How do the bankruptcy systems perform in Eastern Europe?

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Abstract

For post-socialist countries that underwent long phases of economic and judicial transition, an important aspect of the bankruptcy law attractiveness is based on its relative performance of generating higher recoveries. This article uses an original database of 561 closed bankruptcy cases in three Eastern European countries, Hungary, Poland, and Romania. We use this data to evaluate the main determinants of the bankruptcy systems' performances during the post-transitions era. Precisely, we wonder if the specificities of the local bankruptcy codes are significant enough to influence to creditors' recoveries. Besides, we test for the main determinants of the total recoveries, which might be impacted by the presence of private creditors and/or the concentration of the claims. We also contribute to the literature by measuring the priority order of repayment between the competing classes of creditors: namely the public, the social, and the private claims. We additionally investigate the level of competition between those classes of creditors.

First, we find that the Hungarian bankruptcy procedures generate lower total recovery rates than in Poland or Romania. We relate this result to the fact that Hungary followed a more progressive path of reforms, and that the Hungarian bankruptcy practitioners are partially paid *ex-ante*, thus lowering their incentives to increase efficiency. Second, on all three countries, the total recoveries do not benefit from the presence of public, social or secured claimholders. This might reflect some passivity from those classes of creditors. Third, we find that more concentrated creditors do not generate higher total recoveries: despite easier coordination, the Eastern European bankruptcy procedures may suffer from the influence exerted by the largest creditors. Fourth, we confirm that the Eastern bankruptcy systems provide stronger protection of the private secured claims than the public ones. From that view, the post-socialist economies mimic the prioritization of secured creditors that characterizes most of Western European bankruptcy systems. Fifth, we find that the bankruptcy practitioners' action benefit to the other classes of claimants. Sixth, our estimates suggest that the Eastern European bankruptcy systems have successfully implemented competition between the various classes of creditors, which we interpret as a sign of maturity.

Introduction

In a market economy, bankruptcy provides valuable tools to screen between profitable and non-profitable projects. However, at the country level, the design of bankruptcy goes beyond this sole function, as it also reflects the ability of the national institutions to protect the claims of the local and foreign investors. From that perspective, bankruptcy law plays fundamental role in the attractiveness of the national business environment. For the Eastern European countries, the quality of such environment is a core condition to attract capital. This question is all the more important for the post-transition economies that eventually integrated the European Union. Among those countries, we notably find Poland, Hungary, and Romania.

What is an attractive bankruptcy law? The Doing Business Report, published annually by the World Bank, attempts to answer this question and ranks 185 countries regarding their ability to design an attractive business environment ("ease of doing business"), including bankruptcy law ("resolving insolvency"). The latest Doing Business Report (World Bank, 2013) shows a high discrepancy within Eastern Europe: Poland being ranked 37th, Hungary 70th, and Romania 102nd. One of the benefits of the World Bank's approach is to provide recurrent and comparable indicators on countries that differ regarding the design of their institutions. However, the way the Doing Business Report measures bankruptcy attractiveness shows limitations, as the three indicators used for this ranking (time, costs, and recoveries) mainly rely on "rule of thumb". For example, the recovery rates are assessed by local experts who are asked to assess the likely figures out of a case study (a restaurant with 201 employees, 50 suppliers, and being financed by one sole banker): nothing guarantees that such profile adequately represents the companies operating within each country. In fact, the analysis of bankruptcy needs empirical works based on real data, extracted from the local affairs, as they are managed by the bankruptcy courts. But, once again, the question remains: what are the variables to consider while assessing the attractiveness of bankruptcy?

Hart (2006) provides an extensive analysis of the main functions of bankruptcy laws. He notably explains that the main objective of bankruptcy is to maximize the value of the bankrupt firms, this value being divided between the various claimholders. Following the Hart's avenue, Blazy *et al.* (2013) propose legal indexes accounting for the attractiveness of bankruptcy. Those indicators reflect the main functions identified by Hart (2006), namely the coordination of the creditors, the disclosure of public information, the ability of the bankruptcy procedures to protect both the debtor's assets, and the creditors' claims, etc. All these functions are expected to differ from a country to another, having thus strong implications

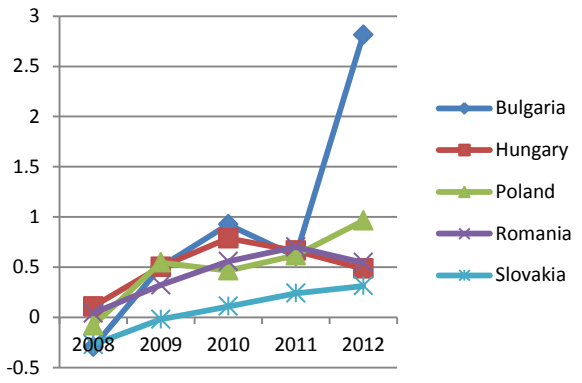
on efficiency. First, the design of bankruptcy has *ex-ante* effects on efficiency, by influencing the firms' capital structure (Stiglitz, 1974, Harris and Raviv, 1991), the ease of credit granting (Cornelli and Felli, 1997), and the design of the banking contracts (Jappelli *et al.*, 2005). Second, the bankruptcy procedures must be *ex-post* efficient by offering a legal framework able to maximize the debtor's value and to avoid an anarchic run between the creditors (Baird, 1986 and 1991).

Up to now, numerous academic works have been published on the developed market economies. One of the most recurrently analyzed country being the United-States, especially regarding the design of its Chapter 11 dedicated to corporate reorganizations (Bris *et al.*, 2006, Franks J.R., Torous, 1994, Delaney, 1992), or to the topical effects of the §363 preplan sales (Radulović, 2008). More recent empirical works have been published on Western Europe too, most of them being focused on the recovery rates: in the United Kingdom (Armour *et al.*, 2008), Germany (Grunert and Weber, 2009), France (Blazy *et al.*, 2013), Finland (Sundgren, 1998), etc. Comparable works on post-socialist countries are missing unfortunately. Those are needed to investigate to which extent those countries have developed institutions (including bankruptcy law) able to attract investors by implementing managerial discipline meanwhile their financial markets were getting developed (Mitchell, 1990). During the early stage of the transition process, bankruptcy law settled sanction mechanisms that usefully compensated the wider managerial autonomy (Legros and Mitchell, 1995). In addition, as quoted by Korobkin (1991), by protecting the bankrupt firms' employees, bankruptcy was an interesting way for the Eastern European economies to relieve weak social protection systems. More generally, within the transition path, bankruptcy law is part of the market mechanisms allocating the property right of the (private) firms' stakeholders (Coase, 1960). Depending on their financial situation, those stakeholders encompass the trade creditors, the banks, the local and the foreign capital owners.

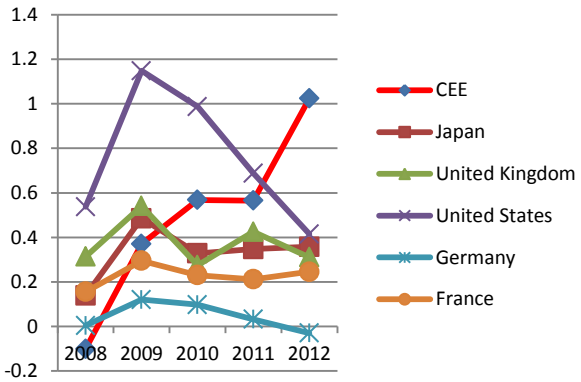
The previous arguments are mostly applicable to the early transition times, when the foremost challenge was to transfer the production means from the public to the private sector. In Romania, for example, this process took the form of mass privatization programs aimed at both the local households and the foreign investors (Earle and Telegdy, 2002). In such context, the bankruptcies initiations remained rather scarce as the agents' habits were still influenced by the "soft budget" constraint (Kim, 1996). In practice, the bankrupt firms were frequently saved thanks to the intervention of the State: in such context, the creditors had little incentives to trigger bankruptcy (Begg and Portes, 1993).

Now however, this initial phase of the transition process is over for most of the Eastern European countries, which now have to face the new challenges of the post-transition era. This is notably the case for our countries of interest (Poland, Hungary, and Romania) that now have sufficiently developed bankruptcy infrastructures to make them more attractive. In addition, as shown by Moore (2009), the rescues of bankrupt firms by the State have dramatically fallen during the post-transition phase, while the number of bankruptcy initiations has notably risen since the second half of the 2000s (Graphs 1a and 1b). Such increase (noticeable in Hungary, and, to a lower extent, in Poland and Romania) exceeds the one observed, during the same period of time, in the United-States, in Western Europe (France and Germany), and in Japan. This evolution might be explained in different ways. First, the financial crisis of 2008 might have led to more failures in the post-transition economies characterized by more recent market structures. Those effects were amplified by the European sovereign debt crisis starting in 2010. Second, the increase of bankruptcy initiations might also reveal that the agents are now less reluctant to trigger, use, and take advantage of the bankruptcy procedures.

Graphs 1a and 1b: Annual growth rate of bankruptcy initiations, compared to year 2007



Sources: Coface Bulgaria, Hungary and Poland Slovak Credit Bureau, UNPIR Romania



Sources: Altares, United States Courts, Insolvency Service, Masashi Takahashi/Kojima Law Office

Obviously, in the post-transition economies, the (private) agents are now more attracted by the specific environment provided by the bankruptcy procedures: one may expect them to take a more active part in the resolution of financial distress. On the contrary, the public creditors (whose position in the financing of the firms has declined) may not have such incentives. As mentioned by Satjer (2010) on the Croatian case: "*When in the position of creditor, in many cases the government fails to take responsibility, and does not take a stand in the processes. In some cases The State Tax Administration Office tolerates non-*

payment of taxes for many years, and government institutions sometimes look the other way for even a decade of non-payment of taxes and other debts." (Satjer, 2010, p.140).

The mechanisms explaining the recent rise of bankruptcy initiations in the Eastern European countries need further investigations. Several papers provide some elements of answer, but the picture remains incomplete. One first explanation relies in the level of development of the post-transition economies. Hashi (1995) interprets such increase as a consequence of the moderately developed capital markets in Eastern Europe. Usually, the capital markets are adequate tools to sanction non-profitable firms, by a drop in the value of their shares. As a substitute, bankruptcy provides similar sanction mechanism by allowing – after default – a transfer of capital from the less to the most profitable firms (Balcerowicz *et al.*, 2003). In such context, the (private) investors have incentives to defend the value of their claims and to take a more active part in the bankruptcy process. A second explanation derives from the interactions between law and economics. Namely, in the preparation of their European integration, the post-socialist countries have deeply changed the design of their legal institutions. Regarding bankruptcy, this took the form of successive reforms, which made the design of the law closer to the wants of the local and foreign investors. This is particularly true for Poland and Romania that both reformed their bankruptcy codes, respectively in 2003 and 2006 (the Hungarian code followed a more progressive path of reforms). More importantly, the bankruptcy practitioners (*e.g.* liquidators, administrators, and judges) developed new competences during the post-transition era, following thus a learning-by-doing process that may have improved their performances in the way they manage the procedures (Balcerowicz *et al.*, 2003). Consequently, despite the persisting risk of corruption, the agents are logically less reluctant to use more efficient legal institutions.

This paper extends the avenue opened by the previous researches on the attractiveness of the Eastern bankruptcy systems. We focus the analysis on the post-transition era, and investigate several hypotheses related to the performances of the bankruptcy procedures in three countries that joined the European Union during this period of time. Namely, we use original micro-data stemming from local courts in charge of the bankruptcy affairs in Poland, Hungary, and Romania. These data help in answering a set of questions that are essential to assess the relative performances of the bankruptcy procedures in the post-socialist economies. Namely: are the specificities of the local bankruptcy codes significant enough to influence the creditors' recoveries? Does the presence of private creditors serve the total recoveries? Does the concentration of the creditors matter? How rank the public, the social, and the private claims in

the priority order of repayment? What is the level of competition between those claims? According to our knowledge, this research is one of the first studies of this kind – based on micro-data directly managed by the local courts and the bankruptcy practitioners –, thus offering a comparative overview of the bankruptcy process in Eastern Europe.

The paper is organized as follows. Section 1 presents our hypotheses in relation with the literature. Section 2 presents the data (sample structure, methodology, and variables). Section 3 provides some descriptive statistics. Section 4 shows the results of our regressions analyses. Section 5 contains some robustness checks. The last section concludes.

1. Hypotheses

Are the bankruptcy procedures relevant devices in the context of post-transition?

Have the post-transition economies achieved to implement efficient bankruptcy laws? This question is of primer importance in the Eastern European countries that mostly depend on the financing of foreign investors. Those investors arbitrate between the various business environments they have access to. As stated by the "Doing Business" Report (World Bank, 2013), corporate bankruptcy law is a core element of business, especially as bankruptcy crystalizes the investors' rights when their money is put at risk. As a consequence, inefficiencies reducing the value of the creditors' claims under bankruptcy might decrease local attractiveness, and eventually discourage foreign investments.

In this paper, we successively consider five questions leading to a set of hypotheses with strong implications on the attractiveness of bankruptcy in Poland, Hungary, and Romania.

Firstly, does the design of bankruptcy in Eastern Europe significantly influence the observed total recoveries? If the answer is positive, this means that bankruptcy code "matters", and the countries are not equivalent regarding the quality of their legal environment (section 1.1, hypotheses H1a and H1b).

Secondly, does the presence of private creditors improve the total recoveries? Such influence can be attributable to (1) the passivity of the public claimholders in the post-transition economies, (2) or a stronger protection of the private investors, now in charge of implementing managerial discipline, (3) or a good protection of the rights of the residual claimants, whoever they are (private or not) (section 1.2, hypotheses H2a and H2b).

Thirdly, we focus on a question recurrently addressed by the literature on corporate governance in the post-transition economies. Namely, we wonder if the level of concentration of the claimholders matters. On the one hand, one may expect concentration to improve the efficiency of bankruptcy procedures as more concentrated creditors monitor more intensively the debtor and are easier to coordinate. On the other hand, bankruptcy procedures in the hands of highly concentrated creditors may be run in their sole interests, which may not maximize the value of the bankrupt firm (section 1.3, hypotheses H3a and H3b). Fourthly, we address the question of the ranking of the public and private claims in the priority order of repayment. We expect our three Eastern European countries to mimic the other European market economies that defined a priority order favoring the private claims over the public ones. But, at the opposite, we expect the social claims to outrank the private claims, as a compensation of the underdeveloped social protection systems in Eastern Europe (section 1.4, hypotheses H4a and H4b).
Fifthly, we wonder whether the bankruptcy procedures in Eastern European have achieved to implement both rivalry and ripple effects between the classes of creditors. Regarding rivalry, we consider that a mature bankruptcy system should be able to enforce a certain level of competition between the investors. Outside bankruptcy, the financial markets play this role, but, under bankruptcy, such competition is needed to create incentives to monitor the debtor and to protect the level of seniority of each claim. Regarding the ripple effects, we wonder if the Eastern European bankruptcy procedures generate (or not) positive externalities between the classes of creditors. Such externalities are a sign that the firms' value may increase after default thanks to the monitoring of some creditors, and to the decisions made by the practitioners (section 1.5, hypotheses H5a and H5b).

1.1. Does bankruptcy code "matter" in Eastern Europe?

Many questions have been investigated by the literature on corporate bankruptcy. One of the most important one is linked to the ability of the bankruptcy procedures to generate recoveries for the claimholders (or equivalently to "create value" out of the bankrupt firms' assets). As pointed out by Bebchuk (2000) and modelled by Blazy and Chopard (2004), this question amounts to examine the (*ex-post*) efficiency of bankruptcy law: a bankruptcy procedure is economically efficient provided its final outcome corresponds to the one (*i.e.* liquidation, sale, debt reorganization, economic restructuring…) that maximizes the value of the firm. Testing for bankruptcy efficiency is a challenge for empirical analysis. The main reason for this is that most of the bankruptcy files lack information on the alternative values of the bankrupt firm for each potential outcome (for example, files on liquidated companies

provide information on the liquidation proceeds only). Thus, the empirical works on corporate bankruptcy use proxies of "efficiency". Most of them (Sundgren, 1998, Thorburn, 2000, Armour *et. al.*, 2008, Couwenberg and de Jong, 2008, Blazy *et al.*, 2013) consider the total recovery rate (*i.e.* the total recovered amounts out of the total due claims). Indeed, one can expect that an efficient bankruptcy procedure generates, *ceteris paribus*, substantial recoveries for the whole set of creditors. Yet, the level of recoveries may be attributable to factors unrelated to the design of bankruptcy: mainly, the firm's specificities (assets' value, causes of default, structure of the claims…) and the national macroeconomic environment (growth, regional effects, corruption…). After having controlled for such factors, any remaining effects on recoveries can be attributed to way bankruptcy is ruled and managed: in that view, as suggested by Davydenko and Franks (2008), "bankruptcy laws matter".

Here, we wonder if bankruptcy law matters for the post-transition economies. This question is of primer importance for the Eastern European countries. First, the bankruptcy procedures act as substitutes to the moderately developed financial markets (Mitchell, 1990). Second, in the transition economies, bankruptcy law provides sanction tools that usefully compensate the wider managerial autonomy (Legros and Mitchell, 1995). Following this perspective, we select a set of countries belonging to the same geographical area, showing complementary national specificities, and having been subject to a common historical change. Namely, we consider Poland, Romania, and Hungary. All three countries share similar transition process, from the centralized socialist systems to the market economies that were ultimately integrated in the European Union. Despite this common transition path, Poland, Romania, and Hungary show strong differences in the way their national bankruptcy code is designed (see Appendix A). Let us consider Poland first. The Polish bankruptcy legislation was reformed once in 2003, one year before the integration of Poland in the European Union. This reform brings an interesting feature: a bankruptcy procedure can be triggered off provided the value of the debtor's assets exceeds the expected bankruptcy costs (mainly the practitioners' fees). Thus, since 2003, the Polish system has implemented a pre-screening mechanism minimizing the risk of non-payment for the practitioners. Such framework is likely to give them stronger (*ex-ante*) incentives to invest time and energy in the procedure. At the opposite, the Hungarian bankruptcy law is noticeably older (it was originally adopted in 1991) and has been reformed following a much more progressive path prior to the European integration. From that view, Hungary may have benefited from learning-by-doing effects on the long run. The Hungarian bankruptcy code is distinctly oriented towards liquidation, and shows an interesting specificity: the creditors' claims are subject to a registration tax that finances the administrators' expenses. This

mechanism is likely to generate opposite effects to the Polish system: being paid *ex-ante* by the creditors, the practitioners have less incentives to increase their level of effort to improve efficiency. Compared to the two previous systems, Romania has adopted a middle way. As for Poland, the stronger bankruptcy reform, in 2006, was made just one year before the European integration. However, Romania has introduced neither a pre-screening mechanism, nor a registration tax system.

Poland, Romania, and Hungary have thus been subject to opposing forces. On the one hand, all three countries followed a comparable transition process in the perspective of their European integration. On the other hand, those countries have designed differently their bankruptcy code, showing strong discrepancy in the timing of their legal reforms and in the incentive mechanisms they have chosen to implement. Consequently, one might expect those countries to show either similar or, on the contrary, different recovery rates, depending on the stronger effect: *i.e.* the post-transition path (common effect) *vs*. the bankruptcy design (differentiation effect). If the latter effect over-compensates the former one, one can conclude that "bankruptcy laws matter".

H1a. *During the post-transition period, the design of bankruptcy does not matter: after having controlled for the bankrupt firms' specificities and for the macroeconomic environment of Poland, Hungary, and Romania, the total recovery rate does not depend on the national bankruptcy code anymore.*

H1b. *During the post-transition period, the design of bankruptcy matters: after having controlled for the bankrupt firms' specificities and for the macroeconomic environment of Poland, Hungary, and Romania, the total recovery rate still depends on the national bankruptcy code.*

H1b, Corollary. *Under H1b, the Polish and the Hungarian bankruptcy codes are subject to opposing forces. On the one hand, by implementing a pre-screening mechanism, the Polish bankruptcy system gives the practitioners stronger incentives to increase their level of effort, which may lead to higher recoveries. On the other hand, having followed a more progressive path of reforms, Hungary has benefited from learning-by-doing effects, that may serve the creditors' repayment eventually. Romania is expected to lie in between both countries.*

1.2. Do the private (residual) claimants improve efficiency?

If law "matters", the way bankruptcy is designed should preserve (*ex-post*) efficiency, by maximizing the overall value of the bankrupt firms. However, not all the classes of claimholders have incentives in

accordance with such objective. This raises the question of the identification of the *residual claimant(s)*. As originally pointed out by Daigle and Maloney (1994), any claimholder is considered to be "residual" if his/her claim worth more after a marginal increase in the value of the firm. Under bankruptcy, the rights of the residual claimants derive from the absolute priority order (APO) of repayment, and their recovery rates are expected to increase with the total value of the debtor. As a consequence, the residual claimants' interests and the efficiency of bankruptcy align together. Therefore, the key question is to identify, for every bankruptcy procedure, who are the residual claimants amid all the classes of creditors. The answer depends on the initial value of the firm and on the specific structure of the claims. For example, when the debtor's value if high and the amounts due to the senior creditors are moderate, the junior creditors may belong to the pool of residual claimants, as they can reasonably expect substantial recoveries. In such context, the bankruptcy procedure should also preserve the interests of the junior creditors as they have incentives to expand the overall value of the firm (which is the repayment basis for all the creditors). Of course, such incentives may disappear for a lower value of the assets and/or another structure of claims, giving them no hope to recover anything from the debtor.

In a mature economy (*i.e.* having achieved its transition path), the residual claimants – whoever they are – should be in position to enforce their interests within bankruptcy, and influence the final outcome of the procedure. In the former centralized economies, the sole prioritized claims were in the hands of the State. At the end of the transition phase however, the private claims are to be prioritized as well, especially because:

1. the (private) claims may be in the hands of some residual claimholders (Daigle and Maloney, 1994);
2. the private creditors are now in charge of implementing managerial discipline to the bankrupt firms (in mature market economies, such discipline is imposed, either by the shareholders outside bankruptcy, or by the creditors once the firm goes bankrupt: *cf.* Mitchell, 1990);
3. the protection of the private claims is a required condition to attract foreign investors (banks and shareholders) and to support local entrepreneurship (World Bank, 2013, Djankov, 2008).

In such context, the ranking of the private claims has logically increased, especially when compared to the public ones. This is all the more true under liquidation (see Appendix A). One may expect two opposite consequences deriving from the current priority order of repayment prevailing in the post-transition economies. First, one may expect more passivity from the State within the bankruptcy procedures: being poorly ranked, the chances to recover anything from the bankrupt firms are lower. More generally, such passivity may also reflect some disengagement by the Public authorities from local

business (Satjer, 2010). Second, at the opposite, one may expect the private creditors (foreign banks, local banks, corporates, and employees) to get more involved in the bankruptcy procedures. Yet, being "involved" implies monitoring and verification costs: to be effective, those creditors should be in position to recover something from the debtor (and even correspond to the residual claimants[1]). If this latter condition is not fulfilled, it is unlikely that the (private) claimholders spend time and energy to improve the total recoveries. This leads to the following hypothesis.

H2a. *The presence of private claims improves the total recoveries, provided the expected value of those claims is positive. This is all the more likely if such claims are hold by residual creditors. Creditors are considered to be residual if their claim benefits from a marginal increase in the total value of the firm. The positive impact of the private claims on the total recoveries may be attributable to, either the passivity of the public creditors in the post-transition economies, and/or a stronger protection of the private investors, now in charge of implementing managerial discipline in Eastern Europe, and/or the ability of the post-transition bankruptcy codes to preserve the rights of the residual claimants, which thus serves ex-post efficiency.*

There is however three main counter-arguments to hypothesis H2a. First, the quite recent bankruptcy procedures in Eastern Europe might not be mature enough to protect all the classes of claimants, including the private ones. Especially, the bankruptcy practitioners may fail in identifying the residual claimants and in protecting their interests. The second counter-argument is related to the outcome of the procedure (liquidation *vs.* reorganization), which may change the nature of the incentives. Let us suppose, for example, that the value of a bankrupt firm is higher under liquidation than under reorganization. Here, a creditor, even in position of being "residual", may promote reorganization for reasons going beyond the sole question of his/her immediate repayment: a bank may decide to abandon a part of its claim, in the hope of pursuing business with the reorganized company, or because the bank fears negative externalities arising from the firm's liquidation (loss of reputation, dominoes effect…). A last counterargument may be attributable to the claims hold by the (private) bankruptcy practitioners. Firstly, those practitioners may lack efficiency in their new role in the procedures. Secondly, their claims differ from the others because, at the early stage of the procedure, the practitioners have not spent money (and effort) yet. In such situation, one may expect them to invest a high level of effort in the procedure if and only if they expect to get paid in full: for such classes of creditors, being partially paid

[1] Provided their recovery rate lies between zero and one.

may not provide enough incentives to increase the repayment of the whole set of creditors. The corresponding counter hypothesis follows.

H2b. *The presence of private claims has no impact on the total recoveries, even if their expected value is positive (or hold by residual creditors). This absence of influence may be attributable to either, the inability of the post-transition bankruptcy procedures to protect all the classes of creditors (including the private ones), and/or by the nature of the outcome (liquidation/reorganization) that may change the nature of the incentives, and/or by a lack of experience or effort from the bankruptcy practitioners.*

1.3. Should the claims be concentrated or not?

The concentration of investors is a variable having been recurrently analyzed by the literature on privatization and on corporate governance in the transition economies. Most of these papers focus on companies where the operating decisions are delegated to the managers. Here, a more concentrated ownership facilitates monitoring of the executives, and reduces the shareholders' incentives to free ride, thus leading to better performances (Aghion and Tirole, 1997). However, an excessive monitoring might discourage the managers' initiatives and reduce the firms' performances eventually (Pagano and Roell, 1998, Burkart *et al.*, 1997). These theoretical arguments have been empirically tested on the Eastern European countries. Several studies made on Hungary (Earle *et al.*, 2005), on the Czech Republic (Weiss and Nikitin, 1997) confirm that the shareholders' concentration has a positive and significant impact on the firms' performances. Some other papers (Claessens and Djankov, 1999, on the Czech Republic, Pop and Le Maux, 2006, on Romania) do not find any significant relation between the shareholders' concentration and the resulting performances, but very few of them conclude to a negative and significant relation. Overall, the consensus seems to predict that more concentration improves performances.

How do these arguments apply in the context of bankruptcy? Indeed, the quoted literature focuses more on the shareholders than on the creditors. But, one must recall that the shareholders do not have the power to decide anymore under bankruptcy, as the net value of the firm is null at the time of default (Brennan and Schwartz, 1978). The fate of the firm mainly relies in the hands of the creditors (under the supervision of a Court), who are given the right[2] to approve (or not) the reorganization of the debtor,

[2] This is true for our countries of interest (Poland, Hungary, and Romania).

against its liquidation. Put differently, the claimholders are delegated the power to decide under bankruptcy. Logically, one may wonder if the concentration of the claims have (or not) a positive impact onto the firm's value[3] (*i.e.* the value to be shared among the set of creditors). This latter question is all the more relevant for the post-transition economies: as mentioned before, those have been characterized by a noticeable increase in the number of the various classes of creditors (public and now private). Thus, their level of concentration may have an influence on each bankruptcy case, and especially on the resulting total recoveries.

On the one hand, more concentrated creditors are more able to monitor the debtor and are easier to coordinate. As suggested by Baird (1986), coordination is a required condition to avoid the "common pool problem", that is an anarchic run between the creditors that may destroy the firm's value, and eventually deserve the total repayments. On the other hand, when the claims are mainly in the hands of a limited set of creditors, there is risk that those creditors manage[4] the procedure in their sole interests, which may not align with *ex-post* efficiency. Moreover, concentrated creditors may also become "lazy" as they do not fear competition from the other claimholders. In a nutshell, the concentration of claims may have contrasted influence onto the total recoveries. This leads to the following hypotheses.

H3a. *A higher concentration of the claims increases the total recovery rate. The reason is mainly attributable to a higher level of monitoring and/or a better coordination between the creditors.*

H3b. *A higher concentration of the claims decreases the total recovery rate. The reason is a risk that the procedure is run in the sole benefits of the main creditor(s), who may not seek to maximize the value of the bankrupt firm.*

1.4. How do the public and private claims rank in the APO?

The questions addressed in the previous sections are mostly related to the ability of the bankruptcy procedures to generate high total recoveries, which is related to the question of efficiency. Now, as highlighted by Hart (2006), the role of bankruptcy procedures goes beyond the sole maximization of the debtor's value: they also prepare and organize the *sharing* of the debtor's value, between the claimholders. This is all the more important for the post-transition economies that have to protect the

[3] Under bankruptcy, the notion of "performance" is less relevant than outside bankruptcy: by definition, the firm's performances were not sufficient to avoid default. Here, the main variable of interest is the firm's expected value.
[4] Of course, the creditors do not manage the procedure directly: they are represented by a liquidator who works under the supervision of a Court. Still, they might influence the procedure from the beginning to its end.

rights of the new private creditors. This question is of primer importance for the Eastern countries that now belong to the European Union, seeking to attract foreign investors who are used to "forum shopping" within Europe. Those investors require protection of their rights both outside and under bankruptcy. Practically, in the latter case, the protection of the claims means that the bankruptcy procedures protect adequately their level of seniority.

Bankruptcy laws organize seniority by defining an absolute priority order (APO) between the various classes of creditors: this APO organizes the sharing of the debtor's value depending on the seniority of each claim. Indeed, as shown by White (1989), some classes of creditors should be protected more than others. Firstly, we find the claims hold by the secured lenders who collateralized their claims, and consequently, who paid the related costs (mainly controlling costs and registration fees). Secondly, some other classes of creditors are considered to be "preferential", in the sense that they represent "superior" interests. One find, among them, the social claims (unpaid wages) and the public claims (the State and public institutions). First, the prioritization of the social claims is justified as the employees are notably vulnerable when their employer goes bankrupt. This is all the more important in countries such as Poland, Hungary, or Romania that have not developed strong social protection systems yet. Second, the public claims are prioritized as they stand for the interests of the State and, more generally, of the public sector. Yet, in the contemporary European economies, the importance of the public sector is narrowed, and the public claims are often outranked by the other senior (private) creditors. For instance, in the United Kingdom, the Crown's preferential status was abolished by the *Enterprise Act* that came into force in September, 2003. Within their integration process, the European Eastern countries have logically followed the same direction. In Poland, under liquidation, the public claims are now outranked by the bankruptcy costs, the employees' and farmers' claims, and the secured claims (those are paid separately, for each collateralized asset). In Hungary, despite the fact that taxes and social insurance contributions are not subject to a stay of payment, the public claims are still outranked by the secured claims (mainly bankers), the bankruptcy costs, the employees' claims (unpaid wages), the alimony and life-annuity payments, and the small firms' claims. In Romania, the public claims are similarly outranked by the secured claims, the bankruptcy costs bankruptcy costs, the employees' claims, and the claims attached to credit contracts signed after the opening of the procedure (*i.e.* "new money" claims).

Thus, one can expect the recovery rates of the public claims to be lower than the others, thus reflecting their low ranking within the APO. However, in practice, the bankruptcy procedures might not respect the theoretical APO, and some deviations of priority might arise: some funds might be paid to junior

creditors whereas more senior ones are not fully repaid. Such deviations might have positive (Blazy and Chopard, 2004) or negative (Davydenko and Franks, 2008) impact on efficiency. Yet, whatever their consequences, one may interpret deviations in favor of the public sector as a sign that the transition process within Eastern Europe remains incomplete and immature. We thus have to test for the effective repayment rates between the private, the social, and the public claims in our countries of interest.

H4a. *The recovery rates of the public claims are expected to be lower than the other senior private claims, thus reflecting their relative poor ranking in the APO. This feature mimics the prioritization of the secured (private) creditors that prevails in most of the other European countries. Deviations in favor of the public sector may be interpreted as a sign that the transition process within Eastern European countries is not achieved yet.*

H4b. *The recovery rate of the social claims (mainly unpaid wages) are expected to outrank the other senior private claims. This specificity derives from the poor bargaining power of the employees under bankruptcy. In the Eastern European countries, the protection of the employees appears all the more important as the social protection systems are still underdeveloped.*

1.5. Are the competing claims subject to rivalry or ripple effects?

The question of *sharing* hides a more important one, which is related to *competition*. Competition (or equivalently, "rivalry") is required so that the investors have incentives to control, supervise, and monitor adequately the firms they finance. Outside bankruptcy, one can expect the financial markets to play this role (Wurgler, 2000). But, when the firms default, bankruptcy law implements a certain level of competition by defining a ranking between the rival classes of claimants, from the most senior to the junior claims (*cf.* the previous section).

Bankruptcy also generates "ripple effects". Indeed, the debtor's value may vary under bankruptcy, and one may expect the recoveries of a specific class of creditors to generate positive externalities onto the others. For example, unsecured creditors may benefit from the monitoring engaged by some secured creditors, or by their higher level of implication in the bankruptcy procedure: here, the recoveries of the senior claims may benefit to the junior ones. Such ripple effects may also stem from the work accomplished by the bankruptcy practitioners. Indeed, as suggested by Lubben (2012) and Webb (1987), bankruptcy costs are not sunk costs only, as they correspond to the counterpart of a service provided by the practitioners. For example, the creditors' representatives register and check the claimants' rights.

Similarly, the legal administrators disclose information on the debtor's situation and protect the value of its assets. From that point of view, the practitioners' recoveries also serve the recoveries of the other classes of creditors.

Overall, one can expect both rivalry and ripple effects to play a role within the procedures in the Eastern European countries. Both effects characterize a mature bankruptcy system. On the one hand, competition is needed to create incentives to improve repayments. On the other hand, positive externalities are the sign that (1) some creditors monitor adequately the debtor, and/or (2) the bankruptcy procedures are not subject to corruption and generate costs that are not pure sunk costs.

H5a. *Rivalry effects: the bankruptcy procedures in the European Eastern countries implement competition between the rival classes of creditors. For the same debtor's value, the recoveries of one class of creditors reduce the recoveries of the other classes of creditors.*

H5b. *Ripple effects: the bankruptcy procedures in the European Eastern countries generate positive externalities between the classes of creditors. The debtor's value may increase under bankruptcy thanks to the monitoring of some classes of creditors, and to the decisions made by the practitioners.*

In the next section, we present our data on Poland, Hungary, and Romania. These data help in testing for the hypotheses, H1 to H5.

2. Our data on Eastern Europe

In this section, we first present our sample, by detailing our data sources (section 2.1). The gathered information was manually extracted in various cities of our countries of interest (Hungary, Poland, and Romania). The resulting dataset is one of a kind collection of micro-level variables describing the succeeding stages followed by the Eastern European firms once they enter the bankruptcy procedure. Then, we explain the methodology underlying our data collection process (section 2.2). The complete presentation of our variables is listed in Appendix B.

2.1. Data source and sample structure

Our database is composed of 561 closed bankruptcy cases divided in three subsamples, *i.e.* subsample of Hungary, Poland and Romania. The cases were collected manually from national courts and/or firms of

insolvency practitioners. Although the data was provided by local firms of practitioners, we requested a randomly selection of bankruptcy cases or we selected randomly the cases from the firm's portfolio. Each case corresponds to a firm for which a bankruptcy procedure was opened. The Hungarian subsample has 158 liquidation cases which were provided by 7 local companies of insolvency practitioners.[5] On a national scale, the Hungarian reorganization procedure is rarely used. According to Coface, approximately 99% of the bankruptcy cases are liquidation cases which explains the absence of reorganization observations in this subsample. The Hungarian cases are based on firms located in all the 7 Hungarian regions.[6] In case of Poland, the subsample contains 202 observations of which 173 are liquidation cases and 29 are reorganization cases. In addition, the Polish cases were treated at the commercial courts of Bialystok, Krakow, Warsaw and Wroclaw. Our database is completed with the Romanian subsample that has 146 liquidation cases and 55 reorganization cases. Compared with the other two countries, the Romanian data was gathered from the commercial court of Maramures (30 cases) and from 26 local firms of practitioners.[7] In a geographical sense, the Romanian subsample has firms from 32 of the 41 Romanian districts including the most important Romanian cities such as Bucharest, Cluj-Napoca, Constanța, Timișoara or Iași. If we consider the triggering date of the procedure, the Hungarian subsample covers the period 2000-2012, the Polish subsample the period 2003-2010 whereas the Romanian subsample the period 2003-2011.

2.2. Methodology

In general, a bankruptcy case offers a various set of information. From a bankruptcy file or case, we can extract data about the firm's identification (sector of activity, legal form, geographical location, creation date), the bankruptcy procedure (type, length and costs of the procedure), causes of firm's default, real market value of the firm's assets at the beginning of the procedure, structure of claims and recoveries (amounts of due claims and recovered claims). However, the claims of creditors are grouped differently depending on the priority rule of the national bankruptcy law. Thus, we created five classes of creditors that allow the statistical comparison between the three bankruptcy systems, *i.e.* the class related to the practitioner's fees, the class of employees, the class of secured creditors, the class associated to the state's claims and the class of junior claimants. Appendix presents the articles or sections of the national

[5] The local firms are: A-Conto(o)-Roll Kft., Csabaholding Zrt., Credit-Audit Kft., Interit Kft., Juris-Invest Kft., Pro-Creditor Kft. and TM-LINE Zrt..

[6] The Hungarian regions are the followings: Észak-Magyarország, Észak-Alföld, Dél-Alföld, Közép-Magyarország, Közép-Dunántúl, Nyugat-Dunántúl and Dél-Dunántúl.

[7] Among the local firms, we mention: Casa de Insolvență Transilvania, Euroinsol, Global Money Recovery IPURL, Pavel Management, Rominsolv, Rovigo, Rominsolv, Solvendi, MRL - Management Reorganizare Lichidare Iași.

law used for the constitution of claimants' classes. Moreover, the three countries have different currencies, *i.e.* the Hungarian forint, the Polish zloty and the Romanian leu. We converted the local currency in euro using the average annual exchange rate. Furthermore, the values in euro were discounted to the present values. In this approach, we used as discount rate the average long term interest rate of government bonds. The causes of the firm's default were aggregated in 8 major types of default causes, *i.e.* causes related to the firm's strategy, to the production, financial causes, causes due to the firm's management, causes associated to accidents, causes related to outlets, causes of the macroeconomic context and other type of causes. The default causes of the Hungarian subsample were provided by the local practitioners whereas the causes of the Polish subsample were inferred directly from the bankruptcy case. In Romania, the practitioner is compelled by the law to write a report of the elements that caused the firm's default.

3. Descriptive statistics

This section provides descriptive statistics on our original sample, and compares them to previous empirical works dealing with corporate bankruptcy in other developed countries. Those statistics can be considered as primer clues regarding our set of hypotheses, prior to the regression analysis (subsequent section). Section 3.1 gathers statistics computed on our three countries of interest. Section 3.2 provide comparative table on previous similar empirical studies.

3.1. Sample analysis

For each procedure (liquidation and reorganization) and every country (Hungary, Poland, Romania), Table 1 provides several univariate statistics (averages and frequencies) on: *i)* the recovery rates (total rate and rate by type of claims), *ii)* the claims due to the various classes of creditors out of the total due amounts (variables "Weight of…"), *iii)* the percentage of creditors holding residual claims[8] (variables "Residual…"), *iv)* the total due claims (thousands of euros), the level of practitioners' fees (thousands of euros), *v)* the concentration of claims (Herfindahl index, and variable "Conc": see Appendix B for a definition), *vi)* the coverage rate (value of the assets at triggering out of the total due claims), *vii)* the duration of the procedure (in months), *viii)* the various causes of default (in frequencies: strategy,

[8] Here, creditors are considered to be "residual" if they own a qualified claim, and if the theoretical absolute priority order makes them expecting to receive (strictly) positive recoveries at the end of the procedure.

production, finance, management, accident, outlets, macroeconomic environment, and others), *ix)* the firm's age (years), size (thousands of euros), and legal form (LTD), *xi)* the city location (dummy "capital"), and *xii)* the sector (services, manufacture, trade).

The whole sample is made of 561 bankrupt firms (158 Hungarian liquidated firms, 173 Polish liquidated firms, 29 Polish reorganized firms, 146 Romanian liquidated firms, and 55 Romanian reorganized firms). The column named "Overall" contains the weighted averages and frequencies of the variables (those weights being computed, on each country, to rebuild the actual repartition of firms between the liquidation and the reorganization procedures[9]). The two last columns provide ANOVA tests by procedure and by country. A significant F-value means that the averages significantly differ from one procedure (or country) to another.

We first notice that the total recovery rates strongly differ from one country to another, which is a first clue that the national design of bankruptcy law might matter. Hungary shows the lowest rate (13%). Contrary to H1b (corollary), this finding rather denies that Hungary might have benefited from learning-by-doing effects on the period, by following a progressive path or reforms. At the opposite, Poland shows the highest recovery rates, which are noteworthy high under liquidation (59%) and reorganization (72%). This finding should be paralleled with the *ex-ante* screening mechanism settled by the Polish bankruptcy procedures (H1B, corollary). Romania also performs quite well, but the total recovery rate is less homogeneous between liquidations (49%) and reorganizations (84%). Compared to previous studies made on Western Europe (Sundgren, 1998, Thorburn, 2000, Armour *et. al.*, 2008, Davydenko and Franks, 2008, Couwenberg and de Jong, 2008,), those figures are relatively high, suggesting that, at primer view, the Eastern bankruptcy perform quite well in the absence of well-developed financial markets. This result can be linked to the average levels of coverage rates found on the three countries, which are quite high in Poland and Romania. This is especially true on the liquidation procedures (51% to 73%).

[9] In Hungary, nearly 100% of the bankrupt firms are liquidated. In Poland, and Romania, on the covered period, the percentages of liquidations equal respectively 91% and 96% of the bankruptcy files.

Table 1. Descriptive statistics per procedure and per country

	Hungary	Poland		Romania			Anova F-test	Anova F-test
	Liquidation	Liquidation	Reorganization	Liquidation	Reorganization	Overall	by procedure	by country
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Recovery rate	13.07%	31.77%	57.29%	18.18%	69.85%	21.71%	0.000***	0.000***
Recovery rate of employees	38.78%	58.79%	71.72%	48.71%	83.69%	56.32%	0.015**	0.822
Recovery rate of State	7.26%	42.90%	63.89%	9.34%	82.70%	18.82%	0.000***	0.000***
Recovery rate of secured claims	30.60%	66.45%	57.60%	33.14%	79.27%	36.22%	0.000***	0.000***
Recovery rate of practitioners	58.52%	100.00%	100.00%	80.35%	79.00%	78.66%	0.000***	0.000***
Recovery rate of junior	4.31%	12.67%	48.46%	5.23%	52.98%	8.12%	0.000***	0.000***
Weight of employees	0.00%	8.70%	5.87%	0.63%	2.24%	3.18%	0.000***	0.000***
Weight of State	31.58%	8.34%	12.62%	34.43%	18.03%	23.82%	0.000***	0.000***
Weight of secured claims	15.55%	3.38%	9.25%	30.70%	36.10%	15.74%	0.000***	0.000***
Weight of practitioners	12.30%	17.29%	9.99%	6.75%	5.34%	14.08%	0.000***	0.000***
Weight of junior	40.57%	62.29%	62.27%	27.49%	38.28%	43.18%	0.000***	0.000***
Residual (employees)	1.00%	63.58%	55.17%	18.49%	38.18%	27.59%	0.000***	0.000***
Residual (State)	34.17%	62.43%	65.52%	34.93%	78.18%	43.55%	0.000***	0.000***
Residual (secured claims)	37.97%	10.98%	24.14%	47.26%	78.18%	30.99%	0.000***	0.000***
Residual (practitioners)	74.68%	94.80%	100.00%	69.18%	70.90%	79.40%	0.000***	0.000***
Residual (junior)	23.41%	53.18%	65.52%	26.71%	80.00%	34.38%	0.000***	0.000***
Due claims (K €)	1043.05	786.65	1289.67	2799.21	7133.48	1488.75	0.000***	0.000***
Practitioners' fees (K €)	53.49	104.59	29.15	67.38	38.04	73.73	0.470	0.407
HH	56.78%	61.83%	61.00%	66.47%	58.54%	62.50%	0.009***	0.002***
Conc	67.19%	72.23%	71.00%	76.05%	69.72%	72.40%	0.000***	0.000***
Coverage rate	29.30%	72.61%	64.84%	50.61%	17.14%	52.00%	0.000***	0.000***
Duration (months)	24.49	25.01	6.59	25.53	16.04	24.58	0.000***	0.387
Cause: Strategy	17.72%	14.45%	10.34%	14.38%	10.90%	17.05%	0.697	0.472
Cause: Production	26.58%	27.75%	48.28%	27.40%	45.45%	27.08%	0.013**	0.488

Cause: Finance	20.89%	32.37%	27.59%	27.39%	34.54%	26.36%	0.146	0.063**
Cause: Management	35.44%	23.12%	6.90%	49.32%	27.27%	34.95%	0.000***	0.000***
Cause: Accident	26.58%	28.90%	34.48%	19.86%	27.27%	25.05%	0.313	0.199
Cause: Outlets	30.38%	32.37%	34.48%	16.44%	41.81%	26.50%	0.002***	0.103
Cause: Macro. Environement	31.01%	35.84%	55.17%	34.25%	41.81%	33.56%	0.119	0.318
Cause: others	12.03%	5.78%	20.69%	8.22%	12.72%	8.80%	0.061*	0.423
Age (years)	8.31	7.32	7.80	9.25	10.10	8.30	0.000***	0.000***
LTD	89.87%	88.44%	89.66%	98.63%	89.09%	92.01%	0.012**	0.018**
Capital	37.97%	32.95%	48.28%	6.16%	16.36%	26.97%	0.000***	0.000***
Sector: Services	36.08%	25.43%	13.79%	19.86%	34.54%	26.95%	0.005***	0.014**
Sector: Manufacture	37.34%	53.76%	65.52%	43.15%	45.45%	44.43%	0.008***	0.002***
Sector: Trade	17.09%	18.50%	13.79%	31.51%	20.00%	22.57%	0.013**	0.010**
Size of firms (K €)	132.92	319.99	931.42	1039.83	5006.27	489.58	0.000***	0.000***
Number of observations	158	173	29	146	55	561		

Notes: The table presents the average values of the Hungarian subsample of liquidation cases (column (1)), of the Polish subsample of liquidation cases (column (2)) and of reorganization cases (column (3)), of the Romanian subsample of liquidation cases (column (4)) and of reorganization cases (column (5)). Column (6) presents the average values of the full sample weighted with the average percentage of liquidation or reorganization cases in the national number of bankruptcy cases. In column (7), the two-way Anova by procedure tests the differences in average for the two possible bankruptcy outcomes, *i.e.* liquidation or reorganization. In column (8), the two-way Anova by country tests the differences in averages between Hungary, Romania and Poland. A detailed description of variables is presented in Appendix (note that the sum of frequencies of all the causes of default exceeds 100%, as several causes may be recorder for one bankruptcy file). The numbers of columns (7) and (8) are the *p*-values of the two-way Anova test. *** implies that the differences in average are significant at 1% level, ** at 5% level and * at 10% level.

Now, when focusing on the recovery rates by classes of creditors, the statistics interestingly show similar rankings between those classes, whatever the considered country. For the liquidations, we find the highest recovery rates for the practitioners (between 58% to 100%), then in second/third position, we find the employees and the secured claims (who show close rates, lying between 31% to 66%), then in fourth position, the State (from 7% to 43%), and, in last position, the junior claims (from 4% to 13%). This ranking on liquidations is very informative, as it reflects the rather low position of the public claims in the new reformed bankruptcy systems in Eastern Europe: the State being ranked in the penultimate position. For the reorganizations, the ranking is close to the previous one found on liquidations, but with a better position for the State, showing average recovery rates that lie between the ones of the employees and the (private) secured creditors. Here, the State still appears to benefit from a certain level of protection when the firm has some chances to get reorganized.

The countries show noticeable differences in the structure of the firm's claims. The Polish firms appear the less collateralized (variable "Weight of secured claims" is lower than 10%), whereas Hungary and Romania show higher levels of collateralization (between 16% and 36% on both countries). Similarly to the secured claims, the public claims are more frequent in Hungary (32%) and Romania (from 18% to 34%) than in Poland (less than 13%).

However, the performances of bankruptcy systems cannot be summarized by their sole ability to generate recoveries. Those should also be cheap (Bris A. et al., 2006). In this paper, we consider a direct measure of the bankruptcy costs (practitioners' fees) and an indirect one (duration of the procedures). Whatever the country, the average bankruptcy costs are noteworthy high in our sample (from 29 100 € to 104 600 € per file). These figures are much higher than the corresponding ones found on Western Europe (see Blazy *et al.*, 2013, for an estimate of the bankruptcy costs in France and in the United-Kingdom). Regarding the duration of the bankruptcy procedures, those last on average between 7 months to 26 months. Those figures are quite standard, and we can conclude that the bankruptcy procedures in Hungary, Poland, and Romania are not too long.

The other figures in Table 1 deal with our control variables. Not all of them are discussed here. However, let us stress that the bankruptcy firms, in our sample, are not start-up firms (their average age lies between 7 to 10 years). Most of them (more than 88%) are limited liability firms, mostly operating in the manufacture sector. On all three countries, the first causes of default are related to management problems (35% of the files).

3.2. International comparison

The average values of the recovery rates of eastern European countries can be compared for the first time with the average values of countries whose bankruptcy systems are more mature. Table 2 provides a statistical comparison per bankruptcy procedure between the countries of our sample and other countries. We can notice that the Polish subsample of liquidation files has an average recovery rate of the creditors' debt higher than the values of U.K., U.S. and France, but its average is exceeded by the average value of Netherlands. Moreover the Romanian subsample of liquidation files has almost a similar average value of the recovery rate as France. In case of liquidation, eastern European secured claimants recover on average a higher value compared to the British claimants whereas the average recovery rates of junior claimants and bankruptcy practitioners of our sample is superior to the average value of France. Nevertheless, the average duration of a liquidation procedure in this part of Eastern Europe is comparable with the average durations registered in U.K., U.S. and Netherlands. The eastern European reorganization procedures have a certain attractiveness in terms of recovery rates and duration. A reorganization procedure in Poland and Romania provide on average a higher degree of satisfaction of junior claims and secured claims than in U.K. and France. Such procedures also seem to be faster than the Chapter 11 of U.S. and the receivership procedure of U.K.

Table 2. Eastern Europe vs. other countries

Liquidation procedure	Hungary	Poland	Romania	U.S.	U.K.	France	Netherlands
Recovery rate	13.07%	31.77%	18.18%	27.00%	8.60%	19.60%	37.20%
Recovery rate of employees	38.78%	58.79%	48.71%				
Recovery rate of State	7.26%	42.90%	9.34%				
Recovery rate of secured claims	30.60%	66.45%	33.14%	90.00%	16.20%	40.30%	
Recovery rate of practitioners	58.52%	100.00%	80.35%		3.80%	55.80%	
Recovery rate of junior	4.31%	12.67%	5.23%	1.00%	7.70%	3.10%	
Duration (months)	24.49	25.01	25.53	24.00	26.40	3.1	25.04
Number of observations	158	173	146	61	100	100	137

Reorganization procedure	Poland	Romania	U.S.	U.K.	France
Recovery rate	57.29%	69.85%	69.00%	29.70%	45.80%
Recovery rate of employees	71.72%	83.69%			
Recovery rate of State	63.89%	82.70%			
Recovery rate of secured claims	57.60%	79.27%	92.00%	43.70%	51.90%
Recovery rate of practitioners	100.00%	79.00%		5.70%	33.90%
Recovery rate of junior	48.46%	52.98%	52.00%	1.60%	38.20%
Duration (months)	6.59	16.04	28.00	38.90	11.60
Number of observations	29	55	225	198	164

Notes: The table presents the average values of the recovery rates per classes of claimants and the average durations of bankruptcy procedures. The average values related to U.S. originate from Bris et. al. (2006), to France and U.K. from Blazy et al. (2013) and to France from Couwenberg and De Jong (2008). In Blazy et al. (2013), the French reorganization procedure that is considered is the procedure of *redressement judiciaire* whereas the receivership procedure is considered in case of U.K..

4. Econometric results

This section adopts a multivariate approach to test for hypotheses H1 to H5. In sub-section 4.1, we focus the attention on the main determinants of the total recovery rate, as a proxy of *ex-post* efficiency (H1 to H3). In sub-section 4.2, we model the interactions between the competing classes of creditors (H4, H5).

4.1. The determinants of the total recovery rate

Hypotheses H1 to H3 relate to the determinants of the total recovery rate (*i.e.* the total recovered amounts out of the total due claims). As discussed before, this ratio is recurrently used as a proxy of the *ex-post* efficiency of bankruptcy, such efficiency being in turn one element of the attractiveness of the bankruptcy national systems.

Hypotheses H1a and H1b suggest that, after having controlled for the bankrupt firms specificities (internal factors) and for the macroeconomic environment (external factors), any residual country effect might be attributed to the local bankruptcy institutions. This "residual approach" is analogous to the one used by Davydenko and Franks (2008) on France, Germany and the United Kingdom. Here, our control variables are *i)* the individual causes of default (strategy, production, finance, management, accident, outlets, and bad environment), ii) the firm's size (initial value of the assets, in log), *iii)* the legal form (dummy "limited liability"), *iv)* the location (dummy "capital", equal to 1 when the bankruptcy court is located in the capital city), *v)* the sector (services and manufacture, compared to trade), *vi)* the annual growth rate (DGDP), *vii)* the national level of corruption (DCPI index). The test variables are dummies reflecting the national environment of bankruptcy: "RO" for Romania and "PL" for Poland (Hungary being the reference point). For each country, we split between the liquidation and the reorganization procedures.

Hypotheses H2a and H2b test for the presence of private creditors being in position of residual claimants. H2a predicts that those claimants have incentives to increase the recovery rate of the whole set of creditors, thus compensating the passivity of the public creditors, or simply because the post-transition bankruptcy codes are now able to preserve the rights of the residual claimants, including the private ones. Hypothesis H2b predicts an opposite finding. To test for those rival hypotheses, we build original dummy variables, each being attached to one class of claimant (employees, State, private

secured, practitioners, and private junior claims). Each dummy equals one provided *i)* the considered class of creditors is in possession of qualified claim(s) (*i.e.* the value of their claim(s) is positive), and *ii)* the theoretical APO makes them expecting to recover strictly positive amounts. Practically, two sources of information were used to build those dummies. First, information contained in the bankruptcy files themselves (*cf.* the structure of the declared claims and the market value of the debtor's assets, as assessed at the early stage of the procedure). Second, for each class of creditors, we modelled the expected recoveries using the content of the Hungarian, Polish, and Romanian bankruptcy chapters,[10] depending on the debtor's nationality. As a result, our dummies "residual-X" ("X" standing for the class of creditors) equal one every time the considered creditors are in position to receive a positive repayment[11] out of the procedure, based on *i)* the initial value of the total assets, at the beginning of the procedure, and *ii)* the theoretical order of repayment, as it is defined by the national bankruptcy code. Here, we consider that creditors being in position to receive positive recoveries are more likely to invest time and money in the procedure than the others. Such level of commitment should generate wealth, ultimately serving the total debtor's value. We consequently predict a positive relation between those dummies and the total recovery rate. Up to our knowledge, this is the first empirical study measuring the effect of the residual claimants on the final output bankruptcy (most of the studies dealing with the residual claimants being mostly theoretical).

Hypotheses H3a and H3b suggest that the total recovery rate depends on the concentration of the debtor's claims. To reflect this, we consider two set of variables: first, a global index (Herfindahl) accounting for the level of concentration of all claims; second, for each class of creditors, the percentages of their due amounts out of the total due claims (variables "Weight of…").

[10] The legal sources are, respectively: section 57 of the 1991 XLIX bankruptcy act (Hungary), article 342 of the 2003/2009 bankruptcy laws (Poland), and the bankruptcy law n°85/2006 (Romania).

[11] In theory, a claimant is considered to be "residual" provided his/her expected recovery rate strictly lies between zero (no repayment) and one (full repayment): under this situation, any marginal increase in the debtor's value is expected to serve his/her repayment. In our approach however, the situations under which the observed recovery rate equals 100% are very scarce

Table 3. Determinants of the total recovery rate (OLS)

	Liquidation (1)	Reorganization (2)	Overall (3)	Subsample (4)
RO	0.048**	0.010	0.054**	
	(0.034)	(0.938)	(0.011)	
PL	0.098***		0.107***	
	(0.000)		(0.000)	
Residual Employees	0.023	–0.112	0.017	0.028
	(0.344)	(0.168)	(0.474)	(0.224)
Residual State	–0.031	0.005	–0.027	–0.001
	(0.120)	(0.961)	(0.153)	(0.955)
Residual Secured	–0.050	–0.138	–0.048*	0.004
	(0.106)	(0.312)	(0.094)	(0.902)
Residual Practitioner	0.066**	0.018	0.059**	0.013
	(0.015)	(0.882)	(0.019)	(0.677)
Residual Junior	0.035*	0.220**	0.042**	0.039*
	(0.095)	(0.020)	(0.033)	(0.076)
Weight of Employees	–0.156	0.613	–0.135	–0.107
	(0.105)	(0.113)	(0.141)	(0.241)
Weight of State	0.017	0.264	0.022	–0.026
	(0.614)	(0.149)	(0.495)	(0.457)
Weight of Secured	0.091**	0.494**	0.094**	0.072
	(0.048)	(0.011)	(0.031)	(0.145)
Weight of Practitioner	0.411***	0.267	0.406***	0.776***
	(0.000)	(0.640)	(0.000)	(0.000)
HH	–0.225***	–0.018	–0.221***	–0.118**
	(0.000)	(0.941)	(0.000)	(0.043)
Cause: Strategy	0.034	–0.065	0.032	0.048*
	(0.129)	(0.616)	(0.137)	(0.054)
Cause: Production	0.003	0.018	0.008	–0.004
	(0.868)	(0.816)	(0.636)	(0.836)
Cause: Finance	–0.005	–0.005	–0.005	–0.011
	(0.804)	(0.947)	(0.757)	(0.576)
Cause: Management	0.017	0.079	0.017	–0.003
	(0.404)	(0.430)	(0.373)	(0.902)
Cause: Accident	0.003	0.039	0.006	–0.020
	(0.871)	(0.643)	(0.725)	(0.321)
Cause: Outlets	0.047**	0.060	0.049***	0.020
	(0.011)	(0.432)	(0.004)	(0.340)
Cause: Macroeconomic	–0.009	0.044	–0.006	–0.027
	(0.625)	(0.622)	(0.727)	(0.181)
Coverage rate	0.117***	0.047*	0.117***	0.083***
	(0.000)	(0.094)	(0.000)	(0.000)

Assets	0.016***	–0.032	0.016***	0.022***
	(0.002)	(0.278)	(0.000)	(0.000)
Age	0.006	–0.009	0.005	0.010
	(0.630)	(0.161)	(0.667)	(0.467)
LTD	0.023	–0.012	0.019	0.111***
	(0.410)	(0.927)	(0.476)	(0.001)
Capital	–0.030	0.043	–0.027	0.000
	(0.103)	(0.624)	(0.118)	(0.999)
Sector: Services	0.006	0.093	0.008	0.020
	(0.780)	(0.386)	(0.675)	(0.391)
Sector: Manufacture	–0.009	0.076	–0.008	–0.019
	(0.606)	(0.481)	(0.631)	(0.331)
DGDP	0.003	–0.009	0.003	0.005**
	(0.192)	(0.417)	(0.160)	(0.011)
DCPI	–0.263	–0.075	–0.332**	–0.402**
	(0.106)	(0.918)	(0.030)	(0.018)
Constant	0.041	0.595	0.037	–0.047
	(0.530)	(0.123)	(0.540)	(0.543)
Number of observations	477	84	561	403
Adjusted R^2	0.627	0.216	0.619	0.658

Notes: The coefficients are estimated using the OLS (ordinary least squares) method. The dependent variable is the recovery rate of the total debt. A detailed description of the explanatory variables is presented in Appendix. Column (1) presents the estimated coefficients of the subsample of the liquidation cases, column (2) of the subsample of the reorganization cases, column (3) of the full sample whereas column (4) of subsample composed of Romanian and Polish bankruptcies cases. The full sample of column (3) and the subsample of column (4) are weighted with the average percentage of liquidation or reorganization cases in the national number of bankruptcy cases. The numbers in parentheses are the *p*-values. *** implies that the coefficient is significant at 1% level, ** at 5% level and * at 10% level.

Table 3 provides the results of an OLS regression explaining the total recovery rate, defined as the sum of all recoveries out of the total due claims. As such rate is bounded between zero and one, the section dedicated to robustness checks provides the estimates of a TOBIT regression. The results are close to the ones obtained with the OLS method. In Table 3, the dummy accounting for the Hungarian liquidation procedures is withdrawn from the regressions, to avoid multicolinearity issue. Thus, Hungary is our reference point. For similar reasons, the weights of the junior claims are withdrawn from the set of explanatory variables, as the sum of all weights equals one.

Secondly, we identify two classes of creditors that serve the total recoveries, when being in position of residual claimants: namely the practitioners (dummy “Residual Practitioners” is positive and significant on the liquidations) and the junior claims (dummy “Residual Junior” is positive and significant on both

outcomes). For the former class, we interpret this result as a direct consequence of the way the practitioners are remunerated. Clearly, the (liquidation) procedures benefit from the action of the practitioners, provided they expect to be paid (even partially) at the end of the process. This feature might create a bias in favor of the (biggest) companies having substantial assets at the early stage of the procedure, and for which the perspective of fast liquidation might preserve the value of their assets. Even if the consequences of this bias are hard to assess, on might fear that the small firms suffer the most. Overall, with the exception of the practitioners, we observe that hypothesis H2a is confirmed, but for the private junior claims only. This result is interesting as it shows that the other classes of creditors (State, employees, and private secured claims) exert no influence on the total recoveries, despite holding residual claims. Up to a certain point, this might reflect some passivity from those creditors. This latter effect might be attributed to two polar reasons. Either those classes of creditors are *ex-ante* discouraged as they feel having lost their bargaining power under the new bankruptcy framework, or, at the opposite, they consider to be protected well-enough so that they have little incentives to spend too much time and money in the bankruptcy procedure. Both explanations lead to an absence of impact onto the total recoveries. At this stage of the analysis, this is quite difficult to split between the two opposite interpretations. Now, hypothesis H2a is partially verified regarding the junior claims: when those are in possession of residual claims, the overall recoveries are significantly higher. This result is quite encouraging regarding the question of *ex-post* efficiency: seemingly, the Eastern European bankruptcy procedures provide a legal framework that does not serve the interests of the preferential and/or secured creditors only. On the contrary, when they are in position to expect some recoveries, the presence of junior creditors matters, and eventually serve the overall interests. This latter result is all the more important that the junior claims are mostly composed of private local companies.

Thirdly, we find mixed results regarding the impact of the concentration of claims onto the total recovery rate. On the one hand, the Herfindahl index – measuring the concentration of all claims – is significantly associated to a lower total recovery rate, thus supporting hypothesis H3b (for the liquidation files only). On the other hand, when considering the relative weights of the various classes of creditors, we find that the total recovery rate is positively explained by the weights of the secured creditors (both outcomes), the practitioners (liquidations), and the State (reorganizations). Obviously, the financial outcome of bankruptcy is not independent from the structure of the claims. First, the positive influence of the secured claims most likely derives from the monitoring of the bankers who can control their borrowers more easily than other creditors, thanks to their long term commercial relationships. *Ceteris paribus*,

such monitoring is all the more needed when the amounts due to the bankers are high. As observed theoretically (Besanko and Katanas, 1993) and empirically (Hoshi *et al.*, 1990), such effect is a well-known feature of the intermediated economies. Second, the positive influence of the public claims is observed on reorganizations: public creditors are thus more active when their financial stakes are high and when the bankrupt firms show chances of reorganization. Such phenomenon (that we can observe in Western Europe as well) seems not to undermine *ex-post* efficiency. On the contrary, the weight of the public claims significantly increases the total recovery rate. Third, the positive influence of the practitioners' claims onto the total recovery rate confirms our previous findings: most of their efforts are obviously targeted to the files generating substantial bankruptcy costs. Eventually, their efforts serve the whole set of creditors, but, as suggested before, one may fear that the total recoveries are *in fine* captured by them.

We finally end up with our control variables. We find a quite logical significant and positive impact of the coverage rate (*i.e.* the initial value of assets out of the total due amounts) onto the total recovery rate. Some causes of default also appear positive and significant: mainly the economic and managerial difficulties (outlets and strategy). Last, the DCPI index, measuring the level of corruption at the country level, logically decreases the total recovery rate (all the procedures put together).

Overall, our analysis of the determinants of the total recovery rates confirms H1b: total recoveries depend on the design of bankruptcy law (the Polish system being able to generate higher recoveries). We also accept hypothesis H2a, but for two classes of private creditors only: the bankruptcy practitioners and the junior claims. When holding residual claims, these two classes of creditors have a positive influence on the total recovery rate. Last, we find mixed results regarding our hypotheses on concentration (H3a and H3b).

At this stage of the analysis, we only focus the attention on the total recoveries (*ex-post* efficiency), without splitting between the various creditors (sharing issue). Yet, bankruptcy systems also organize the sharing of the debtor's value among the competing classes of claimants. The next section studies the determinants of such sharing.

4.2. The competition between the classes of claimants

During the preparation of their European integration, the post-socialist economies have converged toward the other European countries, by prioritizing the senior private claimholders over the public ones. The content of the Polish, Hungarian, and Romanian bankruptcy codes reflects this change, but one may wonder if such prioritization is fully respected in practice. According to hypothesis H4a, any deviation in favor of the public claims over the private ones might reflect some incompleteness in the post-transition process. In section 3, we found a primer average ranking between the various classes of creditors: on all three countries, hypothesis H4a was respected mainly under liquidation.[12] Now considering hypothesis H4b, we expect the Eastern European bankruptcy systems to favor the social claims, thus compensating the weaker level of development of the social systems. In section 3, the descriptive statistics confirmed hypothesis H4b, as the employees' recovery rate ranked quite well on average, just behind the bankruptcy practitioners.

Nevertheless, one may suspect those rankings to be impacted by some other variables also influencing the recovery rates (for instance, higher recoveries for the employees might be attributed to differences in the firms' characteristics). We thus consider multivariate analysis, and split between our test and control variables. Here, simple OLS regressions fail in capturing interactions between the various classes of claimants. Precisely, the more the senior classes would recover, the less the junior ones should get repaid. Hypothesis H5a follows this idea and predicts that mature bankruptcy systems should be able to implement competition between the various classes of creditors ("rivalry effect"). At the opposite, hypothesis H5b suggests that the bankruptcy procedures might also generate positive externalities between them ("ripple effect").

Below, we estimate regression models to test for hypotheses H4a, H4b, H5a, and H5b. With the purpose of capturing the interdependencies between the creditors' recoveries, we build a simultaneous equations system (one equation per class of creditors). As we consider five classes of creditors (employees' claims, public claims, private secured claims, practitioners' fees, and junior claims), our

[12] Yet, under reorganization, the secured creditors were slightly outranked by the public ones (especially in Poland).

system is made of five equations (see below, eq.1 to eq.5).[13] The parameters of the whole system are estimated through a weighted[14] 3SLS regression.[15]

$$
\begin{cases}
\textbf{Eq1.} \quad ln(\text{recov}_{\text{EMPL}}) = \alpha_0 + \alpha_1\, ln(\text{recov}_{\text{STATE}}) + \alpha_2\, ln(\text{recov}_{\text{SECURED}}) + \alpha_3\, ln(\text{recov}_{\text{PRACT}}) + \alpha_4\, ln(\text{recov}_{\text{JUNIOR}}) \\
\qquad + \alpha_5\, ln(\text{due}_{\text{EMPL}}) \times \text{Romania} + \alpha_6\, ln(\text{due}_{\text{EMPL}}) \times \text{Poland} + \alpha_7\, ln(\text{due}_{\text{EMPL}}) \times \text{Hungary} \\
\qquad + \sum_{j>7} \alpha_j \ \text{control variables} \\
\textbf{Eq2.} \quad ln(\text{recov}_{\text{STATE}}) = \beta_0 + \beta_1\, ln(\text{recov}_{\text{EMPL}}) + \beta_2\, ln(\text{recov}_{\text{SECURED}}) + \beta_3\, ln(\text{recov}_{\text{PRACT}}) + \beta_4\, ln(\text{recov}_{\text{JUNIOR}}) \\
\qquad + \beta_5\, ln(\text{due}_{\text{STATE}}) \times \text{Romania} + \beta_6\, ln(\text{due}_{\text{STATE}}) \times \text{Poland} + \beta_7\, ln(\text{due}_{\text{STATE}}) \times \text{Hungary} \\
\qquad + \sum_{j>7} \beta_j \ \text{control variables} \\
\textbf{Eq3.} \quad ln(\text{recov}_{\text{SECURED}}) = \delta_0 + \delta_1\, ln(\text{recov}_{\text{EMPL}}) + \delta_2\, ln(\text{recov}_{\text{STATE}}) + \delta_3\, ln(\text{recov}_{\text{PRACT}}) + \delta_4\, ln(\text{recov}_{\text{JUNIOR}}) \\
\qquad + \delta_5\, ln(\text{due}_{\text{SECURED}}) \times \text{Romania} + \delta_6\, ln(\text{due}_{\text{SECURED}}) \times \text{Poland} + \delta_7\, ln(\text{due}_{\text{SECURED}}) \times \text{Hungary} \\
\qquad + \sum_{j>7} \delta_j \ \text{control variables} \\
\textbf{Eq4.} \quad ln(\text{recov}_{\text{PRACT}}) = \gamma_0 + \gamma_1\, ln(\text{recov}_{\text{EMPL}}) + \gamma_2\, ln(\text{recov}_{\text{STATE}}) + \gamma_3\, ln(\text{recov}_{\text{SECURED}}) + \gamma_4\, ln(\text{recov}_{\text{JUNIOR}}) \\
\qquad + \gamma_5\, ln(\text{due}_{\text{PRACT}}) \times \text{Romania} + \gamma_6\, ln(\text{due}_{\text{PRACT}}) \times \text{Poland} + \gamma_7\, ln(\text{due}_{\text{PRACT}}) \times \text{Hungary} \\
\qquad + \sum_{j>7} \gamma_j \ \text{control variables} \\
\textbf{Eq5.} \quad ln(\text{recov}_{\text{JUNIOR}}) = \eta_0 + \eta_1\, ln(\text{recov}_{\text{EMPL}}) + \eta_2\, ln(\text{recov}_{\text{STATE}}) + \eta_3\, ln(\text{recov}_{\text{SECURED}}) + \eta_4\, ln(\text{recov}_{\text{PRACT}}) \\
\qquad + \eta_5\, ln(\text{due}_{\text{JUNIOR}}) \times \text{Romania} + \eta_6\, ln(\text{due}_{\text{JUNIOR}}) \times \text{Poland} + \eta_7\, ln(\text{due}_{\text{JUNIOR}}) \times \text{Hungary} \\
\qquad + \sum_{j>7} \eta_j \ \text{control variables}
\end{cases}
$$

For each equation, the explained variable corresponds to the amounts recovered by one specific class of claimants (in log). Among the explanatory variables, we first find the amounts recovered (in log) by the other competing classes (each variable being, in turn, an explained variable in another equation of the system). Thus, in every equation, the sign of the coefficient multiplying these variables indicates which effect (rivalry *vs.* ripple: H5a, H5b) is the most important one. For instance, in equation 1, a negative and significant value for parameter α_1 indicates that the State's recoveries mostly compete with the employees' ones. At the opposite, a positive value would have suggested that the employees benefit from higher public recoveries (ripple effect).

[13] The labels "recov" and "due" respectively stand for "recovered amounts" and "due debts".

[14] The weights stand for the actual repartition of the bankruptcy outcomes (liquidations *vs.* reorganizations) within each country: respectively, 100%, 91%, and 96% of liquidations in Hungary, Poland, and Romania.

[15] The 3SLS method follows: a first-step OLS regression is computed on several instruments to obtain the predicted values of the endogenous variable (here, the logarithms of the recovered amounts). Then, the predicted values are brought back into the initial equations that are estimated once more. The resulting residuals are then used to estimate the variance-covariance matrix of the errors. Finally, generalized least squares (GLS) are used to estimate the whole system.

Table 4. Determinants of the recoveries per classes of creditors (3SLS)

Dependent variable:	Log (Recovery of Employees) {X}=EMPLOYEES (1)	Log (Recovery of State) {X}=STATE (2)	Log (Recovery of Secured) {X}=SECURED (3)	Log (Recovery of Practitioner) {X}=PRACT (4)	Log (Recovery of Junior) {X}=JUNIOR (5)
Log (Debt of {X}) x RO	0.577***	0.268***	0.646***	0.764***	0.041
	(0.000)	(0.000)	(0.000)	(0.000)	(0.487)
Log (Debt of {X}) x PL	0.650***	0.354***	0.755***	0.823***	0.148**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.019)
Log (Debt of {X}) x HU	0.444	0.108***	0.588***	0.652***	0.063
	(0.519)	(0.001)	(0.000)	(0.000)	(0.228)
Log (Recovery of Employees)		–0.210***	–0.086	0.025	–0.222**
		(0.009)	(0.374)	(0.586)	(0.040)
Log (Recovery of State)	–0.164*		–0.450***	0.021	–0.210
	(0.052)		(0.000)	(0.725)	(0.182)
Log (Recovery of Secured)	–0.054	–0.198***		–0.021	–0.152*
	(0.202)	(0.000)		(0.495)	(0.066)
Log (Recovery of Practitioner)	0.223***	0.154*	0.143		0.332***
	(0.002)	(0.062)	(0.194)		(0.002)
Log (Recovery of Junior)	–0.244***	–0.161	–0.281*	0.158**	
	(0.005)	(0.152)	(0.062)	(0.021)	
Weight of Employees		–1.649**	–0.159	0.477	–2.533**
		(0.027)	(0.856)	(0.285)	(0.012)
Weight of State	2.784***		2.403***	0.088	–0.117
	(0.000)		(0.000)	(0.726)	(0.760)
Weight of Secured	2.202***	–0.161		0.034	–0.714
	(0.000)	(0.636)		(0.899)	(0.132)
Weight of Practitioner	2.612***	–0.279	2.403***		–0.961
	(0.000)	(0.564)	(0.000)		(0.156)
Weight of Junior	2.786***	0.146	1.921***	–0.036	
	(0.000)	(0.528)	(0.000)	(0.875)	
HH	0.095	–0.352	0.135	–0.057	0.675*
	(0.676)	(0.253)	(0.683)	(0.726)	(0.098)
Cause: Strategy	0.005	0.180	–0.166	–0.038	0.656***
	(0.966)	(0.206)	(0.293)	(0.614)	(0.001)
Cause: Production	–0.080	–0.168	0.002	0.018	–0.295*
	(0.362)	(0.139)	(0.988)	(0.766)	(0.057)
Cause: Finance	0.059	0.110	–0.076	0.045	0.236
	(0.514)	(0.346)	(0.560)	(0.467)	(0.141)
Cause: Management	0.113	0.106	–0.041	0.050	0.216
	(0.239)	(0.393)	(0.765)	(0.441)	(0.201)
Cause: Accident	0.082	–0.046	–0.041	–0.082	–0.077
	(0.353)	(0.684)	(0.746)	(0.176)	(0.621)
Cause: Outlets	0.051	0.128	0.097	0.113*	0.246
	(0.562)	(0.260)	(0.443)	(0.063)	(0.113)
Cause: Macroeconomic	0.101	0.034	–0.127	0.076	–0.041
	(0.244)	(0.760)	(0.311)	(0.203)	(0.787)
Coverage rate	0.013	0.160**	–0.110	–0.013	0.240***
	(0.787)	(0.016)	(0.140)	(0.716)	(0.009)

Assets	0.038	0.173***	0.354***	0.127***	0.181***
	(0.146)	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.030	0.046	–0.064	–0.007	0.93
	(0.633)	(0.572)	(0.476)	(0.870)	(0.401)
LTD	–0.066	–0.165	0.142	0.040	–0.044
	(0.632)	(0.356)	(0.474)	(0.676)	(0.856)
Capital	–0.024	0.122	0.125	–0.037	0.034
	(0.780)	(0.285)	(0.320)	(0.533)	(0.828)
Sector: Services	0.035	0.147	–0.007	–0.105	0.026
	(0.721)	(0.247)	(0.960)	(0.120)	(0.882)
Sector: Manufacture	–0.074	–0.156	–0.091	–0.079	–0.093
	(0.408)	(0.175)	(0.479)	(0.200)	(0.554)
DGDP	0.005	0.022*	–0.000	0.001	0.013
	(0.581)	(0.087)	(0.991)	(0.875)	(0.472)
DCPI	–0.994	0.075	–1.488	–0.155	–0.357
	(0.188)	(0.941)	(0.173)	(0.767)	(0.793)
Constant	–2.987***	–0.363	–2.547***	–0.189	–1.069*
	(0.000)	(0.400)	(0.000)	(0.492)	(0.076)
System Weighted R^2 : 0,771					

Notes: The coefficients reported are the estimated coefficients of the 3SLS (three-stage least squares) regressions. The estimations results of the 2SLS (two-stage least squares) regressions are reported in Appendix. In column (1), the variable Log (Debt of {X}) x RO is the product between the variable RO and the variable Log (Debt of Employees) given that {X} is equal to Employees. In column (2), the variable Log (Debt of {X}) x PL is the product between the variable PL and the variable Log (Debt of State) given that {X} is equal to State. The number of observations is 561. The observations are weighted with the average percentage of liquidation or reorganization cases in the national number of bankruptcy cases. The numbers in parentheses are the *p*-values. *** implies that the coefficient is significant at 1% level, ** at 5% level and * at 10% level.

The explanatory variables also cover the initial due amounts. Let us stress that, instead of considering the recovery rates directly, we regress the logarithm of the repayments (*ln*(recov)) on the logarithm of the corresponding due debts (*ln*(due)). By considering logarithms, the value of the coefficient multiplying the due debts (for each class of creditors) can be interpreted as the elasticity of the recoveries to the due claims. Those elasticities provide information analogous to the recovery rates, and their value can be usefully considered to rank the classes of creditors, depending on how much they are repaid under bankruptcy (H4a, H4b). For each equation, the logarithm of the due amounts is multiplied by dummies accounting for the country of interest (Hungary (0/1), Poland (0/1), and Romania (0/1)). Thus, we obtain one specific ranking per country (see the values of α_5, α_6, α_7, in equation 1).

Finally, the other variables of the system, account for *i)* the weight of each class of creditors (in percentage of the total due claims), *ii)* the concentration of the claims (Herfindahl index), and *iii)* the other control variables (coverage rates, duration of the procedure, causes of default, firm's size (total assets in log), firm's age, limited liability, capital, sector, annual change in the GDP, corruption index).

Table 4 provides the estimates of the third stage of the 3SLS regression ("X" stands for the considered class of creditors). The second step of the 3SLS is provided in Appendix C.

The system weighted R square of the third stage of the 3SLS regression equals 76.6% (561 observations). Whatever the country, the 3SLS approach confirms hypothesis H4a but rejects hypothesis H4b. Precisely, in Hungary, Poland, and Romania, the elasticities of repayment (to the due debts) are all significant, and rank as follows (in decreasing order): 1) practitioners' claims, 2) private secured claims, 3) employees' claims, 4) public claims, 5) private junior claims. This ranking confirms that the private creditors who collateralized their claims (mainly the bankers) are relatively well protected under bankruptcy, and notably outrank the public claims. Following hypothesis H4a, we interpret this result as a sign that the post-socialist economies achieved to mimics the other European countries, especially in their capacity of protecting the secured private creditors, without deviations of priority that would favor the State eventually. Surprisingly, those private secured claims are even more protected than the social claims (middle ranked, before the State and the junior claims). This result (in contradiction with H4b) is interesting, as it does not reflect the rather high level of protection prevailing in some Western countries such as France (a country however characterized by a strong social protection system). On the contrary, Hungary, Poland, and Romania do not use their bankruptcy system to compensate their moderate level of social protection. To sum up, we accept H4a and reject H4b: namely, we find that bankruptcy systems in the post-transition period protect well the secured creditors (mainly bankers), whereas the protection of the social claims remains temperate. Last, we find that the bankruptcy practitioners are highly protected (they rank first). On the one hand, this gives the practitioners incentives to preserve the debtor's value (as they expect high level of payments at the end of the procedure). On the other hand, this might reflect that the bankruptcy procedures are quite expensive in Eastern Europe.[16]

Let us turn now to hypotheses H5a (rivalry effect) and H5b (ripple effect). Table 5 summarizes the estimates found on the 3SLS model. For each class of creditors, the rows and the columns respectively deal with the explained and the explanatory recoveries. The cells of indicates whether the estimated

[16] This last interpretation is rather supported by the figures shown in section 3: depending on the country and procedure, the average direct costs associated to every bankruptcy file lie between 30 000€ and 100 000€, which is higher than similar average figures computed by OSEO (2008) on France (5 000€), the United-Kingdom (21 000€), or Germany (47 000€). This specificity remains true, when comparing these costs to the total due claims.

coefficients are non-significant (*i.e.* no rivalry, nor ripple effects), negative (*i.e.* rivalry effects prevail), or positive (*i.e.* ripple effects prevail).

Table 5. Interactions between the classes of creditors (3SLS)

Explained variable / *Explanatory variable*	**Employees**	**State & public creditors**	**Secured private creditors**	**Bankruptcy practitioners**	**Private junior creditors**
Employees		Rivalry**	Non significant	Non significant	Rivalry*
State & public creditors	Rivalry*		Rivalry***	Non significant	Non significant
Secured private creditors	Non significant	Rivalry***		Non significant	Non significant
Bankruptcy practitioners	Ripple***	Ripple***	Ripple***		Ripple***
Private junior creditors	Rivalry***	Non significant	Non significant	Ripple**	

Note - The number of stars indicated coefficient respectively significant at the 10%, 5%, and 1% levels (|t| stat.).

Let us consider first the (explanatory) practitioners' recoveries (row 4 in Table 5). In all cases, those explain higher repayments for all the other classes of creditors. In other words, the way the practitioners manage the procedure generates positive externalities (ripple effects), and thus cannot be viewed as pure sunk costs. This result confirms the view of Lubben (2012) and Webb (1987). This feature is all the more noticeable that the bankruptcy system in transition economies is recent, and has reached maturity quite rapidly. One of the consequences is a greater level of efficiency.

Let us exclude now the practitioners from the analysis, and consider the other cells of Table 5. Interestingly enough, our estimates mainly find rivalry effects (six times) and one ripple effect only. This primer finding suggests that the bankruptcy procedures in Eastern Europe have successfully implemented a certain level of competition between the creditors. More precisely, we isolate three groups of claims that compete together (in both directions). First, we find significant rivalry between the employees and the State (both being part of the preferential claims). This feature mimics the other European market economies that usually split between the various types of preferential rights, depending on their economic nature, private (employees) or public (State). More interestingly, our results confirm that the secured private creditors and the public creditors compete together. This feature is of primer importance, as it reflects that the private banks (owing secured claims) are now in position to challenge the public interests. As suggested by the "Doing Business" reports (World Bank,

2013), the level of protection of the secured claims is one of the required conditions to attract foreign investors. Finally, we find a bi-directional rivalry effect between the junior creditors and the employees. Such symmetrical competition is rather surprising as both claimants rank oppositely in the APO: thus, one might have expected the junior creditors only to suffer from competition from the employees. However, such finding may be attributed to the fact that the junior claims are mainly composed of trade creditors. Some of them are in position to increase their recoveries (despite a low ranking) by retaining some goods that have not been paid in full. Such "retention rights" are usually attached to vending contracts under which property is transferred from the seller (creditor) to the buyer (debtor) only once the payment (on account) is full.

Overall, our findings confirm, first, that the bankruptcy procedures in Hungary, Poland, and Romania are now able to mimic the competition that normally prevails in the other Western European countries (Hypothesis H5a). Second, ripple effects (Hypothesis H5b) are more attributable to the presence of the bankruptcy practitioners.

Finally, some of our control variables are significant in Table 4. We notably find that the recoveries of each class of creditors are sensitive to the weights of the other classes of creditors (in percentage of the total due claims). Namely, the employees, the secured claims, and the practitioners recover more when the amounts due to the other classes of claimants are relatively higher. We find a reverse relation for the public claims and the junior claims. Few other control variable are found significant, with the exception of the coverage rate (that logically increases the creditors' recoveries), and of some causes of default (see column 5, Table 4). Last, we find that the DCPI index (accounting for the macroeconomic level of corruption) decreases (at the 10% level) the recoveries of the secured private creditors.

5. Robustness checks

We test the robustness of the OLS results using a TOBIT model. However, we replace the variables related to the part of the debt held by a class of claimants in the total debt with the logarithm of the amount of debt of the claimants' class. *HH* is also substituted with *CONC* as a measure of the debt concentration. The estimations of the regression are presented in Appendix D. We can observe that the econometric results sustain the same consistency of the hypotheses. Nevertheless, the presence of a residual status of the secured creditors (Residual Secured) and of the junior claimants does not have a significant impact on the recovery rate of the debt in the case of the full sample of our database. In the subsample associated with the liquidation procedure, the level of corruption has a negative impact on the recovery rate of the debt. The coefficient of *DCPI* is significant at 10%. Hence, corruption seems to affect the functioning of bankruptcy procedure in Eastern Europe.

Conclusion

Attractive bankruptcy law can promote foreign investments. For the post-socialist countries that underwent long phases of economic and judicial transition, an important aspect of their bankruptcy laws' attractiveness depends on their ability to generate substantial recoveries for the creditors. From that perspective, this paper tests for various hypotheses, encompassing questions that are essential to assess the performances of the Eastern European bankruptcy systems: are the national bankruptcy codes specific enough to influence the creditors' recoveries? Are such recoveries impacted by the presence of private creditors? Does the concentration of the creditors matter? How rank the public, the social, and the private (secured or not) claims in the priority order of repayment? How those classes of creditors compete together? To answer these questions, the analysis uses an original database of 561 closed bankruptcy cases in Hungary, Poland, and Romania. Those cases were triggered during the post-transition period of those countries.

We first find that the Hungarian bankruptcy system generate lower recoveries. We relate this result to the fact that Hungary followed a more progressive path of reforms from 1991. Additionally, the bankruptcy practitioners are partially paid *ex-ante* in Hungary, thus lowering the incentives to manage efficiently the procedure. Overall, the eastern European bankruptcy laws have distinct impacts on the recovery rates. We also propose an innovative methodology of identifying the residual claimants of a bankruptcy process. Our methodology supposes to apply the absolute priority order of the national

bankruptcy law on the value of firms' assets at the beginning of the procedure in order to compute the potential value that a class of claimants can receive. The results show that the presence of junior claimants and bankruptcy practitioners (with a residual status) increases significantly the total recovery rate. At the opposite, the total recoveries do not benefit from the presence of the State, the employees, nor the secured creditors. This might reflect some passivity from those classes of creditors. Beside the presence of some classes of creditors, we also investigate the impact of their relative concentration. We find that a higher concentration of the claims decreases the total recovery rates produced by the liquidation procedure, *i.e.* despite an easier coordination, large creditors might exert influence on the procedure, following their private interests.

When considering the recovery rates per class of creditors, we find that the Hungarian, the Polish, and the Romanian bankruptcy systems provide stronger protection of the private secured claims than the public ones. As a consequence, the post-socialist economies mimic the prioritization of secured creditors that characterizes most of the Western European bankruptcy systems. We also suggest that bankruptcy procedures are likely to engender two opposite interactions effects between the classes of claimholders. On the one hand, “ripple effects” characterize situations under which any increase in the recovery rate of a certain class of claimants produces an increase in the recovery rate of a different class of claimants. On the second hand, “rivalry effects” imply that any increase in the amount recovered by one class of creditors harms the amount recovered by a different class. Our estimations reveal both types of effects. First, we find signs of ripple effects on all three countries, from the bankruptcy practitioners to the other classes of claimants. Precisely, the creditors, whatever they type, benefit from the payment of bankruptcy costs, which cannot be viewed as mere sunk costs. Second, we detect three rivalry effects: (1) from the social claims to the public claims, (2) from private secured claims to the public claims, and (3) between the junior and the social claims. The presence of such rivalries confirms that the contemporary Eastern European bankruptcy systems achieved a certain level of maturity, by being able to implement competition between the various claimholders. Such competition is a way to implement incentives that should serve efficiency eventually. The next step for research is to link those bankruptcy performances with development and regional attractiveness.

Appendix A. Bankruptcy laws in Eastern Europe

Appendix A1. Bankruptcy act of Hungary

The Hungarian bankruptcy procedures are governed by the act XLIX of 1991 on bankruptcy proceedings and liquidation proceedings. Although the Hungarian law was adopted in 1991, the law suffered progressive modifications. A bankruptcy petition can be filed at the county court by the debtor or by the creditor. The employees and the creditors must be informed if the debtor submits a bankruptcy petition. The court's approval of the bankruptcy petition is followed by the appointment of an administrator from the national register of liquidators. An administrator must monitor the debtor's activity and protect the creditors' interests. Moreover, a stay of payment can be imposed for a period of ninety-days (moratorium). The objective of the stay of payment is to preserve the debtor's assets and to provide a possibility of reaching an agreement with creditors. Nevertheless, the stay of payment does not apply to the employees' wages and to the public claims such as taxes or social insurance contributions. If the bankruptcy petition is filed by creditors, the moratorium is not enforced.

After the notification of creditors of the bankruptcy proceedings opening, creditors must register their claims. The registrations of creditors' claims are subject to a registration tax amounting to 1% of the claim value. The registration tax has a minimum value threshold of 5000 forints and a maximum amount of 100000 forints.[17] Administrator's expenses are covered from the registration taxes. Registered claimants can constitute a creditors' committee for the purpose of protecting their claims and monitoring the activities of the administrator or the liquidator.

Debtor has two bankruptcy procedures that can be used for the settlement of the creditors' claims: a composition agreement (Csődeljárás) or a liquidation procedure (Felszámolási eljárás). In case of a composition agreement, debtor has to prepare a restructuring plan or an arrangement proposal aimed to restore the debtor's solvency. Creditors decide the acceptance of the agreement that can also include an extension of the moratorium. If the composition agreement is not signed by the parties, the court declares the debtor as insolvent and orders the opening of a liquidation procedure. Hence, the administrator's duties are taken over by a liquidator.

[17] 5000 forints are approximately 16 euros and 100000 forints are 327 euros.

A liquidation petition can be filed by debtor or creditors. The liquidation procedure can also be opened after the failing of a composition agreement. The court examines the debtor's insolvency. In general, the court considers a debtor as insolvent if the value of the debtor's assets is insufficient to satisfy the amount of its liabilities. If the petition is filed by creditors, the court verifies the existence of the conditions stated in the petition. A liquidation petition will be dismissed by the court in absence of any proofs of the debtor's insolvency. If the debtor is insolvent, the liquidation procedure is opened and a liquidator is appointed by the court using a random electronic selection system. The legal feature of liquidators' selection was introduced in 2010 at the request of judges and liquidators. Furthermore, the liquidator has to sell the debtor's assets through public sales. At the end of the liquidation procedure, the liquidator prepares the closing report for the court, the report of the liquidation revenues and expenditures and a proposal of the distribution of debtor's assets. The priority order of debts satisfaction is the following: claims of secured creditors after the deduction of the costs related to the collateral such as maintenance costs and costs of the sale of the pledged asset (1), bankruptcy costs and employees' claims (2), claims secured up to the remaining value of the pledged property (3), alimony and life-annuity payments (4), claims of small and micro firms (5), taxes and social insurance debts (6), other claims (6), defaults interests and debt penalties (7) and claims of the shareholders (8). Nevertheless, debtor can propose a composition agreement to creditors at any moment during the liquidation procedure.

Appendix A2. Bankruptcy law of Poland

The Polish law on bankruptcy and reorganization was adopted in 2003 as a prerequisite of the 2004 European Union integration. According to the Polish law, the debtor must submit the bankruptcy petitions at the commercial court of the regional district. The law states that a bankruptcy petition must be rejected by the court if the value of the debtor's assets does not cover the costs of the bankruptcy procedure. If the debtor's financial situation respects the filter criterion, three bankruptcy procedures are available in the law: a winding-up procedure, an insolvency arrangement procedure (*Upadlosc z mozliwoscia zawarcia ukladu*) and a reorganization procedure (*Postepowanie naprawcze*). Following the bankruptcy petition, the court appoints a judge commissioner responsible for the execution of the bankruptcy procedure and the control of the documents issued by the practitioner, *i.e.* liquidator or court's supervisor.

If the winding-up procedure emerges, a liquidator appointed by the court prepares an inventory and an estimation of the debtor's assets. The liquidator's documents must be sent to the judge commissioner. Debtor's assets are sold entirely or partially. The liquidator distributes the obtained monetary value to creditors in respect to the priority rule of the law. Firstly, the bankruptcy costs, the employees' claims and the farmers' claims (1) are satisfied.[18] Secondly, the taxes and other public financial obligations (2) are satisfied if the category (1) was fully covered. Thirdly, the liquidator uses the remaining value to satisfy the claims associated to interests due in the year prior to the bankruptcy petition (3). Fourthly, the last claims that are satisfied are the other claims not included in the other categories, the judicial and the administrative fines (4). If an asset of the debtor is the object of a mortgage or other type of collateral, the amounts received from its sale are separately distributed. A maximum amount of 10% of the collateral value is used to cover the bankruptcy costs. The employees' are also entitled to a maximum value of three legal minimum wages. Finally, the remaining amount is distributed to secured creditors.

An insolvency arrangement procedure is a bankruptcy procedure that can be imposed by the court if the arrangement is more likely to provide higher recovery of creditors' debt compared to a winding-up procedure. The proposal of arrangement can be made by the debtor or the court's supervisor. In the absence of any proposals of the debtor, he is replaced by a receiver that can propose an arrangement. The judge commissioner summons a meeting of creditors that have to decide the acceptance of the arrangement proposal. An arrangement must define the restructuration of the debtor's assets. However, the arrangement does not have legal effects on the employees' claims and claims of the secured creditors. If the arrangement is not approved by creditors or confirmed by the court, the winding-up procedure overcomes the insolvency arrangement procedure.

The reorganization procedure represents an out-of-court proceeding addressed to debtors that are threatened by insolvency. A debtor for whom the delay of the payment obligations does not exceed three months and the amount of the unpaid obligations is less than 10% of the debtor's assets can also apply for the reorganization procedure. The main advantage of the opening of a reorganization procedure is the suspension of the payment of debtor's debts and interests until the confirmation of the

[18]Since May 2009, the priority rule of the Polish bankruptcy law was modified. The category (1) was divided into two categories. The liquidation values are first used to cover the category of the bankruptcy costs. After the full payment of the bankruptcy costs, the second category that is satisfied is the category of employee's claims and farmers' claims. The priority of the other categories holds.

reorganization plan. In this procedure, the reorganization plan is voted by the creditors. The plan must improve the debtor's competition abilities in the market. Measures of debt and assets restructuration can also be included in the plan. If the plan accepted by creditors is approved by the court, a court's supervisor is appointed to verify the plan's implementation. The debtor continues to administrate the firm under the observation of the court's supervisor. Nevertheless, the court can terminate the reorganization procedure if the debtor refuses to adopt the measures of the plan.

Appendix A3. Bankruptcy law in Romania

As Poland, Romania adopted a new bankruptcy law in 2006, a year prior the 2007 European Union integration. The Romanian bankruptcy law number 86/2006 defines two main bankruptcy procedures: the general procedure and the simplified procedure. The general procedure offers the possibility of directing the debtor's business into a judicial reorganization (Reorganizare judiciara) or into a liquidation procedure (Procedura falimentului). The simplified procedure introduces directly the debtor into a liquidation procedure. Creditors and debtor have to submit a bankruptcy request at the bankruptcy section of the court or at the commercial court. A bankruptcy request of debtor embodies the debtor's intention in favor of a simplified or a general procedure. Nevertheless, creditors can file a request only if the value of their claims is superior to 45000 lei or at least 6 average gross wages in case of employees.[19]

The judge opens the general procedure if the debtor is insolvent. A debtor is treated as insolvent if the payment of the debts has a delay longer than 90 days due to insufficient funds. After the confirmation of the general procedure, debtor is subject to an observation period. An administrator is also appointed by the judge. The administrator examines the debtor's economic situation and prepares a report for the judge in which he proposes the opening of a simplified procedure or the continuation of the observation procedure. Creditors are notified by the administrator for the registration and verification of their claims. A reorganization plan can be formulated during the observation period by the administrator, creditors that hold at least 20% of the total claims or debtor that expressed a reorganization intention in the bankruptcy request. The plan can include restructuration measures of the debtor's activity and the liquidation of certain assets. If the judge confirms the reorganization plan voted by claimants, the observation period terminates and debtor can continue to manage the business under the surveillance of the administrator. In absence of a confirmed plan, the liquidation procedure is opened against the debtor.

[19] 45000 lei are approximately 10200 euros.

In the liquidation procedure, debtor loses the administration right of the business. A liquidator is appointed to notify the creditors and to verify the content of each claim. An inventory is conducted by the liquidator to identify the debtor's assets. The liquidator can sell the assets under the control of the judge. The amount obtained is used to satisfy the claims in the following order: claims of secured creditors that arose before and during the procedure and the bankruptcy costs associated to the preservation of the pledged asset (1), bankruptcy costs (2), claims of employees (3), claims of contract credits signed after the opening of the procedure (4), public claims (5), alimonies (6), claims established by the judge for the survival of the debtor's family (7), claims from deliveries and services (8), other unsecured claims (9) and shareholder's claims. A bankruptcy procedure can be terminated by the judge if the assets are lacking or are insufficient to cover the bankruptcy costs. If a creditor is willing to satisfy the uncovered costs, the procedure can continue.

Appendix A4. Constitution of claimants' classes using the national bankruptcy law

Class of creditors	Hungary (HU)	Poland (PL)[20]	Romania (RO)
Employees	Section 57.1.a)	Art. 342. I	Art. 123.2
State	Section 57.1.e)	Art. 342. II	Art. 123.4
Secured claimants	Section 57.1.b) + Section 49/D	Art. 335-345	Art 121 1') + Art. 123.3
Practitioners' fees	Section 57.1.a)	In the bankruptcy case	Art. 123. 1) + Art. 121.1)
Junior Claimants	Section 57.1. c),d),f)-h)	Art. 342. III-IV	Art. 123. 6)-9)

[20] If we consider the 2009 modification of the Polish law, the priority of the class of employees is governed by the article 342. II, the priority of state by the article 342. III whereas the priority of junior claimants by the article 342. IV-V.

Appendix B. Definition of variables

Variable	Definition
A. Recovery rate of the debt	
Recovery rate	Ratio between the amount recovered by claimants at the end of the bankruptcy procedure and the value of total debt.
Recovery rate of Employees	Amount recovered by the class of employees divided by the employees' debt value.
Recovery rate of State	Amount recovered by the public authorities divided by the debt value of the public authorities.
Recovery rate of Secured	Amount recovered by the class of secured claimants divided by the secured claimants' debt value.
Recovery rate of Practitioner	Amount recovered by the practitioner of the bankruptcy case divided by the claim due to the practitioner.
Recovery rate of Junior	Amount recovered by the class of junior claimants divided by the total value of the junior claims.
Log(Recovery of Employees)	Logarithm of the amount recovered by the employees' class.
Log(Recovery of State)	Logarithm of the amount recovered by the public authorities.
Log(Recovery of Secured)	Logarithm of the amount recovered by the secured claimants.
Log(Recovery of Practitioner)	Logarithm of the amount recovered by the practitioner.
Log(Recovery of Junior)	Logarithm of the amount recovered by the junior claimants.
B. Countries' identification variables	
HU, PL, RO	Dummy variable equal to 1 if the bankruptcy case was treated in Hungary (HU), Poland (PL) or Romania (RO).
C. Variables of the residual claimants	
Residual Employees	Dummy variable equals 1 if the class of employees has a positive due claim and an expected theoretical recovery rate of the debt strictly superior to 0.[21]
Residual State	Dummy variable that considers the residual position of public claims.
Residual Secured	Dummy variable equal to 1 if the class of secured creditors have a positive due claim and an expected theoretical recovery rate strictly superior to 0.
Residual Practitioner	Dummy variable that considers the residual position of the class associated to the practitioner's fees.
Residual Junior	Dummy variable that identifies the residual position of the junior claimants.
D. Variables of the total debt distribution among classes	
Weight of Employees	Ratio between the debt value of employees and the total debt value.
Weight of State	Ratio between the debt value of public authorities and the total debt value.

[21] The expected theoretical recovery rate of a debt is the ratio between the expected theoretical payment of the debt and the total value of the debt. In the case of a certain claimants' class, the expected theoretical payment of the class's debt is established using the firm's assets value at the date of the bankruptcy triggering and the absolute priority rule as explained by the bankruptcy law of the country in which the bankruptcy petition was filled.

Weight of Secured	Ratio between the debt value of the secured claimants and the total debt value.
Weight of Practitioner	Ratio between the practitioner's fees and the total debt value.
Weight of Junior	Ratio between the debt value of the junior claimants and the total debt value.
E. Variables of the total debt concentration	
HH	Herfindahl-Hirschmann index. HH = (Weight of Employees)² + (Weight of State)² + (Weight of Secured)² + (Weight of Practitioner)² + (Weight of Junior)²
CONC	Maximum value between Weight of Employees, Weight of State, Weight of Secured, Weight of Practitioner and Weight of Junior.
F. Control Variables	
Causes of default	Dummy variables that identify the causes of the firm's defaults. The default's causes are classified such as:
Strategy	Inexperience firm, Voluntary dissolution, Failure of important projects (partnerships, investments, reorganizations), Voluntary acceptance of little profitable markets
Production	Overinvestment, Assets' depreciation, Higher operating costs, Higher wages expenses, Disappearance of firm's suppliers, Obsolete production process, Under-investment
Finance	Longer delays on accounts receivable, Contagion/reported losses from subsidiaries, Shorter delays n accounts payables, Firm's bad speculation (Exchange rates fluctuation), Lack of financial support from the holding, Lack of equity (compared to leverage/ liabilities), Loan refusal to the firm, Reduction of public subventions, Excessive interest rates of contracts
Management	Weak accounts reporting, Problems of competence, Conflicts among the managers, Excessive takings from the managers, Insufficient provisions, Lack of knowledge on the real level of costs of returns, Bad evaluation of the inventory, Problems of transmission of the firm/difficulties in restructuring
Accident	Swindle/embezzlements affecting the firm, Another bankruptcy procedure is extended to the firm, Conflicts with public partners, Conflicts with private partners, Death/ disease/ disappearance of the manager, Disaster, Social problems within the firm
Outlets	Brutal disappearance of customers, Customers in default, Expensive products, Bad evaluation of the market, Cheap products, Unsuitable products, Obsolete products, Loss of market shares
Macroeconomic	Unfavorable exchanges rates fluctuation, Increase of the competition, Decreasing demand to the sector, ''Force majeure'' (war, natural catastrophe, industrial crisis, bad price evolution), Public policy less favorable to the firm's sector, Credit crunch period, Excessive macroeconomic interest rates, Macroeconomic increase of operating costs (raw materials...)
Others	Any other cause not related to the previous causes.

Coverage rate	Ratio between the market value of the firm's assets at the date of the bankruptcy triggering and the total value of the debt.
Assets	Logarithm of the market value of the firm's assets at the date of the bankruptcy triggering
Age	Logarithm of the firm's age in years at the moment of the bankruptcy triggering.
LTD	Dummy variable equals 1 if the firm is a limited liability firm, 0 otherwise.
Capital	Dummy variable equal to 1 if the firm's activity is conducted in the capital of the country, *i.e.* Budapest, Bucharest or Warsaw.
Sector of activity	Dummy variables that identify the firm's activity sector, *i.e.* Services, Manufacture or Trade.
DGDP	Annual change of the national gross domestic product (GDP). Source: World Bank
DCPI	Annual change of the corruption perception index (CPI). The CPI is an index that assesses the corruption level of the public sector on a scale from 0 (highly corrupt) to 100 (very clean public sector). Source: Transparency international.

Appendix C. Two-stage least squares of the equations system

Dependent variable:	**Log (Recovery of Employees)** {X}=EMPLOYEES	**Log (Recovery of State)** {X}=STATE	**Log (Recovery of Secured)** {X}=SECURED	**Log (Recovery of Practitioner)** {X}=PRACT	**Log (Recovery of Junior)** {X}=JUNIOR
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Log (Debt of {X}) x RO	0.605***	0.274***	0.643***	0.814***	–0.028
	(0.000)	(0.000)	(0.000)	(0.000)	(0.692)
Log (Debt of {X}) x PL	0.667***	0.360***	0.815***	0.871***	0.118
	(0.000)	(0.000)	(0.000)	(0.000)	(0.108)
Log (Debt of {X}) x HU	0.502	0.088**	0.561***	0.687***	–0.030
	(0.553)	(0.026)	(0.000)	(0.000)	(0.629)
Log (Recovery of Employees)		–0.169**	–0.089	0.005	–0.251**
		(0.042)	(0.386)	(0.914)	(0.024)
Log (Recovery of State)	–0.114		–0.442***	0.006	–0.138
	(0.181)		(0.001)	(0.920)	(0.393)
Log (Recovery of Secured)	–0.022	–0.145**		–0.026	–0.040
	(0.609)	(0.011)		(0.401)	(0.649)
Log (Recovery of Practitioner)	0.114	0.023	0.085		0.273**
	(0.122)	(0.792)	(0.471)		(0.011)
Log (Recovery of Junior)	–0.062	0.072	–0.172	0.072	
	(0.506)	(0.553)	(0.305)	(0.318)	
Weight of Employees		–1.173	–0.011	0.329	–2.613**
		(0.122)	(0.990)	(0.464)	(0.011)
Weight of State	2.262***		2.286***	0.112	–0.456
	(0.000)		(0.000)	(0.658)	(0.280)
Weight of Secured	1.748***	–0.215		–0.006	–1.283**
	(0.004)	(0.555)		(0.981)	(0.011)
Weight of Practitioner	2.190***	–0.249	2.135***		–1.285*
	(0.001)	(0.618)	(0.000)		(0.073)
Weight of Junior	2.160***	–0.033	1.743***	0.057**	
	(0.000)	(0.889)	(0.000)	(0.808)	
HH	0.064	–0.470	0.033	–0.032	0.560
	(0.777)	(0.141)	(0.922)	(0.843)	(0.174)
Cause: Strategy	–0.003	0.168	–0.160	–0.037	0.674***
	(0.980)	(0.239)	(0.312)	(0.630)	(0.001)
Cause: Production	–0.074	–0.158	0.016	0.014	–0.276*
	(0.399)	(0.165)	(0.902)	(0.812)	(0.076)

Cause: Finance	0.057	0.107	–0.078	0.046	0.227
	(0.527)	(0.358)	(0.553)	(0.462)	(0.157)
Cause: Management	0.112	0.099	–0.047	0.049	0.220
	(0.243)	(0.423)	(0.732)	(0.455)	(0.193)
Cause: Accident	0.066	–0.064	–0.052	–0.075	–0.070
	(0.457)	(0.575)	(0.686)	(0.220)	(0.655)
Cause: Outlets	0.057	0.138	0.098	0.114*	0.266*
	(0.521)	(0.223)	(0.441)	(0.061)	(0.087)
Cause: Macroeconomic	0.102	0.033	–0.117	0.075	–0.036
	(0.242)	(0.770)	(0.350)	(0.210)	(0.810)
Coverage rate	0.010	0.154**	–0.122	–0.011	0.226**
	(0.848)	(0.022)	(0.102)	(0.753)	(0.013)
Assets	0.034	0.167***	0.356***	0.128***	0.187***
	(0.193)	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.050	0.074	–0.030	–0.014	0.133
	(0.430)	(0.360)	(0.739)	(0.744)	(0.229)
LTD	–0.064	–0.176	0.148	0.036	–0.096
	(0.639)	(0.323)	(0.456)	(0.709)	(0.695)
Capital	–0.045	0.109	0.110	–0.030	0.041
	(0.603)	(0.342)	(0.382)	(0.623)	(0.790)
Sector: Services	0.030	0.138	–0.018	–0.101	0.029
	(0.758)	(0.278)	(0.897)	(0.137)	(0.867)
Sector: Manufacture	–0.085	–0.171	–0.098	–0.073	–0.092
	(0.343)	(0.138)	(0.447)	(0.239)	(0.556)
DGDP	0.004	0.021	–0.003	0.003	0.013
	(0.647)	(0.102)	(0.833)	(0.711)	(0.451)
DCPI	–1.034	–0.043	–1.456	–0.139	–0.779
	(0.343)	(0.966)	(0.184)	(0.789)	(0.570)
Constant	–2.424***	–0.180	–2.376***	–0.255	–0.631
	(0.000)	(0.687)	(0.000)	(0.355)	(0.312)
Adjusted R^2	0.630	0.339	0.735	0.900	0.303

Notes: The coefficients reported are the estimated coefficients of the 2SLS (two-stage least squares) regressions. In column (1), the variable Log (Debt of {X}) x RO is the product between the variable RO and the variable Log (Debt of Employees) given that {X} is equal to Employees. In column (2), the variable Log (Debt of {X}) x PL is the product between the variable PL and the variable Log (Debt of State) given that {X} is equal to State. The number of observations is 561. The observations are weighted with the average percentage of liquidation or reorganization cases in the national number of bankruptcy cases. The numbers in parentheses are the *p*-values. *** implies that the coefficient is significant at 1% level, ** at 5% level and * at 10% level.

Appendix D. Robustness test

	Liquidation (1)	Reorganization (2)	Overall (3)	Subsample (4)
RO	0.048**	0.185	0.054**	
	(0.036)	(0.101)	(0.012)	
PL	0.052*		0.066**	
	(0.079)		(0.020)	
Residual Employees	0.021	–0.102	0.018	0.019
	(0.466)	(0.226)	(0.523)	(0.516)
Residual State	–0.006	–0.051	–0.005	0.001
	(0.769)	(0.610)	(0.796)	(0.958)
Residual Secured	–0.001	–0.036	0.002	0.044
	(0.972)	(0.804)	(0.965)	(0.337)
Residual Practitioner	0.062**	0.149	0.054**	0.047
	(0.028)	(0.321)	(0.040)	(0.168)
Residual Junior	–0.013	0.204**	–0.009	–0.015
	(0.519)	(0.033)	(0.657)	(0.522)
Log (Debt of Employees)	–0.013*	0.013	–0.014*	–0.015**
	(0.070)	(0.577)	(0.055)	(0.048)
Log (Debt of State)	–0.021***	0.034*	–0.020***	–0.020***
	(0.000)	(0.075)	(0.000)	(0.000)
Log (Debt of Secured)	–0.010	–0.001	–0.011*	–0.011
	(0.106)	(0.973)	(0.068)	(0.110)
Log (Debt of Practitioner)	0.042***	0.013	0.039***	0.050***
	(0.000)	(0.732)	(0.000)	(0.000)
CONC	–0.357***	0.125	–0.353***	–0.348***
	(0.000)	(0.553)	(0.000)	(0.000)
Cause: Strategy	0.034	–0.062	0.033	0.050*
	(0.145)	(0.684)	(0.137)	(0.058)
Cause: Production	–0.003	–0.005	0.003	–0.004
	(0.876)	(0.940)	(0.868)	(0.858)
Cause: Finance	–0.014	–0.015	–0.015	–0.022
	(0.465)	(0.832)	(0.410)	(0.289)
Cause: Management	0.001	0.046	0.001	–0.022
	(0.957)	(0.596)	(0.957)	(0.343)
Cause: Accident	0.003	0.074	0.006	–0.021
	(0.870)	(0.306)	(0.714)	(0.339)
Cause: Outlets	0.033*	0.056	0.036**	0.017
	(0.077)	(0.425)	(0.041)	(0.428)
Cause: Macroeconomic	–0.022	–0.012	–0.018	–0.032

	(0.235)	(0.883)	(0.288)	(0.144)
Coverage rate	0.155***	0.076***	0.154***	0.156***
	(0.000)	(0.001)	(0.000)	(0.000)
Assets	0.009	–0.067**	0.012*	0.009
	(0.163)	(0.039)	(0.064)	(0.259)
Age	0.007	–0.143**	0.006	0.008
	(0.585)	(0.014)	(0.611)	(0.559)
LTD	0.050*	–0.123	0.044	0.128***
	(0.083)	(0.208)	(0.109)	(0.001)
Capital	–0.006	0.012	–0.003	0.003
	(0.734)	(0.882)	(0.917)	(0.888)
Sector: Services	–0.010	0.134	–0.007	–0.008
	(0.627)	(0.142)	(0.708)	(0.762)
Sector: Manufacture	–0.021	0.126	–0.020	–0.042**
	(0.241)	(0.160)	(0.254)	(0.049)
DGDP	0.002	–0.001	0.002	0.007***
	(0.293)	(0.946)	(0.259)	(0.006)
DCPI	–0.301*	–0.795	–0.378**	–0.483***
	(0.076)	(0.204)	(0.018)	(0.009)
Constant	0.208***	0.716*	0.208***	0.182**
	(0.002)	(0.009)	(0.001)	(0.026)
Number of observations	477	84	561	403
Log Likelihood	159.711	0.427	172.630	103.973
Mean of dependent variable	0.214	0.650	0.215	0.259

Notes: The coefficients are estimated using the Tobit model. The dependent variable is the recovery rate of the total debt. Log (Debt of Employees) is the logarithm of the total debt of employees. Log (Debt of State) is the logarithm of the public claims' value. Log (Debt of Secured) is the logarithm of the secured creditors' debt. Log (Debt of Practitioner) is the logarithm of the practitioner's fees. The other explanatory variables are presented in Appendix B. Column (1) presents the estimated coefficients of the subsample of the liquidation cases, column (2) of the subsample of the reorganization cases, column (3) of the full sample whereas column (4) of the subsample of Romanian and Polish bankruptcy cases. The full sample of column (3) and the subsample of column (4) is weighted with the average percentage of liquidation or reorganization cases in the national number of bankruptcy cases. The numbers in parentheses are the *p*-values. *** implies that the coefficient is significant at 1% level, ** at 5% level and * at 10% level.

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