**Laboratoire
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& Economie**

Working Paper

Working Paper
2015-08

When secured and unsecured creditors recover the same: The emblematic case of the Tunisian corporate bankruptcies

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October 2015

IFS

Institut de Finance
de Strasbourg

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Abstract

Bankruptcy is an essential screening mechanism for developing economies. This paper focuses on the way bankruptcy is managed in Tunisia, a country characterized by the importance of its banking sector. We hand collected data on a set of Tunisian firms that went bankrupt between 1995-2009. We gathered original and unique information on the firms' characteristics, the causes of default, the values of assets, the structure of claims, the recovery rates, and the bankruptcy costs. We use this information to answer several questions (those questions being investigated both directly, and by controlling for any risk of selection bias): 1) are the Tunisian bankruptcy procedures able to generate high total recoveries? 2) Are the secured creditors (mostly banks) well-enough protected under bankruptcy? 3) Do the secured creditors influence the choice between liquidation and reorganization? 4) To what extent the recoveries of the secured creditors compete (or not) with the ones of the other classes of creditors?

We find that the Tunisian reorganization procedures are able to generate substantial recoveries, but those are mainly captured by the preferential claims (employees and public claims). This is coherent with the authorities' willingness to improve social protection, but this raises concerns as the Tunisian firms are mainly financed by bankers. Our analysis shows that the secured creditors are poorly protected under bankruptcy: they rank almost last in the priority order of repayment, and their recovery rate is similar to one of the unsecured creditors. We also find that the rather high level of recovery rate is mainly attributable to the reorganization procedures. We finally find that the court's choice between reorganization and liquidation is not influenced by the structure of claims. Thus, in Tunisia, the creditors are losing hand once bankruptcy is triggered.

The likely consequences on development are twofold: first, higher risks of capital misallocation and of credit rationing; second, stronger incentives for the banks to prioritize informal workouts.

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Introduction

Most developing countries have in common undersized financial markets and suffer from inefficient capital allocation. As shown by Wurgler (2000), on the period 1963-1995, the countries characterized by underdeveloped financial markets were less able than others to target their investments in the most expanding industries. Tunisia is part of them: being ranked 47th out of 65 countries in terms of GDP per capita, the Tunisian elasticity of industrial investment to value added ranked 41st only out of 65 countries. As shown by Wurgler (2000), such elasticity is a good proxy of capital allocation efficiency, and is significantly correlated with financial development.

However, when compared to the other countries, Tunisia exhibits on the long run an interesting financial specificity: in the Wurgler's sample, Tunisia ranks relatively low (40th) regarding the development of its financial market (stock market capitalization to GDP), *but* ranks quite high (6th) regarding the size of its credit market (credit claims to GDP). A geographically close country such as Morocco (ranked 52nd in terms of economic development) shows a completely different structure, ranking respectively 48th and 42nd for its financial and credit markets. This indicates that, in Tunisia, the underdeveloped financial market is being compensated by a rather well-developed credit market: the commercial banks play a key role in the financing of the Tunisian economy. Such imbalanced specificity is shared be some other moderately developed countries (Egypt, Greece, Iran, Malta, Panama…).

This feature has important implications on the efficiency of capital allocation in Tunisia. As suggested by Wurgler (2000), capital allocation is expected to be more efficient in the presence of developed financial markets. Indeed, such markets offer the investors the ability to screen between the industries, by investing more into the growing projects, hence sanctioning the declining ones by offering them fewer opportunities to raise capital. Now, in a country such as Tunisia – where the banks act as

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substitutes to the lack of well-functioning financial markets –, the quality of such screening process mainly depends on the way those banks are protected as credit dispensers. One important mean to protect them is to preserve the value of their claims, especially when those claims are hold against financially distressed debtors. Here, corporate bankruptcy Law plays a central role by protecting the recovery power of the various claimants (including the banks). Put differently, corporate bankruptcy Law can be viewed as a substitute for the lack of financial markets (Legros and Mitchell, 1995), as it provides a set of legal rules that both protect (more or less) the investors' claims, and sanction (severely or gently) the firms not being able to respect their financial constraints.

Corporate bankruptcy procedures are triggered when (1) a firm defaults, and (2) an informal workout cannot be reached with the creditors (Franks and Sussman, 2005). Their outcome may be either the reorganization or the liquidation of the bankrupt[5] firms. As shown by Hart (2006), once triggered, bankruptcy procedures follow two main (*ex-post*) objectives at the same time. A first objective is related to *efficiency*: bankruptcy procedures should aim at maximizing the value of the bankrupt firm, which is the basis for the creditors' repayment. The second objective is related to *sharing*: besides the maximization issue, corporate bankruptcy Law sets a specific priority order to reimburse the different classes of creditors. This "absolute priority order" (APO) has been extensively studied by the literature (White, 1989) and varies from one country to another. From that perspective, two main reasons justify why some claimants should benefit from a higher level of protection. First, some claims may be secured ones, *i.e.* hold by creditors who initially took collaterals to protect themselves, and consequently, who accepted to pay for the associated costs (as shown by Blazy and Weill (2013), collaterals generate controlling and registration costs). Such cost can be considered as the price to pay for a higher level of protection. Second, some other claims may be preferential ones, *i.e.* hold by creditors who should be protected *per se*, either because their bargaining power is low under bankruptcy (employees) of because they represent public interests (State and public claims). Both secured and preferential claims belong to the set of "senior" claims that outrank the "junior" ones (*i.e.* unsecured claims). Most of the time – provided the firms are in position to provide collaterals –, the banks own secured claims. This provides them, either a higher rank on the proceeds of liquidation of the bankrupt firm (mortgages, pledges…), or an extended repayment basis on another patrimony (personal guarantees).

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[5] In Tunisia, a firm is legally "bankrupt" when it cannot repay its creditors. The precise criterion relies on cash shortage (the Tunisian Law states that (in French): "*est considérée en état de cessation de paiement, toute entreprise qui se trouve dans l'impossibilité de faire face à son passif exigible avec ses liquidités et actifs réalisables à court terme*", Law n°95-34, 17th of April 1995).

In a country like Tunisia, relying heavily on the banking sector, the degree of protection of the secured claims is of primer importance, as there are few substitutes to banking credit. If the banks' claims are not protected enough by the bankruptcy Law, the screening mechanism between profitable and non-profitable projects, as discussed before, might not prevail. Following Wurgler (2000), in the absence of well-developed financial markets, this may generate a risk of capital misallocation.

In this paper, we address four main questions (from *Q1* to *Q4*): *Q1.* Are the Tunisian bankruptcy procedures efficient enough to generate high recoveries for all the creditors? *Q2.* Is the level of protection of the secured creditors (mainly banks) strong enough to generate high recoveries for them, and how do these recoveries rank when compared to the others? *Q3.* Do the secured creditors influence the screening process taking place under bankruptcy, by liquidating some debtors and reorganizing the others? *Q4.* Do the secured creditors compete with the other classes of creditors (unsecured and preferential claims, bankruptcy costs) or, on the contrary, do they benefit from some ripple effects (*i.e.* do the secured creditors recover more when the other creditors receive higher repayments)?

Answering these questions is crucial as they are directly related to the ability of Tunisian bankruptcies to protect the class(es) of claimants who are the main investors of the economy. If it appears that the banking claims are not protected enough under bankruptcy, one can expect two main consequences. The first consequence is that the Tunisian firms may be credit-constrained, because (1) the banks anticipate moderate recovery rates in the event of bankruptcy (Davydenko and Franks, 2008), and/or (2) the banks cannot use collaterals to screen between their debtors, and hence, cannot overcome adverse-selection issues (Bester, 1985). The second consequence is that the Tunisian banks may adapt themselves, and preserve their (strong) bargaining power by prioritizing informal renegotiation over formal bankruptcy (Blazy, Martel, and Nigam, 2013). The consequences of this strategy are contrasted: on the one hand, private renegotiation helps in saving bankruptcy costs, but on the other hand, it may lead to renegotiations that are run at the expense of the other creditors.

We also address two subsidiary issues, related to the other classes of creditors. We first question the recovery power of the *unsecured creditors*, mainly made of commercial firms (suppliers) involved in trade credit. Indeed, in a country where the firms strongly depend on banking credit, trade credit can be used as an interesting alternative to manage cash: if those commercial claims are not protected enough, this may result in a more fragile business environment (see Dietsch, 2003, for an analysis of the financial

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role of trade credit). We also question the importance of *direct bankruptcy costs* in the Tunisian bankruptcy system. Those costs – that belong to a specific class of claims – are related to the functioning of the bankruptcy procedures. Some authors (Lubben, 2012, Webb, 1987) consider them as the counterpart of a service provided by the judiciary system (protection of the claims and of the assets, auditing expenses, verification costs, registration fees…). But a majority of papers rather consider them as sunk costs that decrease the value of the firm (Haugen and Senbet, 1988), and eventually impact on their capital structure (Stiglitz, 1974).

To answer these questions, we collected original data from four Tunisian courts located in Tunis, Sfax, Sousse, and Monastir. This data-collection process was made manually as the Tunisian bankruptcy files were available in hardcopy format only. The collection process took place between 2008 and 2012. It was lengthened as this period of time overlaps the Arab Spring, and because the surveyed Courts appeared not to store information in the same way. We were able to gather more than 200 variables out of 100 Tunisian corporate bankruptcy cases. Those variables encompass a wide range of aspects of the bankruptcy procedures: the values of the bankrupt firms' assets (last known book value), the due liabilities and the associated recovery rates by types of claims (preferential claims, bankruptcy costs, secured and unsecured claims), the causes of default (outlets, strategy/management, production, finance, accident, environment), the duration of the procedures, and the firms' characteristics (sectors, coverage rates, age, number of employees, legal form). Several previous studies made on Tunisia address the question of corporate bankruptcy, but they are mostly restricted to the analysis of the default prediction tools using financial ratios (Mestiri and Hamdi, 2012; Matoussi, Mouelhi, and Salah, 1999). To our knowledge; our study is the first extensive work of this kind made on the Tunisian bankruptcies. The closest approach was proposed by Hamadi, El Omari, and Khlif (2014), but their study rather deals with the role of the accounting advisors on the decision to open (or not) a voluntary arrangement. As we suggested before, Tunisia is an interesting country showing specificities that help in answering questions related to development. The original information we have gathered in the Tunisian bankruptcy Courts helps us in answering the addressed questions.

This article is organized as follows. Section 1 presents the data in more details and provides an overview of the Tunisian bankruptcy procedures. Section 2 discusses descriptive statistics (univariate analysis) leading to a primer ranking between the various claims (including secured ones) in terms of recoveries. Section 3 extends this approach by running multivariate analyses: several regressions are

estimated in order to give some elements of answer to the addressed questions. Precisely, in subsection 3.1, we model the determinants of the outcome of the bankruptcy procedure (liquidation *vs.* reorganization) and check to which extent the presence of secured claims influences (or not) this outcome (Q3). Subsection 3.2 models the determinants of the total recoveries (Q1) (this section also addresses the risk of selection bias by proposing both OLS and Heckman regressions). Last, subsection 3.3 investigates the competition between the different classes of claimants. This helps in answering questions Q2 (*i.e.* how do the secured claims ranks when compared to the others?) and Q4 (*i.e.* competition *vs*. ripple effects).

1. The Tunisian data*: collecting information on the legal environment of bankruptcy*

In this section, we provide a general view of the legal environment of corporate bankruptcy in Tunisia (1.1). Then, we introduce our sample and discuss the data that were collected in the Tunisian courts in order to describe such legal environment (1.2).

1.1. *The Tunisian bankruptcy procedures*

Tunisia shows numerous similarities with the French legislation. The reasons for this are mostly historical, as the country was under the protectorate of France between 1881 and 1956. Since the Tunisian independence in 1956, and until 2010, France has maintained some influence on Tunisia. One manifestation of this influence can be found in the Tunisian corporate bankruptcy Law that remains close to the French legislation (Civil Law country). One reason for this is the Tunisian willingness to harmonize its legislation with those of the European countries, especially after the signature of an association agreement between Tunisia and the European Union in 1995.[6] The proximities between the French and the Tunisian bankruptcy codes may be justified as both countries are characterized by a critical role of the banking sector in the financing of the firms, mainly made of SMEs. However, the level of development of both countries is clearly not the same, as the Parisian financial market place is far more developed, thus offering the firms more alternatives to raise funds. Put differently, France has both mature banking and financial markets. Thus, one can wonder whether the French legislation is the most appropriate reference for Tunisia. In this paper, we do not directly answer this latter question, but we provide some elements of thought regarding the impact of the Tunisian legal environment (close to the French one) onto the climate of affaires in Tunisia.

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[6] This agreement came into force the 1st March of 1998. One of the objectives is to implement a free-trade zone between both geographical areas.

The Tunisian corporate bankruptcy Law came into force the 17th of April 1995. Following the same objectives of the 1985 French legislation[7], Tunisia prioritizes[8] the protection of businesses and of employment over the creditors' interests.[9] As we shall see, this also implies a specific order of repayment, mainly in favor of the preferential claims (including the unpaid wages) over the secured and unsecured ones.

Graph 1. General organization of the Tunisian Corporate Bankruptcy Laws (1995, 1999, 2003)

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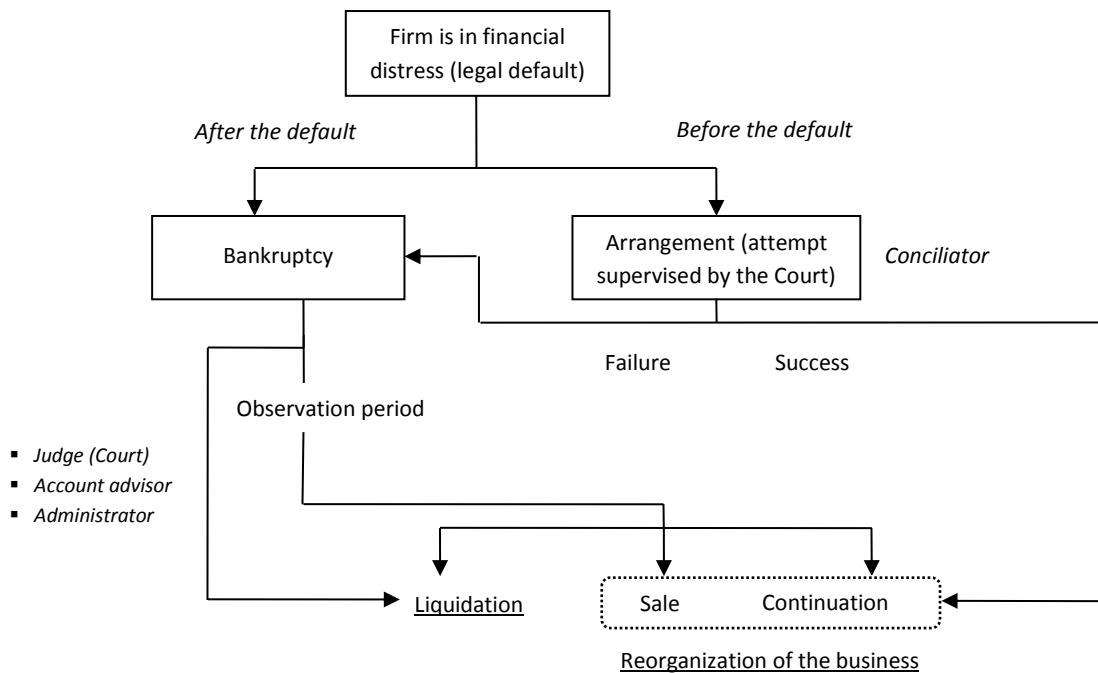
[7] The first article of the French bankruptcy code (25th of January 1985) states that (in French) "*[La procédure de redressement judiciaire est] destinée à permettre la sauvegarde de l'entreprise, le maintien de l'activité et de l'emploi et l'apurement du passif. Le redressement judiciaire est assuré selon un plan arrêté par décision de justice à l'issue d'une période d'observation. Ce plan prévoit, soit la continuation de l'entreprise, soit sa cession. Lorsque aucune de ces solutions n'apparaît possible, il est procédé à la liquidation judiciaire*". The French legislation has been reformed three times since 1985: The 1994 reform (10th of June) did not change the main functioning of the procedure, but introduced some amendments favoring a little more the bankers, especially in the event of liquidation. Eleven years later, the French legislation was reformed (26th of July 2005). The main objectives remained the same, but prevention was reinforced, and a new procedure dedicated to reorganization (close to the US "Chapter 11") was introduced ("*sauvegarde*"). In 2008, the 2005 French legislation was slightly changed once again, but the main framework remains.

[8] The first article of the Tunisian Law n°95-34 defines a hierarchy of objectives, by stating that (in French) "*le régime de redressement judiciaire tend essentiellement à aider les entreprises connaissant des difficultés économiques à poursuivre leur activité, à y maintenir les emplois et à payer leurs dettes*".

[9] Since the 2000s, the priority given to employment preservation has gained ground, notably in Europe. A good example for this is the case of England, a country having the reputation to be rather "creditor friendly": in September 2003, the new British Enterprise Act added to the initial objective "to produce better returns for creditors as a whole" a new one "to facilitate company rescue".

The general organization of the Tunisian corporate bankruptcy Law is synthesized in Graph 1. When a firm has first signs of difficulties, it may attempt to find an arrangement with the creditors. This attempt may be purely informal or it may be supervised by a conciliator (appointed by the Court) whose mission is to help the distressed firm and its creditors to find an arrangement. If such attempt fails, or if the firm appears to be eventually bankrupt (*i.e.* a cash shortage prevents the firm to repay its creditors), a formal bankruptcy procedure is triggered. Then, a Court belonging to the same geographical area as the debtor ("*tribunal de première instance*") opens a new bankruptcy procedure. This one is overseen by the "*Commission de Suivi des Entreprises Économiques*" (CSEE) and remains under the control of a judge ("*juge commissaire*"), with the help of an accounting advisor and of an administrator. The former has up to two months to audit the financial situation of the debtor and to assess its chances to get reorganized. The latter monitors and supports the debtor's manager(s) during a period of three months (renewable once). At the end of this "observation period", the administrator writes a report proposing an outcome: either the piecemeal liquidation of the firm or its reorganization, through either a continuation plan or a sale (as a going concern) to an external buyer. As in France, and contrary to other European countries such as United-Kingdom or Germany, the creditors do not vote on the outcome to be decided. In a nutshell, the fate of the firm, and its chances to survive, mainly depend on the appreciation of the Court.[10] In most of the Tunisian procedures (without taking into account the impact of the personal guarantees), the APO is the following: the employees' claims (*i.e.* unpaid wages) outrank the bankruptcy costs and the public claims. In return, those latter claims outrank the secured ones, which ultimately outrank the unsecured claims. Thus, it appears that the secured claims (mainly banks) are not top-ranked in the Tunisian APO (in France as well, in some extent). Now, the question follows: in practice, do the secured creditors really outrank the unsecured ones?

Since 1995, the Tunisian bankruptcy Law has been reformed twice, mainly regarding the conditions of accessibility. Since 1999, (15th of July), the bankruptcy procedures are now accessible to agricultural and fishery businesses. Since 2003 (29th of December), neither the firms able to repay the creditors (but not willing to), nor those that stopped making business for more than one year, can trigger bankruptcy.

1.2. *The sample and data*

The data collection process took place between 2008 and 2012, in four Courts located in Tunis (24% of our sample), Sfax (38%), Sousse (33%), and Monastir (5%). The three first cities were prioritized in our

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[10] The "*Commission de Suivi des Entreprises Économiques*" also gives an advice on the reorganization plan.

sample as they correspond to the three biggest towns in Tunisia.[11] Monastir ranks 17th regarding the size of its population. We extracted manually 200 variables out of 100 bankruptcy files. Those were opened during the period lying between 1995 and 2009. The first year corresponds to implementation of the 1995 bankruptcy legislation. The last year is one year before the Arab Spring. Thus, the sample is not biased by the presence of firms that may have defaulted because of the historical changes that took place during this period. The time repartition of our sample is shown in Graph 2.

Graph 2. **Time repartition of the Tunisian sample (1995-2009)**
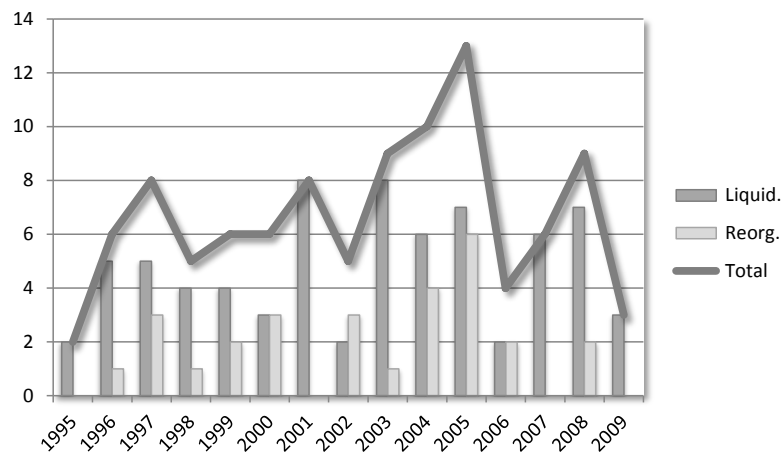
Source: the authors (Tunisian sample, 1995-2009).

We split our sample between the two main outcomes of bankruptcy: liquidation and reorganization. The former outcome corresponds to the piecemeal liquidation of the assets (the proceeds of liquidation being the basis for the creditors' repayment). The latter outcome encompasses the continuation plans and the sales as a going concern. Let us stress that the question of the basic nature of "sales" is debatable. One may consider them as a way to ultimately liquidate the bankrupt firm, as a whole. On the contrary, one may consider sales as a way to revive business (once reorganized), after a change of owner. In this paper, we adopt this second approach, by considering sales as an alternate way of reorganizing the firm's project: instead of settling a plan with the creditors (extended delays and/or debt forgiveness), the firm's capital is transferred to new owners (the sale price being, then, the basis for the creditors' repayment). The liquidation files account for 72% of our sample. The remaining 28% are made of reorganization files. At the national level, according to the "*Commission de Suivi des Entreprises*

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[11] Source: *Institut National de la Statistique* (2004).

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Économiques",[12] the breakdown of the Tunisian bankruptcy procedures is 40% of liquidations and 60% of reorganizations (out of which one third are sales as a going concern). Thus, in our computations, we re-weighted our sample so that the total (weighted) statistics represent this actual breakdown.

All the selected files are "closed files" (*i.e.* files for which a final outcome (liquidation or reorganization) was eventually decided by the Court). Those files contain several useful documents, including *i)* the corporate registration form, *ii)* the financial accounts, *iii)* the complete list of the claims, *iv)* the identification of the employees and of the manager(s), *v)* the administrators' and the advisors' reports, *vi)* the various legal authorizations, *vii)* the judgments. These documents describe, on a day-to-day frequency, the story of each bankruptcy procedure (from the initial triggering to the final outcome). Using this information, we extracted quantitative and qualitative variables that are detailed below:

1. The procedure's characteristics: the location (Tunis, Sfax, Sousse, Monastir), the duration of the procedure before a decision is made (in month), the outcome (reorganization or liquidation).
2. The debtor's characteristics: *i)* the firm's sector (commerce, industry, services); *ii)* the legal form (limited or unlimited liability); *iii)* the firm's age (in years); *iv)* the number of employees.
3. The situation of the debtor at the early stage of the procedure: *i)* the causes of default (we categorized the causes of default – as mentioned in the administrators' reports – into 52 codes, and gathered them into 6 main groups: difficulties related to "outlets", "strategy/management", "production", "finance", "accident", and "macroeconomic environment"); *ii)* the values[13] of the debtor's assets, prior to default (intangibles, tangibles, financial and current assets, cash); *iii)* the coverage rates (*i.e.* the total value of the assets – at triggering – divided by the total due claims).
4. The situation of the creditors (at the early stage and at the end of the procedure): *i)* the structure of the claims at the triggering (by priority order:[14] unpaid wages, bankruptcy costs, public claims, secured claims, and unsecured claims); *ii)* the recoveries[15] at the end of the procedure (same priority order). The way these recoveries are computed depends on the outcome of the procedure. In case of piecemeal liquidation, the proceeds of the assets' sales are the basis for the repayment of the creditors. In case of sale as a going concern, the sale price is the basis for

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[12] Source: CSEE, www.tunisieindustrie.nat.tn/fr/doc.asp?docid=684&mcat=4&mrub=83
[13] We consider the last known book value of the assets, priori to default. If such information is missing, we take the market value of those assets, as recorded by the practitioners when the debtor enters bankruptcy.
[14] Our data do not contain any "new money" claims, *i.e.* claims born after the triggering of the procedure (that is during the "observation period" and before the final judgment).
[15] As our sample is made of bankrupt firms, the recoveries of the shareholders (*i.e.* subsidiary claims) are most of the time equal to zero.

the repayment. In case of a continuation plan, the repayment schedule may be extended and some claims may be lowered. For this latter outcome, we thus discounted the scheduled repayments on the whole period covered by the plan, as it was initially depicted in the administrator's report. The discount rate equals to the risk-free interest rate (*i.e.* the interest rate for the Tunisian public bonds, at the horizon of 10 years or 12 years, depending on the availability of the public data).[16]

In the subsequent section, we present some descriptive statistics providing primer elements on answers to the addressed questions.

2. Descriptive statistics: a primer ranking between the various creditors

This section provides some descriptive statistics. Those figures provide first elements of answer to our set of questions. Indeed, they can be usefully paralleled with previous works made on Europe that use comparable data (see Blazy, Petey, and Weill, 2010). In particular, Tunisia can be paralleled with France, as both bankruptcy systems present numerous similarities in terms of objectives and of general organization.[17] Table 1 gathers the average values and frequencies of our main variables of interest. The first and second columns respectively account for liquidations (outcome 1) and for reorganizations (outcome 2). The third column provides weighted[18] averages and frequencies for the whole sample of bankruptcies. The Fisher statistics test for the differences in averages between the two outcomes of the procedure. The number of stars (*, **, ***) indicates significant differences, respectively at the 10%, 5%, and 1% levels.

Without surprise, the reorganized firms *i)* show significantly higher initial coverage rates (total assets / due claims), *ii)* are bigger (considering either the number of employees, or the total due claims in Tunisian Dinar (TND)), *iii)* and are older (6 years more on average) than the liquidated firms. Overall, the most frequent[19] causes of default are mainly attached to external factors, either accidental (36%) or

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[16] Sources: http://www.cmf.org.tn and www.bct.gov.tn/bct/siteprod/francais/indicateurs/interet.jsp. For the plans starting before 2003, we consider the interest rate delivered by the Tunisian public bonds in year 2003 (no information of this kind was published before 2003). On the whole period, depending on the year, our discount rate lies between 5.67% and 8.19%.

[17] This is mainly true until the 2005 French bankruptcy reform.

[18] The weights reflect the actual breakdown of the liquidation and reorganization procedures in Tunisia.

[19] When summing the frequencies of all the causes of default, we obtain a total exceeding 100%, as there may be more than one cause of default for every file.

related to the macroeconomic environment (32%). The first causes of default reflecting the debtor's internal difficulties are equally related to outlets (28%) and finance (27%). This latter figure confirms that the Tunisian firms are very sensitive to their financing conditions, especially regarding their access to credit. In practice, because of the lack of financing alternatives, one sole credit refusal may initiate bankruptcy.

Table 1. Descriptive statistics, Tunisian corporate bankruptcy files

Variables (and Fisher tests#)	Liquidations	Reorganisations (sales & plans)	All bankruptcies (weighted)
Sample size	72	28	100
Recovery rate (all claims)*	**12%**	**50%**	**22%**
Recovery rate (practitioners fees)	64% (18)	78% (10)	66% (28)
Recovery rate (public claims)***	14% (15)	59% (1)	27% (16)
Recovery rate (employees)***	31% (46)	72% (16)	41% (62)
Recovery rate (secured claims)***	4% (33)	46% (4)	21% (37)
Recovery rate (unsecured cred.)***	7% (15)	48% (3)	20% (18)
% of practitioners' fees (in total claims)	3%	1%	3%
% of public claims (in total claims)	27%	17%	24%
% of employees' claims (in total claims)	8%	7%	7%
% of secured claims (in total claims)***	25%	55%	33%
% of unsecured & others (in tot. claims)***	37%	20%	33%
Practitioners' fees	13 000 TND	12 720 TND	12 120 TND
Duration of the procedure (months)	66 months (1)	77 months (5)	70 months (6)
Intangible assets (last known book value)***	470 TND	49 650 TND	11 330 TND
Tangible assets (last known book value)***	100 800 TND	3 067 200 TND	747 100 TND
Financial assets (last known book value)**	2 710 TND	180 100 TND	45 290 TND
Current assets (last known book value)***	161 350 TND	2 067 580 TND	588 050 TND
→ Incl. cash (last known book value)**	17 450 TND	99 600 TND	37 430 TND
Total due claims (excl. pract. fees)***	1 108 410 TND	7 759 230 TND	2 419 610 TND
Coverage rate***	31%	98%	45%
Age (years)***	11	17	12
LTD companies	89%	86%	87%
Number of employees	13.6 (67)	79.2 (19)	49.8 (86)
Cause(s) of default: outlets**	22%	43%	28%
Cause(s) of default: strategy & management**	15%	36%	21%
Cause(s) of default: production**	10%	29%	14%
Cause(s) of default: finance*	25%	43%	27%
Cause(s) of default: accident	32%	43%	36%
Cause(s) of default: macro. / environment***	25%	54%	32%
Sector: trade**	26%	7%	22%
Sector: industry*	61%	79%	64%
Sector: services	13%	14%	14%
Monastir	4%	7%	5%
Sfax	38%	39%	38%
Sousse*	28%	46%	32%
Tunis**	31%	7%	25%

(#) ANOVA tests on the differences in averages for the two outcomes: liquidation or reorganization. Note: *, **, and ***
indicate a statistically significant difference in averages at the 10%, 5%, and 1% levels, respectively (Fisher tests). The small
figures in parentheses correspond to the number of observations with missing values.

Source: the authors (Tunisian sample, 1995, 2009).

The average total recovery rate equals 22%, which is relatively high when compared to more developed countries. According to Blazy, Petey, and Weill (2010), in Europe, the same statistics lies between 13% (for the United Kingdom), and 21% (for France and Germany, equally). Thus, at first sight, the design of the Tunisian bankruptcy system seems good enough to protect the value of the claims. However, this figure hides huge discrepancy between the various outcomes: on average, while the reorganization procedures lead to substantial recoveries (50%), the liquidation ones are associated to poor levels of repayments (12%). This latter figure is much lower than the corresponding ones found on the French and the German liquidation procedures (between 20% and 21% according to Blazy, Petey and Weill, 2010). More importantly, the "efficiency" of a procedure cannot be restricted to its sole ability to generate recoveries. One must focus also on the cost of that procedure.[20] There are two ways to measure bankruptcy costs (White, 1989): either directly by assessing the practitioners' fees, or indirectly by measuring the duration of the procedures. Our statistics suggest that the Tunisian procedures, despite being able to generate recoveries, are quite long on average. This is all the more noticeable for the liquidation procedures that are nearly as long as the reorganization procedures (close to 6 years). Yet, such long durations generate moderate direct costs (less than 3% of the total claims). But, once again, the liquidations surprisingly appear more expensive than the reorganizations. This latter feature is quite uncommon as liquidation is much a simpler process to manage than reorganization. In a nutshell, our descriptive statistics provide some elements of answer to question Q1: *the Tunisian reorganization procedures generate substantial recoveries, but the creditors recover significantly less under liquidation, which is a long and rather costly procedure. Overall, the system globally performs quite well, thanks to the relatively high proportion of companies being reorganized eventually*.

As stressed by Hart (2006), another basic function of the bankruptcy procedures is to share the value of the firm between the creditors, some of them being more protected than others. Not surprisingly, in Tunisia, the creditors' recoveries strongly differ from one category to another, but in a rather unexpected direction. The most striking feature is the extremely low level of recovery of the secured creditors (most of them being composed of banks). Whatever the outcome, the average recovery rate of the secured creditors is the lowest one (4% under liquidation and 46% under reorganization). More importantly, this recovery rate is similar to the one observed for the unsecured creditors (7% and 48%

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[20] The "efficiency" of the bankruptcy procedures also depends on the determinants of their final outcomes (especially when compared to the initial objectives of the Law): are the Tunisian bankruptcy procedures able to save firms that deserve reorganization? Is the arbitration between liquidation and reorganization mainly attributable to the design of bankruptcy law, or to the sole characteristics of the bankrupt firms?

for liquidations and reorganizations, respectively). This Tunisian specificity is very unusual, and provides some elements of answer to question Q2: *the secured and unsecured creditors recover nearly the same, and are both ranked last. At the opposite side, the highest recovery rates are observed for the practitioners (64% and 78%), the employees (31% and 72%), and the public claims (14% to 59%).* The resulting consequences for Tunisia are contrasted. On the one hand, the poor level of protection of the secured claims is likely to generate inefficiencies in terms of development, especially as the Tunisian firms mainly depend on the banking sector. The banks might, either engage credit rationing, or increase their bargaining power by prioritizing out-of-court renegotiation in order to escape formal bankruptcy. In each case, this may destroy the firms' ability to raise funds powerfully. On the other hand, the high level of protection of the social claims (employees) and of the bankruptcy costs (practitioners' fees) may have some positive impact on development. The protection of employees is rather coherent with the Tunisian authorities' willingness to improve social protection, which is an essential component of development (African Development Bank, 2012, Ministry of Development and International Cooperation, 2010). The protection of bankruptcy practitioners is more debatable. From the claim holders' point of view, bankruptcy costs are pure loss of money challenging their own recoveries. Even more, if they are not allocated efficiently, bankruptcy costs might decrease the bankrupt firm's value, and thus provide rationale to avoid formal bankruptcy. On the contrary, Webb (1987) and Lubben (2012) suggest that the bankruptcy costs are not sunk costs only, as they are the counterpart of tangible services (verification, coordination, audit…) that aim at preserving the firm's value. As the Tunisian system seems more efficient in reorganizing the firms than in liquidating them (see *supra*), the protection of the practitioners' fees is economically justified mainly for reorganizations.

At this level of the analysis, we have identified two interesting features of the Tunisian system. Both may have an impact on the development path of this country. Firstly, the Tunisian procedures generate substantial recoveries on average, but this is mainly attributable to the reorganization procedures. Those are more frequent than in other (developed) countries (according to Couwenberg, 2001, in Europe, the reorganization rates does not exceed 20%). At the opposite, the liquidation procedures appear long, relatively costly, and are associated to poor recovery rates. From that perspective, Tunisia lacks fast and accessible procedures dedicated to the piecemeal liquidation of non-performing projects: in such a context, capital allocation may not be optimal. Secondly, the analysis of the recovery power of the various classes of creditors leads to an unusual ranking: the procedures mainly serve the practitioners

and the preferential claims (*i.e.* the social claims, and – in a lower proportion –the public claims). At the opposite, both secured and unsecured creditors are ranked last, and recover similar (low) payments.

However, these primer findings should be considered with caution, as simple descriptive statistics do not control for the other factors that may explain the outcomes of the bankruptcy procedures. To control for these factors, we must consider multivariate approach. This is the purpose of the following section.

3. Regression analysis: the situation of the secured creditors

In this section, we estimate several regression models to answer more extensively to our initial set of questions. In subsection 3.1, we wonder if the presence of secured claims influences (or not) the chances to get reorganized (Q3). Then, in subsections 3.2 and 3.3, we analyze the determinants of the recoveries. We first consider the total recoveries (3.2). Then, we investigate to which extent the various classes of creditors compete (or not) together (Q4), and we (re)estimate how the secured claims rank compared to the others (Q2).

3.1. Understanding the outcome of the Tunisian bankruptcy procedures

A developed market economy needs institutions (financial market, bankruptcy law, etc.) able to screen between the profitable projects (to get financed and/or reorganized) and the non-profitable ones (to get liquidated). Such screening process might take place either before or after default.

Before default, the screening process takes place at the time of financing, and usually lies either in the hands of the financial market (shareholders) or of the banking sector (secured creditors). The latter source of financing is of most importance in Tunisia, and the banking sector is initially in position to screen between projects. After default, the screening between profitable and non-profitable projects follows a double-stage process: first, the various stakeholders chose either to renegotiate informally or to trigger formal bankruptcy (see Blazy, Martel, and Nigam, 2013, for a modelling of this choice). Second, in case of bankruptcy, the firm's project is liquidated or reorganized eventually (White, 1989). This latter alternative relies on the creditors' willingness (through a vote) or is delegated to a Court (the judges usually work with the help of the bankruptcy practitioners). In Tunisia, the fate of a bankrupt firm mainly

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depends on the decision of the Court (under the supervision of the "*Commission de Suivi des Entreprises Économiques*", CSEE). In such context, one can wonder whether the Court's choice should be influenced (or not) by the structure of claims, and more particularly by the importance of the secured claims. The answer to this question is not straightforward. On the one hand, the judges should strictly follow the direction shown by the law, and respect its general principles *per se*, whatever the structure of the claims. Thus, their decision to liquidate or to reorganize should not depend *a priori* on the presence of secured claims. On the other hand, realistic courts should not decide reorganization without the support of the most important creditors, especially the secured ones. To test for this, we model the probability of reorganization (LOGIT regression) as a function of *i)* the structure of claims (due amounts to each class of creditors, in logarithm) and of *ii)* control variables (the *firm's specificities* – value of assets (in log), age (in log), limited liability[21], number of causes of default linked to internal difficulties –, and the *environmental context*: sector (commerce, industry *vs.* services), geographical location (Sousse, Sfax, Monastif *vs.* Tunis), economic growth (annual change in GDP), and number of causes of default linked to the macroeconomic environment). The LOGIT estimates are shown in Table 2 (model 1). Each figure corresponds to the estimated parameters. The number of stars (*, **, ***) indicates Chi-square statistics significant at the 10%, 5%, and 1% levels, respectively.

The model is globally significant, and shows a concordant percentage of classification close to 93%. We also computed the condition index of Belsley *et al.* (1980) to test for multicollinearity, which appears satisfactory with a total value below 30.

Regarding our main question, we find that the Court's decision to reorganize (against liquidation) does not depend on the importance of the secured claims. At the opposite, previous works made on the United States (Morrison, 2007) and Europe (see Bergström *et al.*, 2002, for the Finnish case) have shown that the presence of secured creditors influences the final outcome of bankruptcy: according to these works, the more secured creditors are, the lower is the likelihood to reorganize the debtor, especially in bankruptcy systems where reorganization requires the creditors' approval. Clearly, Tunisia does not confirm such findings. This is quite coherent with the main objectives of the Law (*i.e.* prioritizing *per se* reorganization over liquidation), but this also raises some concerns on the chances of success of such plans that do not require the approval of the main credit dispensers. More generally – except for the practitioners' claims –, no class of claimant significantly influences the outcome of the procedure. This

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[21] We consider a dummy variable equal to one if the debtor is protected by limited liability.

result might generate some *ex-ante* inefficiencies: if the courts' decisions are independent from some categories of creditors (whatever their type), those creditors may try to avoid bankruptcy by any means, simply because they are losing hand once bankruptcy is triggered. Such fear of bankruptcy was noticed in France that also delegates the decision power to a Court (Lyazami, 2013).

Table 2. **The determinants of the bankruptcy outcome (model 1, LOGIT regression)**

Model 1: Reorganization (plans & sales) *vs.* liquidation (LOGIT regression)			
Explained variable: Dummy "Reorganization" (*prob. of*)			
I) Explanatory variables: firms' specificities		II) Explanatory variables: environment	
ln (due claims for PRAC)	-1.013** 0.032	Nb. causes of default related to "macro. & environment"	0.3846 0.658
ln (due claims for PUBL)	-0.0867 0.686	Dummy "industry" (ref: trade)	-0.1678 0.912
ln (due claims for EMPL)	0.1926 0.426	Dummy "services" (ref: trade)	-1.2435 0.514
ln (due claims for SECU)	0.3537 0.110	Dummy "Court located in Monastir" (ref: Tunis)	1.6531 0.426
ln (due claims for JUNIO)	-0.0184 0.941	Dummy "Court located in Sfax" (ref: Tunis)	4.6471*** 0.008
ln (intangible assets)	0.2782 0.642	Dummy "Court located in Sousse" (ref: Tunis)	3.1907* 0.050
ln (tangible assets)	0.4035 0.225	Tunisian GDP (annual change)	-25.4430 0.517
ln (current assets, excl. cash)	-0.0945 0.779	Constant	-4.2273 0.221
ln (cash)	0.8555** 0.035		
ln (age)	0.3184 0.518		
Dummy "limited liability"	-2.1237 0.161		
Nb. causes of default related to "outlets"	-0.0408 0.960	**Number of observations : 100** → **72 piecemeal liquidations** → **28 reorg°. (plans & sales)**	Likelihood (χ²): 65.76*** (<.0001) Score stat.:: 52.54*** (<.001) Belsley condition index: 27.18 % Concordant: 92.6
Nb. causes of default related to "strategy & management"	0.2783 0.796		
Nb. causes of default related to "production"	0.0603 0.954		
Nb. causes of default related to "finance"	0.7524 0.477		
Nb. causes of default related to "accident"	0.3953 0.695		

Source: the authors (Tunisian sample, 1995, 2009).

The previous findings have one exception: one specific class of claimant – the practitioners' claims – significantly decreases the chances of reorganization. According to us, this result mainly reflects that the Tunisian liquidation procedures are more expensive than the reorganization ones (*cf. supra*). Put differently, the bankruptcy costs do not serve the initial objectives of the law (favoring reorganization), and a significant part of them is spent to prepare liquidation. Moreover, our results suggest that the chances of reorganization are not the same depending on the geographical location. Namely, when compared to Tunis, the chances to get reorganized are significantly higher in Sfax and in Sousse (whereas

the city of Monastir does not show any significant effect). This can be explained in two ways: either the profile of the bankrupt firms is different from one region to another, or there is some heterogeneity in the way the various courts (and/or the local practitioners) manage the bankruptcy procedures. According to us, this second explanation is more plausible, as the former effect is (partially) captured by our control variables. Those variables account for the firms' specificities at the time of default (structure of assets, age, limited liability, and causes of default). Among the control variables, the amount of cash (in log) significantly increases the chances of reorganization. Let us stress that, contrary to the tangible assets, the cash does not guarantee the chances of success of the reorganization plan on the long run.

To sum up, with the noticeable exception of the bankruptcy costs, the final outcome of bankruptcy is independent from the structure of claims. We notably find that the amounts being due to the secured creditors do not influence the chances to get reorganized. This confirms that, in Tunisia, the secured creditors lose hand within the bankruptcy process. The consequences are twofold. On the one hand, this may protect the bankrupt firms against the pro-liquidation bias of their (secured) creditors, but on the other hand, this may also generate inefficiencies in the way bankruptcy is managed. Indeed, if the creditors cannot influence the choice between liquidation and reorganization, there is no guarantee that the courts will protect the interests of the residual claimants, *i.e.* the creditors who benefit from a marginal increase of the debtor's value (Daigle and Maloney, 1994). This may result in a decrease of the total debtor's value, which is a loss of efficiency.

Testing for the efficiency of bankruptcy procedure is empirically a challenge, as it would require comparing alternative values of the bankrupt firm, once liquidated or reorganized. Thus, most of the papers use a convenient proxy, which is the total recovery rate (Davydenko and Franks, 2008). This latter variable does not directly test for the efficiency of the procedures, but account for their ability to preserve value for the whole set of creditors. In the subsequent sections, we use our set of Tunisian bankrupt firms to model the determinants of the creditors' recoveries. Section 3.2 considers the total recoveries, while section 3.3 focuses on the recoveries of each class of creditors.

3.2. Understanding the determinants of the total recoveries

The total recovery rate is the total amounts recovered by the creditors divided by the total due claims. In our presentation, instead of considering this ratio directly, we rather regress the logarithm of the total recoveries on the logarithm of the total due claims. By doing this, the level of the coefficient

multiplying the total due claims (in log) can be interpreted as the elasticity of the recovered amounts to the total due claims (which gives similar information than the recovery rate). This approach shall be useful in the subsequent section 3.3. Additionally, by doing this, the explained variable can be modeled through a simple OLS regression, as it is not bounded between zero and one. We also decided to run one sole regression on the whole sample (instead of splitting our sample in two subsamples – one for the liquidated firms, the other for the reorganized ones – and running two separate regressions). This methodological choice is driven by the moderate size of our sample. In order to distinguish reorganizations from liquidations, we build two combined variables. The first one multiplies the total due claims (in log) with a dummy variable equal to one when the firm is liquidated, and zero otherwise. The second one is similar, but considers a dummy variable equal to one when the firm is reorganized. The other control variables are close to the ones used in the precedent model (*cf.* model 1): some are related to the firm's specificities (value of the assets, age, limited liability, and number of "internal" causes of default), and the others are related to the environment (sector, location, and number of "macroeconomic" causes of default). Table 3 gathers the OLS results (model 2). The number of stars (*, **, ***) indicates Student statistics significant at the 10%, 5%, and 1% levels, respectively.

The adjusted R square of the model equals 63%, and the condition index (28) confirms the absence of multicolinearity. The model is globally significant (Fisher stat.). The regression analysis confirms the result primarily brought by our descriptive statistics: after having controlled for the debtor's characteristics and for the environment of default, the elasticity of the recovered amounts to the total due claims is superior when attached to reorganization (0.85) than when attached to liquidation (0.40). This confirms that the prioritization of reorganization over liquidation does not destroy value for the creditors. Put differently, the Tunisian reorganization procedures do not serve the debtor's interests only – by allowing them to prolong business –, they also protect the creditors' one – by enlarging their repayment. Once again, this confirms the superiority of reorganization procedures in Tunisia. From a methodological perspective however, one can notice that the combined variables in model 2 use dummies attached to the outcome of the procedure. As such outcome is a decision variable, one can suspect our results to be biased by endogeneity (selection effect). In appendix A1, we thus provide a Heckman regression as a robustness check. The Heckman model confirms the presence of a selection effect, but brings results similar to the OLS regression. We notably confirm that the Tunisian reorganizations serve more the creditors' repayment than the liquidations. This result seems quite logical but interestingly shows that, once again, the protection of the debtor does not always compete

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with the creditors' interests. From that perspective, the pro-continuation bias of the Tunisian bankruptcy code cannot be viewed as challenging the creditors as a whole. In the subsequent section, we address a more fundamental question about the way the various classes of creditors are protected by the Law: is such protection homogeneous or not?

Table 3. **The determinants of the total recoveries (model 2, OLS regression)**

Model 2: Total recoveries (OLS regression)			
Explained variable: *In* **(total recovered amounts)**			
I) Explanatory variables: firms' specificities		**II) Explanatory variables: environment**	
In (total due claims) x dummy "liquidation"	0.4013*** 0.008	Nb. causes of default related to "macro. & environment"	0.5354 0.111
In (total due claims) x dummy "reorganization"	0.8495*** <.0001	Dummy "industry" (ref: trade)	-0.2589 0.639
In (intangible assets)	0.0250 0.907	Dummy "services" (ref: trade)	-0.4327 0.569
In (tangible assets)	0.3177** 0.023	Dummy "Court located in Monastir" (ref: Tunis)	2.1797** 0.028
In (current assets, excl. cash)	-0.1763 0.157	Dummy "Court located in Sfax" (ref: Tunis)	1.5253*** 0.006
In (cash)	-0.1720 0.306	Dummy "Court located in Sousse" (ref: Tunis)	0.6118 0.284
In (age)	-0.3969* 0.063	Tunisian GDP (annual change)	7.4804 0.653
Dummy "limited liability"	-0.4676 0.483	Constant	-0.5327 0.709
Nb. causes of default related to "outlets"	-0.2088 0.609		
Nb. causes of default related to "strategy & management"	0.3036 0.471	**Number of observations : 100** **→ 72 piecemeal liquidations** **→ 28 reorg°. (plans & sales)**	Fisher stat.: 9.29 (<.0001) Adjusted R² : 0.63 Belsley condition index: 28.49
Nb. causes of default related to "production"	0.3128 0.489		
Nb. causes of default related to "finance"	-0.0826 0.855		
Nb. causes of default related to "accident"	0.1924 0.674		

Source: the authors (Tunisian sample, 1995, 2009).

Some additional remarks can be made on our control variables. Firstly, among all the assets, we find that tangibles assets only increase the recoveries. All the other types of assets (intangibles, current assets, and cash) have no significant influence. This result might stem from the creditors' monitoring taking place before default. Indeed, tangible assets (1) are easier to control than intangibles when the debtor is running business, and (2) are less volatile than cash (*i.e.* they are less likely to get destroyed before default). Overall, the higher the tangibles are, the more value is preserved within the firm. Secondly, our regression confirms the geographical effect found in model 1: with the noticeable exception of Sousse,[22] Sfax and Monastir are associated with higher total recoveries. Here again, this

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[22] Yet, the city of Sousse becomes significant when turning to the Heckman regression (see appendix A1).

might indicate, either differences between the local bankruptcy affairs, or some heterogeneity in the way the various local courts manage bankruptcy.

This section has provided elements of answer on the ability of the Tunisian system to generate recoveries for the whole set of creditors. This "creation of value" is mainly confirmed under reorganization. Yet, beyond the question of total recoveries, our main point of interest remains focused on the way the secured creditors are treated under bankruptcy. This question is addressed in section 3.3.

3.3. Understanding the competition between the various classes of creditors

In this section, we address two questions related to the way the secured creditors are protected under the Tunisian bankruptcy law. First, to which extent the secured creditors compete with the others (question Q4), and how do the secured recoveries rank within the whole set of creditors (question Q2)? These two questions are of primer importance as the secured creditors are mainly composed of banks who are the main credit dispenser in Tunisia, and thus a vector of development for this country. To answer these questions, we must take into consideration that the recoveries of one class of claimant compete with those of the other classes. To account for this, we estimate a simultaneous equations model that captures the interdependencies between the repayments of the competing classes of creditors. The system has five equations, each explaining the recoveries (in log) of one specific class of claims (denoted (i) below): *i.e.* the bankruptcy practitioners (PRACT), the public creditors (PUBL), the social claims (EMPL), the secured claims (SECU), and the unsecured claims (JUNIO). For each class of creditors (i), the corresponding equation in the system has the following form:[23]

$$ln(\text{recovery }_i) = \alpha_0 + \sum_{j \neq i} \beta_j \, ln\big(\text{recovery }_j\big) + \gamma \, ln(\text{due claim }_i) \cdot \text{dummy } 'reorganization'$$

$$+ \, \delta \, ln(\text{due claim }_i) \cdot \text{dummy } 'liquidation' + \sum_k \theta_k \, \text{control variable }_k + \epsilon$$

For each equation (i), the recovered amounts of a class (i) of creditors is a linear combination of (1) the recoveries of the other classes of creditors (j≠i), (2) the due amounts to the class (i) (we use combined variables to split between the due amounts under reorganization and the due amounts under liquidation), (3) control variables, (4) an error term. The model is estimated by a 3SLS regression, which results are gathered in Table 4 (model 3).

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[23] For simplicity purpose, we do not make appear the index attached to the current observation.

Table 4. The determinants of the recoveries by classes of creditors (model 3, 3SLS regression)

Explanatory variables (instruments are in *italics*) (endogenous var. are in **bold**)	Bankruptcy practitioners (PRAC) 3SLS (first step)	Bankruptcy practitioners (PRAC) 3SLS (final model)	Public creditors (PUBL) 3SLS (first step)	Public creditors (PUBL) 3SLS (final model)	Employees (EMPL) 3SLS (first step)	Employees (EMPL) 3SLS (final model)	Secured claims (SECU) 3SLS (first step)	Secured claims (SECU) 3SLS (final model)	Junior claims (JUNIO) 3SLS (first step)	Junior claims (JUNIO) 3SLS (final model)
In (recovered value for PRAC)				0.2712 / 0.104		0.1919* / 0.051		0.0643 / 0.686		-0.0756 / 0.716
In (recovered value for PUBL)		0.0289 / 0.721				-0.0525 / 0.712		0.1404 / 0.575		-0.5281* / 0.063
In (recovered value for EMPL)		0.0764 / 0.105		0.0629 / 0.622				-0.2328** / 0.037		0.1055 / 0.549
In (recovered value for SECU)		0.0289 / 0.717		0.4693*** / 0.006		0.1396 / 0.349				0.7629*** / 0.001
In (recovered value for JUNIO)		0.0195 / 0.759		-0.2971* / 0.094		-0.1480 / 0.213		0.4429*** / 0.002		
In (due claims for PRAC) x dummy "liquidation"	0.8060*** / <.0001	0.7777*** ① / <.0001	0.2940** / 0.032		0.1813** / 0.028		0.2230* / 0.064		0.1124 / 0.486	
In (due claims for PRAC) x dummy "reorganization"	0.9321*** / <.0001	0.8823*** ② / <.0001	0.0543 / 0.814		-0.0092 / 0.947		-0.3708* / 0.070		-0.4779* / 0.084	
In (due claims for PUBL) x dummy "liquidation"	-0.0434* / 0.092		0.0651 / 0.384	0.1241** ④ / 0.031	0.0067 / 0.882		-0.0696 / 0.291		-0.1352 / 0.130	
In (due claims for PUBL) x dummy "reorganization"	0.0371 / 0.504		0.5782*** / 0.001	0.5656*** ③ / <.0001	0.0240 / 0.806		-0.2265 / 0.116		-0.3208* / 0.099	
In (due claims for EMPL) x dummy "liquidation"	0.0633** / 0.029		0.0789 / 0.345		0.5531*** / <.0001	0.4863*** ② / <.0001	-0.0318 / 0.665		-0.0308 / 0.756	
In (due claims for EMPL) x dummy "reorganization"	0.0026 / 0.953		-0.1004 / 0.440		0.8893*** / <.0001	0.9470*** ① / <.0001	-0.3617*** / 0.002		-0.2156 / 0.165	
In (due claims for SECU) x dummy "liquidation"	-0.0130 / 0.532		0.0711 / 0.242		-0.0506 / 0.166		0.0578 / 0.281	0.0983 ⑤ / 0.103	-0.0276 / 0.702	
In (due claims for SECU) x dummy "reorganization"	-0.0088 / 0.841		0.2331* / 0.073		-0.0245 / 0.751		0.8169*** / <.0001	0.4856*** ④ / 0.004	0.2842* / 0.066	
In (due claims for JUNIO) x dummy "liquidation"	0.0374 / 0.119		0.0008 / 0.991		-0.0438 / 0.296		0.0045 / 0.941		0.1857** / 0.027	0.1908*** ③ / 0.009
In (due claims for JUNIO) x dummy "reorganization"	0.0283 / 0.514		0.0934 / 0.461		0.0489 / 0.520		0.2853** / 0.012		0.7804*** / <.0001	0.4234*** ⑤ / 0.003
In (intangible assets)	0.0591 / 0.236	0.0415 / 0.473	0.0718 / 0.621	-0.1065 / 0.521	0.0686 / 0.432	0.0250 / 0.809	0.0252 / 0.844	0.2332 / 0.136	-0.1467 / 0.396	-0.2726 / 0.188
In (tangible assets)	0.0634* / 0.053	0.0692* / 0.096	0.0208 / 0.826	0.0199 / 0.860	0.0998* / 0.081	0.1159 / 0.101	0.1698** / 0.044	0.2931*** / 0.004	0.0785 / 0.485	-0.1179 / 0.435
In (current assets, excl. cash)	-0.0503 / 0.122	-0.0608* / 0.07	0.0038 / 0.968	0.0084 / 0.929	-0.0099 / 0.861	-0.0320 / 0.592	-0.0373 / 0.654	-0.0684 / 0.458	-0.0981 / 0.384	-0.0626 / 0.613
In (cash)	-0.1389*** / 0.002	-0.0811 / 0.101	-0.2271* / 0.070	-0.1037 / 0.472	-0.2513*** / 0.001	-0.1902** / 0.030	-0.0659 / 0.547	-0.2604** / 0.048	0.1988 / 0.180	0.1592 / 0.334
ln (age)		-0.0624 / 0.247		-0.1707 / 0.276		-0.2290** / 0.023		-0.2107 / 0.160		-0.1330 / 0.503
Dummy "limited liability"		0.2390 / 0.131		-0.5597 / 0.220		-0.1660 / 0.559		-0.4868 / 0.268		-0.6301 / 0.285
Nb. causes of default related to "outlets"		-0.0020 / 0.986		-0.3268 / 0.283		-0.3799** / 0.048		-0.0443 / 0.879		0.4098 / 0.299
Nb. causes of default related to "strategy & management"		0.0196 / 0.855		0.1631 / 0.597		0.1658 / 0.390		0.1212 / 0.681		0.0753 / 0.850
Nb. causes of default related to "production"		-0.1347 / 0.250		0.4689 / 0.168		0.2189 / 0.296		-0.4559 / 0.161		0.1738 / 0.689
Nb. causes of default related to "finance"		-0.0824 / 0.474		-0.2382 / 0.468		-0.3978* / 0.055		-0.1574 / 0.616		0.7631* / 0.075
Nb. causes of default related to "accident"		-0.1185 / 0.330		-0.1542 / 0.657		-0.0511 / 0.815		-0.0329 / 0.922		0.5512 / 0.221
Nb. causes of default related to "macro. & environment"		-0.0197 / 0.820		0.2030 / 0.416		-0.0064 / 0.967		0.1831 / 0.448		0.2081 / 0.521
Dummy "industry" (ref: trade)		-0.1746 / 0.210		-0.3356 / 0.403		-0.0420 / 0.866		-0.6037 / 0.122		-0.1040 / 0.841
Dummy "services" (ref: trade)		-0.4375** / 0.027		-0.1147 / 0.837		-0.0264 / 0.939		-0.1989 / 0.711		0.4427 / 0.538
Dummy "Court located in Monastir" (ref: Tunis)		-0.2112 / 0.397		-1.3448* / 0.064		0.9937** / 0.030		0.5827 / 0.404		0.2748 / 0.767
Dummy "Court located in Sfax" (ref: Tunis)		0.1657 / 0.248		-0.2731 / 0.511		-0.1750 / 0.502		0.1355 / 0.744		0.2607 / 0.625
Dummy "Court located in Sousse" (ref: Tunis)		-0.1712 / 0.235		-0.8659** / 0.039		-0.3260 / 0.214		0.0870 / 0.829		0.5553 / 0.304
Tunisian GDP (annual change)		0.3427 / 0.934		5.5591 / 0.645		1.5890 / 0.832		-1.9912 / 0.862		-10.795 / 0.488
Constant	-0.0508 / 0.669	0.0426 / 0.889	-0.2388 / 0.492	1.1053 / 0.216	0.0343 / 0.869	0.8034 / 0.148	-0.0300 / 0.922	0.9241 / 0.275	0.1198 / 0.771	0.5901 / 0.604
3SLS regression / **System Weighted R²: 0.85** / **Number of observations : 100**	Fisher: 49.39 (prob: <.0001) / Adj. R²: 0.87		Fisher: 12.65 (prob: <.0001) / Adj. R²: 0.62		Fisher: 40.88 (prob: <.0001) / Adj. R²: 0.85		Fisher: 30.74 (prob: <.0001) / Adj. R²: 0.81		Fisher: 8.83 (prob: <.0001) / Adj. R²: 0.53	

Explained variable: *In* (recovered value) for...

Source: the authors (Tunisian sample, 1995, 2009). Note: The circled figures (in black and in grey) accounts for the ranking of the five classes of creditors, regarding the value of their elasticities of repayment, and depending on the outcome of the procedure (liquidation or reorganization). For instance, compared to the other classes of creditors, the practitioner's claims respectively rank first and second under liquidation and reorganization.

The 3SLS method follows successive steps. A first-step regression (OLS) is run on a set of instruments to get the predicted values of each endogenous variable (*i.e.* the recoveries). Then, those predicted values are reintroduced in the initial equations, which are estimated once again. The corresponding residuals are then used to estimate the covariance matrix of the error terms. Then, generalized least squares can be used to estimate simultaneously the whole system (final model).

Table 4 provides the estimates (first step regression and final model) for each class of creditors (i). The R square of the weighted system equals 85%. For each class (i), the first-step regressions are shown in columns 1, 3, 5, 7, and 9. For those equations, the instruments are the due amounts to class (i), and the structure of assets.[24] The final regressions (showing the estimates for each equation of the system) are provided in columns 2, 4, 6, 8, and 10. Those columns provide important information. Firstly, for every class of creditors (i), the five first rows contain the estimated parameters of the (other) creditors' recoveries (j). A (significant) positive sign indicates that both classes (i) and (j) compete together within the APO. A negative sign indicates, on the contrary, that the recovery of one class of creditors (j) serves also the repayment of class (i): in that latter case, ripple effects are stronger than competition effects. Secondly, the 10 subsequent rows contain the estimated parameters of the due claims (in log) to every class of creditor (i). Here, as for model 2, the values of those parameters can be interpreted as elasticities, and help in ranking the recovery power of the various classes of creditors. Lastly, the other subsequent rows contain the estimated parameters for our control variables (values of assets, age, limited liability, causes of default, sector, geographical location, and annual change in GDP).

How do the five classes of creditors compete together? Our estimates show several significant relations between the various classes of creditors. Below, in Table 5, we provide a list of the most significant couples of creditors who, either compete together, or on the contrary, mutually serve each other. This Table 5 stems directly from Table 4. Let us stress that the competition between two classes of creditors (i) and (j) may be bidirectional: the recoveries of one class (i) may influence the recoveries of another class (j), and *vice versa*. Consequently, each cell within Table 5 should be read like this: (1) the number of signs (plus or minus) indicates the sign and the level of significance found in Table 4 (10%, 5%, or 1% levels; "n.s." stands for "non-significant"); (2) the corresponding row indicates the class of creditors, considered as an explanatory variable in Table 4; (3) the corresponding column indicates the class of creditors considered as the explained variable in Table 4.

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[24] Indeed, according to us, the due amounts and the values of assets are the most direct explanatory variables of the creditors' repayment.

Table 5. Most significant couples of creditors competing together (derived from Table 4)

From... (explanatory var.) \ ...To (explained var.)	Bankruptcy practitioners (PRACT)	Public creditors (PUBL)	Employees (EMPL)	Secured claims (SECU)	Junior claims (JUNIO)
Bankruptcy practitioners (PRACT)	▨	n.s.	+	n.s.	n.s.
Public creditors (PUBL)	n.s.	▨	n.s.	n.s.	–
Employees (EMPL)	n.s.	n.s.	▨	– –	n.s.
Secured claims (SECU)	n.s.	+++	n.s.	▨	+++
Junior claims (JUNIO)	n.s.	–	n.s.	+++	▨

Source: the authors (Tunisian sample, 1995, 2009). This table derived from Table 4.

According to Table 5, we isolate five significant relations: (1) a bidirectional ripple effect between the secured and the junior (unsecured) claims; (2) a bidirectional competition effect between the public and the junior claims; (3) a unidirectional competition effect between the employees and the secured claims, at the expense of the secured claims; (4) a unidirectional ripple effect between the secured and the public claims, at the sole profit of the public claims; (5) a unidirectional ripple effect between the bankruptcy practitioners and the employees, at the sole profit of the employees. Overall, our regressions confirm the poor position of the secured creditors, whose recoveries are challenged by the employees. More importantly, the recoveries of the secured creditors mainly serve the public claims. The sole effect serving the secured creditors is a bidirectional ripple effect between them and the junior claims. This last result is uncommon, as usually, the secured and the junior claims compete together under bankruptcy. In Tunisia, on the contrary, both secured and unsecured claims seem protected in the same way.

Being challenged by the other classes of claimants does not always mean being ranked last in the APO. To assess the relative ranking of the secured claims when compared to the others, we compare the values of the parameters multiplying our combined variables, *In* (due amounts (i) × dummy "reorganization" and *In* (due amounts (i) × dummy "liquidation". As those variables are in logarithm, their parameter can be interpreted as elasticity. For the reorganizations, we find the following ranking of repayment (in descending order): (1) employees > (2) practitioners > (3) public > (4) secured > (5) junior. For the liquidations, we find this other ranking: (1) practitioners > (2) employees > (3) junior > (4) public > (5) secured. Hence, whatever the bankruptcy outcome, the secured repayments rank last or second-last. This confirms the primer findings in the descriptive statistics: the banks are not well protected under the

Tunisian bankruptcy system. Their relative ranking is quite close to one of the junior claims. According to us, this is one the main weaknesses of the Tunisian bankruptcy system, as it may generate credit rationing. Several recent works have confirmed that the Tunisian SMEs are credit rationed (Adair and Fhima, 2013, Fhima and Bouabidib, 2011). In such context, the financial difficulties logically rank among the first (internal) causes of default (see above, section 2).

Concluding Remarks

The Tunisian bankruptcy process has hardly been studied empirically. This paper aims at providing original information on the way bankruptcy procedures are managed in Tunisia. For that purpose, we collected quantitative and qualitative information on a set of 100 bankrupt firms on the period covering years 1995 to 2009. We use this information to answer several questions of primer importance for the development of Tunisia: are the Tunisian bankruptcy procedures efficient enough to generate high total recoveries? Is the level of protection of the secured creditors strong enough? Do the secured creditors influence the outcome of bankruptcy? Do the secured creditors compete with the other classes of creditors or, on the contrary, do they benefit from ripple effects?

Understanding the process of bankruptcy is all the more essential in an economy mainly financed by the banking system. Indeed, corporate bankruptcy law offers a screening mechanism between the projects being financed. As for Tunisia, France also relies quite heavily on the banking sector, especially for the SMEs (the French bigger companies have a better access to the financial markets). Thus, not surprisingly, Tunisia has adopted a legal framework close for the French one (this is also due to historical reasons). Both countries prioritize reorganization, under which the whole set of creditors benefit from substantial recovery rates. This is one of the strengths of the Tunisian bankruptcy system which is able to produce satisfactory levels of recovery under reorganization, in proportions that are challenging the ones found in more developed countries. Yet, the Tunisian liquidation procedures are much less performant, and generate lower recovery rates, while their associated costs and duration are nearly the same.

Now, despite the similarities between the Tunisian and the French legal framework, the way the secured claims are protected appears quite different in Tunisia. Indeed, our work suggests that the secured creditors recover nearly the same as the unsecured ones. We also find that the secured claims

are challenged by the preferential creditors (employees and public claims). In a nutshell, the Tunisian bankruptcy procedures are able to generate high recoveries, but those are mainly captured by the preferential claims. Last, we do not find a clear priority order between the secured and the unsecured creditors.

What are the likely consequences for development in Tunisia? On the one hand, the Tunisian system is able to generate value out of the bankrupt firms. This recovered value seems to serve mainly the social claims (*i.e.* the employees), which is coherent with the authorities' willingness to reduce unemployment and improve social protection, an essential component of development. On the other hand, the Tunisian liquidation procedures are too long and expensive when compared to the reorganizations, which might put at risk the *ex-post* efficiency of the Tunisian bankruptcy system.

What can we conclude from the poor level of protection of the secured creditors in Tunisia? One can expect to main consequences. First, this may increase the risks of capital misallocation and of credit rationing, without ability to turn to other substitutable sources of financing (the main alternative being trade credit). Several macroeconomic works confirm such rationing, and stress the lack of collaterals. Our study suggests that, beyond the level of collateralization, the collaterals are not protected enough under bankruptcy. Second, the bankers may have incentives to escape formal bankruptcy by prioritizing out-of-court ways of resolving default. Such incentives are all the more strong that the secured creditors do not significantly influence the outcome of bankruptcy. To be able to measure such incentives, we still miss a part of the puzzle: namely information on the informal workouts. This opens avenue for future research.

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Appendixes

Robustness checks: the determinants of the total recoveries (Heckman model)

Section 3.2 uses OLS regression to explain the total recoveries. In the OLS regression, dummies related to the outcome of bankruptcy appear along with our explanatory variables: *In*(total due claims) × dummy "liquidation" and *In*(total due claims) × dummy "reorganization". Being a decision variable, such outcome may be explained by unobserved variables, which may influence both the outcome of the procedure and the total recoveries. Thus, the OLS approach may be subject to some endogeneity bias (or selection effect). As a robustness check, we thus consider the Heckman's approach (Heckman, 1979, Briggs, 2004). We estimate a two equations model: a first equation (the "selection function") explains the choice of the outcome (reorganization *vs.* liquidation), and a second equation (the "response schedule") regresses the total recoveries (in log) on a set of explanatory variables, including the selected outcome. The selection function (equation 1) and the response schedule (equation 2) are estimated simultaneously (maximum likelihood estimates). This leads to the following system:

$$\text{Eq.1: Reorganization}_i = 1, \text{ if } \alpha + \beta \cdot Z_i + u_i > 0$$
$$\text{Eq.2: In(recoveries}_i) = a + b \cdot \text{Reorganization}_i + c \cdot X_i + \sigma \cdot \varepsilon_i$$

For each bankrupt firm (i), (Z_i) and (X_i) represent the set of explanatory variables entering respectively in equation (1) and (2). Taking into consideration the moderate size of our sample, we only include in equations (1) and (2) the variables that appeared to be significant in models 1 and 2. [25] Thus, (Z_i) encompasses the variables that significantly explained the probability of reorganization in model 1 (see section 3.1): namely, the practitioners' due claims and the amount of cash. Similarly, (X_i) encompasses the variables that significantly explained the total recoveries in model 2 (see section 3.2): namely, the total due claims, the value of tangible assets, and the firm's age. The residuals of equations (1) and (2) are denoted (u_i) and (ε_i). Both are white noises following a normal distribution. (σ) is the standard deviation of (ε_i), and (ρ) is the covariance between (u_i) and (ε_i). Table A1 shows the estimates for the selection function (equation 1) and for the response schedule (equation 2).

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[25] Precisely, we take all the explanatory variables accounting for the external environment of the bankrupt firm, but we take only a subset of the variables accounting for the firm's specificities. For the latter variables, we only select those that were significant in models 1 and 2.

Table A1. The determinants of the total recoveries (model 2bis, Heckman regression)

Model 3 **Link between the total recoveries and the outcome of the bankruptcy procedure** **(HECKMAN regression *)**	**Equation 1** **Selection function** Explained variable: Dummy "Reorganization" (*prob. of*)	**Equation 2** **Response schedule** Explained variable: *In* (total recovered amount)
I) Variable subject to endogenity		
Dummy "Reorganization"*		1.4122** 0.047
II) Explanatory variables: firms' specificities		
In (total due claims)		0.5071*** <.0001
In (due claims for PRAC)	-0.357** 0.012	
In (tangible assets)		0.2371*** 0.005
In (cash)	0.5098*** <.0001	
In (age)		-0.3959** 0.026
III) Explanatory variables: environment		
Nb. causes of default related to "macro. & environment"	0.4652* 0.098	0.5431* 0.082
Dummy "industry" (ref: trade)	0.5832 0.209	0.1099 0.831
Dummy "services" (ref: trade)	-0.5163 0.437	-0.2683 0.699
Dummy "Court located in Monastir" (ref: Tunis)	1.7622** 0.049	2.4722*** 0.006
Dummy "Court located in Sfax" (ref: Tunis)	1.8153*** 0.006	1.9605*** <.0001
Dummy "Court located in Sousse" (ref: Tunis)	1.4919** 0.025	1.0524** 0.048
Tunisian GDP (annual change)	-21.6938 0.121	-2.3976 0.878
Constant	-1.5421* 0.085	-1.606 0.188
Variance of errors (σ), equation n°2 (response)		1.7748*** <.0001
Covariance of errors (ρ), equations n°1 (sel. function) and 2 (response)	0.6133*** <.001	
Number of observations : 100 → **72 piecemeal liquidations** → **28 reorg°. (plans & sales)**	Schwarz Criterion: 565.70 AIC: 503.17	

(*) The bankruptcy outcome (dummy "reorganization") is an explanatory variable of the total recovered amounts (In) in the second equation of the system.

The estimate of (ρ) is significant (at the 1% level), so the selection effect is confirmed, and the Heckman's approach is preferable to the OLS. Yet, most of the results driven by the OLS approach are

confirmed here. The main variable of interest (dummy "reorganization") significantly increases the total recoveries. Thus, the Heckman's approach confirms that the Tunisian reorganizations serve more the creditors than the liquidations. Now, regarding the variables accounting for the debtor's specificities, we find similar results than with models 1 and 2. Equation 1 confirms that the chances to get reorganized decrease with the practitioners' fees, and increase with cash. Equation 2 shows that the recoveries mechanically increase with the total due claims. The tangible assets are also an essential component of the total repayments. Last, the creditors' recoveries decrease with the debtor's age. Regarding the explanatory data accounting for the external environment, both the probability of reorganization and the total recoveries increase when the location (relatively to Tunis) is Sfax, Monastir, and Sousse. Let us note that this latter city was not significantly related to the total recoveries in the OLS regression.

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