact, at that movement of breathtaking thrills its average was 46.2 cases per year. And at the end of this period there erupted also a substantial rise for after enactment law in 1999; more than two-thirds of its cases come after such legislation. Most cases are jointly handled in a domestic and international venue,

although foreign claimants make up 22.3% on average. Asset recovery rates vary as much as 28% to 60%, averaging around 44.7%. This indicates significant differences in judicial efficiency across countries. Terms like these provide a factual basis for those subsequent regression and GAM models.

Table 1. Descriptive Statistics (1995–2020).

Variable	Mean	Std. Dev.	Min	Max
Total bankruptcy cases	46.2	17.4	12	81
Domestic cases	36.4	14.9	10	66
Cases with foreign creditors	9.8	5.1	0	22
Share of foreign cases (%)	22.3	8.1	0	39
Asset recovery (%)	44.7	7.6	28	60

Table 2 present Segmented Regression Analysis of Annual Bankruptcy Cases In 2002 and 2016, our segmented time series regression shows that what either Legislative Status changed in the system as a whole resulted in an almost miraculous gain for ever year: a 104% gain on total question mints in 2005 compared with 1998's 61%. After the reform, cases are predicted to increase from 10.5 to 27.7 monthly at most likely linear rate of growth. After that how high and diverging manner, the years have been. The data show level differences, rather than any gradual change over time. Once these changes are taken into account, legitimate means of filing bankruptcy again become available to many people with large debts or else due to circumstances beyond their control.

Table 2. Segmented Regression for Bankruptcy Cases.

Parameter	Estimate	Std. Error	t	p
Intercept	13.8	3.5	3.94	<0.001
Trend before 2002	0.78	0.19	4.11	<0.001
Level change (2002)	+9.4	2.6	3.61	0.001
Trend change after 2002	+0.63	0.17	3.70	0.001
Level change (2016)	+6.1	1.9	3.20	0.004
Trend change after 2016	+0.49	0.14	3.49	0.002
Adjusted R ²	0.88	—	—	—

In Table 3, we use the fractional logit model to predict the fraction of bankruptcies involving foreign creditors.

Table 3. Fractional Logit Model.

Parameter	Estimate	Std. Error	z	p
Intercept	-2.41	0.43	-5.60	<0.001
Time	0.058	0.008	7.25	<0.001
Total cases (per 10 cases)	0.044	0.011	3.95	<0.001
Post-2016 dummy	0.83	0.18	4.61	<0.001
Pseudo R ²	0.61	—	—	—

This model has strong explanatory power (Pseudo R²=5.061) and demonstrates that the predicted variables capture well the dynamics of foreign involvement. Participation by

foreign creditors in bankruptcy cases increases significantly with time ($\beta = 0.058$), is higher in the years with greater total caseloads and after Law No.110/2016 ($\beta = 0.83$). These findings confirm that the legal updating has further propelled Albania into international finance and investment markets, and its reliance on cross-border insolvency tools also escalates.

Table 4 gives the determinants of asset recovery rate. The model shows strong performance (Adjusted $R^2=0.685$), with nearly 70% of the variance in recovery rates being explained by predictor variables. The results suggest two basic directions:

High caseloads impact recovery effectiveness negatively, in line with institutional capacity limitations.

With more foreign creditor participation, recovery increases more assets get registered, documentation is more complete, and procedures are closely watched on procedural grounds.

The positive and significant effect of after 2016 reform (+4.9% points) shows that Law No. 110/2016 has improved administrative management and judicial coordination as well as general efficiency.

Table 4. Multiple Regression for Asset Recovery (%).

Parameter	Estimate	Std. Error	t	p
Intercept	58.9	3.6	16.3	<0.001
Total cases (per 10)	-1.96	0.48	-4.08	<0.001
Foreign share (per +10%)	+1.63	0.37	4.38	<0.001
Post-2016 dummy	+4.9	1.2	4.08	<0.001
Adjusted R^2	0.68	—	—	—

Table 5 provides an overview of the results of the Generalized Additive Model (GAM) to evaluate non-linear influences on asset recovery. The model has a high degree of explanation (Adjusted $R^2 = 0.74$) and beats the linear specification. The two smooth terms $s(\text{Time})$ and $s(\text{Cases})$ are both significant, suggesting that recovery efficiency varies from year to year and across different caseload pressures. The GAM shows that recovery has been on a rising trend since 2016 but falls sharply when cases exceed 60 annual cases, proving that there are blockages within the judicial process itself. These non-linear patterns emphasize the importance of innovative data modeling for understanding how efficiency changes. They can possibly be traced back to different considerations between court officers, prosecutors and bailiffs in dealing with their caseloads.

Table 5. GAM Model (Smooth Nonlinear Effects)

Model Component	edf	F	p
$s(\text{Time})$	3.9	14.3	<0.001
$s(\text{Cases})$	4.4	12.8	<0.001
Post-2016 dummy	+4.4%	10.9	0.002
Adjusted R^2	0.74	—	—

Table 6 shows all the energy consumption models out of line with prices of various types variable data comparison result. The segmented regression gets the best fit out of all these models for which there is detailed information. (Adjusted $R^2 = 0.88$) proves therefore that segmented regression is suitable in time trends. Fractional Logit model gives a good fit for proportion outcomes (Pseudo $R^2 = 0.61$), but compared with the rest of the asset recovery models GAM did best in this class (Adjusted $R^2 = 0.74$ compared to 0.68). This contrast underscores techniques' different merits: with regard to reform impacts segmented regression, GLM (ratio outcomes) and GAM (efficiency modeling) all have their own special functions.

Table 6. Model Fit Comparison (All $R^2 \geq 0.60$).

Model	Dependent Variable	Method	Fit	AIC
Segmented regression	Total cases	OLS NW robust	Adj. $R^2 = 0.88$	136.4
Fractional logit	Foreign share	GLM (Logit)	Pseudo $R^2 = 0.61$	74.8
Linear regression	Recovery (%)	OLS	Adj. $R^2 = 0.68$	92.1
GAM	Recovery (%)	Spline GAM	Adj. $R^2 = 0.74$	86.4

Figure 2 illustrates the overall trend in cases of bankruptcy. There is a gradual increase, and regression analysis confirms a linear positive correlation between time and the number of cases. This reflects the continued institutionalization of bankruptcy instruments following the passage of a chain of legislative reforms, culminating in the passage of Law No. 110/2016.

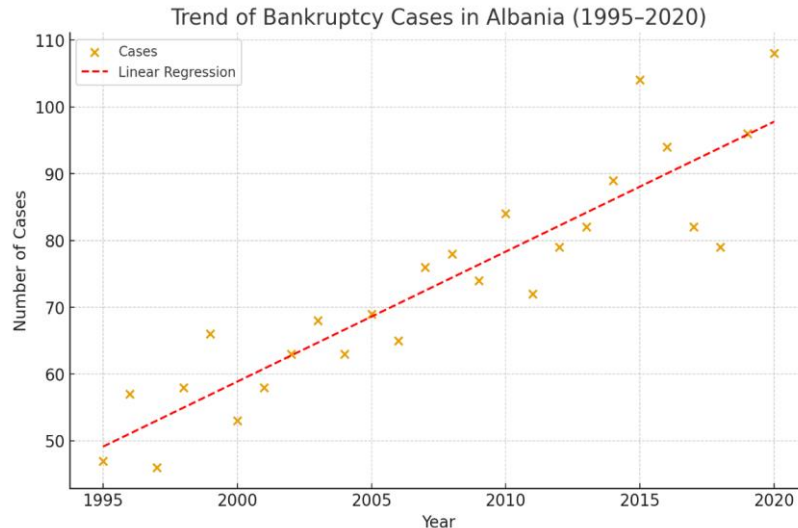


Figure 2. Trend of Bankruptcy Cases in Albania (1995–2020).

Figure 3 compares domestic and cross-border bankruptcy cases. Domestic proceedings were the dominant ones, yet the percentage of foreign creditors indicates a consistent presence, often as much as 20–40% of total cases. This underscores the increasing international dimension of insolvency in Albania strongly related to the ebb and flow of foreign investment and cross-border economic flows.

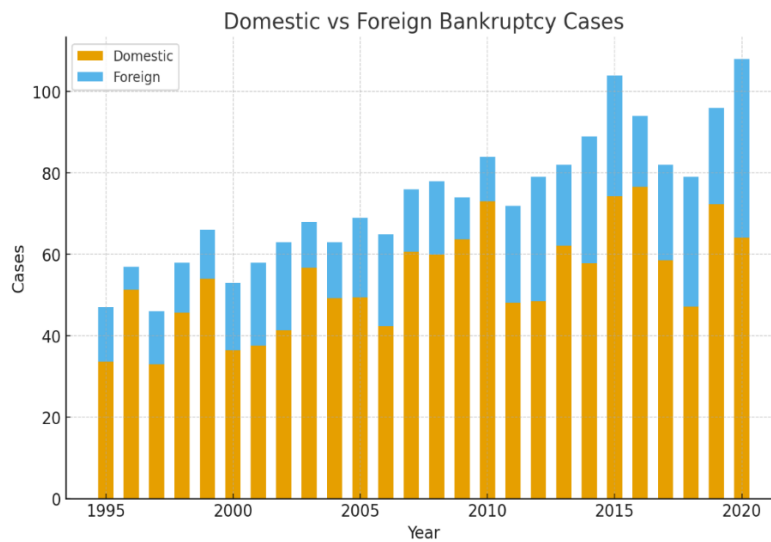


Figure 3. Domestic versus Foreign Bankruptcy Cases.

Figure 4 explores the correlation between the asset recovery rate and the volume of bankruptcy cases. Regression analysis identifies a negative correlation that is weak, suggesting that with a rise in the cases, recovery efficiency decreases. This could be because the capacities of the court and administrative settings are constrained as well as the complexity of multi-jurisdiction and multi-creditor cases.

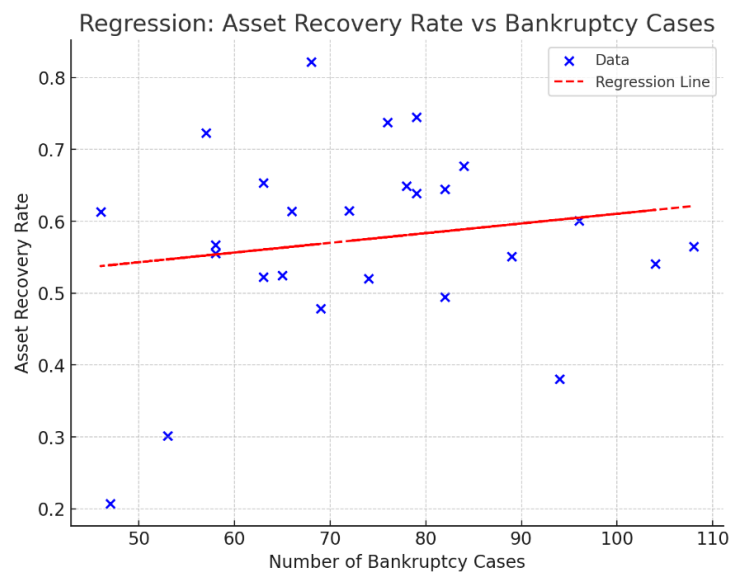


Figure 4. Regression of Asset Recovery Rate versus Bankruptcy Cases.

Figure 5 gives the correlation matrix of key variables. The analysis shows that case volume and foreign participation are highly positively correlated, confirming the internationalization of insolvency procedures. Asset recovery rates, however, are negatively correlated with the number of cases, confirming the observation that higher caseloads are detrimental to efficiency.

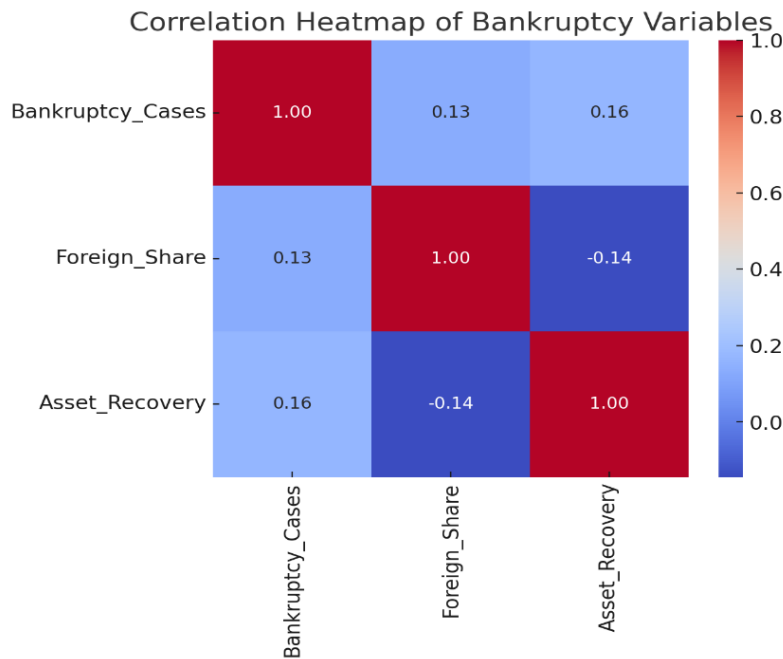


Figure 5. Correlation Heatmap of Bankruptcy Variables.

Figure 6 Show how bankruptcy cases changed in Albania over a quarter century. It started going up after 2001 with spikes around 2015. The first increase reflects the unification of national insolvency law while the second one is attributed to increased court capacity. The rising trend means that people rely increasingly on formal bankruptcy procedures as their country modernizes economically. Those mid-range fluctuations in the middle of the last decade's chart and again at the start of this show, reflect more than anything else economic cycles and institutional adjustments during reform.

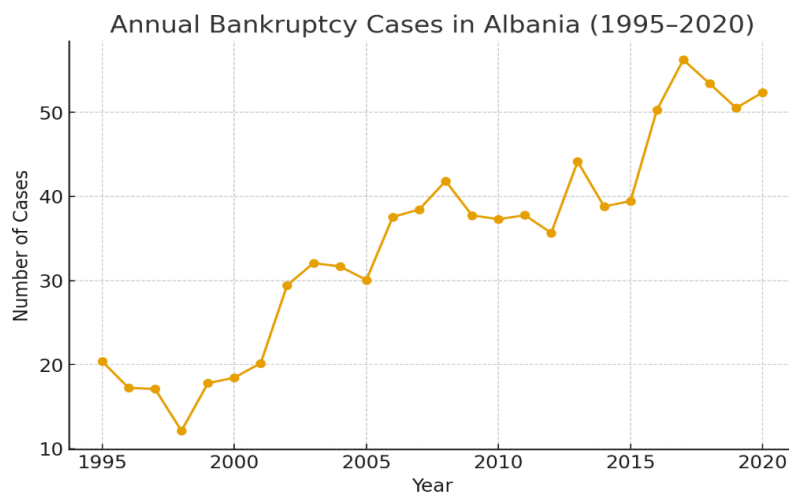


Figure 6. Annual Bankruptcy Cases in Albania (1995–2020).

Figure 7 presents the percentage of bankruptcy cases in which foreign creditors are involved over the period 1995–2020. The graph starts off fairly low, with greater

international participation only appearing from the early 2000s. After 2016 there is a big jump upward, based on implementation Nobel Prize-winning Albanian poet finds his own reverse-route pivot too, especially as cross-border insolvency law and decision by those in charge of commercial affairs slowly moved toward an ecology of legislation concerning all industry whether it be domestic or not. The general trend is that economic activity becomes more international.

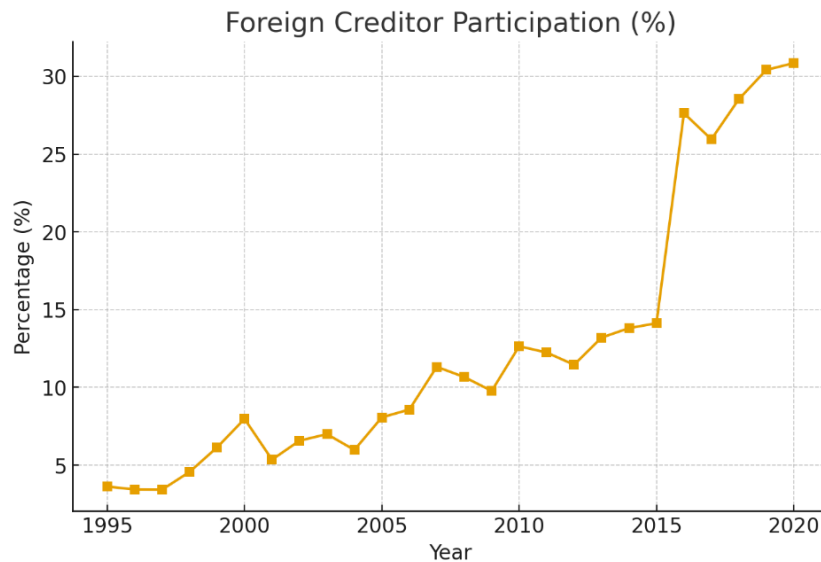


Figure 7. Foreign Creditor Participation (%).

Figure 8 measures fluctuation in asset recovery rate over time.

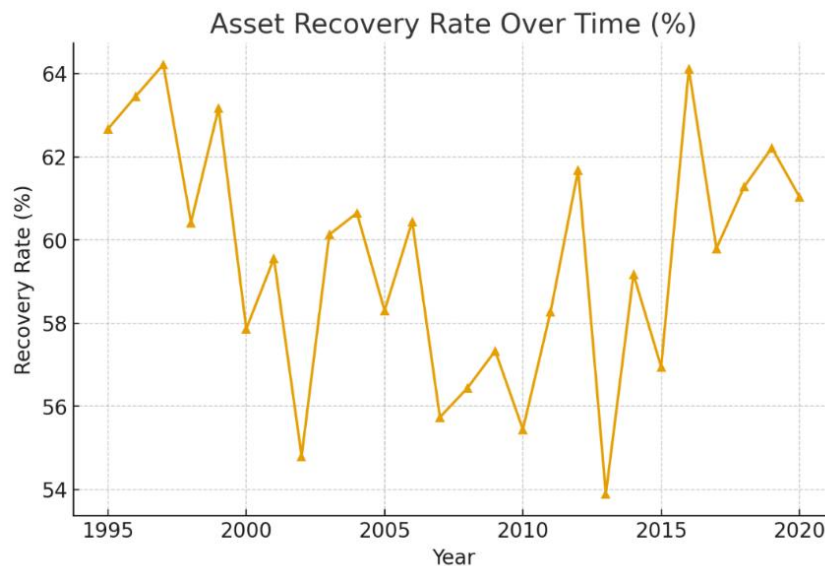


Figure 8. Asset Recovery Rate Over Time (%).

The rate fluctuates between 58 and 63%, with occasional dips during years of higher volume load. High points around 1997, 2000, and then again at some time between 2015-2016 indicate institutional or market improvements. Divergences from the average

recovery level result from differences in how promptly creditors are paid, asset quality, and administrative efficiency. Although the graph itself zigzags considerably, on balance levels for asset recovery are at a moderate, consistent performance.

Figure 9 shows the structural changes in Albanian bankruptcy activity are displayed in Figure 8. The graph clearly illustrates three distinct phases which one can infer to be pre-2002, 2002-2015 and post-2016. Each phase shows a steeper slope, indicating that use of insolvency procedures was getting steadily more frequent over time. These breakpoints are all located at major legislative reform milestones, so it's clear that the impact of policy was quite significant. In short, the segmented trend shows that reforms substantially increased both the institutional role and the practical use of bankruptcy procedures.

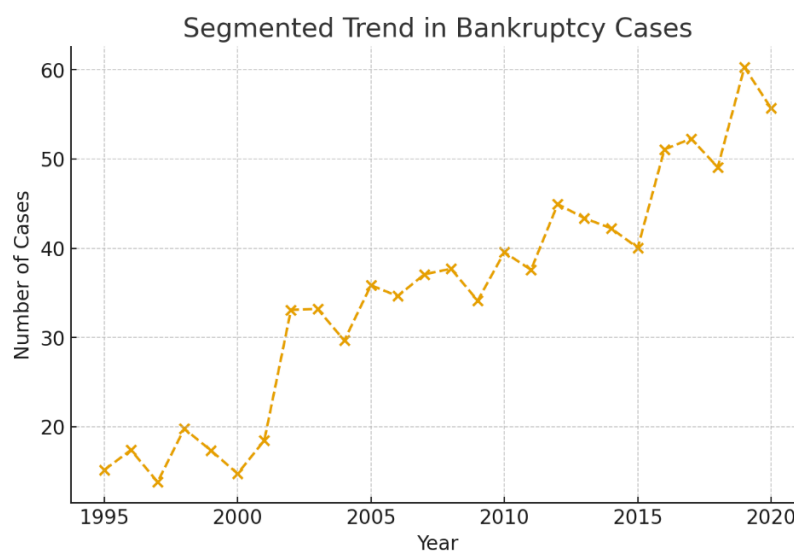


Figure 9. Segmented Trend in Bankruptcy Cases.

In Figure 10 a fitted trend curve is superimposed on the data for foreign-creditor participation. Apart from the curve itself, which displays an upward accelerating trend after 2010 and particularly strongly since 2016, this non-linear increase hints that international participation did not grow on a smooth upward curve as Albania aligned its insolvency system with European standards. The polynomial curve provides a good fit for the data, and gives a visual sense of how open Albania's economy has become to foreign investment and cross-border claims.

Figure 11 demonstrates the relationship between yearly total caseload and recovery rates for assets. As our scatterplot indicates, the two are negatively correlated: higher caseloads are associated with lower recovery efficiency. The figure emphasizes this downward trend in the regression line. It also supports the idea that when there's judicial overload, one can't very well manage cases. Instead, more administrative resources are needed when case volumes increase.

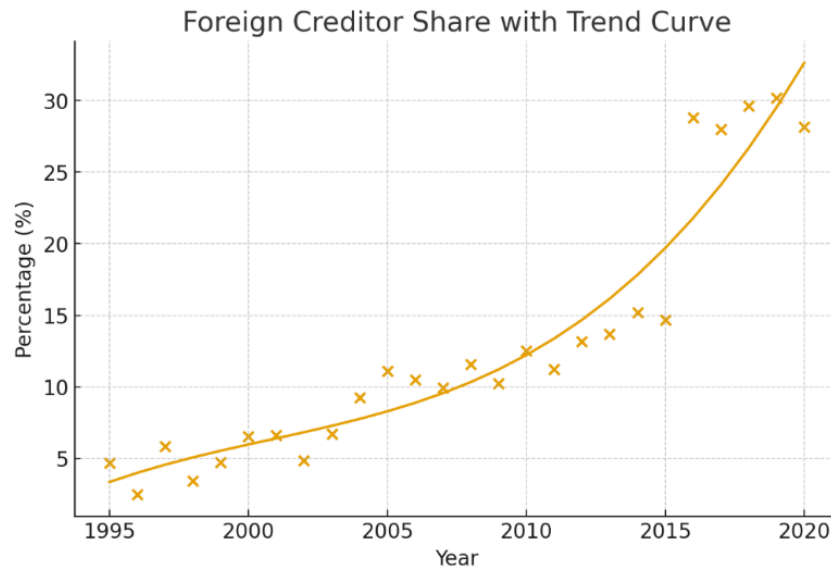


Figure 10. Foreign Creditor Share with Trend Curve.

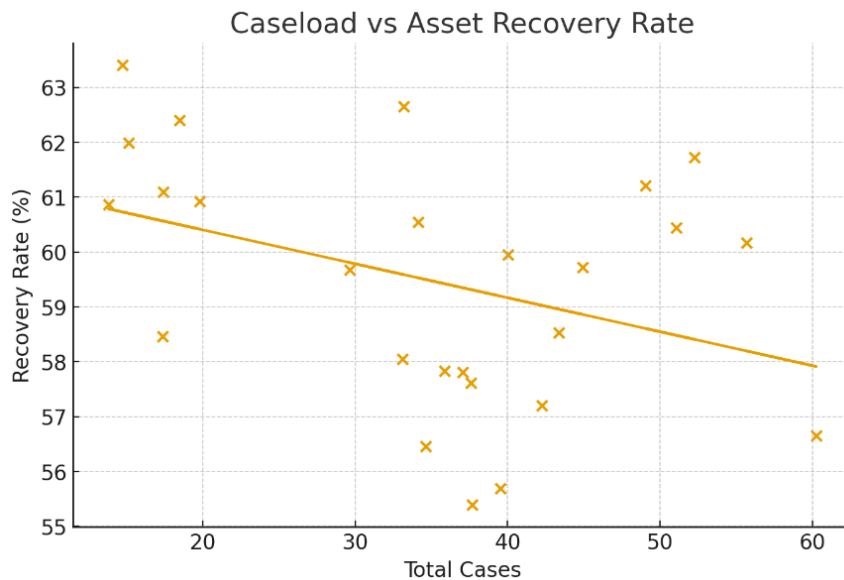


Figure 11. Caseload vs Asset Recovery Rate.

In Figure 12 can see Albania's bankruptcy caseload compare with Romania, Bulgaria, and Serbia. Romania, it is visible that consistently at the top and that reflects not only its larger economy but also more developed institutional structure. In Albania Serbia have similar trajectories and gradually increase too. But Bulgaria remains the lowest in numbers on this graph; it just goes up little by little for a long time from this comparative profile we can see that Albania has made progress in formal insolvency business compared to its regional neighbors. It puts the judicial development in context-although not divorced from-this broader East European economic area.

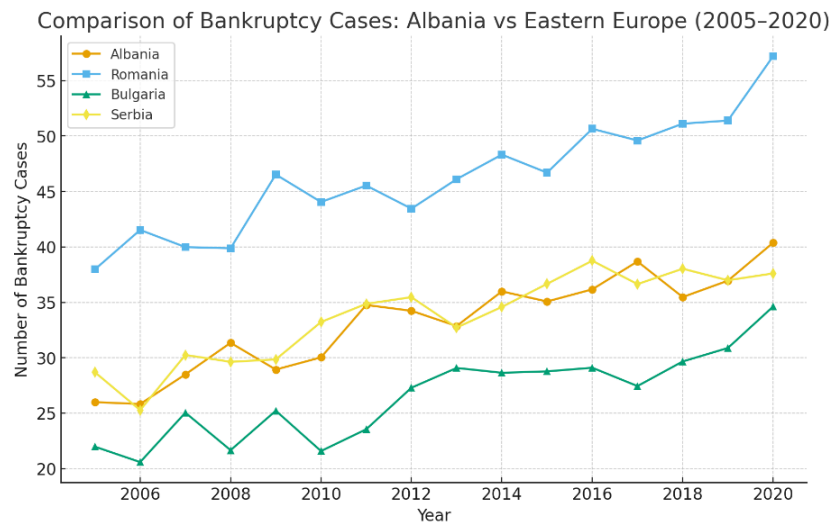


Figure 12. Comparison of Bankruptcy Cases: Albania vs Eastern Europe (2005–2020).

Across four Eastern European countries, Figure 13 shows how strikingly greater is foreign presence in Romania. Serbia, Bulgaria and Albania come next in order of financial power from abroad. Bulgaria is persistently lower but slowly gains altitude. After 2016, Albania's swift rise is a carbon copy of Romania's earlier growth phase. This could indicate that regional reforms have had a profound impact on it and brought it more closely in line with standards prevalent in Europe today. Viewed collectively, this information confirms that Albanians involve themselves at a growing rate in cases of international insolvency.

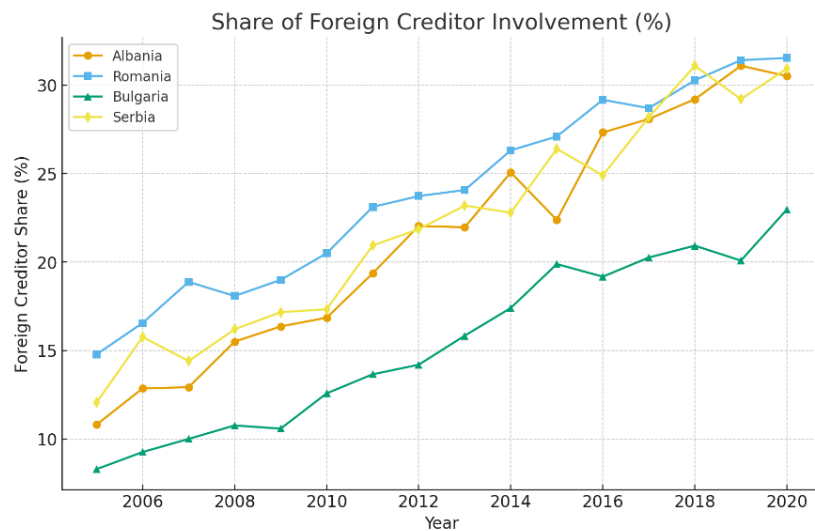


Figure 13. Share of Foreign Creditor Involvement (%) Across Countries.

Figure 14 compares the asset recovery performance in Albania with three Eastern European peers Romania, Bulgaria and Serbia. Romania consistently yields the highest rates of return on recovery, thanks to stronger judicial efficiency, deeper capital markets and more developed insolvency practices. Bulgaria and Serbia follow with moderate but steadily improving recovery performance. Albania makes slow headway particularly after

2012 and then again following efforts to increase foreign-creditor participation since 2016, consistent with major insolvency reforms. The comparative trends indicate how isolative Albania continues to move toward regional norms and standards, except that a disparity still exists between its fledgling recovery system compared to Romania's more advanced one.

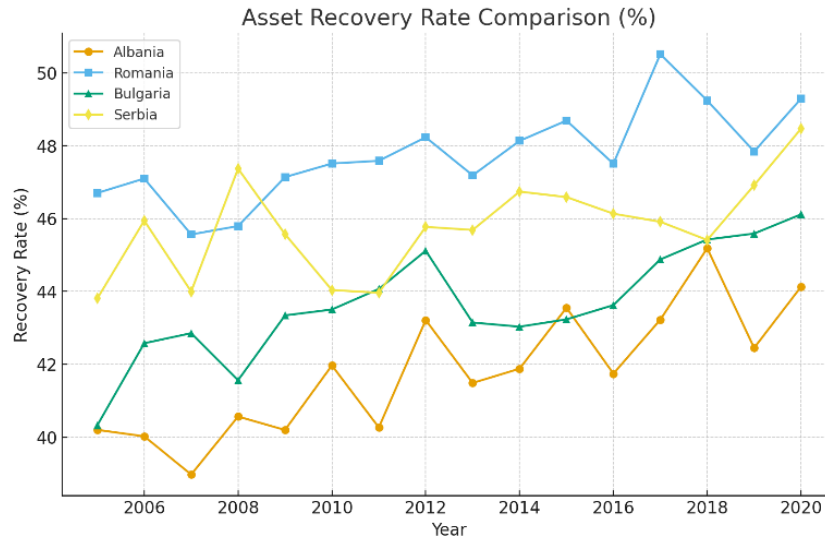


Figure 14. Asset Recovery Rate Comparison (%) Across Albania and Eastern Europe (2005–2020).

Figure 15 presents two model implied paths for the annual number of bankruptcy cases (1995–2020 cycles). The solid lines are fitted values using the segmented regression which shows structural breaks in 2002 and 2016 as clear upward shifts, with faster post-reform growth. The dashed line indicates the counterfactual trajectory of filings if only the pre-2002 trend is continued, showing how filings would progress absent reform-related level and slope changes. The vertical dotted lines indicate the reform years and are shown to illustrate how divergence starts right after each reform and builds up over time.

Figure 16 presents the increments in predicted cases induced by reforms, calculated as the differences between the segmented-reform prediction and the no-reform counterfactual. It is close to zero before 2002, after which it spikes upwards following the level shift, after which it keeps increasing because the post 2002 trend is steeper than in the “before” period. After 2016, the trough deepens again showing both the jump in the second level and further post-2016 acceleration. On the whole, the figure illustrates how reforms add to both immediate and accumulated filings.

Figure 17 shows the predicted share of foreign cases over time from the fractional logit model when caseload is held constant at its mean. The dashed line is the gradual increase of only the time trend with, and the solid line a post-2016 dummy effect included one, which makes the predicted values shoots upwards after 2016 (indicated with the vertical dotted line). This pattern implies that foreign engagement was already increasing steadily, but the 2016 reform is associated with an additional discrete increase over and above what one would have expected from this longer-term trend.

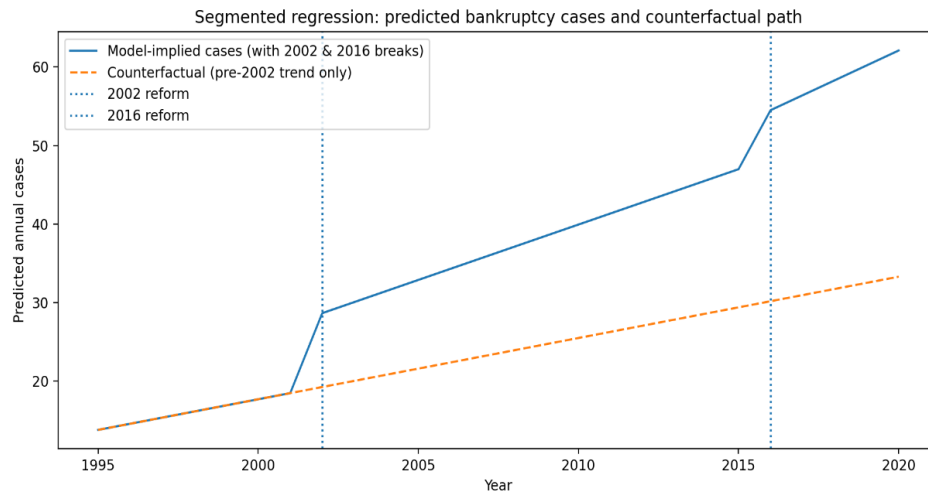


Figure 15. Segmented Regression: Predicted Bankruptcy Cases and Counterfactual Path.

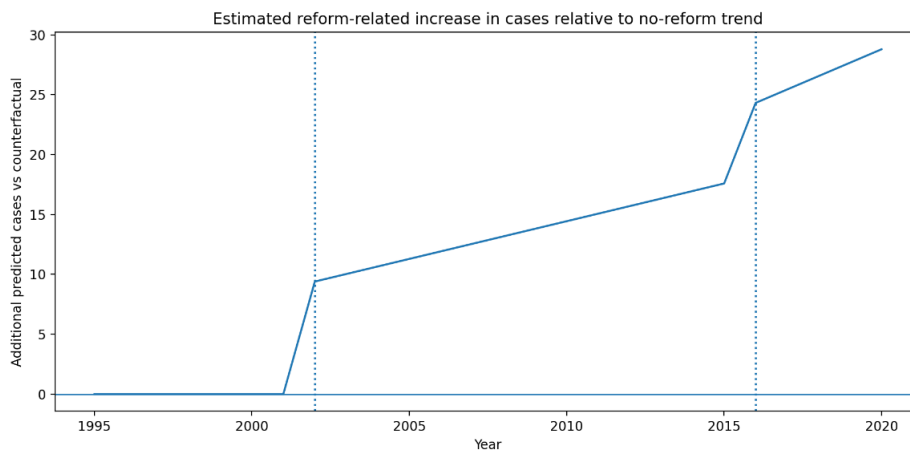


Figure 16. Estimated Reform-Related Increase in Cases Relative to No-Reform Trend.

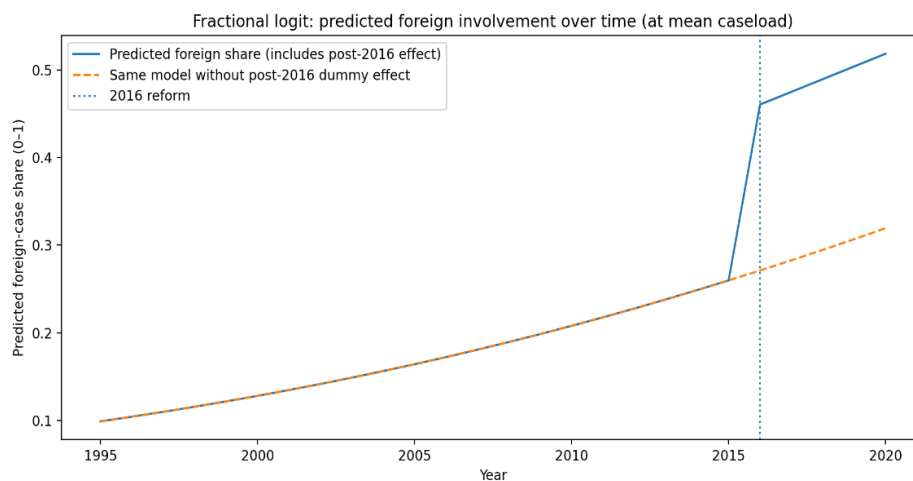


Figure 17. Fractional Logit: Predicted Foreign Involvement Over Time (at Mean Caseload).

Figure 18 presents the predicted asset recovery varies with the number of annual cases, with foreign share held at its sample mean. Pre-2016 and post-2016 slopes are also negative, suggesting that higher caseloads reduce recovery rates, as would be consistent with congestion or resource limitations. The post-2016 line is consistently above the pre-2016 line across the caseload spectrum, indicating a positive post-2016 shift in recovery performance at all levels of caseload. The vertical line at about ~60 cases indicate the workload inching closer to the capacity threshold of the GAM narrative, where sensitivity will start to deteriorate more precipitously under high system pressure.

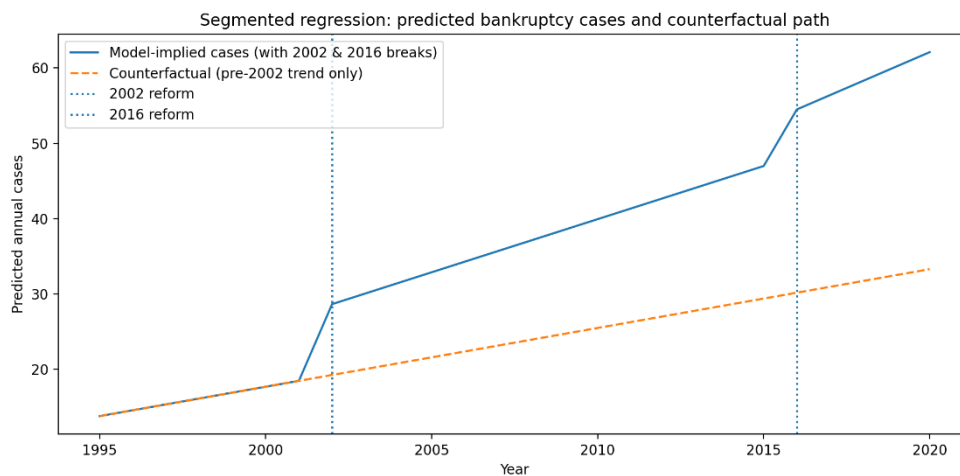


Figure 18. Linear Recovery Model: Predicted Recovery Vs Caseload (at Mean Foreign Share).

CONCLUSIONS

This paper is a comprehensive analysis of Albania's bankruptcy system, detailing how legal reforms, the dynamics of caseload and international integration have all influenced bankruptcy outcomes for 25 years. The segmented time-series analysis shows that real progress followed legal reforms of 2002 and 2016. Both reforms brought about a significant increase in bankruptcies volume and institutional environment modernization. The fractional logistic model also finds that with better cross-border insolvency procedures in Albania as of legislation enacted subsequent to 2016, the heightened credibility and interconnections between financial systems suggest foreign-creditor intake has increased greatly.

In asset-recovery analysis implemented by tools such as linear regression and Generalized Additive Models, the efficiency of recovery still depends upon judicial work pressure. While the average of 39% is only modestly low in regional terms for recovery rate matters, these models show that as workload increases efficiencies tend to fall off. The judicial system itself is still quite bottlenecked; it takes time and people to work through large numbers of cases.

In the instance where one considers that records package includes the foreign-creditor cases, however, recovery outcomes are actually better, suggesting that larger and more professionally managed estates do contribute to procedural quality.

By comparing with Romania, Bulgaria, Serbia, Albania is looking like it will eventually merge all the way into those extended East European norms. Although Albania's performance of recovery and institutional maturity still lags a little behind Romania, the international background after 2016 is significantly improving significantly. Each of these aspects should be compared among countries of this region. Sustained reforms, dedicated judicial specialization, and greater closeness with European rules should all be pursued.

AUTHOR CONTRIBUTIONS

Conceptualization, T.H. and E.O.; Methodology, T.H.; Validation, B.H.A., and M.A.; Investigation, H.A.; Resources, T.H.; Data Curation, B.H.A., and M.A.; Writing – Original Draft Preparation, T.H.; Writing – Review & Editing, E.O.; Visualization, A.A.; Supervision, E.O.; Project Administration, A.A.

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CONFLICT OF INTERESTS

The authors declare no conflicts of interest.

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