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The impact of institutionalized representation: creditors' committees and the resolution of corporate liquidation bankruptcies

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Abstract
We utilize micro-level data on corporate liquidation bankruptcies in Slovenia to conduct the first systematic quantitative investigation of the impact of creditors' committees (CCs) on liquidation bankruptcy outcomes. Slovenian law permits, but does not mandate, the establishment of a CC in liquidation bankruptcy proceedings, ensuring variation in CC incidence across cases. To address the non-random formation of CCs, we use propensity score matching and employ a rich set of covariates. Our findings reveal that CCs boost the liquidation value of bankrupt debtors' assets, thereby facilitating recovery, particularly for priority and ordinary unsecured creditors. Additionally, CCs elevate the overall rate of creditors' recovery relative to the value of liquidated assets. However, CCs also prolong the duration of proceedings and increase the likelihood of litigation. Our analysis thus underscores the multifaceted nature of the effect of institutionalized creditor representation on the efficacy of liquidation bankruptcy proceedings.

Keywords Corporate bankruptcy · Liquidation bankruptcy proceedings · Creditors' committees · Debt recovery · Duration · Slovenia

JEL Classification G33 · K22 · P12 · D02

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1 Introduction

Resolution of corporate bankruptcy has been a topic of major interest to scholars in economics, finance, and law. At the micro level, an effective insolvency framework promotes the liquidation of unviable firms and the restructuring of financially distressed but otherwise viable businesses (e.g., EBRD, 2021; UNCITRAL, 2005, Bris et al., 2006; White, 1989). Well-functioning insolvency regimes thus safeguard creditor rights (e.g., Djankov et al., 2008), which in turn facilitates private credit.

In the context of liquidation bankruptcies, when the debtor is no longer deemed economically viable, the primary objective of the proceedings is to maximize the liquidation value of the debtor's assets and ensure timely distribution of the proceeds among the creditors (see, e.g., UNCITRAL, 2022; Hart, 2006; Blazy & Chopard, 2011; Cornelli & Felli, 2012). Yet empirical evidence on the resolution of liquidation bankruptcies, and in particular the extent to which different procedural and institutional features promote efficacious proceedings, remains scant.[1]

In the present paper, we fill the abovementioned gap in the literature by empirically investigating the role of one underexplored design feature of corporate liquidation bankruptcy proceedings: the involvement of creditors' committees (henceforth CCs). Drawing on detailed micro-level data on corporate liquidation bankruptcies in Slovenia, our analysis provides the first systematic quantitative insight into the impact of CCs on key liquidation bankruptcy outcomes.

The significance of CCs as means of institutionalized creditor representation has been an important point of emphasis in policy discussions regarding best practices in resolution of corporate insolvency (see, e.g., UNCITRAL, 2005; Block-Lieb et al., 2013; Tomasic, 2006) and beyond (see, e.g., Park & Samples, 2021). The formation of a CC is expected to alleviate creditors' distributional conflicts and collective action problems (see, e.g., Baird & Jackson, 1984; Eklund & Roberts, 1997) by providing an opportunity for creditors to consolidate bargaining power, streamline communication, and enhance information sharing. Although committees of creditors can go rogue (see, e.g., Gensburg, 2019), the involvement of CCs is in general anticipated to improve creditors' recovery as well as the overall efficacy of bankruptcy resolution.

Accordingly, national laws afford CCs an important role especially in the context of U.S. Chapter 11-like reorganization proceedings, where the debtor remains in possession. In such settings, a proactive CC that participates in the conduct of the case and reviews the debtor's proposed reorganization plan is considered crucial for protecting creditors' interests (Zipes & Lambert, 2003; Klee & Schaffer 1993; DeNatale, 1981). Although rare empirical evidence on the impact of CCs in bankruptcy reorganizations is overall inconclusive, national laws tend to encourage and

[1] For empirical studies illuminating aspects of resolution of corporate liquidation bankruptcies (as opposed to contrasting liquidation and reorganization, as e.g., Bernstein et al. (2019)), see especially Blazy et al., (2011, 2013), Blazy and Letaief (2017), Blazy and Nigam (2019), Blazy et al. (2018), Blazy and Stef (2020), Cepec and Grajzl (2017), Couwenberg and de Jong (2008), Hardman and MacPherson (2023), Sundgren (1998), Thorburn (2000), and Lubben (2007).

sometimes even require the formation of CCs in reorganization proceedings (see Block-Lieb et al., 2013 and Sect. 2.2).,[23]

In contrast, in liquidation bankruptcy proceedings akin to U.S. Chapter 7, there is less need for a CC because, at least from a legal standpoint, the interests of creditors are already represented by a court-appointed bankruptcy trustee (see, e.g., DeNatale, 1981: 44). In many jurisdictions, the role of CCs in liquidation bankruptcies is thus comparatively more restricted, with statutory rules emphasizing the CCs' advisory and supervisory role (see Block-Lieb et al., 2013). Nevertheless, as we highlight in the following section, CCs do have considerable opportunity to influence liquidation bankruptcy proceedings. However, to date, no empirical study has endeavored to investigate the impact of CCs on the outcome of corporate liquidation bankruptcies.

We assemble a dataset on the universe of more than 7500 corporate liquidation bankruptcy cases filed and resolved in Slovenian courts between late 2008 and the start of the Covid-19 pandemic in 2020. Slovenia is a relevant jurisdiction for examining the impact of CCs on liquidation bankruptcy outcomes for three key reasons. First, liquidation bankruptcy has been the primary mode of court-supervised resolution of corporate insolvencies (Cepec, 2016). Second, the core legal framework governing corporate liquidation proceedings has been stable since 2008. And third and most important, Slovenian law permits, but does not mandate, the formation of a CC in liquidation bankruptcy proceedings. As a result, only a subset of liquidation bankruptcy cases actually involves a CC. In fact, as we clarify below, the proportion of liquidation bankruptcies involving a CC is very small—just over one percent—suggesting that these cases may differ significantly from the others.

We exploit the variation in the incidence of CCs across Slovenian liquidation bankruptcy cases to assess the impact of CCs on a wide range of bankruptcy outcomes. To account for the non-random nature of CC formation, we use propensity score matching and employ an extensive set of covariates. Using Slovenia as a case study, we thereby contribute to the ongoing discourse on the effectiveness of different modes of creditor representation in insolvency (e.g., Block-Lieb et al., 2013)

[2] Empirical literature on the role of CCs in reorganization bankruptcies draws on U.S. data. A subset of this scholarship (see, e.g., LoPucki and Doherty 2015; Harner and Marincic 2011a, b; Jaggia and Thosar 2019) indicates that the formation of a CC in reorganization bankruptcies is associated with greater prospects of failed reorganization, lower prospects of firm survival, and greater case duration. As emphasized by LoPucki and Doherty (2015: 998), these "puzzling" findings quite possibly reflect unaddressed endogeneity problems rather than capturing the ceteris-paribus effect of a CC. In contrast, in Lawton's (2012) analysis, the formation of a CC is associated with higher odds of plan confirmation and successful plan performance.

[3] Section 1102(a)(1) of the U.S. Bankruptcy Code generally requires the appointment of a committee of creditors holding unsecured claims. This section also states that the bankruptcy trustee may appoint a committee of equity holders to protect the interests of equity in reorganizations. As Coleman and Woodruff (1994: 295–296) emphasize: "Unlike creditors' committees…equity committees are relatively rare" and are "appointed only in the 'mega-cases' involving large, publicly-traded debtors" to "represent large numbers of shareholders and substantial collective interests". Recent legal practice indicates that equity committees can play an important role in the reorganization of such companies (Pintarelli et al., 2017), with some practitioners advocating for amendments to the U.S. Bankruptcy Code "to require the appointment of an equity committee by the U.S. Trustee in every bankruptcy involving publicly traded companies where equity holders are willing to serve" (Rothberg and Carey Brown 2017: 23).

and, more broadly, the consequences of creditor empowerment in insolvency resolution (e.g., Agrawal et al., 2022; Davydenko & Franks, 2008; Vig, 2013).

The rest of the paper proceeds as follows. In Sect. 2, we provide the necessary institutional and conceptual background. Section 3 introduces our data. Section 4 offers preliminary descriptive analysis. In Sect. 5, we lay out our main empirical approach. Section 6 presents our findings. The final section concludes.

2 Institutional and conceptual background

2.1 Slovenian liquidation bankruptcy proceedings

As in many other jurisdictions worldwide, the Slovenian legal framework for resolution of corporate insolvency[4] encompasses two broad groups of bankruptcy proceedings: reorganization and liquidation. Unlike in some other European countries (e.g., Germany and France), but in line with U.S. Chapter 7 bankruptcy rules, the initial choice between reorganization versus liquidation is the prerogative of the initiator of the proceedings (the debtor or a creditor).[5] A debtor cannot be forced into liquidation if they wish to pursue reorganization.[6] Once liquidation begins, reorganization is no longer possible, meaning that equity holders can only be paid if all creditors have been fully compensated.[7]

The key objectives of the Slovenian liquidation bankruptcy proceedings are the maximization of the value of liquidated assets to be distributed among creditors and timely resolution.[8] Liquidation bankruptcy proceedings must be initiated at the district court with geographic jurisdiction over the area of the debtor's domicile.[9] Following a failed attempt at reorganization or voluntary dissolution, liquidation bankruptcy proceedings commence automatically.[10]

Upon court filing, the debtor's management is dismissed.[11] At the court, the liquidation bankruptcy case is assigned to a judge who in turn appoints a bankruptcy trustee to serve as the debtor's legal representative. The assignment of cases to judges and bankruptcy trustees is based on alphabetical order and thus de facto random.[12]

[4] The pertinent law is referred to as "Zakon o finančnem poslovanju, postopkih zaradi insolventnosti in prisilnem prenehanju (ZFPPIPP)" and is available online at http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO4735. In English, the law has been referred to as the Financial Operations, Insolvency Proceedings, and Compulsory Dissolution Act.

[5] Art. 139 and 231 of ZFPPIPP.

[6] Art. 152 and 236 of ZFPPIPP.

[7] Art. 140 and 373 of ZFPPIPP.

[8] See Plavšak (2017).

[9] Art. 52 of ZFPPIPP.

[10] Art. 141 of ZFPPIPP and Art. 414 of ZGD-1 (Companies Act).

[11] Art. 245. of ZFPPIPP.

[12] Art. 116 of ZFPPIPP; Art. 160 of Sodni Red (Rules of Court).

The bankruptcy trustee's main tasks are to verify creditors' claims, sell the debtor's assets, and distribute the value of liquidated assets among the creditors in accordance with the statutory rules.[13] The trustee's remuneration is regulated and is part of the costs of proceedings.[14]

The judge's role in the proceedings is to supervise the trustee. The judge approves the trustee's decisions and reports, including on remuneration, and issues resolutions of relevance to the case.[15] Both the judge and the trustee, however, must consider the actions and views of the creditors' committee, if one is formed (see below).

The debtor's assets can be sold piecemeal or, if the value of the whole business estate exceeds the sum of individual assets, as a going concern. Assets are sold via a public auction or a binding call for tenders. If neither the auction nor tenders for sale result in a sale of assets, the sale of assets may proceed via direct negotiations with potential buyers following a non-binding call for tenders.[16]

The proceeds from the sale of the debtor's estate are first used to cover the costs incurred during the proceedings.[17] These costs entail regular operating expenses, overdue employee compensation and taxes, as well as the costs incurred as a result of proceedings per se, including the costs of accounting, administrative and legal services, litigation expenses, and the bankruptcy trustee's remuneration.[18] If the value of the bankruptcy estate is insufficient to cover the total costs incurred during the course of the proceedings, the court, upon the bankruptcy trustee's petition and consent of the creditors' committee (if one exists), concludes the proceedings without payment to the creditors.[19]

Creditors are paid according to the absolute priority rule (APR): first, secured creditors (e.g., through the sale of specific collateral securing their debt); then, priority unsecured creditors (e.g., employees); and finally, ordinary unsecured creditors (e.g., suppliers). Slovenian law on liquidation bankruptcy proceedings does not allow for any deviations from the APR.[20]

2.2 Creditors' committees: formation

The Slovenian rules concerning the establishment of creditors' committees (CCs) resonate with the regulations applicable to U.S. Chapter 7 bankruptcies and similar frameworks internationally. Unlike in reorganization bankruptcy proceedings, the formation of a CC in Slovenian liquidation bankruptcy proceedings is not mandatory. The court appoints a CC only upon the creditors' request.[21]

[13] Art. 97 of ZFPPIPP.
[14] Art. 103 and 104 of ZFPPIPP.
[15] See Plavšak (2017).
[16] Art. 329 of ZFPPIPP.
[17] Art. 226 of ZFPPIPP.
[18] Art. 354 to Art. 357 of ZFPPIPP.
[19] Art. 378 of ZFPPIPP.
[20] Art. 359 of ZFPPIPP.
[21] Art. 77 of ZFPPIPP.

Any creditor can submit a request to form a CC. If the request to form a CC is submitted before the recognition of claims, the court appoints individual members directly. Individual members must include creditors who are the holders of the largest ordinary unsecured claims.[22]

In contrast, if the request to form a CC is submitted after the recognition of claims, the court invites the creditors to vote on the formation of a CC and to submit proposals for individual CC members. A CC is formed if the majority of the creditors vote in favor of one. The composition of the CC is then determined through election results.[23]

The number of members of the CC is expected to reflect the total number of creditors in the case. The number of CC members must be odd and should not be less than three or more than eleven.[24] Not every creditor may be appointed as a member of the CC. For example, debtors of the insolvent debtor, recent members of the management or supervisory board of the insolvent debtor, and secured creditors in general cannot serve on the CC.[25]

Slovenian law does not envisage any reimbursement for participation on a CC. Serving on a CC therefore entails incurring both direct and indirect (opportunity) costs. At the same time, the law does not impose any fiduciary obligations on members of a CC.

A CC is not an independent procedural entity and thus cannot perform acts on its own behalf. For example, the CC does not possess the right to appeal against the first-instance decision. Rather, the CC performs actions on behalf of the creditors.[26] As such, the CC can nevertheless play a vital role in liquidation bankruptcy proceedings.

2.3 Creditors' committee: role

Echoing related corporate liquidation bankruptcy frameworks in the U.S. and elsewhere, the Slovenian law affords the CC in liquidation bankruptcy proceedings primarily a supervisory and advisory role. As we clarify below, the CC performs this role by issuing opinions, providing consent, and requesting reports. The CC has the authority to examine all proceedings-related documentation acquired or produced by the bankruptcy trustee.[27] The CC therefore monitors the trustee both directly and indirectly, by providing valuable input to the court.

In particular, the CC can shape the court's decision on whether the insolvent debtor may perform aspects of their business activity even after the start of liquidation proceedings. Upon the commencement of liquidation proceedings, the insolvent debtor may be allowed to complete any urgent business, as requested by the

[22] Art. 80 and 82 of ZFPPIPP.
[23] Art. 83 of ZFPPIPP.
[24] Art. 79 of ZFPPIPP.
[25] Art. 78 of ZFPPIPP.
[26] Art. 76 of ZFPPIPP.
[27] Art. 87 of ZFPPIPP.

bankruptcy trustee, if the court grants its permission. However, prior to granting its permission, the court is mandated to obtain an opinion of the CC.[28] Similarly, following a bankruptcy trustee's petition, the court may grant the insolvent debtor the right to continue its production and business. Prior to allowing such continuation, however, the court must secure the consent of the CC.[29]

The CC partakes in the process of management and sale of the bankrupt firm's estate. The bankruptcy trustee is tasked with drafting a plan detailing the actions to be taken in connection with asset liquidation, along with the timeframe for execution. The plan is ultimately approved by the court. However, the CC issues an opinion on the bankruptcy trustee's plan as well as on any subsequent proposed modifications to it.[30] Moreover, if in the process of management of the bankrupt's estate disputes arise between the insolvent debtor and its debtors, the CC issues an opinion on any proposal for settlement as a means of resolution of such disputes.[31]

Importantly, the CC directly oversees the bankruptcy trustee's sale of the bankruptcy estate, weighing in on both the utilized process (e.g., public auction, direct negotiation) and the proposed sale price.[32] In particular, irrespective of the process through which the debtor's assets are sold, the bankruptcy trustee must obtain consent from the CC if the asking price is lower than one half of the originally-assessed liquidation value.[33] At the request of the CC, the bankruptcy trustee is further obliged to submit a written report on any matter deemed important for the protection of creditors' rights.[34]

Finally, in Slovenia, the CC has the authority to request a dismissal of the bankruptcy trustee. Until a 2013 amendment to the insolvency legislation, the CC could petition the court to dismiss the trustee if the trustee violated their legally-imparted obligations, or had their license revoked, or could no longer perform their duties (e.g., due to illness). Since the 2013 amendment, however, the CC may, following a majority decision of its members, request a vote of creditors at large on the dismissal of the appointed trustee and, at the same time, the appointment of a new trustee. In requesting the appointment of a new trustee, the CC may propose any person who meets the conditions for appointment as bankruptcy trustee.[35]

Anecdotal evidence, gathered through brief interviews with several practicing bankruptcy trustees, suggests that CCs actively exercise their statutory rights, particularly in the management and sale of a bankrupt firm's assets. For example, in one case, a CC formally recommended a higher reservation price for a public auction.

[28] Art. 316 of ZFPPIPP.
[29] Art. 317 of ZFPPIPP.
[30] Art. 321 of ZFPPIPP.
[31] Art. 322 of ZFPPIPP.
[32] Art. 331 of ZFPPIPP.
[33] Art. 332 and 341 of ZFPPIPP. According to Art. 327 of ZFPPIPP, the liquidation value of each asset is determined by a certified appraiser licensed by the Slovenian Institute of Auditors. Exceptions to this rule, where the trustee independently assesses the liquidation value, include securities, goods traded on an organized market, and perishable goods (Art. 346 of ZFPPIPP).
[34] Art. 100 of ZFPPIPP.
[35] Art. 118, 119, and 119a of ZFPPIPP.

In another instance, a CC requested a faster timeline for the sale of time-sensitive inventory. In many cases, an active CC significantly increased the trustee's workload due to the need to generate additional reports and documentation. This, in turn, revealed new facts about the liquidation case but also delayed the proceedings and raised the prospects of litigation. For instance, in several cases, CC members who gained additional insights into the case by participating in the CC were more willing to advance the necessary funds to facilitate the trustee's filing of civil liability claims against the company's former management.[36]

2.4 Hypothesis development

As highlighted by the legal provisions discussed in the previous section, within the Slovenian framework for resolution of corporate liquidation bankruptcy, CCs are able to influence the course of proceedings. In theory, CCs can thereby shape liquidation bankruptcy outcomes.

Considering the CC's role in managing and selling the debtor's bankruptcy estate, we anticipate that the presence of a CC will increase the overall value of liquidated assets. Consequently, we hypothesize that CC involvement will aid creditors' recovery, particularly for priority and ordinary unsecured creditors. In contrast, due to the unique nature of secured claims and the inability of secured creditors to serve on a CC (see Sect. 2.2), we do not anticipate a notable impact of CC involvement on the recovery of secured creditors. Moreover, by helping ensure the timely liquidation of the debtor's assets, we expect that CC involvement shortens the time required for the first payment disbursement to creditors.

An active CC issues opinions, deliberates before giving consent, and requests progress reports. Consequently, the presence of a CC tends to slow down the pace of procedural execution and requires additional effort from the bankruptcy trustee. We thus hypothesize that involvement of a CC increases both the overall duration and the costs of proceedings.

CC involvement is therefore also bound to impact the rate of creditors' recovery for given value of liquidated assets. Whether CC participation enhances the rate of creditors' recovery depends on the magnitude of the anticipated increase in the overall value of liquidated assets relative to the expected rise in the costs of proceedings. On this point, we do not articulate an explicit hypothesis but rather let the data tell us the answer.

Lastly, by reviewing and analyzing proceedings-related documentation, a CC can provide fresh insights into the bankruptcy case. The interpretation of these newly illuminated facts may lead different stakeholders to form different expectations about case resolution. Because divergent expectations may escalate disputes (see, e.g., Shavell, 2004: Ch. 17), we anticipate that CC involvement will heighten the likelihood of litigation during the proceedings.

[36] Because the bankruptcy estate typically lacks liquid funds, trustees in liquidation cases are often unable to fund lawsuits without creditors' monetary advances.

In the ensuing sections, we explore our hypotheses empirically. To this end, we first introduce our data.

3 Data

3.1 Sources

We utilize three distinct data sources. Our starting point were publicly available court records on corporate liquidation bankruptcies, compiled and published by the Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES). These records include a subset of information drawn from the court files on individual liquidation bankruptcy cases. We investigated the AJPES records and hand-collected the relevant information to assemble a comprehensive dataset on Slovenian liquidation bankruptcy proceedings. The data includes information on key outcomes, including recovery of different groups of creditors, as well as the core characteristics of the proceedings.

We augmented this data with the information on which liquidation bankruptcy cases involved the formation of a CC. Because the formation of a CC in a liquidation case constitutes a procedural action, it is tracked systematically in the case-level databases maintained by the Slovenian Supreme Court. The Supreme Court shared with us the pertinent information for research purposes.

Finally, we combined the data on liquidation bankruptcy proceedings and CC formation with information about the insolvent debtor available in the AJPES business registry and annual reports databases. We thereby include in our analysis data on the size of the failed business, ownership type and origin, age, legal form, the industrial sector, and whether the bankrupt firm was an exporter. As we clarify in Sect. 5.2 below, we use these variables as covariates in assessing the impact of CCs on liquidation bankruptcy outcomes.

3.2 The sample

Upon merging the data collected from the three sources and dropping a small set of observations with substantially missing information (less than 2.5 percent of the original sample), our final dataset consists of 7524 corporate liquidation bankruptcy cases that began after October 1, 2008 and were resolved by March 12, 2020. The former date signifies the enactment of substantially reformed insolvency legislation and thus represents a natural starting point for our sample. On the latter date, the Slovenian government declared the Covid-19 outbreak that led to noteworthy adaptations in insolvency law and practice. The observation window of our focus therefore constitutes a period of stable and predictable rules relevant to the resolution of corporate insolvency and liquidation bankruptcy proceedings.

Table 7 in the Appendix provides the complete list of variables that we use in our analysis. In the ensuing sections we draw on these variables to provide insights

into the role of CCs for liquidation bankruptcy outcomes. We start with descriptive analysis.

4 Descriptive analysis

4.1 The incidence of cases with a creditors' committee

From the 7,524 liquidation bankruptcy cases in our sample, a CC was formed in 81 instances, or 1.1 percent of the cases. The formation of a CC in Slovenian corporate liquidation bankruptcies is therefore a rather rare event. This finding resonates with the notion that creditors choose to form a CC only when the perceived benefits exceed the costs. Given the non-trivial direct and opportunity costs associated with participation in a CC (see Sect. 2.2), the perceived net benefits of CC formation in Slovenia may have been limited during the period under consideration.

From a methodological standpoint, the small incidence of cases with a CC in our data has two important implications. First, liquidation bankruptcy cases involving a CC may differ significantly from the rest, both in observable and unobservable ways. We revisit this crucial point in Sects. 4.3 and 5 below. Second, estimating the effect of CC using standard methodology (see Sect. 5) will be subject to greater sampling variability and limited statistical power, making it comparatively more challenging to detect the effects of CC.

4.2 Outcomes with and without a creditors' committee

Table 1 contrasts the investigated liquidation bankruptcy outcomes in the presence versus the absence of a CC. For a given outcome, column (3) reports the *p*-value based on a *t*-test of the null hypothesis that there is no difference between the mean outcome with a CC (column (1)) and the mean outcome without a CC (column (2)). Part 1 summarizes the results when we use all cases, regardless of the type of claims. The remaining parts of the table summarize the results when we in turn focus on the subset of cases featuring a positive value of priority unsecured claims (part 2), ordinary unsecured claims (part 3), and secured claims (part 4).

The central insight implied by Table 1, part 1, is that, with a CC, creditors are more likely to see recovery and they are paid more when there is recovery. Moreover, with a CC, the value of liquidated assets is larger and, even though the costs of proceedings are higher as well, the ratio of the amount paid to creditors to the value of liquidated assets is greater. In the presence of a CC, however, the proceedings take longer, and the prospects of litigation during the proceedings are greater.

Similar findings apply if we focus on subsets of cases featuring a least some priority unsecured claims and cases involving at least some ordinary unsecured claims. With a CC, both priority unsecured creditors and ordinary unsecured creditors are more likely to see some recovery, and if they do, the recovery is greater. But with a CC, it takes longer for either class of creditors to receive their first payment. Only for secured creditors we see few discernible differences in the prospects of recovery

and the time to first payment with regard to the presence and absence of a CC. However, even secured creditors tend to recover a higher amount, if any, in the presence of a CC.

4.3 Characteristics of cases with and without a creditors' committee

The insights based on Table 1 are purely descriptive and cannot be considered reflective of the effect of the CC. Specifically, cases featuring a CC may be substantially different from cases without a CC, introducing confounding variables that affect liquidation outcomes. Table 2, based on the sample of all cases, confirms substantial differences between cases with and without a CC. This disparity is evident across nearly all observable characteristics except for firm ownership origin, industry, and court. To isolate the impact of CC on liquidation bankruptcy outcomes, we therefore adopt a more purposeful approach.

5 Assessing the impact of creditors' committees: methodology

5.1 Empirical approach

In estimating the effect of CCs, the treatment of our interest, the key empirical challenge stems from the fact that we do not observe the outcomes of a treated case (i.e., a case with a CC) had the case not entailed the formation of a CC. To construct the missing counterfactual, we must therefore rely on cases that do not feature the formation of a CC. However, as emphasized in Sects. 4.1 and 4.3, nontreated cases differ systematically from the treated cases, reflecting the fact that case selection into the CC treatment is not random.

In particular, creditors are likely to form or join a creditors' committee (CC) only when they believe that the benefits of doing so outweigh the associated pecuniary and non-pecuniary costs (see Sect. 2.2). Several factors may influence creditors' perceived net benefits from participating in a CC, including the size of their claims, the value of the assets to be liquidated, the severity of distributional conflicts among creditors (as indicated by the presence of competing claims), and their confidence in the supervising court. Notably, these same factors could also influence the resolution of a liquidation bankruptcy case, regardless of whether a CC is formed.

To address the corresponding challenge, we use propensity score matching (PSM), a standard technique for assessing treatment effects in the absence of natural experiments (see, e.g., Cerulli, 2015; Rosenbaum & Rubin, 1983).[37] Unlike regression analysis, matching entails a nonparametric estimation of the treatment effects. As in regression analysis, however, identification is based on selection on observables. To ascertain the effect of a CC on liquidation bankruptcy outcomes, we must therefore control for factors that, on the one hand, influence the

[37] See Lubben (2007) for an early application of PSM in the context of bankruptcy and modes of business liquidation.

Table 1 Liquidation bankruptcy outcomes with and without a creditors' committee (CC), all cases

Outcomes	Mean		
	(1) With CC	(2) Without CC	(3)$p > \|t\|$
Part 1: All cases			
Any payment to creditors (dummy)	0.728	0.204	< 0.001
Log amount creditors paid, if paid	13.032	10.501	< 0.001
Log value of liquidated assets	12.423	8.646	< 0.001
Log costs of proceedings	11.486	8.449	< 0.001
Ratio amount creditors paid to value of liquidated assets	0.463	0.108	< 0.001
Log duration (in days) of proceedings	7.340	5.903	< 0.001
Litigation during proceedings (dummy)	0.716	0.108	< 0.001
Part 2: Cases where priority unsecured claims value > 0			
Any payment to priority unsecured creditors (dummy)	0.745	0.288	< 0.001
Log amount priority unsecured creditors paid, if paid	11.665	9.407	< 0.001
Log days to 1st payment of priority unsecured creditors, if paid	6.829	6.557	0.008
Part 3: Cases where ordinary unsecured claims value > 0			
Any payment to ordinary unsecured creditors (dummy)	0.291	0.101	< 0.001
Log amount ordinary unsecured creditors paid, if paid	12.626	9.457	< 0.001
Log days to 1st payment of ordinary unsecured creditors, if paid	7.058	6.727	0.008
Part 4: Cases where secured claims value > 0			
Any payment to secured creditors (dummy)	0.796	0.770	0.654
Log amount secured creditors paid, if paid	13.078	11.208	< 0.001
Log days to 1st payment of secured creditors, if paid	6.483	6.519	0.632

The unit of observation is a liquidation bankruptcy case. Column (1) shows mean values of bankruptcy outcome variables in the presence of a CC. Column (2) shows mean values of the same variables in the absence of a CC. For any given outcome variable, column (3) reports the *p*-value based on the *t*-test of equality of means in columns (1) and (2). The number of cases with a CC is 81. The number of cases without a CC is 7443

formation of a CC and, at the same time, exert an independent effect on the outcomes of our interest. Fortunately, our data allow us to include as covariates a rich set of relevant case characteristics, summarized in Table 2 and Table 7. We briefly discuss each included covariate in the ensuing subsection.

Nevertheless, the reader should bear in mind that there may still exist unobservable factors that influence CC formation and shape bankruptcy outcomes. Given the broad range of included covariates, it is difficult to identify specific relevant unobservable factors. Moreover, if pertinent factors are omitted, the direction of bias in our estimates is ambiguous. For example, while unaccounted-for factors influencing creditors' optimism might positively correlate with the likelihood of CC formation, their direct impact on liquidation outcomes is unclear. In Sect. 6.3, we provide some sensitivity analysis on the likely importance of unobservables in our setting.

Table 2 Characteristics of cases with and without a creditors' committee (CC), all cases

	Mean		
	(1) With CC	(2) Without CC	(3) $p > \|t\|$
Proceedings characteristics			
Court: Maribor (dummy)	0.099	0.140	0.288
Court: Celje (dummy)	0.111	0.148	0.292
Court: other (dummy)	0.247	0.321	0.155
Start of proceedings: 2011–2013 (dummy)	0.481	0.238	< 0.001
Start of proceedings: 2014–2016 (dummy)	0.123	0.364	< 0.001
Start of proceedings: 2017–2019 (dummy)	0.012	0.307	< 0.001
Initiator: creditor (dummy)	0.457	0.255	< 0.001
Initiator: failed reorg. or vol. dis. (dummy)	0.123	0.031	< 0.001
Log number of creditors	3.958	1.766	< 0.001
Log trustee-evaluated assets value	12.703	6.086	< 0.001
Log priority unsecured claims value	8.052	2.788	< 0.001
Log ordinary unsecured claims value	13.992	7.283	< 0.001
Log secured claims value	9.512	2.140	< 0.001
Banks or BAMC as creditor (dummy)	0.864	0.299	< 0.001
Firm characteristics			
Size: small (dummy)	0.259	0.049	< 0.001
Size: medium (dummy)	0.173	0.006	< 0.001
Size: large (dummy)	0.086	0.003	< 0.001
Ownership type: state (dummy)	0.123	0.007	< 0.001
Ownership origin: foreign (dummy)	0.185	0.151	0.392
Age (in years)	13.8	10.5	< 0.001
Exporter (dummy)	0.519	0.186	< 0.001
Not limited liability company (dummy)	0.210	0.024	< 0.001
Sector: manufacturing (dummy)	0.185	0.132	0.156
Sector: construction (dummy)	0.222	0.211	0.798
Sector: agriculture or mining (dummy)	0.012	0.006	0.412

The unit of observation is a liquidation bankruptcy case. Column (1) shows mean values of variables in the presence of a CC. Column (2) shows mean values of the same variables in the absence of a CC. For any given variable, column (3) reports the *p*-value based on the *t*-test of equality of means in columns (1) and (2). The omitted (benchmark) category (not reported) is Ljubljana for court, 2008–2010 for start of proceedings, debtor for initiator of proceedings, micro for firm size, and services for firm sector. The number of cases with a CC is 81. The number of cases without a CC is 7443

5.2 Included covariates

In a given jurisdiction, courts can vary considerably with respect to the underlying culture and modes of operation (see, e.g., Ostrom & Hanson, 2009; Church, 1985). Courts may therefore differ in the manner in which they oversee bankruptcy trustees and interact with creditors. The resulting differences can shape

both creditors' intent to form a CC and liquidation bankruptcy outcomes. We thus control for the court at which the liquidation bankruptcy proceedings take place.

Similar to how the incidence of corporate insolvency is influenced by the business cycle (see, e.g., Bruneau et al., 2012; Bhattacharjee et al., 2009), creditors' incentives to form a CC and liquidation bankruptcy outcomes likely depend on macroeconomic trends. Changes in the interest rate, for example, directly shape creditors' opportunity costs of involvement on a CC as well as the value of the firm's assets in alternative uses. Therefore, we control for the three-year period of the start of proceedings.

In a given liquidation bankruptcy case, the process of the initiation of proceedings reflects fundamental traits of the case. For instance, if liquidation bankruptcy is initiated by a creditor, this may indicate the unwillingness on behalf of the debtor's management to cease control of the failing business, a phenomenon associated with continuation bias in insolvency resolution (Morrison, 2007; White, 1989). Alternatively, a creditor's initiation of liquidation bankruptcy proceedings may simply signal their proactive stance. In either scenario, the genesis of the proceedings can influence the likelihood of CC formation and liquidation outcomes. Accordingly, we include controls for the initiator of the proceedings (debtor, creditor, or failed reorganization bankruptcy or voluntary dissolution).

The formation of a CC may be proposed by any creditor (see Sect. 2.2). As long as collective action problems among creditors are not too severe, we would expect the prospects of formation of a CC to be greater when a case features a large number of creditors, indicating greater severity of the distributional conflict. At the same time, the number of creditors can influence liquidation bankruptcy outcomes beyond the formation of a CC. For example, a larger group of creditors can complicate the recognition of claims, affecting the costs of the proceedings. We therefore control for (logged) number of creditors.

Liquidation outcomes, and in particular creditors' recovery, ultimately depend on the value of the assets to be liquidated relative to the value of creditors' claims (see, e.g., Blazy et al., 2013; Thorburn, 2000; Sundgren, 1998). At the same time, because forming a CC involves non-pecuniary and opportunity costs (see Sect. 2.2), creditors' incentives to propose CC formation depend on their perception that a CC can in fact be effective at improving bankruptcy outcomes, despite the inherent distributional conflict among creditors. We thus control for (logged) value of debtor's assets as appraised at the start of the proceedings and (logged) value of claims by each of the key classes of creditors (priority unsecured, ordinary unsecured, and secured).

Even within a given class, creditors can differ considerably in their capacity to impact bankruptcy proceedings (see, e.g., Harner & Marincic, 2011a, b). Institutional creditors, in contrast to physical persons, often have greater resources and may exert more influence on bankruptcy proceedings. We control for whether creditors in a liquidation case include a commercial bank or the state-owned Bank Assets Management Company.[38]

[38] The Slovenian government formed the Bank Assets Management Company (BACM) as means of stabilizing the distressed banking sector following the global financial crisis. Operating between 2013 and 2022, the BACM was tasked with purchasing, managing, and selling bank assets. In the context of corporate bankruptcy resolution, the BAMC was often viewed operating as an "active manager" (Nye 2021).

Last but not least, both the prospects of CC formation and liquidation bankruptcy outcomes may depend on the characteristics of the bankrupt firm. In particular, the characteristics of the insolvent debtor can impact the trustee's ability to manage the bankruptcy estate, thus shaping bankruptcy outcomes and creditors' incentives to actively participate in the proceedings. In our analysis, we include as covariates firm size (micro, small, medium, or large), ownership type (state versus private), ownership origin (foreign versus domestic), age (in years) at the start of proceedings, whether the bankrupt firm was an exporter in the last year prior to bankruptcy, and the bankrupt firm's broad industry sector (services, manufacturing, construction, agriculture or mining). The industry sector dummies at least partly control for the extent of the bankrupt firm's asset specificity (see, e.g., Bernstein et al., 2019: 22), a factor that could influence liquidation outcomes as well as creditors' motives for CC formation.

5.3 Matching and estimation of the treatment effects

We conduct eight separate matching exercises, one for each subsample pertinent to the relevant outcomes. In each instance, we first estimate a probit to ascertain the predicted probability of selection into treatment (formation of a CC) for each liquidation case. We obtain the predicted propensity score for the treated and nontreated cases. We then rely on nearest-neighbor matching without replacement to designate for each treated case its closest nontreated match.[39] We use only the observations on the common support of the estimated propensity score.

Upon conducting matching, we estimate the average treatment effect on the treated (ATET) using the standard approach. We ascertain the value of each outcome variable for every treated and matched nontreated case. Then, for each matched pair, we compute the difference between the two values for the relevant outcome variable and calculate the average across all treated observations.

In the above approach, identification of the treatment effect requires that the potential outcomes of a case are unaffected by the assignment of treatment to other cases, that is, that there are no spillovers from treated to nontreated cases. Unlike in settings involving active firms, where undesirable spillovers of this kind may arise through competition or the labor market, such effects are not a concern in our context.

[39] We use nearest-neighbor matching (NNM) without replacement, rather than with replacement, for three key reasons. First, the number of potential control cases (7443) is very large relative to the number of treated cases (81), so relying on NNM with replacement is unnecessary. Second, using NNM without replacement reduces the risk that our estimates are disproportionately influenced by any single control case (Stuart 2010). Third, although matching without replacement may improve the average quality of the matches, it also increases estimator variance by reducing the number of distinct observations used to construct the counterfactual mean (Caliendo and Kopeinig 2008; Smith and Todd 2005). Nevertheless, we have confirmed that our findings are robust when using NNM with replacement.

6 Assessing the impact of creditors' committees: results

6.1 Treatment propensity and matching quality

In order to assess the impact of CCs, we first estimate the propensity of CC formation. In presenting the results, we focus on the sample of all 7524 liquidation bankruptcy cases. Table 3, columns (1)–(3), show the estimates of the coefficients, z-scores, and average marginal effects based on a probit model relating the incidence of CC formation to the full range of utilized covariates. Importantly, these estimates are not intended to provide insights into the causal drivers of CC formation. Instead, the purpose is to facilitate the matching of treated to control cases using the propensity score (the estimated conditional probability). We thus only briefly review those discovered patterns that are statistically significant, emphasizing the descriptive nature of the findings.

As conjectured (see Sect. 5.2), all else equal, the prospects of CC formation are higher when the proceedings were initiated by a creditor rather than a debtor or following failed alternative proceedings (reorganization bankruptcy or voluntary dissolution). Aligned with our theorizing, the likelihood of CC formation is higher when there are more creditors and when the value of ordinary unsecured claims is larger. Interestingly, a CC is also formed more likely when the bankrupt firm was an exporter, had foreign owners, or was not a limited liability company (e.g., a joint-stock company). In contrast, the likelihood of CC formation is lower when the bankrupt firm was a manufacturing as opposed to a service business. Finally, the prospects of CC formation decrease over time.

For each instance of matching, we examine the extent of covariate balance between the treated and control observations in the matched versus unmatched sample. In assessing the quality of matching, we apply the usual criteria (see, e.g., Caliendo & Kopeinig, 2008). Table 4 summarizes our findings. For each matched sample, the reported pseudo-R^2 from probit-based propensity score estimation is small (column (1)) and we never reject the null of joint insignificance of regressors (column (2)). The mean and median standardized percent bias (columns (3) and (4)) are greatly reduced relative to the unmatched samples. Finally, the covariate means for treated and control firms in the matched samples are never statistically significantly different (at the ten percent level) for more than one out of 25 covariates (column (5)), a pattern that we would expect to observe by pure chance. In sum, in each instance, our application of PSM results in successful balancing of case characteristics across the treated and control group of cases.

6.2 Main results

Table 5 presents our main results, with column (3) displaying the estimates of the ATET of CC involvement on the investigated outcomes. For convenience, column (1) summarizes the hypothesized effects (HE) based on the discussion in Sect. 2.4. Column (2) provides information on the sample-wide mean value

Table 3 Predictors of creditors' committee (CC) formation, all cases

	Dependent variable: Dummy = 1 if CC formed		
	(1) Coeff	(2) *z*-score	(3) AME
Proceedings characteristics			
Court: Maribor (dummy)	− 0.291	− 1.54	− 0.006
Court: Celje (dummy)	− 0.054	− 0.31	− 0.001
Court: other (dummy)	− 0.192	− 1.42	− 0.004
Start of proceedings: 2011–2013 (dummy)	− 0.242*	− 1.79	− 0.005*
Start of proceedings: 2014–2016 (dummy)	− 0.812***	− 4.46	− 0.016***
Start of proceedings: 2017–2019 (dummy)	− 1.077***	− 3.11	− 0.021***
Initiator: creditor (dummy)	0.420***	3.34	0.008***
Initiator: failed reorg. or vol. dis. (dummy)	0.623***	2.61	0.012***
Log number of creditors	0.162*	1.90	0.003*
Log trustee-evaluated assets value	0.030	1.59	0.001
Log priority unsecured claims value	− 0.004	− 0.25	− 0.0001
Log ordinary unsecured claims value	0.049*	1.67	0.001*
Log secured claims value	0.007	0.67	0.0001
Banks or BAMC as creditor (dummy)	0.169	1.07	0.003
Firm characteristics			
Size: small (dummy)	0.228	1.37	0.004
Size: medium (dummy)	0.417	1.65	0.008
Size: large (dummy)	0.508	1.62	0.010
Ownership type: state (dummy)	0.439	1.53	0.008
Ownership origin: foreign (dummy)	0.287*	1.88	0.006*
Age (in years)	− 0.008	− 0.99	− 0.0001
Exporter (dummy)	0.251*	1.92	0.005*
Not limited liability company (dummy)	0.421**	1.96	0.008*
Sector: manufacturing (dummy)	− 0.316*	− 1.94	− 0.006*
Sector: construction (dummy)	0.009	0.06	0.0002
Sector: agriculture or mining (dummy)	0.476	0.90	0.009
Pseudo R^2	0.370		
Observations	7524		

The table reports probit estimates where the dependent variable is the treatment dummy equal to 1 if a CC was formed in the proceedings and 0 otherwise. The unit of observation is a liquidation bankruptcy case. Column (1) reports the estimated coefficients, column (2) the corresponding *z*-scores, and column (3) the implied average marginal effects (AME). In columns (1) and (3), ***, **, and * respectively denote *p*-value smaller than 0.01, 0.05, and 0.1 (two-sided test). The omitted (benchmark) category is Ljubljana for court, 2008–2010 for start of proceedings, debtor for initiator of proceedings, micro for firm size, and services for firm sector

of each outcome variable, providing insight into the magnitude of the estimated effects.

Part 1 summarizes the results when we use the sample of all cases. As hypothesized, the effect of a CC on the value of liquidated assets is positive, statistically

Table 4 Assessing matching quality

	(1) Pseudo R^2	(2) $p > \chi^2$	(3) Mean % bias	(4) Median % bias	(5) # sign. diff
Part 1: All cases					
Unmatched	0.370	< 0.001	62.3	52.1	17
Matched	0.069	0.931	7.4	5.4	1 [0]
Part 2: All cases where creditors paid					
Unmatched	0.357	< 0.001	46.0	44.3	16
Matched	0.051	0.999	7.6	6.0	0 [0]
Part 3: Cases where priority unsecured claims value > 0					
Unmatched	0.352	< 0.001	57.4	53.8	18
Matched	0.088	0.973	9.8	5.6	1 [0]
Part 4: Cases where priority unsecured claims value > 0 and priority unsecured creditors paid					
Unmatched	0.347	< 0.001	47.0	33.1	16
Matched	0.142	0.931	11.5	7.4	0 [0]
Part 5: Cases where ordinary unsecured claims value > 0					
Unmatched	0.356	< 0.001	55.6	47.6	17
Matched	0.041	0.999	8.6	9.2	0 [0]
Part 6: Cases where ordinary unsecured claims value > 0 and ordinary unsecured creditors paid					
Unmatched	0.573	< 0.001	58.9	49.8	16
Matched	0.233	0.976	13.7	14.1	0 [0]
Part 7: Cases where secured claims value > 0					
Unmatched	0.308	< 0.001	44.7	44.9	16
Matched	0.079	0.982	11.1	8.2	0 [0]
Part 8: Cases where secured claims value > 0 and secured creditors paid					
Unmatched	0.337	< 0.001	46.5	37.8	15
Matched	0.040	1.000	5.6	5.3	0 [0]

Each part of the table pertains to a separate matching exercise based on the underlying subsample of observations (liquidation bankruptcy cases). Under each part, in rows, unmatched refers to the unmatched sample and matched to the matched sample. In column (1), Pseudo R^2 is based on the probit estimation of the propensity score. Column (2) reports the *p*-value for the likelihood-ratio test of the null hypothesis of joint insignificance of regressors included in the propensity score specification. Columns (3) and (4) respectively report the mean and the median standardized percent bias. Column (5) reports the number of covariates (out of 25 in total) that exhibit statistically significant (at the ten percent level) differences in means between treated and control observations based on a two-sided *t*-test and, in [brackets], upon applying a Bonferroni correction for multiple-hypothesis testing

significant, and considerable in size. Based on our estimates, the presence of a CC on average leads to an 85 percent increase in the value of liquidated assets. This evidence is consistent with the argument that CC involvement enhances the management and sale process of the bankrupt firm's estate (see Sect. 2.4).

The estimated effects of CC on the prospects of creditors' recovery and the amount of recovery, conditional on there being some recovery, are both positive, but not statistically significant. At least based on the sample of all cases and in contrast to our expectation (see Sect. 2.4), we therefore do not see evidence that

Table 5 The effect of creditors' committee (CC) on liquidation bankruptcy outcomes, main results

Outcome (y)	(1) HE	(2) Mean y	(3) ATET	(4) t-stat	(5) Treated	(6) Obs
Part 1: All cases						
Log value of liquidated assets	>0	8.687	0.851**	2.19	81	7524
Any payment to creditors (dummy)	>0	0.208	0.086	1.18	81	7524
Log amount creditors paid, if paid	>0	10.596	0.204	0.56	59	1568
Log costs of proceedings	>0	8.482	0.506^{+}	1.61	81	7524
Ratio amount creditors paid to value of liquidated assets	?	0.112	0.123**	2.31	81	7524
Log duration (in days) of proceedings	>0	5.918	0.281***	2.85	81	7524
Litigation during proceedings (dummy)	>0	0.114	0.235***	3.12	81	7524
Part 2: Cases where priority unsecured claims value >0						
Any payment to priority unsecured creditors (dummy)	>0	0.300	0.185**	2.03	55	2264
Log amount priority unsecured creditors paid, if paid	>0	9.543	0.004	0.01	41	672
Log days to 1st payment of priority unsecured creditors, if paid	<0	6.574	− 0.140	− 1.02	41	672
Part 3: Cases where ordinary unsecured claims value >0						
Any payment to ordinary unsecured creditors (dummy)	>0	0.104	0.141**	2.18	79	4953
Log amount ordinary unsecured creditors paid, if paid	>0	9.609	0.887*	1.76	23	470
Log days to 1st payment of ordinary unsecured creditors, if paid	<0	6.743	− 0.169	− 1.23	23	470
Part 4: Cases where secured claims value >0						
Any payment to secured creditors (dummy)	≈ 0	0.771	− 0.093	− 1.32	54	1189
Log amount secured creditors paid, if paid	≈ 0	11.296	0.627	1.41	43	914
Log days to 1st payment of secured creditors, if paid	≈ 0	6.517	− 0.020	− 0.18	43	914

The table shows the estimates of the effect of CC on liquidation bankruptcy outcomes. Column (1) shows the hypothesized effect (HE), based on discussion in Sect. 2.4, with '>0', '<0', '≈ 0', and '?' respectively denoting positive, negative, zero, and ambiguous HE. Column (2) reports the sample-wide mean of the outcome variable. Column (3) shows the estimated average treatment effect on the treated (ATET), generated using propensity score matching (PSM) based on nearest-neighbor matching (NNM) without replacement. Section 5.2 and Table 3 provide information on the set of included covariates. In column (3), ***, **, and * respectively denote p-value smaller than 0.01, 0.05, and 0.1 when using a two-sided test, and + denotes p-value smaller than 0.1 when using a one-sided test. Column (4) shows the corresponding t-statistics. Column (5) reports the number of treated observations. Column (6) shows the total number of observations used to generate the estimates, including the estimates of treatment propensity. Given the use of NNM without replacement, the number of observations used to estimate the pertinent ATET (column (3)) is twice the number of treated observations (column (5))

CC participation aids creditor recovery at large. We revisit this finding below, when focusing on subsets of cases featuring claims from specific classes of creditors.

As anticipated, CC involvement increases the costs of proceedings, albeit the estimated effect is only marginally statistically significant (using a one-sided test; $p = 0.109$). Based on our estimates, the involvement of a CC on average increases the costs of proceedings by 51 percent (about €2500 based on the sample-wide mean costs of proceedings).

The presence of a CC thus, on the one hand, increases the value obtained from liquidation of the debtor's assets and, at the same time, raises the costs of proceedings. With the magnitude of the former effect exceeding the latter, CC therefore exert a positive impact on the amount that creditors were paid relative to the value of liquidated assets. Using the sample-wide mean of the variable as a benchmark, CC involvement in the proceedings leads to more than a twofold increase in this measure. Resolving the theoretical ambiguity noted in Sect. 2.4, our estimates indicate that CC partaking therefore improves the efficiency of liquidation bankruptcy proceedings.

CC involvement slows down the overall pace of proceedings, as hypothesized. Based on our estimates, the presence of a CC extends the overall duration of proceedings by 28 percent (104 days based on the sample-wide mean duration of proceedings). Finally, congruent with our conceptual framework, CC involvement increases the prospects of litigation during the proceedings by 24 percentage points (more than two times the sample-wide mean likelihood of litigation).

Parts 2, 3, and 4 of Table 5 summarize the results when we in turn focus on subsets of cases involving claims from specific classes of creditors. As theorized, presence of a CC increases the prospects of recovery for priority unsecured creditors and ordinary unsecured creditors. Based on our estimates, CC involvement increases the likelihood that priority unsecured creditors see at least some recovery by more than 18 percentage points or 62 percent of the sample-wide mean probability that this class of creditors recovers at least some of the claims. Presence of a CC increases the probability that ordinary unsecured creditors receive at least some payments by 14 percentage points or more than 1.3 times the sample-wide mean probability that ordinary unsecured creditors recover at least some of their claims.

In addition, we find some evidence of a positive effect of CC on the amount that ordinary unsecured creditors are paid, if they are paid. Based on our estimates, the involvement of a CC increases the total amount paid to ordinary unsecured creditors, when they are paid, by 89 percent, or about €1700 based on the sample-wide mean of this variable. This effect, however, is marginally statistically significant at the ten percent level (using a two-sided test). As expected (see Sect. 2.4), we do not find any discernible CC effects on either the prospects or the amount of recovery, if there was any, for secured creditors.

Regardless of the class of creditors under consideration, we find no evidence that CCs impact the timing of the first payment received by the relevant creditor class. Specifically, for cases involving priority and ordinary secured claims, where we would have expected to detect an effect (see Sect. 2.4), the estimated effects are negative, as hypothesized, but they are not statistically significant.

Overall, our estimates confirm our theoretical priors, showing either statistically significant effects or a lack of statistically significant effects (e.g., outcomes for secured creditors), in eleven out of the sixteen investigated outcomes. For the remaining outcomes (creditors' recovery at large and the timing of the first payment to unsecured creditors), our estimates align with our theoretical expectations in terms of the direction of the effect, but the effects are not statistically significant at conventional levels. This lack of statistical significance is likely due, at least in part, to the relatively low statistical power resulting from the small number of treated observations in our data (see Sect. 4.1).

6.3 Sensitivity analysis

We performed a number of robustness checks. We re-estimated our models using alternative matching algorithms such as nearest-neighbor matching with caliper, k-nearest-neighbor matching with $k = 2$, and radius matching with caliper. The estimates are summarized in Table 6, columns (2)–(4). The results are both qualitatively and quantitatively very similar to those obtained using our main specification (Table 6, column (1) or Table 5, column (3)). For a subset of the specifications in Table 6, we do find evidence that CCs aid creditors' recovery at large (columns (3) and (4)) and reduce the time to the first payment of ordinary unsecured creditors (columns (2) and (3)).

We re-estimated our models, reported in Table 5, using a placebo treatment. For each matching exercise, we designated as placebo-treated observations the control observations from the original matched sample. We then performed matching to establish a control group for these placebo-treated observations after having excluded the actually treated observations.

If there exist important unaccounted-for factors that affect selection into the actual treatment, those same factors could also shape selection into so-defined placebo treatment. Evidence of a discernible effect of placebo-treatment on the investigated bankruptcy outcomes would indicate that our estimates in Table 5 are driven by omitted variables.

The placebo-treatment estimates are reported in Table 6, column (5). Encouragingly, none of the estimated effects of the placebo treatment are statistically significant and most of the estimated ATETs are very small. These findings provide some indication that are our main estimates, reported in Table 5, column (3), are not an artifact of some uncontrolled-for variable or mere random noise.

Finally, we explored the sensitivity of our results to selection on unobservables systematically, using Rosenbaum (2002) bounds. For each of the scenarios where our main analysis reveals statistically significant effects, we found our estimates to be robust to some departures from the unconfoundedness assumption (see Table 8). Overall, the analysis of Rosenbaum bounds therefore lends credibility to our matching-based approach.

Table 6 The effect of creditors' committee (CC) on liquidation bankruptcy outcomes, sensitivity analysis results

Outcome	ATET				
	(1) Main specification	(2) NNM with caliper	(3) NNM two neighbors	(4) RM with caliper	(5) Placebo treatment
Part 1: All cases					
Log value of liquidated assets	0.851**	0.866**	0.758**	1.085***	− 0.228
Any payment to creditors (dummy)	0.086	0.078	0.043	0.093*	− 0.092
Log amount creditors paid, if paid	0.204	0.107	0.622*	0.874**	0.151
Log costs of proceedings	0.506^{+}	0.509^{+}	0.469^{+}	0.817***	− 0.094
Ratio amount creditors paid to value of liquidated assets	0.123**	0.126**	0.097*	0.101**	− 0.060
Log duration (in days) of proceedings	0.281***	0.301***	0.303***	0.475***	− 0.065
Litigation during proceedings (dummy)	0.235***	0.237***	0.228***	0.261***	− 0.031
Part 2: Cases where priority unsecured claims value > 0					
Any payment to priority unsecured creditors (dummy)	0.185**	0.192**	0.083	0.164**	− 0.091
Log amount priority unsecured creditors paid, if paid	0.004	0.046	0.426	0.656*	0.042
Log days to 1st payment of priority unsecured creditors, if paid	− 0.140	− 0.137	− 0.068	0.029	0.046
Part 3: Cases where ordinary unsecured claims value > 0					
Any payment to ordinary unsecured creditors (dummy)	0.141**	0.120*	0.128**	0.132**	− 0.097
Log amount ordinary unsecured creditors paid, if paid	0.887*	0.691	0.702	0.783	− 0.915
Log days to 1st payment of ordinary unsecured creditors, if paid	− 0.169	− 0.359**	− 0.305**	− 0.143	0.010
Part 4: Cases where secured claims value > 0					
Any payment to secured creditors (dummy)	− 0.093	− 0.096	− 0.064	− 0.008	0.065
Log amount secured creditors paid, if paid	0.627	0.503	0.465	0.758**	− 0.520
Log days to 1st payment of secured creditors, if paid	− 0.020	0.008	0.013	− 0.045	− 0.089

The table reports the estimates of the ATET. Column (1) repeats the estimates from Table 5, column (3), generated using nearest-neighbor matching (NNM). Columns (2)–(4) show the estimates based on alternative matching algorithms: NNM with caliper (column (2)), NNM using two nearest neighbors (column (3)), and radius matching (RM) with caliper (column (4)). To generate the estimates in columns (2) and (4), caliper is set equal to one standard deviation of the estimated propensity scores. Finally, column (5) shows the estimates based on NNM without replacement, as in column (1), but for a placebo treatment (see text for details). All estimates use the same set of covariates as those used to generate the estimates in Table 5. ***, **, and * respectively denote *p*-value smaller than 0.01, 0.05, and 0.1 when using a two-sided test, and + denotes *p*-value smaller than 0.1 when using a one-sided test

7 Conclusions and implications

Using fine-grained data on corporate liquidation bankruptcies in Slovenia, we have offered the first systematic quantitative analysis of the effect of creditors' committees (CCs) on liquidation bankruptcy outcomes. Our investigation shows that certain effects of CC involvement improve the efficacy of the proceedings. Specifically, CC participation increases the liquidation value of debtors' assets, thereby facilitating recovery, particularly for priority and ordinary unsecured creditors. Furthermore, while CC involvement does raise the costs of proceeding, it ultimately enhances the overall rate of creditors' recovery in relation to the value of liquidated assets.

However, not all aspects of CC involvement are efficacy-enhancing. In addition to increasing the costs of proceedings, CC participation extends the duration of proceedings and increases the likelihood of litigation. We also do not find robust evidence that CC involvement accelerates the speed of creditors' recovery. Overall, therefore, the empirically ascertained effects of CCs on liquidation bankruptcy outcomes are more complex than envisaged by those viewing CCs as an especially appealing solution to creditor representation in insolvency (e.g., UNCITRAL, 2005: 203).

The central goals of liquidation bankruptcy proceedings are to maximize the liquidation value of the debtor's assets—thereby facilitating creditors' recovery—and to ensure the timely distribution of proceeds among creditors. From an ex-post efficacy standpoint, the policy implications of our analysis depend on the relative weight policymakers assign to these two objectives. In Slovenia, making the formation of CCs mandatory in liquidation proceedings (as is already the case in reorganization proceedings) would be desirable only if the overall benefits from improved recovery are deemed to exceed the costs of delayed case resolution and increased litigation.

Future work should examine the applicability of our findings to other jurisdictions, where statutory rules and practices governing corporate liquidation bankruptcy and creditors' committees may differ considerably from those in Slovenia. Legal frameworks for creditor representation in insolvency resolution can vary notably across countries (Block-Lieb et al., 2013; UNCITRAL, 2005, 2022). Exploring which modes of creditor participation are most suitable in specific contexts represents an important yet underexplored research avenue.

Appendix

See Tables 7, 8.

Table 7 Variable definitions

Variable	Definition
Treatment	
Creditors' committee	Dummy equal to 1 if a creditors' committee was formed in the course of the proceedings
Outcomes	
All cases	
Log value of liquidated assets	Logged total value of liquidated assets, in €
Any payment to creditors	Dummy equal to 1 if total amount paid to creditors exceeds zero
Log amount creditors paid, if paid	Logged sum of payments to all creditors, in €
Log costs of proceedings	Logged difference between total value of liquidated assets and total amount paid to creditors, in €
Ratio amount creditors paid to value of liquidated assets	Ratio of sum of payments to all creditors to total value of liquidated assets
Log duration of proceedings	Logged duration of liquidation proceedings, in days
Litigation during proceedings	Dummy equal to 1 if liquidation proceedings involved litigation
Cases where priority unsecured claims value > 0	
Any payment to priority unsecured creditors	Dummy equal to 1 if total amount paid to unsecured creditors exceeds zero
Log amount priority unsecured creditors paid, if paid	Logged sum of payments to priority unsecured creditors, in €
Log days to 1st payment of priority unsec. creditors, if paid	Logged number of days until first payment of priority unsecured creditors
Cases where ordinary unsecured claims value > 0	
Any payment to ordinary unsecured creditors	Dummy equal to 1 if total amount paid to ordinary unsecured creditors exceeds zero
Log amount ordinary unsecured creditors paid, if paid	Logged sum of payments to ordinary unsecured creditors, in €
Log days to 1st payment of ordinary unsec. creditors, if paid	Logged number of days until first payment of ordinary unsecured creditors
Cases where secured claims value > 0	
Any payment to secured creditors	Dummy equal to 1 if total amount paid to secured creditors exceeds zero
Log amount secured creditors paid, if paid	Logged sum of payments to secured creditors, in €
Log days to 1st payment of secured creditors, if paid	Logged number of days until first payment of secured creditors
Proceedings characteristics	
Court: Ljubljana	Dummy equal to 1 if proceedings took place at the Ljubljana court
Court: Maribor	Dummy equal to 1 if proceedings took place at the Maribor court
Court: Celje	Dummy equal to 1 if proceedings took place at the Celje court
Court: other	Dummy equal to 1 if proceedings took place at a court other than Ljubljana, Maribor, or Celje

Table 7 (continued)

Variable	Definition
Start of proceedings: 2008–2010	Dummy equal to 1 if proceedings started between 2008 and 2010
Start of proceedings: 2011–2013	Dummy equal to 1 if proceedings started between 2011 and 2013
Start of proceedings: 2014–2016	Dummy equal to 1 if proceedings started between 2014 and 2016
Start of proceedings: 2017–2019	Dummy equal to 1 if proceedings started between 2017 and 2019
Initiator: debtor	Dummy equal to 1 if proceedings were initiated by the debtor
Initiator: creditor	Dummy equal to 1 if proceedings were initiated by creditors
Initiator: failed reorganization or voluntary dissolution	Dummy equal to 1 if proceedings were triggered by failed reorganization or voluntary dissolution
Log number of creditors	Logged number of creditors plus 1
Log trustee-evaluated assets value	Logged value of assets as evaluated by bankruptcy trustee at the beginning of proceedings plus 1, in €
Log priority unsecured claims value	Logged value of claims by priority unsecured creditors plus 1, in €
Log ordinary unsecured claims value	Logged value of claims by ordinary unsecured creditors plus 1, in €
Log secured claims value	Logged value of claims by secured creditors plus 1, in €
Banks or BAMC as creditor	Dummy equal to1 if creditors include a bank or the Bank Assets Management Company
Firm characteristics	
Size: micro	Dummy equal to 1 if liquidated firm was classified as a micro business
Size:small	Dummy equal to 1 if liquidated firm was classified as a small business
Size: medium	Dummy equal to 1 if liquidated firm was classified as a medium business
Size: large	Dummy equal to 1 if liquidated firm was classified as a large business
Ownership type: state	Dummy equal to 1 if liquidated firm was at least in part state owned
Ownership origin: foreign	Dummy equal to 1 if at least one of liquidated firm's founding owners was a foreign person or entity
Age	Firm age at the start of proceedings, in years
Exporter	Dummy equal to 1 if liquidated firm was an exporter
Not limited liability company	Dummy equal to 1 if liquidated firm was not a limited liability company
Sector: services	Dummy equal to 1 if liquidated firm operated in the services sector
Sector: manufacturing	Dummy equal to 1 if liquidated firm operated in the manufacturing sector

Table 7 (continued)

Variable	Definition
Sector: construction	Dummy equal to 1 if liquidated firm operated in the construction sector
Sector: agriculture or mining	Dummy equal to 1 if liquidated firm operated in the agriculture or mining sectors

The table provides the definitions of variables used in the analysis

Table 8 Summary of estimates of Rosenbaum bounds

Outcome	Max. Γ
Part 1: All cases	
Log value of liquidated assets	1.6
Log costs of proceedings	1.3
Ratio amount creditors paid to value of liquidated assets	1.6
Log duration (in days) of proceedings	1.5
Litigation during proceedings (dummy)	2.9
Part 2: Cases where priority unsecured claims value > 0	
Any payment to priority unsecured creditors (dummy)	1.3
Part 3: Cases where ordinary unsecured claims value > 0	
Any payment to ordinary unsecured creditors (dummy)	1.2
Log amount ordinary unsecured creditors paid, if paid	1.2

The table summarizes the estimates of Rosenbaum bounds for those ATET that are labeled as statistically significant in Table 5, column (3). Max. Γ is the maximum log odds (established upon examining increases above 1 in the increments of 0.1) of differential assignment due to unobserved factors that still renders the pertinent ATET statistically significant. Larger values of max. Γ imply that the ATET estimates are less vulnerable to omitted variable bias

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Data availability The data that support the findings of this study are available from the corresponding author upon request.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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