

# How do bankruptcy systems perform in Eastern Europe?

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## **Abstract**

For post-socialist countries that have undertaken long phases of economic and judicial transitions, an important aspect of attractiveness is based on the performances of their bankruptcy systems. Those performances are all the more essential in a context of non-mature capital markets. Precisely, bankruptcy procedures should, first generate substantial recoveries for the whole set of investors, and second share those recoveries in an adequate way – *e.g.* in a way that improves the investors’ individual incentives (in terms of monitoring, control, support, etc.).

This article uses an original hand-collected database of 554 closed bankruptcy cases in three Eastern European countries (Hungary, Poland, and Romania) to evaluate the determinants of bankruptcy systems’ performances during the post-transition era (from year 2003 to 2010/11). In particular, we investigate whether the specificities of these local bankruptcy environments are significant enough to influence the creditors’ total recoveries. We also wonder whether those recoveries are impacted by the presence of private/public creditors and/or the concentration of their claims. This paper goes beyond a mere analysis of the creditors’ overall repayment, by focusing on the competition effects between them. Implementing competition is actually a core issue for post-transition economies, which have to mimic rivalry effects that usually prevail in more mature market economies. Precisely, we measure the priority order of repayment among competing classes of creditors (public, social, and private claims) and investigate the nature of competition (rivalry *vs.* ripple effects) among these classes.

(1) We first confirm that the design of bankruptcy law “matters”: the creditors’ repayment is not independent from the type of bankruptcy procedure, and depends on the national environment in which such procedure is engaged. (2) On all three countries, the total recoveries do not benefit from the presence of public claimholders, even when those are in position of being residual claimants. Following Satjer (2010), this result suggests some passivity from the state, which has lost bargaining power under bankruptcy. On the contrary, the private claimholders exert a contrasting influence on total recoveries: positive for the junior ones (more involved under bankruptcy, to compensate their lack of protection), and negative for the secured ones (confirming the “lazy argument” attached to collaterals). (3) We also find that repayments are lower when the claims are concentrated: despite easier coordination, concentration may generate excessive influence from the largest creditors, willing to run bankruptcy adjudication in their sole interests. (4) We show that the Eastern European bankruptcy systems provide stronger protection for private secured claims than for public claims. From that angle, the post-socialist economies mimic the prioritization of secured creditors that characterizes most Western European bankruptcy systems. (5) Last, we confirm that Eastern European bankruptcy systems have successfully implemented competition among the classes of creditors, which we interpret as a sign of maturity.

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## Introduction

In a market economy, bankruptcy provides a valuable set of tools to help distinguish profitable from non-profitable projects. However, at the country level, the design of bankruptcy extends beyond this sole function by reflecting the ability of national institutions to protect (more or less) the claims of domestic, foreign, private, or public investors. From that perspective, bankruptcy law plays a fundamental role in the attractiveness of the national business environment. For Eastern European countries, the quality of this environment is fundamental to attracting capital, which is all the more important for those post-transition economies that eventually integrated into the European Union, such as 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 by their ability to design and foster an attractive business environment (“ease of doing business”), which includes bankruptcy law (“resolving insolvency”). The latest Doing Business report (World Bank, 2013) shows a high discrepancy within Eastern Europe: Poland is ranked 37<sup>th</sup>, Hungary 70<sup>th</sup>, and Romania 102<sup>nd</sup>. One of the benefits of the World Bank’s approach is to provide recurrent and comparable indicators for countries that differ regarding the design of their institutions. However, the manner in which the Doing Business report measures bankruptcy attractiveness has limitations because the three indicators used in this ranking (time, costs, and recoveries) mainly rely on rules of thumb. The recovery rates are assessed by local experts who are asked to evaluate the likely figures in a case study (a restaurant with 201 employees and 50 suppliers that is financed by one bank), but there is no guarantee that such profile adequately represents the companies operating within each country. In fact, bankruptcy analyses require empirical research based on real data that is extracted from real cases as they are managed by the bankruptcy courts. However, the question remains as to what variables should be considered when assessing the attractiveness of bankruptcy.

Hart (2006) provides an extensive analysis of the main functions of bankruptcy laws. He explains, in particular, that the main objective of bankruptcy is to maximize the value of the bankrupt firms to be divided between the various claimholders. Following Hart’s lead, Blazy *et al.* (2013) propose legal indexes that measure the attractiveness of bankruptcy. These indicators reflect the main functions identified by Hart (2006): coordination of creditors, disclosure of public information, the ability of the bankruptcy procedures to protect both the debtor’s assets and creditors’ claims, etc. All these functions are

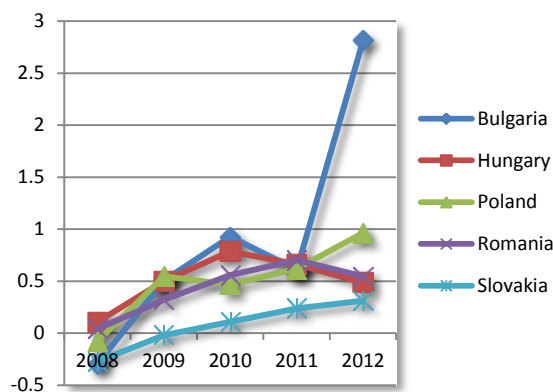
expected to differ from one country to another, with strong implications for efficiency. First, the design of bankruptcy has *ex-ante* effects on efficiency by influencing firms' capital structure (Stiglitz, 1974, Harris and Raviv, 1991), the ease of obtaining credit (Cornelli and Felli, 1997), and the design of lending contracts (Jappelli *et al.*, 2005). Second, bankruptcy procedures must be *ex-post* efficient by offering a legal framework that can maximize the debtor's value and prevent anarchic runs by creditors (Baird, 1986 and 1991).

Until now, numerous academic studies have been published on bankruptcy in developed economies. One of the most studied countries are the U.S.A., particularly with respect to the design of Chapter 11, which addresses corporate reorganizations (Bris *et al.*, 2006, Franks J.R., Torous, 1994, Delaney, 1992), and regarding the topical effects of §363 preplan sales (Radulović, 2008). More recent empirical studies have been published on bankruptcy in Western Europe; most of these are focused on recovery rates in countries such as the U.K. (Armour *et al.*, 2008), Germany (Grunert and Weber, 2009), France (Blazy *et al.*, 2013), Finland (Sundgren, 1998), etc. Unfortunately, there are only a few comparable studies on post-socialist countries; such studies that do exist typically investigate the extent to which those countries have developed institutions (including bankruptcy laws) that were able to attract investors by implementing managerial discipline while their financial markets were developing (Mitchell, 1990). During the early stages of the transition process, bankruptcy law settled on sanction mechanisms that usefully compensated wider managerial autonomy (Legros and Mitchell, 1995). In addition, as quoted by Korobkin (1991), by protecting bankrupt firms' employees, bankruptcy was an effective way for Eastern European economies to relieve weak social protection systems. More generally, on the transition path, bankruptcy law is a market mechanism allocating property rights to (private) firms' stakeholders (Coase, 1960) that might encompass trade creditors, banks, and the local and foreign capital owners.

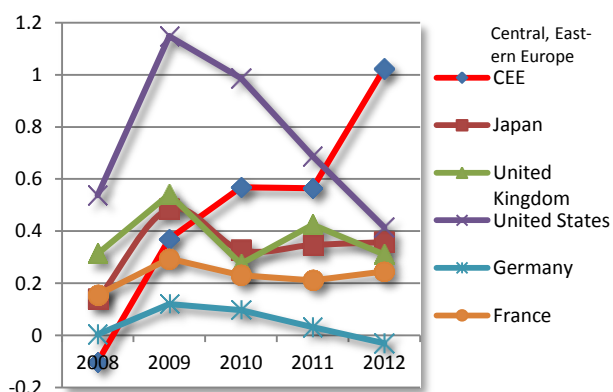
The previous arguments apply primarily to earlier transition times, when the foremost challenge was to transfer the means of production from the public to the private sector. In Romania, for example, this process took the form of mass privatization programs aimed at everyone from local households to foreign investors (Earle and Telegdy, 2002). In such contexts, bankruptcies remained rather scarce as agents' habits continued to be influenced by "soft budget" constraints (Kim, 1996). In practice, bankrupt firms were frequently saved because of state intervention; in such contexts, creditors had little incentive to trigger bankruptcy (Begg and Portes, 1993).

Now, however, this initial phase of the transition process is over for most Eastern European countries, which now must face the new challenges of the post-transition era, which is clearly the case for Poland, Hungary, and Romania, our countries of interest, that have sufficiently developed bankruptcy infrastructures to make them more attractive. In addition, Moore (2009) has shown that the rescues of bankrupt firms by the state have dramatically fallen during the post-transition phase, whereas the number of bankruptcy cases initiated has risen since the second half of the first decade of this century (Graphs 1a and 1b). Such increases (particularly in Hungary and to a lesser extent in Poland and Romania) exceed the increase observed in the U.S.A., Western Europe (France and Germany), and Japan during the same period. This evolution might be explained in several ways. First, the financial crisis of 2008 might have led to more failures in the post-transition economies, as they are characterized by more recent market structures, and those effects were amplified by the European sovereign debt crisis that began in 2010. Second, the increase in the number of bankruptcies initiated might also reveal that agents are now less reluctant to trigger, use, and take advantage of bankruptcy procedures.

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



Sources: Coface<sup>®</sup> Bulgaria, Hungary and Poland  
Slovak Credit Bureau<sup>®</sup>, UNPIR<sup>®</sup> Romania



Sources: Altares<sup>®</sup>, United States Courts, Insolvency Service<sup>®</sup>  
Masashi Takahashi/Kojima Law Office<sup>®</sup>

Obviously, in the post-transition economies, because (private) agents are now more attracted by the specific environment provided by bankruptcy procedures, they should be expected to take a more active part to resolve financial distress. On the contrary, public creditors (whose position in the financing of firms has declined) may not have such incentives. As Satjer (2010) posits with respect to Croatia: *“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 filings in Eastern European countries require further investigation. Several papers offer elements of the answer, but the picture remains incomplete. One explanation relies on the post-transition economies' level of development. Hashi (1995) interprets such increases as a consequence of the moderately developed capital markets in Eastern Europe. Typically, the capital markets provide adequate sanctions for non-profitable firms by dropping their share values. As a substitute, bankruptcy provides a similar sanction mechanism by facilitating a transfer of capital from the least to the most profitable firms upon default (Balcerowicz *et al.*, 2003). In such contexts, (private) investors are incentivized 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. For bankruptcy, this process took the form of successive reforms, which made the design of the law closer to the dictates of both domestic and foreign investors, which is particularly true for Poland and Romania, countries that reformed their bankruptcy codes in 2003 and 2006, respectively. The Hungarian bankruptcy system followed a more progressive path of reforms in which the main body of the 1991 bankruptcy act was preserved over the years and new legal provisions were progressively adopted. More importantly, bankruptcy practitioners (*e.g.*, liquidators, administrators, and judges) developed new competencies during the post-transition era, thus following a learning-by-doing process that may have improved their performances in how they manage their procedures (Balcerowicz *et al.*, 2003). As a consequence, despite the persistent risk of corruption, agents are logically less reluctant to use more efficient legal institutions.

This paper extends previous studies on the attractiveness of Eastern European bankruptcy systems. We focus our analysis on the post-transition era, and investigate several hypotheses related to the performances of bankruptcy procedures in three countries that joined the European Union during this period. Thus, we use original micro-data (2003-2010/11) originating in local courts handling bankruptcies in Poland, Hungary, and Romania. These data help answer a set of questions that are essential to assess the relative performances of the bankruptcy procedures in the post-socialist economies. Such performances are mainly related to the ability to maximize repayments, and to share proficiently such repayments amid the competing classes of creditors. Precisely, we ask the following questions. Are the local bankruptcy procedures organized and designed specifically enough to influence the creditors' recoveries? Does the presence of private creditors (and their concentration) help total recoveries? How do public, social, and private claims rank in order of priority of repayment? What is the level of

competition among those claims? To the best of our knowledge, this research is one of the first studies of its type – based on micro-data directly managed by the local courts and bankruptcy practitioners – offering a comparative overview of these questions on the bankruptcy process in Eastern Europe.

The paper is organized as follows. Section 1 develops our hypotheses in relation to the literature. Section 2 presents the data (sample structure, methodology, and variables). Section 3 provides some descriptive statistics. Section 4 presents the results of our regression analyses. Section 5 proposes 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 Eastern European economies been able to implement efficient bankruptcy laws? This question is of primary importance in the Eastern European countries that depend primarily on financing from foreign investors. Those investors choose from among the various business environments they have access to. The Doing Business report (World Bank, 2013) indicates that corporate bankruptcy law is a core element of the business environment of a country, particularly because bankruptcy crystallizes investors' rights when their money is at risk. As a consequence, inefficiencies reducing the value of creditors' claims under bankruptcy might decrease local attractiveness and eventually discourage foreign investment.

In this paper, we successively consider five questions leading to a set of hypotheses with strong implications regarding the attractiveness of bankruptcy during the post-transition era of Poland, Hungary, and Romania.

First, do the total recoveries differ with (1) the bankruptcy procedure (liquidation/reorganization), and (2) the country in which such procedure takes place? If the answer is positive, this suggests that bankruptcy law "matters", and that our countries of interest are not equivalent regarding the bankruptcy procedures they have designed and implemented locally (section 1.1, hypotheses H1a and H1b).

Second, does the presence of private creditors improve total recoveries? Such influence might be attributable to (1) the passivity of public claimholders in post-transition economies; (2) the stronger protection of private investors, who are now in charge of implementing managerial discipline; or (3) the protection of the residual claimants' rights, whoever they are (whether private or public) (section 1.2, hypotheses H2a and H2b).

Third, we investigate whether the concentration level of claimholders matters. On the one hand, because they are easier to coordinate, more concentrated claimholders might be expected to improve the efficiency of bankruptcy procedures by monitoring the debtor more intensely. On the other hand, bankruptcy procedures with highly concentrated creditors may yield a process that serves only the interests of these highly concentrated creditors, which may not maximize the value of the bankrupt firm (section 1.3, hypotheses H3a and H3b).

Fourth, we address the question of the priority ranking of public and private claims with respect to repayment. We expect our three Eastern European countries to mimic other European market economies that prioritize private over public claims. Conversely, we expect that social claims (employees) will outrank private claims as compensation for the underdeveloped social protection systems in Eastern Europe (section 1.4, hypotheses H4a and H4b).

Fifth, we investigate whether the bankruptcy procedures in Eastern Europe have been able to implement both rivalry and ripple effects among the classes of creditors. Regarding rivalry, we consider that a mature bankruptcy system should be able to enforce a certain level of competition among investors. Outside bankruptcy, the financial markets play this role, but under bankruptcy, such competition is required to create incentives to monitor the debtor and to protect each claim's level of seniority. Regarding ripple effects, we examine whether the Eastern European bankruptcy procedures generate (or fail to generate) positive externalities among the classes of creditors. Such externalities are a sign that the firms' value may increase upon default thanks to the monitoring of some creditors and to the decisions made by practitioners (section 1.5, hypotheses H5a and H5b).

### **1.1. Does bankruptcy “matter” in Eastern Europe?**

Many questions have been investigated by the corporate bankruptcy literature. One of the most important questions is linked to the ability of bankruptcy procedures to generate recoveries for claimholders (or equivalently to “create value” out of the assets of bankrupt firms). As noted by Bebchuk (2000) and modeled by Blazy and Chopard (2004), this question amounts to examining the (*ex-post*) efficiency of bankruptcy law: a bankruptcy procedure is economically efficient if its final outcome corresponds to the outcome (*i.e.*, liquidation, sale, debt reorganization, economic restructuring, etc.) that maximizes firm value. Testing for bankruptcy efficiency is a challenge for empirical analyses mainly because most bankruptcy files lack information on alternative valuations of the bankrupt firm for each potential outcome (for example, files on liquidated companies provide information on the liquidation proceeds only). Thus, empirical studies of corporate bankruptcy use proxies for “efficiency”. Most of

these (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 claims due). Indeed, it might be expected that an efficient bankruptcy procedure generates, *ceteris paribus*, substantial recoveries for the entire set of creditors. Nonetheless, the level of recoveries may be attributable to factors unrelated to the design of bankruptcy, such as the firm's specific attributes (asset value, causes of default, structure of claims, etc.) and the national macroeconomic environment (growth, regional effects, corruption, etc). After having controlled for such factors, any remaining effects on recoveries can be attributed to the way the bankruptcy process is regulated and managed. From this perspective, as suggested by Davydenko and Franks (2008), "bankruptcy laws matter".

Here, we question whether bankruptcy matters for post-transition economies. Precisely, we wonder if the type of procedure engaged in a specific country has a significant impact on the total recovery rate. This question is of primary importance for Eastern Europe for several reasons. First, the bankruptcy procedures act as substitutes for the moderately developed financial markets (Mitchell, 1990). Second, in transition economies, bankruptcy law provides sanctioning tools that usefully compensate for wider managerial autonomy (Legros and Mitchell, 1995). Following this perspective, we select a set of countries belonging to the same geographical area with complementary national specificities and that were subject to a common historical change. Namely, we consider Poland, Romania, and Hungary. All three countries have been through similar transition processes, from centralized socialist systems to market economies that were ultimately integrated into the European Union. Despite this common transition path, Poland, Romania, and Hungary show clear differences in the way their national bankruptcy codes were designed (see Appendix A). Let us consider Poland first. The Polish bankruptcy legislation was reformed once in 2003, one year before Poland's integration into the European Union. This reform brought an interesting feature in which a bankruptcy procedure can be triggered only when the value of a debtor's assets exceeds the expected costs of bankruptcy (mainly the practitioners' fees). Thus, since 2003, the Polish system has implemented a pre-screening mechanism minimizing the risk of non-payment for practitioners. Such framework is likely to give them stronger (*ex-ante*) incentives to invest time and energy into the procedure. Conversely, the Hungarian bankruptcy law is somewhat older (it was originally adopted in 1991) and was reformed after a much more progressive path prior to European integration. From that perspective, Hungary may have benefited from learning-by-doing effects over the long run. The Hungarian bankruptcy code is distinctly oriented toward liquidation with an interesting feature: creditors' claims are subject to a registration tax that finances bankruptcy



administrators' expenses. This mechanism is likely to generate effects that are contrary to those generated under the Polish system; because they are paid *ex-ante* by the creditors, Hungarian practitioners have fewer incentives to work hard to improve efficiency. Compared to the other two systems discussed above, Romania has adopted a middle way. Like Poland, Romania's stronger bankruptcy reform was made in 2006, just one year before its European integration. However, Romania 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 comparable transition processes from the perspective of their European integration. On the other hand, these countries have designed their bankruptcy procedures differently, showing strong differences in the timing of their legal reforms and in the incentive mechanisms they have chosen to implement. Consequently, it might be expected that these countries would show either similar or very different recovery rates, depending on which effect is stronger: *i.e.*, the post-transition path (common effect) vs. the bankruptcy design (differentiation effect). If the latter effect over-compensates for the former, it might be concluded that "bankruptcy matters".

**H1a.** *During the post-transition period, the design of bankruptcy does not matter: after having controlled for i) the bankrupt firms' specificities, and ii) the macroeconomic environment, the total recovery rates are not influenced by the bankruptcy procedures prevailing at the local level anymore.*

**H1b.** *During the post-transition period, the design of bankruptcy matters: after having controlled for i) the bankrupt firms' specificities, and ii) the macroeconomic environment, the total recovery rates are substantially influenced by the bankruptcy procedures prevailing at the local level.*

**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 effort levels, 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 creditors' eventual repayment. The results from Romania are expected to fall 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 bankrupt firms. However, not all claimholder classes have incentives that are in line with

such objectives, which raises the question of the identification of the *residual claimant(s)*. As originally defined by Daigle and Maloney (1994), any claimholder is considered to be “residual” if his/her claim is worth more after a marginal increase in the value of the firm. Under bankruptcy, the rights of 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, residual claimants’ interests and the efficiency of bankruptcy align with one another. Therefore, the key question is to identify who are the residual claimants at the beginning of the procedure, amid all the classes of creditors. The answer depends on *i)* the initial value of the firm, *ii)* the theoretical priority order of repayment, and *iii)* the actual structure of the claims.<sup>1</sup>

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

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

In such contexts, private claimholders are now better ranked, particularly compared with public ones (Appendix A shows this is all the more true under liquidation). They have logically higher chances to hold residual claims. One can expect two opposite consequences. First, the state may be more passive within the bankruptcy procedures: because of the low ranking APO, the chances to recover anything from the bankrupt firms are small. More generally, such passivity might also reflect some disengagement by the public authorities from local business (Satjer, 2010). Second, and conversely, it might be expected that

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<sup>1</sup> For example, when the debtor’s value is high and the amounts due to senior creditors are moderate, junior creditors may belong to the pool of residual claimants because they can reasonably expect substantial recoveries. In such context, the bankruptcy procedure should also preserve the interests of the junior creditors because they are incentivized to expand the overall value of the firm (which is the repayment basis for all the creditors). Of course, such incentives may disappear with lower asset values and/or different claim structures, giving junior creditors no hope of recovery.

private creditors (foreign banks, local banks, corporations, and employees) would become more involved in the bankruptcy procedures. However, being “involved” implies both 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<sup>2</sup>). If this latter condition is not fulfilled, it is unlikely that (private) claimholders will spend the requisite time and energy to improve total recoveries. This leads to the following hypothesis.

**H2a.** *The presence of private claimholders improves total recoveries, provided the expected value of their claim is positive (this effect is all the more likely to prevail if they hold residual claims). The positive impact of private claims on total recoveries may be attributable to the passivity of public creditors in post-transition economies, and/or the stronger protection of private investors – who are 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.*

However, there are two main counter-arguments to hypothesis H2a. First, the recent bankruptcy procedures in Eastern Europe might not be mature enough to protect all the classes of claimants, including private ones. In particular, bankruptcy practitioners may not effectively identify residual claimants, and fail to protect their interests. Second, some classes of (private) creditors, despite holding residual claims, may not wish to invest time and money in the resolution of default, especially if they already benefit from strong and unchallenged legal protection and/or can reallocate their investments somewhere else easily (*cf.* the “lazy creditors” argument, as suggested by Manove and Padilla, 2001). In such situation, the lack of involvement from the residual claimants may even generate negative externalities (insufficient monitoring, poor communication, etc.), at the expense of the whole set of creditors.<sup>3</sup> The corresponding counter hypothesis follows.

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<sup>2</sup> Provided their recovery rate lies between zero and one.

<sup>3</sup> We can also mention two other counterarguments. The first one is related to the (private) bankruptcy practitioners who may lack incentives to behave efficiently. Their claims differ from the others because, at an early stage of the procedure, the practitioners have not spent money (or effort) yet. In such a situation, they might invest substantial effort in the procedure if and only if they expect to be paid in full: for the practitioners’ point of view, being partially paid may not provide sufficient incentives to increase repayment for the entire set of creditors. The second counterargument is related to the outcome of the procedure (liquidation vs. reorganization), which may change the nature of the incentives. Suppose, for example, that the value of a bankrupt firm is higher under liquidation than under reorganization. Here, a creditor, even in the position of being “residual”, may promote reorganization for reasons that extend beyond the sole question of immediate repayment: a bank may decide to abandon part of its claim in the hope of pursuing business with the reorganized company or because the bank fears negative externalities that might arise from the firm’s liquidation (loss of reputation, domino effect, etc.).

**H2b.** The presence of private claims has a null, or even negative, impact on total recoveries, even when the expected value of such claims is positive (or held 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 private ones), and/or by the presence of “lazy creditors”.

### **1.3. Should the claims be concentrated or not?**

The fate of a bankrupt firm lies mainly in the hands of the creditors (under the supervision of a court), who are given the right<sup>4</sup> to approve (or reject) the reorganization – in lieu of the liquidation – of the debtor. In other words, claimholders are delegated the power to decide under bankruptcy. Logically, it may be asked whether concentrated claims have a positive impact on firm value (*i.e.*, the value to be shared among the set of creditors). This latter question is all the more relevant for post-transition economies; as discussed above, 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 on the resulting total recoveries, in particular.

On the one hand, more concentrated creditors are better able to monitor the debtor and easier to coordinate. As suggested by Baird (1986), coordination is a required condition to avoid the “common pool problem” of an anarchic run by creditors that may destroy firm value, and eventually reduce total recovery. On the other hand, when the claims are mainly in the hands of a limited set of creditors, there is a risk that those creditors will manage<sup>5</sup> the procedure solely in their interests, which may not align with *ex-post* efficiency. Moreover, concentrated creditors may also become “lazy” when they do not fear competition from the other claimholders. In a nutshell, the concentration of claims may have opposing influences on total recoveries and leads to the following hypotheses.

**H3a.** Higher claim concentration increases the total recovery rate because of better monitoring and/or better coordination between the creditors.

**H3b.** A higher concentration of claims decreases the total recovery rate because of the risk that the procedure is managed for the sole benefit of the main creditor(s) who may not seek to maximize the value of the bankrupt firm.

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<sup>4</sup> This is true for our countries of interest (Poland, Hungary, and Romania).

<sup>5</sup> Of course, creditors do not manage the procedure directly: they are represented by a liquidator who works under the supervision of a court. Nonetheless, they can influence the procedure from the beginning to its end.

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

The questions addressed in the previous sections mostly deal with the ability of the bankruptcy procedures to generate high total recoveries, which is related to questions of efficiency. However, as highlighted by Hart (2006), the role of bankruptcy procedures extends beyond maximizing the debtor's value: these procedures also prepare and organize how to *share* the debtor's value among the claimholders, which is all the more important for post-transition economies that must protect the rights of new private creditors. This question is of primary importance for those Eastern European countries that now belong to the European Union and that are seeking foreign investors who are used to "forum shopping" within Europe. Those investors require that their rights are protected both outside of and in bankruptcy. With respect to the latter case, protection of the claims as a practical matter means that the bankruptcy procedures adequately protect seniority.

Bankruptcy laws organize seniority by defining the APO among the various classes of creditors: the APO organizes the sharing of the debtor's value based on the seniority of each claim. Indeed, as shown by White (1989), some classes of creditors should be protected more than others. First, we find those claims held by secured lenders who collateralized their claims, and paid the related costs as a consequence (mainly by controlling costs and registration fees). Second, other classes of creditors are considered "preferential" because they represent "superior" interests, including, among others, social claims (unpaid wages) and public claims (the state and public institutions). On the one hand, the prioritization of the social claims is justified because employees are particularly vulnerable when their employer goes bankrupt, which is all the more important in countries such as Poland, Hungary, or Romania that have not yet developed strong social protection systems. On the other hand, public claims are prioritized because they represent the interests of the state and, more generally, of the public sector. Nonetheless, in contemporary European economies, the importance of the public sector has been narrowed, and public claims are often outranked by the other senior (private) creditors.<sup>6</sup> Through their integration process, the Eastern European countries have followed in the same direction.<sup>7</sup>

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<sup>6</sup> For instance, in the United-Kingdom, the Crown's preferential status was abolished by the Enterprise Act that came into force in September, 2003.

<sup>7</sup> In liquidations in Poland, public claims are now outranked by bankruptcy costs, employees' and farmers' claims, and secured claims (those are paid separately per each collateralized asset). In Hungary, although taxes and social insurance contributions are not subject to stays of payment, public claims continue to be outranked by secured claims (mainly bankers), bankruptcy costs, employees' claims (unpaid wages), alimony and life-annuity payments, and small firms' claims. In Romania, public claims are similarly outranked by secured claims, bankruptcy costs, employees' claims, and claims attached to credit contracts signed after the opening of the procedure.

Thus, it might be expected that the recovery rates of public claims are lower than other types of claims, reflecting their low APO ranking. However, in practice, bankruptcy procedures do not always respect the theoretical APO, and some deviations of priority might arise: some funds might be used to pay junior creditors although more senior creditors have not been fully repaid. Such deviations might have positive (Blazy and Chopard, 2004) or negative (Davydenko and Franks, 2008) effects on efficiency. Nonetheless, whatever their consequences, deviations in favor of the public sector may be interpreted as a sign that the transition process within Eastern Europe remains incomplete and immature. Thus, we must test for the effective repayment rates between private, social, and public claims in our countries of interest.

**H4.** *The recovery rates of public claims are expected to be lower than other senior private claims based on their relatively low APO ranking. This feature mimics the prioritization of secured (private) creditors that prevails in most other European countries. Deviations in favor of the public sector may be interpreted as a sign that transition within Eastern European countries has not yet been achieved.*

**H4, Corollary.** *The recovery rate of social claims (mainly unpaid wages) is expected to outrank other senior private claims. This feature derives from the poor bargaining power of employees under bankruptcy. In the Eastern European countries, the protection of the employees is all the more important because social protection systems remain underdeveloped.*

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

The question of *sharing* hides a more important question, which is related to *competition*. Competition (or “rivalry”) is required so that investors have incentives to control, supervise, and monitor the firms they finance. Outside bankruptcy, the financial markets might be expected to play this role (Wurgler, 2000). However, when 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 junior claims (*cf.* the previous section).

Bankruptcy also generates “ripple effects”. Indeed, the debtor’s value may vary under bankruptcy, and the recoveries of a specific class of creditors might be expected to generate positive externalities affecting the recoveries of other classes of creditors. For example, unsecured creditors may benefit from the monitoring engaged in by secured creditors or based on their higher level of implication in the bankruptcy procedure: here, the recoveries of senior claims may benefit junior claims. Such ripple effects may also stem from the work accomplished by bankruptcy practitioners. Indeed, as suggested by Lubben

(2012) and Webb (1987), bankruptcy costs are not simply sunk costs only because they are the consideration paid for a service provided by the practitioners. For example, creditors' representatives register and check claimants' rights. Similarly, legal administrators disclose information about the debtor's situation and protect the value of its assets. From that perspective, the practitioners' recoveries also augment the recoveries of the other classes of creditors.

Overall, both rivalry and ripple effects might be expected to play a role within the bankruptcy procedures of Eastern European countries. Both effects characterize a mature bankruptcy system. On the one hand, competition is required to create incentives to improve repayments. On the other hand, positive externalities signify that (1) some creditors adequately monitor 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: bankruptcy procedures in the Eastern European countries implement competition between 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: bankruptcy procedures in the Eastern European countries generate positive externalities among classes of creditors. The debtor's value may increase under bankruptcy as a result of monitoring by some classes of creditors and because of decisions made by bankruptcy practitioners.*

## **2. Our data on Eastern Europe**

In this section, we introduce our data on Poland, Hungary, and Romania. These data help us test hypotheses H1 to H5. We first present our sample by detailing our data sources (section 2.1). The information gathered was manually extracted in various cities of our countries of interest (Hungary, Poland, and Romania). The resulting dataset is a unique and one-of-a kind collection of micro-level variables describing the succeeding stages followed by Eastern European firms once they enter the bankruptcy process. Then, we explain the methodology underlying our data collection (section 2.2). The complete presentation of our variables is listed in Appendix B.

### **2.1. Data source and sample structure**

Our database consists of 554 closed bankruptcy cases divided into three subsamples, *i.e.*, one each for Hungary, Poland and Romania. The cases were collected manually from the national courts and/or the firms of insolvency practitioners. Although the data were provided by local firms of practitioners, we requested a random selection of bankruptcy cases or we randomly selected the cases from the firm's

portfolio.<sup>8</sup> Each case corresponds to a debtor-firm for which a bankruptcy procedure was opened. The Hungarian subsample has 151 liquidation cases that were provided by seven local insolvency practitioner firms.<sup>9</sup> On a national scale, the Hungarian reorganization procedure is barely used. According to COFACE<sup>®</sup>, approximately 99% of bankruptcy cases are liquidations, which explains the absence of reorganization observations in this subsample. The Hungarian cases are based on firms located in all seven national regions.<sup>10</sup> With respect to Poland, the subsample consists of 173 liquidations (winding-up procedures) and 29 reorganizations (insolvency arrangement procedures). The Polish cases were from the commercial courts of Bialystok, Krakow, Warsaw and Wroclaw. Our database is completed with the Romanian subsample, which consists of 146 liquidations and 55 reorganizations. The Romanian data were gathered from the commercial court of Maramures (30 cases) and from 26 local practitioner firms.<sup>11</sup> The Romanian subsample has firms from 32 of the 41 districts in Romania, including the most important Romanian cities, including Bucharest, Cluj-Napoca, Constanța, Timișoara and Iași. By considering the filing date of the procedure, the Hungarian subsample covers the 2003-2011 period, the Polish subsample the 2003-2010 period, and the Romanian subsample the 2003-2011 period.<sup>12</sup> The time repartition of the sample is given in Appendix A5.

## **2.2. Methodology**

In general, a bankruptcy case offers a varied information set. From a bankruptcy file or case, we can extract data about a firm's identification (sector of activity, legal form, geographical location, creation date), the bankruptcy procedure (type, duration, and costs of the procedure), causes of default, real market value of the firm's assets at the beginning of the procedure, the structure of claims and recoveries (amounts of claims due and amounts recovered). However, the claims of creditors are grouped differently depending on the priority rule of the applicable bankruptcy law. Thus, we created the following five classes of creditors to be able to engage in a statistical comparison of the three

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<sup>8</sup> Practitioners provided us a list with all the bankruptcy cases of their portfolios. We asked non-bankruptcy specialists to select some cases from the lists. Regarding the courts, we requested the court's secretary to randomly select bankruptcy cases (without providing any selection preferences).

<sup>9</sup> 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..

<sup>10</sup> The Hungarian regions consist of the following: Észak-Magyarország, Észak-Alföld, Dél-Alföld, Közép-Magyarország, Közép-Dunántúl, Nyugat-Dunántúl and Dél-Dunántúl.

<sup>11</sup> These local firms include the following: Casa de Insolvență Transilvania, Euroinsol, Global Money Recovery IPURL, Pavel Management, Rominsolv, Rovigo, Rominsolv, Solvendi, MRL - Management Reorganizare Lichidare Iași.

<sup>12</sup> We have more observations on Romania for the most recent years, due the more recent implementation of the reformed Romanian Law.



bankruptcy systems: practitioners, employees, secured creditors, the state, and junior creditors. The appendix presents the statutes used to adjudicate the claimants' classes. Moreover, the three countries have different currencies, *i.e.*, the Hungarian forint, the Polish zloty and the Romanian leu. We converted these local currencies into euros, using the average annual exchange rate. Furthermore, the future values (in euros) were discounted to present value. In this approach, we used the average long-term interest rate of government bonds as the discount rate. The causes of a firm's default were aggregated into eight major types: strategy, production, financial, management, accidents, outlets, macroeconomic environment and other 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 cases. In Romania, the practitioner is compelled by the law to write a report describing the reasons for the firm's default.

### **3. Descriptive statistics**

This section provides descriptive statistics regarding our original sample and compares them to previous empirical studies of corporate bankruptcies in developed countries. Those statistics can be considered as primary clues regarding our set of hypotheses before the regression analysis (subsequent section). Section 3.1 gathers statistics computed on our three countries of interest. Section 3.2 provides comparative tables regarding previous similar empirical studies.

#### **3.1. Sample analysis**

Table 1 provides several univariate statistics (averages and frequencies) for each procedure (liquidation and reorganization) and each country (Hungary, Poland, Romania) regarding the following subjects: *i)* recovery rates (total rate and rate by type of claim); *ii)* claims due to the various classes of creditors out of the total due (variables "Weight of..."); *iii)* the percentage of creditors holding residual claims<sup>13</sup> (variables "Residual..."); *iv)* the total claims due (thousands of euros), the amount 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 (the value of assets at the filing date out of the total due claims); *vii)* the duration of the procedure (in months); *viii)* the various causes of default (in terms of frequency: strategy, 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

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<sup>13</sup> Here, creditors are considered to be "residual" if they own a qualified claim, and if the theoretical absolute priority order makes them expect to receive a (strictly) positive recovery at the end of the procedure.

(dummy “Capital”), and *xi*) the sector (services, manufacture, or trade). The column labeled “Overall” contains the weighted averages and frequencies of the variables on the entire sample (those weights are computed for each country to rebuild the national partition of firms by liquidation and reorganization procedures<sup>14</sup>). The last two columns present 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 note that total recovery rates differ substantially between countries and procedures, which is the first clue that the bankruptcy environment might matter. Hungary shows the lowest rate (13%). Contrary to H1b (corollary), this finding suggests that Hungary did not benefit from the learning-by-doing effects during the period by following a progressive reform path. Conversely, Poland shows high recovery rates for both liquidations (32%) and reorganizations (56%). 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 (18%) and reorganizations (70%). Compared with previous studies of 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 bottom, Eastern European bankruptcy processes perform quite well, even in the absence of well-developed financial markets. This result can be linked to the average rates of coverage found in the three countries, which are high in Poland and Romania, mostly with respect to liquidation procedures (51% to 73%).

When focusing on the recovery rates by classes of creditors, the statistics show similar rankings among the classes in all the countries. This is particularly true under liquidation, the most common outcome of bankruptcy procedures (whatever the country): we find the highest recovery rates for practitioners (between 58% to 100%); in second and third positions, we find employees and secured creditors (who show close rates, between 32% to 66%); in fourth position, the state (between 7% to 43%); and, in last position, junior creditors (between 4% to 13%). This ranking for liquidations is informative because it reflects the rather low position of public claims in the new reformed bankruptcy systems in Eastern Europe, as the state is ranked in the penultimate position. For reorganizations, the ranking is close to that found for liquidations but with a better position for the state. In this instance, the state still appears to benefit from a certain level of protection when the firm has some chances to reorganize.

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<sup>14</sup> In Hungary, nearly 100% of bankrupt firms are liquidated. In Poland, and Romania, the percentages of liquidations equal 91% and 96% of the bankruptcy files during the period covered, respectively.

**Table 1. Descriptive statistics per procedure and per country**

	<i>Hungary</i>		<i>Poland</i>		<i>Romania</i>		<i>Overall</i> (6)	Anova F-test by procedure (7)	Anova F-test by country (8)
	Liquidation (1)	Liquidation (2)	Reorganization (3)	Liquidation (4)	Reorganization (5)				
<b>Total recovery rate</b>	<b>12.80%</b>	<b>31.77%</b>	<b>55.91%</b>	<b>18.18%</b>	<b>69.85%</b>	<b>28.06%</b>	0.000***	0.000***	
Recovery rate of employees	38.78%	58.79%	71.72%	48.71%	83.69%	61.00%	0.015**	0.822	
Recovery rate of State	7.34%	42.90%	63.89%	9.34%	82.70%	27.84%	0.000***	0.000***	
Recovery rate of secured claims	31.97%	66.45%	57.60%	33.14%	79.27%	46.01%	0.000***	0.000***	
Recovery rate of practitioners	58.22%	100.00%	100.00%	80.35%	79.00%	81.35%	0.000***	0.000***	
Recovery rate of junior	4.09%	12.67%	47.06%	5.23%	52.98%	14.98%	0.000***	0.000***	
Weight of employees	0.00%	8.70%	5.87%	0.63%	2.24%	3.41%	0.000***	0.000***	
Weight of State	32.38%	8.34%	12.62%	34.43%	18.03%	22.95%	0.000***	0.000***	
Weight of secured claims	14.89%	3.38%	9.25%	30.70%	36.10%	17.27%	0.000***	0.000***	
Weight of practitioners	12.15%	17.29%	9.94%	6.75%	5.34%	11.54%	0.000***	0.000***	
Weight of junior	40.44%	62.29%	62.30%	27.49%	38.28%	44.78%	0.000***	0.000***	
Concentration index #1 (HH)	56.80%	61.83%	61.02%	66.47%	58.54%	61.28%	0.000***	0.002***	
Concentration index #2 (CONC)	67.23%	72.23%	70.81%	76.05%	69.72%	71.52%	0.000***	0.001***	
Due claims (thousands of €)	1075.73	786.65	1289.67	2799.21	7133.48	2052.26	0.000***	0.000***	
Practitioners' fees (thousands of €)	53.98	104.59	29.03	67.38	38.04	70.42	0.483	0.421	
Duration of procedure (months)	24.84	25.01	6.59	25.53	16.04	23.24	0.000***	0.278	
Coverage rate	26.75%	72.61%	64.84%	50.61%	17.14%	63.68%	0.000***	0.000***	
Cause: Strategy	18.54%	14.45%	10.34%	14.38%	10.90%	14.98%	0.596	0.354	
Cause: Production	27.15%	27.75%	48.28%	27.40%	45.45%	30.32%	0.015**	0.573	
Cause: Finance	21.19%	32.37%	27.59%	27.39%	34.54%	27.97%	0.178	0.082*	
Cause: Management	33.11%	23.12%	6.90%	49.32%	27.27%	32.31%	0.000***	0.000***	
Cause: Accident	27.15%	28.90%	34.48%	19.86%	27.27%	26.17%	0.307	0.194	
Cause: Outlets	30.46%	32.37%	34.48%	16.44%	41.81%	28.70%	0.002***	0.102	
Cause: Macro. Environment	29.80%	35.84%	55.17%	34.25%	41.81%	35.37%	0.087*	0.217	
Cause: others	12.58%	5.78%	20.69%	8.22%	12.72%	9.74%	0.052*	0.339	
Age (years)	8.26	7.32	7.80	9.25	10.10	8.38	0.000***	0.000***	
Limited liability (LTD)	89.40%	88.44%	89.66%	98.63%	89.09%	91.51%	0.011**	0.015**	
Capital	39.73%	32.95%	48.28%	6.16%	16.36%	26.89%	0.000***	0.000***	
Sector: Services	37.08%	25.43%	13.79%	19.86%	34.54%	27.43%	0.003***	0.008***	
Sector: Manufacture	37.74%	53.76%	65.52%	43.15%	45.45%	46.38%	0.010**	0.003***	
Sector: Trade	17.21%	18.50%	13.79%	31.51%	20.00%	21.48%	0.014**	0.012**	
Size of firms (K €)	123.55	319.99	931.42	1039.83	5006.27	953.41	0.000***	0.000***	
<b>Number of observations</b>	<b>151</b>	<b>173</b>	<b>29</b>	<b>146</b>	<b>55</b>	<b>554</b>			

**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.

The countries show noticeable differences in the structure of firm claims. Polish firms appear the least collateralized (variable “Weight of secured claims” is lower than 10%), whereas Hungary and Romania show higher levels of collateralization (between 15% and 36%). As with secured claims, public claims are more frequent in Hungary (32%) and Romania (from 18% to 34%) than in Poland (less than 13%). The overall concentration lies between 61% and 72%, depending on the considered index.

However, the performances of bankruptcy systems cannot be evaluated solely regarding their ability to generate recoveries. They should also be cheap (Bris *et al.*, 2006). In this paper, we consider a direct measure of bankruptcy costs (practitioners’ fees) and an indirect measure (duration of procedures). Whatever the country, the average bankruptcy costs are notably high in our sample (from 29,000 € to 104,600 € per file). These figures are higher than the corresponding figures for Western Europe (see Blazy *et al.*, 2013, for an estimate of the bankruptcy costs in France and in the U.K.). Bankruptcy procedures last an average of 7 to 26 months. Those figures are standard, and we can conclude that the bankruptcy procedures in Hungary, Poland, and Romania are not overly long.

The other figures in Table 1 address our control variables. Not all of these are discussed here. However, we stress that the firms in our sample are not start-ups (their average age is 7 to 10 years). Most firms in bankruptcy (more than 88%) are limited liability firms, mainly operating in the manufacturing sector. Of all three countries, the main causes of default are environmental and management-related difficulties (more than 30% of the files).

### **3.2. International comparison**

The average values of the recovery rates of Eastern European countries can be compared with the average values of countries whose bankruptcy systems are more mature. Table 2 provides a statistical comparison per bankruptcy procedure between the countries in our sample and other countries. We note that the Polish subsample of liquidations has an average recovery rate of creditors' debt that is higher than the values of the U.K., the U.S.A. and France but less than the average value in the Netherlands. Moreover, the Romanian subsample of liquidations has an average recovery rate that is similar to that of France. With respect to liquidations, Eastern European secured claimants recover, on average, a higher value than British claimants, whereas the average recovery rates of junior claimants and bankruptcy practitioners in our sample is superior to the applicable average value in France. The average duration of a liquidation procedure in this part of Eastern Europe is comparable with the average durations registered in the U.K., the U.S.A. and the Netherlands. Overall, Eastern European

reorganization procedures are relatively attractive in terms of recovery rates and duration. A reorganization procedure in Poland and Romania provides a higher degree of satisfaction of junior and secured claims than in the U.K. and France, on average. Such procedures also seem to be faster than Chapter 11 cases in the U.S.A., and than the Receivership procedures in the U.K.

**Table 2. Eastern Europe vs. other countries**

	<i>Hungary</i>	<i>Poland</i>	<i>Romania</i>	<i>U.S.A.</i>	<i>U.K.</i>	<i>France</i>	<i>Netherlands</i>
<b>1) Liquidation procedure</b>							
<b>Total recovery rate</b>	12.80%	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	7.34%	42.90%	9.34%				
Recovery rate of secured claims	31.97%	66.45%	33.14%	90.00%	16.20%	40.30%	
Recovery rate of practitioners	58.22%	100.00%	80.35%		3.80%	55.80%	
Recovery rate of junior	4.09%	12.67%	5.23%	1.00%	7.70%	3.10%	
Duration (months)	24.84	25.01	25.53	24.00	26.40	3.1	25.04
<b>Number of observations</b>	<b>151</b>	<b>173</b>	<b>146</b>	<b>61</b>	<b>100</b>	<b>100</b>	<b>137</b>
<b>2) Reorganization procedure</b>							
		<i>Poland</i>	<i>Romania</i>	<i>U.S.A.</i>	<i>U.K.</i>	<i>France</i>	
<b>Total recovery rate</b>		55.91%	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		47.06%	52.98%	52.00%	1.60%	38.20%	
Duration (months)		6.59	16.04	28.00	38.90	11.60	
<b>Number of observations</b>		<b>29</b>	<b>55</b>	<b>225</b>	<b>198</b>	<b>164</b>	

**Notes:** The table presents the average values of the recovery rates per classes of claimants, and of the durations of procedures. The values related *i)* to the U.S.A. originate from *Bris et al. (2006)*, *ii)* to France and the U.K. from *Blazy et al. (2013)*, and *iii)* to Netherlands from *Couwenberg and De Jong (2008)*. In *Blazy et al. (2013)*, the reorganization procedures being considered are the French “*redressement judiciaire*” and the U.K. *receivership*.

However, attractiveness cannot be restricted to a mere comparison of recovery rates. First, many other factors of attraction enter into account, such as the practitioners’ fees, the levels of corruption, the effective enforcement of the order of repayment, etc. Second, the observed differences between countries may be attributable to disparities in some other variables (coverage rates, structure of claims, etc.). This latter issue justifies the use of multivariate approach, which is the main objective of the subsequent section.

#### **4. Econometric results**

This section adopts a multivariate approach to test for hypotheses H1 to H5. In sub-section 4.1, we focus on the main determinants of the total recovery rate, as a proxy for *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 repayments out of the total valid claims). As discussed above, this ratio is consistently used as a proxy for *ex-post* bankruptcy efficiency, which is, in turn, one element of the attractiveness of the bankruptcy systems.

Hypotheses H1a and H1b suggest that, after controlling for bankrupt firms' specificities (internal factors) and for the macroeconomic environment (external factors), any residual country effect might be attributable to local bankruptcy institutions. This "residual approach" is analogous to that applied by Davydenko and Franks (2008) to France, Germany and the U.K.. Here, our control variables are *i)* the individual causes of default (strategy, production, finance, management, accident, outlets, and bad environment), *ii)* firm size (initial value of the assets, in log), *iii)* legal form (dummy "limited liability company"), *iv)* location (dummy "capital", *i.e.*, equal to 1 when the bankruptcy court is located in the capital city), *vi)* sector (services and manufacture, compared with trade), *vii)* annual growth rate of the country (DGDP), and *viii)* national corruption level (DCPI index). The test variables are dummies reflecting the type of procedure engaged and the country in which this procedure takes place (our reference being the Hungarian liquidations<sup>15</sup>).

Hypotheses H2a and H2b test for private creditors that are residual claimants. H2a predicts that those claimants have incentives to increase the recovery rate of the entire set of creditors, thus compensating for the passivity of public creditors or simply because the post-transition bankruptcy codes are now able to preserve the rights of residual – including private – claimants. Hypothesis H2b predicts the opposite finding. To test for those rival hypotheses, we build original dummy variables, each attached to one class of claimants (employees, state, private secured, practitioners, and private junior claims). Each dummy equals one, provided *i)* the considered creditors have qualified claim(s) (*i.e.*, the value of their claim(s) is positive), and *ii)* the theoretical APO leads them to expect to recover strictly positive amounts. Practically, two sources of information were used to build those dummies. First, information found 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 modeled the expected recoveries using the Hungarian, Polish, and Romanian bankruptcy statutes,<sup>16</sup> depending on

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<sup>15</sup> As mentioned before, there are no reorganization cases in Hungary.

<sup>16</sup> The legal sources are as follows: 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).

the debtor's nationality. As a result, our dummies "residual-X" ("X" standing for the class of creditors) equal one every time the applicable creditors are in a position to receive positive repayment<sup>17</sup> 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 defined by the applicable national bankruptcy code. Here, we consider that creditors that are in a position to receive positive recoveries are more likely to invest time and money in the procedure than creditors that are not. In an efficient bankruptcy system, such commitment should generate wealth, ultimately serving the total repayment. To the best of our knowledge, ours is the first empirical study to measure the effect of residual claimants on the final output of the bankruptcy process (most studies addressing residual claimants are mainly theoretical).

Hypotheses H3a and H3b suggest that the total recovery rate depends (positively or negatively) on the concentration of debtors' claims. To reflect this dependence, we consider a Herfindahl index accounting for claims' concentration.

Table 3 provides the results of an OLS regression explaining the total recovery rate. Column 1 relates to the whole sample (all countries, unweighted regressions). The other columns (2, 3 and 4) show the country-specific estimates. Because the recovery rate is bounded between zero and one, our section 5 (robustness checks) provides the estimates of a TOBIT regression.<sup>18</sup> The results are close to those obtained with the OLS method, but with less significant relations regarding the influence of some residual claimants. One may also argue that our dummies accounting for the type of procedure stem from a decision (liquidation vs. reorganization), and might be endogenous variables (selection effect). Section 5 proposes Heckman models accounting for this issue. Our estimates do not confirm selection effect at the country level, and show results similar to the OLS approach.

Firstly, our regressions on all countries (column 1) confirm that the recoveries depend on the type of procedure and on the country in which it is engaged. We find a country effect which remains significant after having controlled for both internal and external factors of influence. Both the Polish and Romanian bankruptcy systems have higher impact onto the total recovery rate than our reference point (the Hungarian liquidations). The country-specific regressions confirm that – after having controlled for the debtor's initial situation (assets, coverage rate, etc.) – the procedures dedicated to reorganization

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<sup>17</sup> In theory, a claimant is considered to be "residual" if his/her expected recovery rate strictly lies between zero (no repayment) and one (full repayment): then, any marginal increase in the debtor's value is expected to increase his/her repayment. However, the situations under which the observed recovery rate equals 100% are rare.

<sup>18</sup> In this section, we also consider an alternative measure of claims' concentration.

significantly improve recoveries. In other terms, the legal provisions that facilitate the continuation of business do not destroy value for the creditors. These results rather confirm H1b, and provide a primer clue that the bankruptcy environment matters, which justifies further investigations on the legal specificities of post-transition economies.<sup>19</sup>

Secondly, on all countries, we identify two classes of creditors that serve total recoveries when in the position of residual claimants: the practitioners and the junior claims.

For the practitioners, we interpret this result as a direct consequence of the manner in which they are remunerated. Clearly, the procedure benefits 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 with substantial assets at the early stage of the procedure for whom the prospect of rapid liquidation might preserve the value of their assets. For the junior claims, we interpret their positive influence on total recoveries as an encouraging result with respect to the question of *ex-post* efficiency. Indeed, efficient bankruptcy procedures should not serve the interests of preferential and/or secured creditors only. On the contrary, when they are in a position to expect some recoveries, junior creditors matter and eventually serve the overall interests. This latter result is all the more important when the junior claims mostly consist of private local companies.

At the opposite, we find that the presence of secured creditors destroys value for the pool of creditors.<sup>20</sup> As suggested by hypothesis H2b, this result may reflect the negative influence of “lazy” (secured) creditors who free ride during the procedure. An alternative explanation is that the secured creditors are mainly bankers: those may have sufficient bargaining power to run the procedure in their sole interest, eventually at the expense of the other creditors. Whatever the most relevant explanation, the bankruptcy procedures in Eastern Europe do not take advantage of the presence of secured creditors.

The other creditor classes (the state and employees) exert no influence on total recoveries, despite holding residual claims. This may reflect some passivity from such claimholders, up to a certain point. Two divergent reasons explain such passive behavior. Those classes of creditors may be either *ex-ante*

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<sup>19</sup> For example, the use of legal indexes (La Porta *et al.*, 1997) might provide more elements of interpretation. One avenue for research was recently suggested by Blazy *et al.* (2013) on the Western European economies.

<sup>20</sup> Let us stress that private secured claims (when in the position of residual claimants) exert a negative influence on the total recovery rate. This rather surprising result should be considered with caution because the level of significance of this variable is close to 10%. More importantly, this variable is not significant anymore when considering alternative models (see robustness checks).



discouraged because they feel that they have lost their bargaining power under the new bankruptcy framework, or the opposite, *i.e.*, they may consider that they are protected so well that they have little incentive to spend too much time and money in the bankruptcy procedure. Both explanations lead to an absence of impact on total recoveries. In our view, the first interpretation is more credible for public claims, considering the declining role of the state during the transition period.

Overall, our results partially validate hypotheses H2a and H2b. Regarding H2a, we find that (private) practitioners and junior claims improve the overall repayment (however, the positive influence of the junior claims disappears when considering the regression models computed on each country: columns 2 to 4). We also confirm that the public claims exert a null (or negative) influence on total recoveries, which, once again, is in line with hypothesis H2a. At the opposite, the total recoveries do not benefit from the presence of (private) secured creditors. This latter finding rather support hypothesis H2b. Here, the inability of collaterals to create incentives that ultimately serve the overall repayment of creditors may be a source of serious inefficiencies.

Thirdly, our results confirm that more concentrated claims do not serve total repayment (see hypothesis H3b). Obviously, the financial outcome of bankruptcy is not independent of the claim structure. The negative (and significant) sign observed in nearly all regressions confirm that coordination of claims is not the main issue in Eastern Europe. On the contrary, more concentrated claims may decrease the overall repayment whenever the biggest claimholders exert substantial influence on the procedure, following their private interests.

We end with our control variables. We find logically significant and positive impacts of the assets value and of the coverage rate<sup>21</sup> on the total recovery rate. Two bankruptcy causes of default also appear positive and significant, mainly for Hungary: outlets and managerial difficulties. Finally, the DCPI index, which measures the level of corruption at the country level, logically decreases the total recovery rate (this latter effect being mainly confirmed for Poland).

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

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<sup>21</sup> *i.e.*, the initial value of assets (market values) out of the total claims due.

**Table 3. Determinants of the total recovery rate**

	All countries (1)	Hungary (2)	Poland (3)	Romania (4)
<b>Poland : liquidation procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.150*** (0.000)	-	-	-
<b>Poland : reorganization procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.374*** (0.000)	-	-	-
<b>Romania : liquidation procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.073*** (0.006)	-	-	-
<b>Romania : reorganization procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.385*** (0.000)	-	-	-
<b>Reorganization procedures</b> <i>(Ref.: liquidations in the country)</i>	-	-	0.210*** (0.000)	0.350*** (0.000)
<b>Residual claimant (Employee)</b>	-0.037 (0.119)	-0.162 (0.303)	-0.071** (0.041)	0.013 (0.766)
<b>Residual claimant (State)</b>	-0.032 (0.134)	-0.065 (0.113)	-0.080** (0.026)	0.073 (0.177)
<b>Residual claimant (Secured)</b>	-0.051* (0.074)	-0.055 (0.271)	-0.100* (0.064)	-0.016 (0.776)
<b>Residual claimant (Practitioner)</b>	0.078*** (0.007)	0.063 (0.223)	0.084 (0.287)	0.100** (0.034)
<b>Residual claimant (Junior)</b>	0.047** (0.023)	0.011 (0.795)	0.008 (0.821)	0.040 (0.483)
<b>Herfindahl index</b> <i>(claims' concentration)</i>	-0.348*** (0.000)	-0.349*** (0.000)	-0.436*** (0.000)	-0.154 (0.110)
<b>Cause: Strategy</b>	0.019 (0.460)	0.0502 (0.220)	0.048 (0.283)	-0.001 (0.979)
<b>Cause: Production</b>	0.003 (0.885)	0.038 (0.243)	-0.040 (0.239)	0.067* (0.078)
<b>Cause: Finance</b>	-0.016 (0.432)	0.017 (0.630)	-0.029 (0.412)	-0.015 (0.678)
<b>Cause: Management</b>	-0.002 (0.933)	0.070** (0.039)	-0.015 (0.714)	-0.012 (0.771)
<b>Cause: Accident</b>	0.014 (0.491)	0.052* (0.096)	0.002 (0.958)	0.011 (0.777)
<b>Cause: Outlets</b>	0.037* (0.070)	0.091*** (0.006)	0.012 (0.711)	0.063 (0.116)
<b>Cause: Macro. environment</b>	-0.006 (0.759)	0.019 (0.563)	-0.020 (0.559)	0.000 (0.997)
<b>Coverage rate</b>	0.117*** (0.000)	0.216*** (0.000)	0.137*** (0.000)	0.081*** (0.000)
<b>Assets (log)</b>	0.011** (0.050)	0.004 (0.695)	0.023** (0.040)	-0.005 (0.623)
<b>Age (log)</b>	-0.012 (0.429)	-0.018 (0.475)	-0.017 (0.479)	-0.014 (0.638)
<b>Limited liability (LTD)</b>	0.007 (0.834)	-0.090** (0.034)	0.067 (0.173)	0.018 (0.827)
<b>Capital city</b>	-0.038* (0.066)	-0.033 (0.260)	-0.002 (0.948)	-0.054 (0.360)
<b>Sector: Services</b>	0.033 (0.163)	0.010 (0.762)	0.060 (0.179)	0.034 (0.422)
<b>Sector: Manufacture</b>	-0.013 (0.550)	0.022 (0.512)	0.002 (0.965)	-0.050 (0.176)
<b>National growth (DGDP)</b>	0.001 (0.526)	-0.005 (0.163)	0.014 (0.178)	0.001 (0.739)
<b>Corruption index (DCPI)</b>	-0.426** (0.019)	-0.112 (0.755)	-0.893*** (0.004)	0.114 (0.742)
<b>Constant</b>	0.242*** (0.000)	0.284*** (0.005)	0.384*** (0.003)	0.166 (0.269)
<b>Number of observations</b>	554	151	202	201
<b>Adjusted R<sup>2</sup></b>	0.604	0.501	0.553	0.636

**Notes:** OLS estimates. The dependent variable is the total recovery rate (e.g. overall recoveries out of total due debts). Column (1) presents the estimates on all countries (unweighted sample; Hungarian liquidations being the reference). Columns (2), (3), and (4) respectively show the estimates at the country level (national liquidations being the reference). The numbers in parentheses are the *p*-values. \*\*\* implies that the coefficient is significant at 1% level, \*\* at 5% level and \* at 10% level.

#### **4.2. The competition between claimant classes**

In preparation for their European integration, the post-socialist economies have converged toward other European countries by prioritizing senior private claimholders over public creditors. The content of the Polish, Hungarian, and Romanian bankruptcy codes reflects this change, but it may be asked whether such prioritization is fully respected in practice. According to hypothesis H4, any deviation in favor of public claims over private claims might reflect some incompleteness in the post-transition process. In section 3, we found a primary average ranking between the various classes of creditors: for all three countries, hypothesis H4 was rather respected, particularly under liquidation.<sup>22</sup> We also expect the Eastern European bankruptcy systems to favor the social claims and to compensate for the weaker level of social system development.

Nevertheless, it might be suspected that those rankings are impacted by some other variables also influencing the recovery rates (for instance, higher recoveries for employees might be attributed to differences in firm characteristics). We thus consider a multivariate analysis and split between our test and control variables. Here, simple OLS regressions fail to capture the interactions among the various classes of claimants. In particular, the more the senior classes recover, the less the junior classes should be repaid. Hypothesis H5a follows this idea and predicts that mature bankruptcy systems should be able to implement competition among various classes of creditors (“rivalry effect”). Conversely, hypothesis H5b suggests that the bankruptcy procedures might also generate positive externalities among the classes (“ripple effect”).

Below, we estimate regression models to test for hypotheses H4, H5a, and H5b. Aiming to capture the interdependencies among creditors’ recoveries, we build a simultaneous equations system (one equation per class of creditors). Because we consider five classes of creditors (employees’ claims, public claims, private secured claims, practitioners’ fees, and junior claims), our system consists of five equations (see below, eq.1 to eq.5).<sup>23</sup> The parameters of the entire system are estimated through a three-stage least squares (3SLS) regression.<sup>24</sup>

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<sup>22</sup> Under reorganization, however, secured creditors were slightly outranked by public ones (particularly in Poland).

<sup>23</sup> The labels “recov” and “due” represent “recovered amounts” and “due debts”.

<sup>24</sup> The 3SLS method may be described as follows: the 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 returned to the initial equations that are estimated again. The resulting residuals are used to estimate the variance-covariance matrix of the errors. Finally, generalized least squares are used to estimate the entire system.

$$\begin{aligned}
\text{Eq1. } \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}}) \\
&+ \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} \\
&+ \sum_{j>7} \alpha_j \text{ control variables} \\
\text{Eq2. } \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}}) \\
&+ \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} \\
&+ \sum_{j>7} \beta_j \text{ control variables} \\
\text{Eq3. } \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}}) \\
&+ \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} \\
&+ \sum_{j>7} \delta_j \text{ control variables} \\
\text{Eq4. } \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}}) \\
&+ \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} \\
&+ \sum_{j>7} \gamma_j \text{ control variables} \\
\text{Eq5. } \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}}) \\
&+ \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} \\
&+ \sum_{j>7} \eta_j \text{ control variables}
\end{aligned}$$

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 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. For instance, in equation 1, a negative and significant value for parameter  $\alpha_1$  indicates that the state's recoveries mostly compete with those of employees. Conversely, a positive value would have suggested that the employees benefit from higher public recoveries (ripple effect).

The explanatory variables also cover the initial amounts due. Rather than considering the recovery rates directly, we regress the logarithm of the repayments ( $\ln(\text{recov})$ ) on the logarithm of the corresponding debts due ( $\ln(\text{due})$ ). 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 for the claims due. Those elasticities provide information that is 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 amounts due 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  $\alpha_5$ ,  $\alpha_6$ , and  $\alpha_7$  in equation 1).

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

Table 4 provides the estimates of the third stage<sup>25</sup> of the 3SLS regression (“X” stands for the class of creditors considered). The system-weighted R square equals 76.6%. The 3SLS approach confirms hypothesis H4 but rejects its corollary. Precisely, in Poland and Romania, the elasticities of repayment (to debts due) are all significant, and rank as follows (in decreasing order): 1/ practitioners’ claims, 2/ secured claims, 3/ employees’ claims, 4/ public claims, and 5/ junior claims. The Hungarian case is even more extreme: the elasticities of recoveries are not significant for two classes of creditors (employees and junior claims), but the three other classes of creditors rank in accordance with hypothesis H4 (1/ practitioners, 2/ private secured, 3/ public claims). Overall, this ranking confirms that private creditors who collateralized their claims (mainly banks) are relatively well protected under bankruptcy and, notably, outrank public claims. Following hypothesis H4, we interpret this result as a sign that those post-socialist economies are now mimicking other European countries, particularly insofar as they are protecting secured private creditors without deviations of priority in favor of the state. Surprisingly, those private secured claims are even more protected than the employees. This result (which contradicts the corollary of H4) is interesting because it does not mirror the rather high level of protection prevailing in some Western countries, such as France (a country that is nonetheless characterized by a strong social protection system). Alternatively, Poland, Romania, and Hungary do not use their bankruptcy systems to compensate for their moderate levels of social protection.

In summary, we accept H4 but reject the corollary of this hypothesis. Namely, we find that bankruptcy systems in the post-transition period protect well secured creditors (mainly banks), whereas protection of social claims remains lukewarm. We also find that bankruptcy practitioners are highly protected (they rank first). On the one hand, this finding incentivizes practitioners to preserve the debtor’s value (because they would expect high levels of payments at the end of the procedure). On the other hand, it might reflect that bankruptcy procedures are expensive in Eastern Europe.<sup>26</sup>

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<sup>25</sup> The second step of the 3SLS is not shown in this article, but available on request.

<sup>26</sup> This last interpretation is rather supported by the figures shown in section 3: depending on the country and procedure, the average direct costs associated with every bankruptcy case is between 30,000€ and 100,000€, which is higher than similar average figures computed by OSEO (2008) for France (5,000€), the U.K. (21,000€), or Germany (47,000€). This specificity remains true when comparing these costs to total claims due.

**Table 4. Determinants of recoveries per class of creditors (3SLS)**

Dependent variable:	Log (Recovery of Employees) (1) {X}=EMPLOYEES	Log (Recovery of State) (2) {X}=STATE	Log (Recovery of Secured) (3) {X}=SECURED	Log (Recovery of Practitioner) (4) {X}=PRACT	Log (Recovery of Junior) (5) {X}=JUNIOR
Log (due debt of {X}) x Romania	0.705*** (0.000)	0.497*** (0.000)	0.772*** (0.000)	0.881*** (0.000)	0.152* (0.061)
Log (due debt of {X}) x Poland	0.662*** (0.000)	0.535*** (0.000)	0.790*** (0.000)	0.967*** (0.000)	0.241*** (0.003)
Log (due debt of {X}) x Hungary	0.480 (0.524)	0.130*** (0.001)	0.627*** (0.000)	0.754*** (0.000)	0.054 (0.426)
Log (Recovery of Employees)	-	-0.303*** (0.000)	-0.075 (0.305)	0.005 (0.899)	-0.244** (0.028)
Log (Recovery of State)	-0.037 (0.461)	-	-0.185** (0.012)	-0.082** (0.021)	-0.049 (0.670)
Log (Recovery of Secured)	-0.066* (0.066)	-0.189*** (0.003)	-	-0.038 (0.164)	-0.109 (0.231)
Log (Recovery of Practitioner)	0.096** (0.020)	-0.035 (0.588)	-0.009 (0.872)	-	0.058 (0.506)
Log (Recovery of Junior)	-0.114* (0.097)	-0.047 (0.643)	-0.221** (0.026)	0.006 (0.910)	-
Weight of Employees	-	0.006 (0.994)	0.176 (0.828)	-0.024 (0.954)	-1.013 (0.365)
Weight of State	1.444*** (0.006)	-	2.092*** (0.000)	0.330 (0.170)	-0.291 (0.554)
Weight of Secured	1.212** (0.031)	0.376 (0.393)	-	0.086 (0.744)	-0.850 (0.162)
Weight of Practitioner	1.125* (0.070)	0.109 (0.851)	2.168*** (0.000)	-	-0.758 (0.341)
Weight of Junior	1.440*** (0.007)	0.380 (0.220)	1.689*** (0.000)	0.267 (0.227)	-
Herfindahl index (Claims' concentration)	0.085 (0.710)	-0.326 (0.383)	0.070 (0.830)	-0.299* (0.058)	1.272*** (0.008)
Cause: Strategy	-0.007 (0.953)	0.097 (0.576)	-0.142 (0.362)	-0.028 (0.711)	0.391* (0.090)
Cause: Production	-0.018 (0.838)	-0.089 (0.510)	-0.028 (0.819)	-0.045 (0.447)	-0.034 (0.849)
Cause: Finance	0.078 (0.388)	0.058 (0.684)	-0.014 (0.914)	0.032 (0.604)	-0.009 (0.961)
Cause: Management	0.144 (0.138)	0.063 (0.678)	0.087 (0.526)	0.056 (0.393)	0.026 (0.898)
Cause: Accident	0.103 (0.239)	0.096 (0.486)	0.007 (0.952)	-0.087 (0.146)	-0.107 (0.557)
Cause: Outlets	0.113 (0.190)	0.215 (0.112)	0.117 (0.338)	0.058 (0.321)	0.287 (0.112)
Cause: Macro. environment	0.064 (0.465)	0.021 (0.879)	-0.022 (0.860)	0.105* (0.079)	-0.107 (0.561)
Coverage rate	0.044 (0.309)	0.182*** (0.007)	-0.076 (0.209)	-0.033 (0.267)	0.310*** (0.001)
Assets (log)	0.059** (0.020)	0.265*** (0.000)	0.362*** (0.000)	0.106*** (0.000)	0.324*** (0.000)
Age (log)	0.031 (0.622)	0.049 (0.622)	-0.093 (0.301)	-0.036 (0.405)	0.164 (0.214)
Limited liability (LTD)	-0.170 (0.204)	-0.262 (0.215)	0.022 (0.908)	0.027 (0.774)	-0.074 (0.793)
Capital city	0.046 (0.593)	0.325** (0.017)	0.145 (0.231)	-0.087 (0.134)	0.082 (0.649)

<b>Sector: Services</b>	-0.002 (0.983)	0.271* (0.086)	0.076 (0.589)	-0.138** (0.042)	0.209 (0.316)
<b>Sector: Manufacture</b>	-0.078 (0.391)	-0.072 (0.614)	-0.107 (0.410)	-0.110* (0.077)	0.090 (0.636)
<b>National growth (DGDP)</b>	0.007 (0.467)	0.032** (0.035)	0.023* (0.094)	-0.004 (0.532)	0.025 (0.226)
<b>Corruption index (DCPI)</b>	-1.700** (0.022)	-2.705** (0.020)	-2.394** (0.022)	0.350 (0.485)	-4.397*** (0.005)
<b>Constant</b>	-1.568*** (0.005)	-0.800 (0.126)	-2.239*** (0.000)	-0.123 (0.637)	-1.578** (0.031)
<b>System Weighted R<sup>2</sup> : 0,780    Nb. of observations: 554</b>					

Notes: The figures reported are the estimated coefficients of the 3SLS regression. In column (1), the variable  $\text{Log(Debt of } \{X\}) \times \text{RO}$  is the product between the variable RO and the variable  $\text{Log(Debt of Employees)}$ , given that  $\{X\}$  is equal to Employees. In column (2), the variable  $\text{Log(Debt of } \{X\}) \times \text{PL}$  is the product between the variable PL and the variable  $\text{Log(Debt of State)}$  given that  $\{X\}$  is equal to State. The number of observations is 554 (unweighted sample). The numbers in parentheses are the  $p$ -values. \*\*\* implies that the coefficient is significant at 1% level, \*\* at 5% level and \* at 10% level.

Some of our control variables are significant in Table 4. Notably, we find that the recoveries of each class of creditors are sensitive to the weights of the other classes of creditors (as a percentage of total claims due). In particular, employees and secured claims recover more when the amounts due to the other classes of claimants are relatively high. Few other control variables are found to be significant, with the exception of assets value and of coverage rate (that logically increase creditors' recoveries), and of several environmental variables (level of corruption, growth, and sector).

Let us turn now to hypotheses H5a (rivalry effect) and H5b (ripple effect). Table 5 summarizes the estimates found in the 3SLS model (see Table 4). For each class of creditors, the rows and columns address the explanatory and the explained recoveries, respectively. The cells indicate whether the estimated 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 among classes of creditors (3SLS)**

<i>Explained variable</i> \ <i>Explanatory variable</i>	Employees	State & public creditors	Secured creditors	Bankruptcy practitioners	Junior creditors
Employees		Rivalry***	Non-significant	Non-significant	Rivalry**
State & public creditors	Non-significant		Rivalry**	Rivalry**	Non-significant
Secured private creditors	Rivalry*	Rivalry***		Non-significant	Non-significant
Bankruptcy practitioners	Ripple**	Non-significant	Non-significant		Non-significant
Private junior creditors	Rivalry*	Non-significant	Rivalry**	Non-significant	

Note: The number of stars indicated coefficient respectively significant at the 10%, 5% and 1% levels.

Our estimates mostly show rivalry effects (eight times), and a unique ripple effect (for practitioners). If we exclude the practitioners from the analysis (indeed, their status is special compared to the other creditors, given their role in the procedure), the non-significant effects are rather scarce (five occurrences only). This primary finding suggests that bankruptcy procedures in Eastern Europe have successfully implemented a certain level of competition among creditors, which we interpret as a sign of maturity of their bankruptcy systems.

Let us then consider each class of claimholders, from the most-well ranked in the APO to the last ones.

We observe first that the practitioners' fees (row 4 in Table 5) do not challenge the recoveries of the other classes of creditors, and even serve those of the employees. In other words, the manner in which the practitioners manage the procedure does not destroy value for the rest of creditors, and even generate positive externalities for some of them (employees). In that view, bankruptcy costs are not pure sunk costs, confirming the view of Lubben (2012) and Webb (1987). This feature is all the more notable because bankruptcy systems in transition economies are recent phenomena: despite the fact that these systems were found quite expensive (see section 3), the absence of rivalry effect, here, suggests that the recoveries are fortunately not captured by the practitioners themselves.

The secured creditors, (row 3 in Table 5) compete with the employees (unidirectional rivalry effect), and more importantly, with the public creditors (in both directions). The fact that secured private creditors and public creditors compete against one another is of primary importance because it reflects that private banks (who have secured claims) are now in a position to challenge the public interests. As suggested by the Doing Business reports (World Bank, 2013), the level of protection of secured claims is one of the conditions required to attract foreign investors.

The employees (row 1 in Table 5) logically challenge the junior and the public claimholders. This effect confirms the ranking found in the previous sections (the employee's recovery rate was found superior to the one of the two other classes). At the opposite, the public creditors (row 2 in Table 5) surprisingly challenge the secured creditors and the practitioners, despite a lower ranking in terms of recovery rate. For the secured creditors however, this rivalry effect is to be relativized, as the rivalry effect between both classes of creditors is found bidirectional. In fact, the most surprising effect is found for the junior creditors (row 5 in Table 5) who challenge two preferential claimholders: the employees (bidirectional rivalry effect) and the secured creditors (unidirectional rivalry effect). One might have expected the junior creditors only to lose in competition with preferential ones. This might reflect some deviations from the APO. However, this finding might also be attributed to the fact that junior claims consist mainly of trade creditors. Some of these trade creditors can increase their recoveries (despite a low ranking) by retaining some goods that have not been paid for in full. Such "retention rights" are typically attached to



vending contracts under which property is transferred from the seller (creditor) to the buyer (debtor) only after payment (on the account) is made in full.

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

## **5. Robustness checks**

We consider two alternative ways of modelling the total recovery rate. The results are gathered in appendixes D and E, and can be compared with our OLS regressions in section 4.1.

We first estimate a TOBIT regression accounting for the fact that recovery rates are bounded between zero and one. We also consider an alternative way of measuring the claims' concentration (variable "CONC": see appendix B). On all countries, our findings are confirmed. The main difference with the OLS approach is that some effects due the presence of residual claimants disappear. Namely, we do not observe any significant influence from the secured and junior creditors anymore. Yet, this finding does not contradict our conclusions relative to hypotheses H2a and H2b, which are still partially validated.

We also consider that the choice of a procedure (reorganization vs. liquidation) stems from a decision made by the debtor and/or its creditors.<sup>27</sup> This might generate a selection effect, and our dummies "Reorganization procedures" might be endogenous variables.<sup>28</sup> To account for this, we consider a Heckman model (Heckman, 1979). Precisely, for the countries that propose two types of bankruptcy procedures (Poland and Romania), we estimate two equations simultaneously. The first equation (selection function) explains the choice to reorganize the bankrupt firm. The second equation (response schedule) explains the total recovery rate (the chosen procedure being part of the set of explanatory variables).<sup>29</sup> Overall, we do not find any selection effect being able to negate our results. The estimates of the Heckman model are similar to the ones obtained with the OLS regression, and the covariance of errors between both equations is not significantly different from zero.

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<sup>27</sup> One should distinguish the initial choice of a bankruptcy procedure (liquidation vs. reorganization filings) from the final decision made at the end of the procedure (liquidation vs. reorganization of the debtor, Morrison, 2007).

<sup>28</sup> Of course, such risk of endogeneity exists at the country-level only: our companies being mostly SMEs, they are not in position to choose between two different national bankruptcy systems.

<sup>29</sup> It does not matter whether the explanatory variables differ between equations 1 and 2. As mentioned by (Briggs, 2004), the system can be identified owing to its nonlinearity. However, the identification of the system is weak when the variables are the same in both equations (Breen, 1996). To prevent this, we exclude from the response schedule i) the causes of default, ii) the firm's age, and iii) its legal form (those variables are the instruments).

## Concluding remarks

Attractive bankruptcy law can stimulate foreign investments. For the post-socialist countries in Eastern Europe that undertook long phases of economic and judicial transition, an important aspect of their bankruptcy laws' attractiveness depends on their ability to generate substantial recoveries for 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 applicable national bankruptcy codes specific enough to influence creditors' recoveries? Are such recoveries impacted by the presence of private creditors? Does the concentration of creditors matter? How do public, social, and private (secured and/or unsecured) claims rank in the priority order of repayment? How do those classes of creditors compete against one another? To answer these questions, the analysis uses an original database of closed bankruptcy cases in Hungary, Poland, and Romania that were triggered during the post-transition period of the three countries.

We split our analysis into two successive steps. We first focus on *ex-post* efficiency, by investigating the determinants of the total recovery rate. We then investigate another core function of bankruptcy procedures, relative to the value distribution among the creditors.

We first find that the creditors' total repayment is influenced by the type of bankruptcy procedure, and depends on the national environment in which such procedure is engaged. From that perspective, we observe that the Hungarian liquidations generate lower recoveries than the other two bankruptcy systems. We also propose an innovative methodology of identifying the residual claimants of a bankruptcy process. Our estimates on all three countries show that the presence of junior claimants and bankruptcy practitioners (with a residual status) increases the total recovery rate. In that view, the practitioners seem to serve the interests of the creditors they represent, provided they expect some rewards. The other classes of creditors exert a null or negative influence on total recoveries. We relate this latter finding to the passivity of the state in post-transition economies, as mentioned earlier by Satjer (2010), and to the "lazy bank" argument of Manove and Padilla, (2001). Last, our analysis of claims' concentration shows that, despite an easier coordination, large creditors might exert an influence on the procedure that favors their own private interests.

When considering the recovery rates per class of creditors, we find that the Hungarian, Polish, and Romanian bankruptcy systems provide stronger protection for private secured claims than for public

claims. As a consequence, the post-socialist economies mimic the prioritization of secured creditors that characterizes most Western European bankruptcy systems. We also suggest that bankruptcy procedures are likely to engender two opposite interaction effects among 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 other hand, “rivalry effects” imply that any increase in the amount recovered by one class of creditors lowers the amount recovered by a different or competing class. Our estimations mostly reveal rivalry effects. The presence of such rivalries confirms that the contemporary Eastern European bankruptcy systems have achieved a certain level of maturity because they are able to implement competition among the various claimholders. Such competition is one manner in which to implement incentives that should eventually serve efficiency. The next step for research is to link those bankruptcy performances with development and regional attractiveness.

### **Acknowledgements**

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## **Appendix A. Bankruptcy laws in Eastern Europe and time repartition**

### **Appendix A1. Bankruptcy Act of Hungary**

The Hungarian bankruptcy procedures are governed by Act XLIX of 1991 on bankruptcy proceedings and liquidation proceedings. Although the Hungarian law was adopted in 1991, the law has been progressively modified. A bankruptcy petition can be filed at the county court by the debtor or by a creditor. Employees and creditors must be informed when a 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 is charged with monitoring the debtor's activity and protecting creditors' interests. Moreover, a stay of payment can be imposed for a period of 90 days (moratorium). The objective of the stay of payment is to preserve the debtor's assets and to increase the likelihood of reaching an agreement with creditors. Nevertheless, the stay of payment does not apply to employees' wages and to public claims such as taxes or social insurance contributions. If the bankruptcy petition is filed by creditors, the moratorium is not enforced.

After being notified of the bankruptcy proceedings, creditors must register their claims. 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 5,000 forints and a maximum amount of 100,000 forints.<sup>30</sup> 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.

The debtor has two bankruptcy procedures that can be used to settle creditors' claims: a composition agreement (Csődeljárás) or a liquidation procedure (Felszámolási eljárás). In the case of a composition agreement, the debtor must prepare a restructuring plan or an arrangement proposal aimed to restore its solvency. Creditors deciding whether to accept the agreement can also include an extension of the moratorium. If the composition agreement is not signed by the parties, the court declares the debtor to be insolvent and orders the opening of a liquidation procedure. At this juncture, the administrator's duties are taken over by a liquidator.

A liquidation petition can be filed by a debtor or creditors. The liquidation procedure can also be opened after a composition agreement fails. The court examines the debtor's insolvency, and, in general, the court considers a debtor to be insolvent if the value of the debtor's assets is insufficient to satisfy its

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<sup>30</sup> 5000 forints are approximately 16 euros and 100000 forints are 327 euros.

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 the absence of any proof of the debtor's insolvency. If the debtor is deemed insolvent, a liquidation procedure is opened and a liquidator is appointed by the court using a random electronic selection system. The legal feature of liquidator selection was introduced in 2010 at the request of judges and liquidators. The liquidator must sell the debtor's assets by means of 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 for the distribution of the debtor's assets. The priority order of debt satisfaction is as follows: claims of secured creditors after deducting 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), default interests and debt penalties (7) and claims of shareholders (8). Nevertheless, a debtor can propose a composition agreement to creditors at any time during the liquidation procedure.

#### **Appendix A2. Bankruptcy law of Poland**

The Polish law on bankruptcy and reorganization was adopted in 2003 as a prerequisite to Poland's 2004 European Union integration. According to Polish law, the debtor must submit bankruptcy petitions at the commercial court of the applicable 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 under the law: a winding-up procedure (*upadłość obejmująca likwidację majątku upadłego*), an insolvency arrangement procedure (*upadłość z możliwością zawarcia układu*), and a restructuring procedure (*Postępowanie naprawcze*). Our sample encompasses the two first procedures. Following the bankruptcy petition, the court appoints a judge commissioner responsible for execution of the bankruptcy procedure and the control of the documents issued by the practitioner, *i.e.*, the liquidator or court supervisor.

If the winding-up procedure is engaged, 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. The debtor's assets are then sold entirely or partially, and the liquidator distributes the monetary value obtained to creditors in accordance with the APO. First, bankruptcy costs, employees'

claims and farmers' claims (1) are satisfied.<sup>31</sup> Second, taxes and other public financial obligations (2) are satisfied if category (1) was fully covered. Third, the liquidator uses the remaining value to satisfy claims associated with interest due in the year prior to the bankruptcy petition (3). Fourth, the last claims that are satisfied are those claims not included in the other categories, judicial and administrative fines (4). If an asset of the debtor is the object of a mortgage or other type of collateral, the proceeds received from its sale are distributed separately. A maximum amount of 10% of the collateral value is used to cover bankruptcy costs. The employees' are also entitled to a maximum value of three times the legal minimum wage. 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 it is more likely to provide higher recovery of creditors' debt than 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 from the debtor, (s)he is replaced by a receiver that can propose an arrangement. The judge commissioner summons a meeting of creditors that must decide whether to accept the arrangement proposal. An arrangement must define the restructuring of the debtor's assets. However, the arrangement does not have legal effects on the employees' claims and the claims of the secured creditors. If the arrangement is not approved by creditors or confirmed by the court, the winding-up procedure supersedes the insolvency arrangement procedure.

The restructuring procedure represents an out-of-court proceeding addressed to debtors that are threatened by insolvency. A debtor with a delay of payment obligations that does not exceed three months and an amount of unpaid obligations that 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 interest until confirmation of the reorganization plan. In this procedure, the reorganization plan is voted on by the creditors. The plan must improve the debtor's competitive abilities in the market. Measures of debt and asset restructuring can also be included in the plan. If the plan accepted by creditors is approved by the court, a court supervisor is appointed to verify the plan's implementation. The debtor continues to run the firm under the observation of the court's supervisor. Nevertheless, the court can terminate the reorganization procedure if the debtor does not follow the measures of the plan.

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<sup>31</sup> Since May 2009, the priority rule of the Polish bankruptcy law was modified. Category (1) was divided into two categories. The liquidation values are first used to cover bankruptcy costs. After 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 remains the same.

### **Appendix A3. Bankruptcy law in Romania**

As in Poland, Romania adopted a new bankruptcy law in 2006, a year prior to its 2007 European Union integration. The Romanian bankruptcy law number 86/2006 defines two main bankruptcy procedures: a general procedure and a 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 the debtor directly into a liquidation procedure. Creditors and the debtor must submit a bankruptcy request in the bankruptcy section of the court or in a commercial court. A bankruptcy request from a debtor embodies the debtor's intention in favor of a simplified or a general procedure. Creditors can file a request only if the value of their claims is greater than 45,000 lei or at least six average gross wages, in the case of employees.<sup>32</sup>

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

In the liquidation procedure, the debtor loses administration rights to the business. A liquidator is appointed to notify 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 claims in the following order: claims of secured creditors that arose before and during the procedure and the bankruptcy costs associated with the preservation of the pledged asset(s) (1), bankruptcy costs (2), claims of employees (3), claims of contract credit signed after the opening of the procedure (4), public claims (5), alimony (6), claims established by the judge for the

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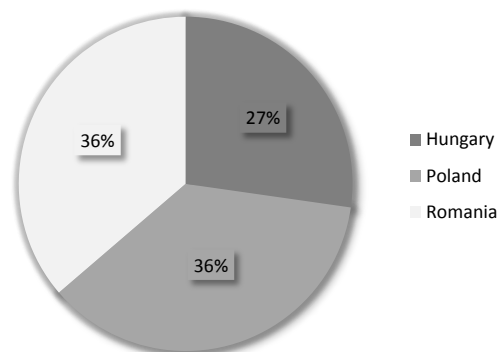
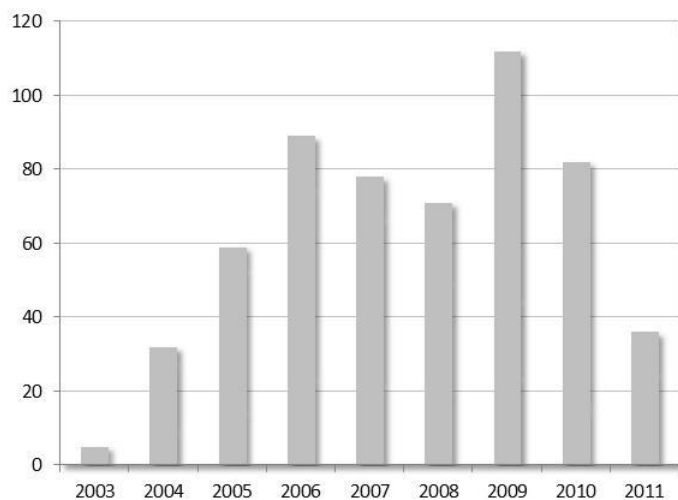
<sup>32</sup>45,000 lei equal approximately 10,200 euros.

survival of the debtor's family (7), claims from deliveries and services (8), other unsecured claims, and (9) 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) <sup>33</sup>	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)

#### Appendix A5. Time repartition of the sample



<sup>33</sup> 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

<i>Variable</i>	<i>Definition</i>
<b>I. Recovery rate of the debt</b>	
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>II. Countries' identification variables</b>	
Hungary, Poland, Romania	Dummy variable equal to 1 if the bankruptcy case was treated in Hungary (HU), Poland (PL) or Romania (RO).
<b>III. Variables of the residual claimants</b>	
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. <sup>34</sup>
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.
<b>IV. Variables of the total debt distribution among classes</b>	
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.
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.
<b>V. Variables of the total debt concentration</b>	
Herfindahl (HH)	Herfindahl-Hirschmann index. This variable accounts for the claims' concentration. $HH = (\text{Weight of Employees})^2 + (\text{Weight of State})^2 + (\text{Weight of Secured})^2 + (\text{Weight of Practitioner})^2 + (\text{Weight of Junior})^2$

<sup>34</sup> 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.

CONC	Alternative measure of the claims' concentration. Maximum value between Weight of Employees, Weight of State, Weight of Secured, Weight of Practitioner and Weight of Junior.
<b>VI. Control Variables</b>	
<u>Causes of default:</u>	
<i>Strategy</i>	Dummy variables that identify the causes of the firm's defaults. The default's causes are classified such as: Inexperience firm, Voluntary dissolution, Failure of important projects (partnerships, investments, reorganizations), Voluntary acceptance of little profitable markets
<i>Production</i>	Overinvestment, Assets' depreciation, Higher operating costs, Higher wages expenses, Disappearance of firm's suppliers, Obsolete production process, Under-investment
<i>Finance</i>	Longer delays on accounts receivable, Contagion/reported losses from subsidiaries, Shorter delays on 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
<i>Management</i>	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
<i>Accident</i>	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
<i>Outlets</i>	Brutal disappearance of customers, Customers in default, Expensive products, Bad evaluation of the market, Cheap products, Unsuitable products, Obsolete products, Loss of market shares
<i>Macroeconomic</i>	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...)
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 (log)	Logarithm of the market value of the firm's assets at the date of the bankruptcy triggering
Age (log)	Logarithm of the firm's age in years at the moment of the bankruptcy triggering.
LTD (limited liability)	Dummy variable equals 1 if the firm is a limited liability firm, 0 otherwise.
Capital city	Dummy variable equal to 1 if the firm's activity is conducted in the capital of the country, <i>i.e.</i> Budapest, Bucharest or Warsaw.
Sector of activity	Dummy variables that identify the firm's activity sector, <i>i.e.</i> Services, Manufacture or Trade.
DGDP (national growth)	Annual change of the national gross domestic product (GDP). Source: World Bank
DCPI (corruption index))	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 D. Robustness check: TOBIT regression

	All countries (1)	Hungary (2)	Poland (3)	Romania (4)
<b>Poland : liquidation procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.126*** (0.000)	-	-	-
<b>Poland : reorganization procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.338*** (0.000)	-	-	-
<b>Romania : liquidation procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.033 (0.235)	-	-	-
<b>Romania : reorganization procedures</b> <i>(Ref.: Hungary (liquidations))</i>	0.349*** (0.000)	-	-	-
<b>Reorganization procedures</b> <i>(Ref.: liquidations in the country)</i>	-	-	0.215*** (0.000)	0.354*** (0.000)
<b>Residual claimant (Employee)</b>	-0.028 (0.263)	-0.150 (0.309)	-0.056 (0.113)	0.025 (0.583)
<b>Residual claimant (State)</b>	-0.022 (0.332)	-0.032 (0.396)	-0.079** (0.030)	0.091 (0.104)
<b>Residual claimant (Secured)</b>	-0.029 (0.326)	-0.043 (0.360)	-0.095* (0.084)	0.008 (0.885)
<b>Residual claimant (Practitioner)</b>	0.113*** (0.000)	0.035 (0.465)	0.148* (0.067)	0.152*** (0.002)
<b>Residual claimant (Junior)</b>	0.034 (0.116)	0.012 (0.767)	-0.036 (0.294)	0.016 (0.785)
<b>“CONC” index</b> <i>(Claims’ concentration)</i>	-0.499*** (0.000)	-0.641*** (0.000)	-0.383** (0.031)	-0.283 (0.267)
<b>Cause: Strategy</b>	0.019 (0.489)	0.055 (0.156)	0.031 (0.486)	0.004 (0.939)
<b>Cause: Production</b>	0.002 (0.942)	0.038 (0.215)	-0.063* (0.067)	0.074* (0.061)
<b>Cause: Finance</b>	-0.025 (0.245)	0.030 (0.350)	-0.058 (0.101)	-0.029 (0.460)
<b>Cause: Management</b>	-0.006 (0.784)	0.078** (0.015)	-0.046 (0.271)	-0.015 (0.716)
<b>Cause: Accident</b>	0.019 (0.384)	0.058** (0.048)	-0.002 (0.948)	0.014 (0.746)
<b>Cause: Outlets</b>	0.032 (0.135)	0.092*** (0.003)	0.001 (0.983)	0.072* (0.086)
<b>Cause: Macro. environment</b>	-0.007 (0.727)	0.025 (0.429)	-0.039 (0.243)	0.001 (0.987)
<b>Coverage rate</b>	0.130*** (0.000)	0.203*** (0.000)	0.154*** (0.000)	0.092*** (0.000)
<b>Assets (log)</b>	0.013** (0.023)	0.006 (0.477)	0.027** (0.016)	-0.002 (0.819)
<b>Age (log)</b>	-0.016 (0.291)	-0.007 (0.775)	-0.021 (0.395)	-0.027 (0.384)
<b>Limited liability (LTD)</b>	0.033 (0.317)	-0.058 (0.141)	0.083* (0.093)	0.037 (0.677)
<b>Capital city</b>	-0.019 (0.388)	-0.011 (0.693)	-0.019 (0.576)	-0.039 (0.524)
<b>Sector: Services</b>	0.031 (0.214)	0.0156 (0.620)	0.054 (0.226)	0.026 (0.565)
<b>Sector: Manufacture</b>	-0.017 (0.443)	0.034 (0.273)	-0.002 (0.953)	-0.071* (0.070)
<b>National growth (DGDP)</b>	0.002 (0.474)	-0.004 (0.264)	0.014 (0.176)	0.001 (0.677)
<b>Corruption index (DCPI)</b>	-0.560*** (0.004)	-0.109 (0.749)	-0.923*** (0.003)	0.077 (0.842)
<b>Constant</b>	0.444*** (0.000)	0.597*** (0.000)	0.429** (0.035)	0.263 (0.351)
<b>Sigma</b> <i>(variance of errors)</i>	0.202*** (0.000)	0.139*** (0.000)	0.198*** (0.000)	0.215*** (0.000)
<b>Number of observations</b>	554	151	202	201
<b>Log Likelihood</b>	64.211	80.142	35.264	-0.520

*Note:* TOBIT estimates. The dependent variable is the total recovery rate, which equals zero and one 25 and 10 times respectively. Sigma gives the estimated variance of errors. Column (1) presents the estimates on all countries. Columns (2), (3), and (4) show the estimates at the country level. 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 E. Robustness check: HECKMAN regression

<i>Explained variables</i> →	Poland		Romania	
	<u>Selection function (1)</u> <i>Reorganization</i>	<u>Response schedule (2)</u> <i>Total recovery rate</i>	<u>Selection function (3)</u> <i>Reorganization</i>	<u>Response schedule (4)</u> <i>Total recovery rate</i>
<b>Reorganization procedures</b> <i>(endogenous variable)</i>	-	0.251*** (0.007)	-	0.451*** (0.000)
<b>Cause: Strategy (#)</b>	-0.038 (0.935)	-	0.197 (0.686)	-
<b>Cause: Production (#)</b>	0.847** (0.011)	-	0.183 (0.599)	-
<b>Cause: Finance (#)</b>	0.298 (0.423)	-	0.173 (0.626)	-
<b>Cause: Management (#)</b>	-0.344 (0.479)	-	0.223 (0.554)	-
<b>Cause: Accident (#)</b>	0.217 (0.506)	-	0.107 (0.774)	-
<b>Cause: Outlets (#)</b>	0.212 (0.514)	-	0.652* (0.055)	-
<b>Cause: Macro. environment (#)</b>	0.614* (0.065)	-	0.142 (0.689)	-
<b>Age (log) (#)</b>	0.224 (0.396)	-	0.286 (0.299)	-
<b>Limited liability (LTD) (#)</b>	0.198 (0.672)	-	-1.249 (0.140)	-
<b>Residual claimant (Employee)</b>	-0.832** (0.025)	-0.077** (0.021)	-0.844** (0.024)	0.030 (0.485)
<b>Residual claimant (State)</b>	0.353 (0.320)	-0.091*** (0.006)	0.164 (0.748)	0.065 (0.217)
<b>Residual claimant (Secured)</b>	0.440 (0.377)	-0.102** (0.040)	0.339 (0.525)	-0.019 (0.724)
<b>Residual claimant (Practitioner)</b>	5.180*** (0.000)	0.092 (0.215)	-2.093*** (0.001)	0.120** (0.012)
<b>Residual claimant (Junior)</b>	0.625 (0.103)	-0.002 (0.955)	1.0540** (0.039)	0.016 (0.777)
<b>Herfindahl index</b> <i>(Claims' concentration)</i>	-0.728 (0.437)	-0.450*** (0.000)	-0.247 (0.822)	-0.173* (0.055)
<b>Coverage rate</b>	-0.333 (0.138)	0.132*** (0.000)	0.743*** (0.000)	0.075*** (0.000)
<b>Assets (log)</b>	0.230** (0.044)	0.019* (0.065)	0.316*** (0.002)	-0.005 (0.590)
<b>Capital city</b>	0.995*** (0.005)	-0.000 (0.993)	-0.253 (0.601)	-0.053 (0.342)
<b>Sector: Services</b>	-0.153 (0.754)	0.076* (0.07)	0.962** (0.018)	0.025 (0.542)
<b>Sector: Manufacture</b>	-0.299 (0.451)	0.003 (0.942)	0.108 (0.771)	-0.037 (0.274)
<b>National growth (DGDP)</b>	0.036 (0.7294)	0.014 (0.162)	0.031 (0.307)	0.000 (0.982)
<b>Corruption index (DCPI)</b>	-10.524*** (0.000)	-0.781** (0.016)	-8.049** (0.024)	0.200 (0.552)
<b>Constant</b>	-8.031*** (0.000)	0.408*** (0.000)	-1.931 (0.207)	0.167** (0.041)
<b>Variance of errors (sigma)</b> <i>(response schedule)</i>		0.189*** (0.000)		0.201*** (0.000)
<b>Covariance of errors (rho)</b> <i>(response sched. &amp; selection function)</i>		-0.170 (0.544)		-0.326 (0.138)
<b>Number of observations</b>		202		201
<b>Log Likelihood</b>		-4.241		-15.718

Note: Maximum likelihood method estimates (Heckman model). For the countries with reorganization procedures (Poland and Romania), two equations are estimated simultaneously. First, the selection function that explains the choice of reorganization (vs. liquidation) (columns 1 and 3). Second, the response schedule that explains the total recovery rate (columns 2 and 4). In the second equation, the choice of procedure (*cf.* dummy "Reorganization procedures") is part of the explanatory variables. Variables marked with (#) are instruments in the selection function equation. Sigma is the variance of errors for the response schedule equation. Rho is the covariance of errors for both equations. Whatever the country, rho is not significant (no selection effect). 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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