Does Group-Affiliation Save Company from Bankruptcy during Economic Downturns? Recent Evidence from French Data[*]

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Abstract: *This paper studies the business group affiliation-bankruptcy relationship for a set of small and medium sized companies operating in France over the 2009-2012 period. Unlike previous research, we extend analysis beyond a simple exploration of the impact of group affiliation on bankruptcy, and study the influence of group characteristics over affiliated companies' risk of bankruptcy. The empirical results, stemming from binary logit model estimations reveal a strong relationship between group affiliation and bankruptcy. Companies belonging to business groups (BGs) are particularly shown to have a higher risk of bankruptcy. A closer analysis of BGs' characteristics shows that both external and internal spillovers are the main incentives which encourage BGs, saving their distressed affiliates.*

Introduction

Following the economic recession which started since 2008, and the upsurge of some bankruptcy cases in France, around which has developed endless legal disputes that made headlines of local and national press, it is hardly surprising that there is a rise of interest in bankruptcy among scholars. With high and increasing unemployment rate since 2009, France has fell victim of the economic downturn of 2008. In 2013, 61 468 bankruptcy proceedings were opened, compared with 59 780 in 2012, and 58 195 in 2011. The bulk of nearly 60 000 proceedings annually opened since 2009 concern very young and small businesses, mainly with no or very few employees (92 percent of bankruptcy proceedings opened in 2013 concerned companies with less than 10 employees). These figures are not unexpected since the empirical evidence on the relationship between firm characteristics such as age or size, and bankruptcy risk insist on the so-called "liability of smallness" and "liability of newness" (Thornhill and Amit 2010; Kale and Arditi 1998).

The typology of companies typically affected by bankruptcy seems then to be well identified. On the one hand, one can find a vast majority of very small companies suffering from serious difficulties related to management or financial issues. The "emergency exit" for this category of companies consists of a procedure of quick asset liquidation with a view to creditors' reimbursement. On the other, one can identify medium and large sized companies suffering from temporary difficulties due to market misalignments. Their situation is often settled by an asset reorganization procedure which allows partial sales of assets. Yet, a third category consisting of medium sized enterprises, most of which are affili-

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ated to BGs, have emerged recently. In 2012, 296 medium companies with more than 50 employees have filed for bankruptcy, which is equivalent of an increase by nearly 75 percent of their number, as compared to 2007.

Given the number of French companies which end up liquidated after filing for bankruptcy, commentators often conclude the inefficiency of the country's legal framework. In fact, France has long been recognized as one of the so-called "Civil Law Countries" according to the classification typology defined by the World Bank[1]. The weak protection of creditors' rights and their low recovery rights, are often argued to be the source of inefficiency.

The French bankruptcy regime is mainly based on law number 84-148 of March 1984, and law number 85-98 of January 1985. Both explicitly set company rescue and employment safeguard as a primary goal, over creditors' reimbursement[2]. Two main proceedings are provided for bankrupt companies (i.e companies in cessation of payments[3]): the "Judicial Reorganization" procedure and the "Judicial Liquidation" procedure[4]. Hence, companies identified as being bankrupt in our studied sample are subject to one of the above mentioned proceedings.

Remarkably, the French bankruptcy regime does not include yet any comprehensive device designed exclusively for BGs. The general principle is to ignore the ownership structure of any company, and thus to consider equally, stand alone and group affiliated companies. In concrete terms, regardless of the fact that a company belongs or not to a BG, it is treated as a stand-alone body, solely liable for its own debts with its own assets. Therefore, in case of bankruptcy of one or more components of a BG, a separate bankruptcy procedure is opened with respect to each bankrupt company. The question which often arises then is, whether and to what extent each of the group components should really be treated as a separate legal and economic entity. In order to overcome the inherent limits of such an "atomistic approach", the French legislation has recently proposed and adopted new rules directed towards BGs ("Grenelle II" law reform and "Petroplus law"[5]. The main objective is to thwart the detrimental acts of multinational companies, and ensure their discharge from social and environmental liabilities in particular. The new rules allow the court to assign liabilities among BGs' members; namely the parent company, when situations such as a merger of assets or an interference in the affiliated company activities are shown to be existing.

Similarly, previous studies on bankruptcy often ignore companies' ownership and control structure. The general implicit assumption is that independent and group affiliated companies can be analyzed indifferently in the context of bankruptcy. From the relevant literature, we find a limited number of studies which address the group membership-bankruptcy relationship. The dominant view is consistent with an inverse relationship between group affiliation and bankruptcy for any given company (Dewaelheyns and Van Hulle 2006; Gopalan, Vikram, and Seru 2007).

To the best of our knowledge, this question has however not been investigated yet on French data. Here, we try to bring evidence on this issue, by ad-

[1]Under the heading "Resolving Insolvency", the World Bank's annual survey evaluates the legal framework efficiency of 181 economies based on their business regulations.

[2]The several amendments which have reformed the law since the late $1980's$ show the increased will of the legislator to encourage the prevention of companies' difficulties and business preservation in France.

[3]The cessation of payments represents the case of a company unable to meet its current liabilities with its available assets.

[4]These proceedings are respectively referred to in France as "Procédure de Redressement Judiciaire" and "Procédure de Liquidation Judiciaire.

[5]See Deforge (2010), and Le Corre (2012) for an overview of the reforms in question

dressing the question of whether and and in what manner, companies' ownership structure influence their probability of bankruptcy. Following Dewaelheyns and Van Hulle (2006), we identify group affiliation based on the criterion of existence of an Ultimate Corporate Owner (UCO). We define the UCO as the parent company which holds shares in our sample-companies, and which is not controlled by any other company. Using information on BGs' characteristic, we further investigate whether the group affiliation-bankruptcy relationship is moderated by BGs' characteristics. We gather information on the percentage of control rights[6] held by the UCO in our sample companies, and control for companies' characteristics,in order to study BGS' behavior towards their distressed affiliates. Our assumptions are built on the basis of the extensive literature dealing with the functioning of BGs internal capital markets and their underlying costs and advantages.

On their benefits and costs, BGs have received vast attention from both scholars and legislators. Their key role as "perfect market substitutes" is well recognized, specially in emerging countries (Bamiatzi, Cavusgil, Jabbour, and Sincoviks 2014). Their role of "risk buffer" towards financially distressed affiliates is also well acknowledged. In this line, group affiliated companies are deemed to have a lower risk of bankruptcy than their stand alone counterparts. Negative spillovers likely to occur after the bankruptcy of one group component are often argued to be the main reason why BGs may extend help to their distressed affiliates (Gopalan, Vikram, and Seru 2007). Nevertheless, BGs are described as dark, opaque institutions, where controlling shareholders are free to undertake actions in their own interests, to the detriment of those of minority shareholders (Khanna and Yafeh 2007).

In order to bring evidence on the benefits and costs of group affiliation in the context of bankruptcy, we run three distinct sets of binary logit estimations, and try to bring answers to the following questions: Does group-affiliation influence company bankruptcy, and in what manner? Does company's and group-level characteristics moderate the BG-bankruptcy relationship? Does control of UCO over affiliated companies influence their probability of bankruptcy?

Our empirical analysis leads us to interesting results. We find that BG affiliation, not only does not protect company from bankruptcy, but also increases the chances to enter a judicial procedure for an affiliated company, in comparison with a stand alone one. This result which may be largely due to the period analyzed, clearly challenges those of previous studies. One possible interpretation is that unfavorable macroeconomic conditions may encourage BGs to speed up the elimination of their "lame ducks". However, a closer analysis of BG companies' characteristics allows us to confirm that the potential negative spillovers associated with the bankruptcy of a group member remain the major reason why a BG may decide to save its distressed affiliate.

The paper proceeds as follows. Section two reviews the relevant literature on internal capital markets, and their aspects related to bankruptcy. It also summarizes the hypotheses to be tested empirically. Section three describes data, and sample analyzed. Section four discusses the methodology and the empirical results. And finally, Section five concludes and discusses the implications of the paper.

Literature Review and Hypotheses

Bright Aspects to Internal Capital Mar-

[6]Control rights represent voting rights for the controlling firm, which may not necessarily coincide with its Cash flow rights

kets

On the advantages of BGs, researchers strive to highlight their ability to help affiliates overcome certain obstacles, namely financial distress. Becchetti and Sierra (2003) bring evidence in this line by studying the determinants of bankruptcy for a set of Italian industrial companies. Authors use a dummy variable for group affiliation and underline a strong inverse relationship between bankruptcy and group membership. In contrast, Heiss and Köke (2001) use German data and suggest no influence of pyramidal ownership structure[7] on company's bankruptcy risk.

Using data from Belgian medium and large sized companies, Dewaelheyns and Van Hulle (2004) confirm the result reached by Becchetti and Sierra (2003), and consider the solidarity within BGs as economically wise responses to strategic, taxation, or other group-specific motivations. They emphasize that the inconclusiveness of the results reached by previous studies may be the "rudimentary way" of accounting for group membership in those studies (that is, the simple use of a dummy variable for BG affiliation). Authors assess the impact of ignoring group ties in bankruptcy prediction models and conclude that the inclusion of information on intra-group relations can significantly improve the classification accuracy and performance of some well-known existing prediction models. The originality of their paper lies in the use of data encompassing both subsidiaries' and group's levels.

Dewaelheyns and Van Hulle (2006) add that BGs are prone to extend financial help to their weak subsidiaries (and particularly, subsidiaries in the group-core activities), as long as the group as a whole have sufficient resources. Authors introduce a measure of group's financial health (Altman Z score)[8] and suggest that group membership may preserve company from bankruptcy, conditionally to the financial soundness of their BG. Our data lack information which allow us to proxy for groups' financial health since we consider that data from UCO's level cannot be a perfect proxy for group's financial health. Consequently, our first hypothesis disregards groups' financial health and stipulates that companies operating in BGs have a lower probability of bankruptcy than their stand alone counterparts.

H1: Subsidiaries are more protected from bankruptcy than stand alone companies.

Gopalan, Vikram, and Seru (2007) explore data on Indian intragroup loans over the period 1922-2001 and underline that reasons why BGs may save their distressed affiliates from bankruptcy are manifold. The main one concerns the negative spillovers which may affect the other members of the group. Authors allude to reputation issues in addition to financial interlinkages issues, as the primary factors encouraging a group to extend loans to financially distressed affiliates. Their findings reveal a significant drop in external financing, investments and profits of other firms in the group after the bankruptcy of the first affiliated company. Authors specify that a significant portion of the negative spillover effects revealed in their results stem from the financial linkages which bind group companies.

Besides, Gopalan, Vikram, and Seru (2007) add that group insiders may be prone to save a distressed affiliate in view to protect their equity stake. In this line, authors find a lower probability of bankruptcy for companies with higher insider ownership. Buchuk, Larrain, Munoz, and Urzua (2014) highlight the particularity of intra-group funding and their key role in financial distress situations.

[7]The pyramidal structure is equivalent to the case where a parent company at the top owns shares in subsidiaries, which in turn have subsidiaries of their own.

[8]We should note that the authors use UCO information level in order to proxy for the health of the entire group; which is not without limits

They portray group loans as soft and flexible ways of financing, very easy to be renegotiated in financial distress situations. Authors argue that controlling shareholders may be an interested party at both ends of the lending relationship.

In the same vein, Khanna and Yafeh (2005) rely on data from Japanese BGs and bring evidence on "liquidity smoothing practices". They show that liquidity transfers do help group members increase their debt capacity, but also reduce bankruptcy costs, even if they do not reach any evidence on such practices outside Japan. Here, we try to bring evidence on these issues. We particularly assess the extent to which both potential external and internal spillovers may influence an affiliated company bankruptcy risk. On the internal spillovers, we assume in our second hypothesis that high financial inter-linkages inside a BG are likely to increase the chances of affiliated companies to be speared from bankruptcy.

H2: A high level of financial commitments held by affiliated companies towards the group increases their chances to be speared from bankruptcy.

The financial commitments we proxy for here, are the net financial transfers which benefit to the sample-affiliated companies. Information used consists of the net indebtedness an affiliated company holds towards its group. Our assumption implies that negative spillovers likely to occur after an affiliated company bankruptcy, are all the more serious since the latter is highly indebted towards its group.

Besides, on the external negative spillovers, we assess whether reputation issues influence an affiliated company risk of bankruptcy. The proxy we use here is affiliated company's origin which we compare with that of its BG. In our third hypothesis, we consider that reputation of a group might be more impacted if the bankrupt affiliate is operating in the same country as that of its group. In fact, affiliated companies are more likely to have the same investors as the other members of the group, if they operate in the same country. Thus we assume that domestic BGs may be more prompted to support a distressed affiliate, if the latter's bankruptcy is likely to impact its reputation, and access to external financing.

H3: Companies operating in domestic BGs are more likely to be saved from bankruptcy than companies owned by foreign groups.

Dark Aspects to Internal Capital Markets

Despite the privileges they are able to ensure for affiliated companies, BGs may also be a burden on their company members. In fact, literature often views BGs as opaque institutions where controlling shareholders are free to undertake actions in order to meet their ultimate goal of expropriating minority shareholders.

Theoretically, the proportionality between corporate ownership and control rights implies that any shareholder owns the same fraction of cash flow rights and voting rights. Inside BGs however, deviation from the "one share-one vote" principle is very easy and common, leading to large discrepancies between ownership and control (Bianco and Nicodano 2006). Therefore, the misalignment between controlling and non-controlling shareholders' incentives becomes inescapable (OECD 2007), and leads inevitably to the destruction of companies' performance (Shleifer and Vichny 1997).

A majority of empirical studies point out the drawbacks of excess of control, that is, the discrepancies between ownership and control inside BGs. Two opposite incentive mechanisms are identified as influencing companies' performance. A positive effect induced by the dominant shareholder's cash flow rights (CFR), and a negative effect stemming from its share of control rights (CRs)[9] (Ariffin 2014;

[9]In concrete terms, CFRs represent shareholder's stake in the firm, while CRs represent voting rights of this shareholder.

Gompers, Ishii, and Metrick 2010).

Evidence from large BGs in emerging markets is consistent with minority shareholders' expropriation mechanisms. The term "Tunneling" is often used in literature, and is related to the corporation decisions that enable controlling shareholders to increase their wealth at the expense of minority shareholders (Johnson, La Porta, Lopez-de-Silanes, and Schleifer 2000; Bertrand, Mehta, and Mullainathan 2002). Concretely, it represents the cash transfer from firms where controlling shareholders have low CFRs, to firms where they have larger CFRs.

Using data from Indian BGs, Bertrand, Mehta, and Mullainathan (2002) examine cash-flow transfers between corporate group members and find significant evidence on profits tunneling. They point out transfers of cash to the benefit of controlling shareholders from firms in which they have high cash-flow rights.

In France, the issue of "Tunneling" has never been studied, until recently in Hamelin (2011). The latter explores data from French small business groups (SBGs) over the period 1997-2007 and uses two variables of excess of control. The first, measures the wedge between CFRs and CRs of controlling shareholders (as in Claessens, Djankov, and Lan 2000)), while the second provide information on company's position in the control chain. Author's findings suggest that company's distance from control has a positive influence on its performance. It further concludes that only in case of unfavorable business environments, companies higher in the control chain tend to tunnel resources out from minority shareholders.

In our paper, we try to bring evidence in this line and focus our analysis on the impact, excess of control may have on affiliated companies bankruptcy risk. Since our data lack information on CFRs, we proxy for the excess of control using information on the direct control rights held by the UCO in our sample companies. In line with the empirical studies which suggest that excess of control is detrimental to firm value, we assume in our fourth hypothesis that companies closer to control positions, i.e companies with higher CRs held by the UCO are more exposed to bankruptcy.

H4: Companies closer to control positions are more likely to file for bankruptcy than companies far from the UCO.

Data and Method

Data Collection

Data collected originate from two French sources. The first one is the *"BODACC"*[10] *database* which makes an inventory of all agreements[11] published in the French Trade and Companies Register. Information we gather relates to bankruptcy proceedings, and encompass a wide range of practical details related to all procedures initiated in the French courts. It contains information such as, the date of the Cessation of Payments (In French, *"Date de Cessation des Paiements"*), the type of procedure initiated (Reorganization/ Liquidation), the court of the competent jurisdiction, and the text form of the legal announcement. The second source is "Diane" database, which gathers annual financial and accounting information of firms operating in France[12].

We begin our sample selection process starting from a large dataset extracted from Diane and which lists all businesses operating in France at least one fiscal year between 2009 and 2011. Using company's

[10] In French: *Bulletin Officiel des Annonces Civiles et Commerciales.*

[11] Agreements gathered range from registrations to insolvency proceedings.

[12] The source covers annually around 1.3 million enterprises established in France.

[13] The *"Numéro siren"* is a unique nine-digit identifier assigned by the *National Institute of Statistics and Economic Studies* to every legal unit operating in France.

identification number (called "Numéro Siren", in France)[13], we match with *BODACC* available for the years 2010-2012. We identify 116 725 companies as filing for bankruptcy over the studied period[14]. Financial and ownership structure information for these companies is completed using Diane database for the year $t-1$ prior to the year of entry into bankruptcy, since the use of any information published after the moment a company files for bankruptcy may artificially increase performance of classification models (Ohlson 1980). Following common practice, companies with missing or incomplete accounts are eliminated. Our subsample of failing companies is thus reduced to 15 821 companies.

We pursue the selection process and consider all companies remaining in our initial sample[15] as being sound companies[16]. From a set of 98 275 non-failing companies, we randomly select 46 259 for our study. Overall, our final sample consists of 62 080 companies, among which 15 821 filed for bankruptcy between 2010 and 2012, and 46 259 are still operating all over the studied period.

Variables

Data collected for each company combine general descriptive information (activity, form, legal status, etc...), financial data (balance sheet and income statements), and information on company's ownership structure (shareholders, percentage of control, etc...). Variables we use in our empirical analysis are of two types. The structural variables include companies' age, size, BG affiliation, BG origin, control structure, industry, and geographic localization. The financial variables on the other hand include leverage and liquidity ratios, in addition to a ratio of financial intra-BG commitments.

Structural Variables. Age and size variables are used to control for "liabilities", companies may be confronted with, while operating in their different life cycles. First, information on company's date of establishment is used to calculate the variable *Age*[17]. And second, the amount of total assets at year $t-1$ prior to bankruptcy is used as a proxy for company size.

Following Dewaelheyns and Van Hulle (2006), BG affiliation is identified using information on companies' UCO. In this sense, a company is considered as a BG member since it is controlled by an UCO, which in turn isn't controlled by any other company. Furthermore, UCO-level information is used to proxy for BG origin. Therefore, a company is identified as a part of a domestic (respectively, foreign) BG since its UCO is French (respectively, abroad). For companies' control structure, we use information on direct control rights held by the UCO in the sample affiliated companies. Information gathered shows percentages of control ranging from less than 10 percent, to 100 percent (that is, the case where the company is wholly owned directly by its UCO). We use it to create a variable which allows us to distinguish companies majority controlled by the UCO[18], from companies minority controlled by the UCO, all in a direct manner.

Variables of industry affiliation are included in order to control for sector-specific effects, and therefore, to capture for opportunities such as the intensity of competition, as well as the importance of economies of scale on the industry where the

[14]It is worth noting that we took care to eliminate any procedure that would have started prior to the years 2010-2012.

[15]We refer to the sample of companies that were not identified as bankrupt in *BODACC* database

[16]For further accuracy however, we control for companies' financial health using a variable of "legal situation" available in Diane. Only companies informed as having normal situation are retained for our analysis.

[17]Company's age at bankruptcy is computed as the difference between the year of entry into bankruptcy, and the establishment year.

[18]Major control is equivalent to the case where the UCO holds more than 50 percent of control rights in the affiliated company

company operates. Our industry variables are constructed according to the French classification of activities (NAF Rev. 2, 2008)[19], which comprises five levels of classification. Starting from the broader level (that is, the level "Section"), we define eleven aggregated sectors: food industries, manufacturing industries, construction, retailing, transport and mail, hotels and restaurants,communication technologies industry, finance and insurance, real estate, business services, and finally household services.

The final structural variable we construct is the geographic localization of the company, which we use to adjust for specific local characteristics. We carry out a breakdown of the French territory, and distinguish six regions: Greater Paris region, North West, North East, South West, South East, and Central region).

Financial Variables. The financial variables are created using information from company's balance sheet and attached tables. Leverage ratio is included since it represents potential negative effects which weight on business profits and asset valuation, raising bankruptcy concerns. We compute it as the total debt level to total assets. Furthermore, we include a liquidity indicator. It is the quick ratio which is the current assets (net from inventory and works-in-progress)[20], to current liabilities ratio. And finally, we use information on intra-BGs financial commitments, and compute a ratio of net indebtedness, exclusively for group affiliated companies. In this regard, the group transfers ratio we create, is the ratio of net borrowing[21] for a given company, to its total assets.

Empirical Model

Since our dependent variable is a categorical binary variable, where the company can be either bankrupt, or normally operating, we assume that a binary Logit model is well suited for our empirical analysis. The growing use of Logit/Probit models, since the 1980's is primarily due, on the one hand, to its simple mathematical formulation, and the facility of its results interpretation, on the other. In this paper, we run three distinct sets of binary logit estimations over both global sample, and the sample of group affiliated companies. We use the Maximum Likelihood estimation technique[22], and report results in the following section.

In our three model estimations, we consider a binary dependent variable which takes value "1" if the company is identified as filing for bankruptcy, and "0" otherwise. The logistic equation to be estimated in each set can be written as follows:

$$log\frac{\Pi_i}{(1-\Pi_i)} = \alpha_1 + \beta_1 VAR_i + \beta_2 Size_i + \beta_3 Age_i + \beta_4 Liquidity_i + \beta_5 Leverage_i + D_1 Industry_j + D_2 Region_k + \varepsilon$$

where Π_i is the probability of obtaining $Y_i = 1$ (that is, a company files for bankruptcy), and $(1 - \Pi_i)$, the probability of having $Y_i = 0$ (that is, company does not file for bankruptcy). VAR_i represents the four key variables to be estimated in each set. These are ($Group$, $GroupTransfers$, $GroupOrigin$, and $PercentControl$). For control variables, we retain variables likely to affect our dependent variable (that is, entry into a bankruptcy procedure), according to the relevant literature. We thus control for company financial and structural characteristics, by including ratios of leverage and liquidity.

[19]The French classification of activities (NAF Rev. 2, 2008) is the national statistical classification of activities which has superseded since January 2008 NAF Rev.1, the latter being in use since January 2003.

[20]We exclude inventory and W.I.P, because they are more difficult to turn into cash

[21]The net borrowing is the difference between debts held by a given affiliated company, towards its group, on the one hand, and the lending raised by the same company, to the profit of its BG, on the other.

[22]We use Stata software for our estimations. Stata provides two equivalent commands for the binary logit model estimations. The *logit* command produces the estimated coefficients, while the *logistic* command reports odd ratios

Besides, we use variables of company size (proxied by the total amount of assets), age, industry and geographic localization.

We correct for heteroscedasticiy in all our estimations, using the robust standard errors, and ensure that multicollinearity is absent, based on the Variance Inflation Factors test (VIF)[23]. In order to reduce the impact of extreme observations and outliers, we winsorize all explanatory variables at 1% and 99%. Estimation results are reported in the following section and consist in the Odds ratios, since the estimated coefficients cannot be interpreted, except their sign. Odds ratios allow us quantifying the relative probability of being $Y = 1$ (here, the probability for a company, to file for bankruptcy), instead of $Y = 0$ (that is, the probability of being a sound company), following a Δx_j variation of x_j (where x_j is one explanatory variable).

Results

Group affiliation-bankruptcy relationship

Estimations of the impact of group-affiliation, displayed in Table 4 show a positive, and significant relationship between group affiliation (proxied by the variable *GroupDummy*) and the explained variable (entry into bankruptcy). This means a higher risk of bankruptcy for companies when affiliated with BGs. According to the odds-ratios, group affiliated companies have, on average, near 37 percent of chances higher,[24] to enter a bankruptcy procedure than their stand alone counterparts. The estimated coefficient is remarkably significant at 1 percent level according to the Z-test[25], and is stable regardless of the number of control variables included in the equation.

The dominant view in existing works is consistent with a strong inverse relationship between group affiliation and companies' risk of bankruptcy. Underlying mechanisms such as liquidity smoothing and risk sharing are often used as arguments (Khanna and Yafeh 2005; Dewaelheyns and Van Hulle 2006). Our findings suggest however that being a group member, not only fails to save the company from bankruptcy, but also increases its probability of entering a bankruptcy procedure.

Besides invalidating our first hypothesis, this result challenges those of previous studies. Nevertheless, one should carefully interpret the suggested relationship. A possible explanation may be that during economic downturns, BGs are already enough bearing the adverse general circumstances, so they might be incited to speed up the elimination of their "lame ducks". This interpretation is mainly based on the limited liability principle which governs BGs' interconnections. According to Bianco and Nicodano (2006), moral hazard problems are likely to arise within BGs since their members are separate legal entities, solely liable for their own liabilities with their own assets. The authors suggest that BGs are able to exploit their limited liability and try to sharpen the company losses, until reaching the default of the unsuccessful entity. This assumption may certainly be strong given that we do not have any evidence on such behavior, but can still eventually be plausible.

Group characteristics' influence

Group Origin. To our knowledge, no study

[23]VIF is an indicator of how much of the inflation of the standard error could be caused by collinearity. Overall, the VIF for each of the variables included in our estimations do not exceed the threshold of "1.2".

[24]For qualitative variables, an odds ratio (OR) of 1.3 would mean that being category "1" instead of "0" (for instance) increases the probability of being in the situation $Y = 1$ by 30 percent. If the OR was 0.8, it would reduce the probability by 20 percent. In other words, an OR <1 is equivalent to a negative coefficient for the estimated variable, while an OR>1 is equivalent to a positive coefficient. Here, the OR of the variable *Group* is 1.35, which means that being a BG affiliate, instead of a stand alone company, increases the probability of filing for bankruptcy by 35 percent.

[25]The Z statistic is the Wald test. We us it to test the statistical significance of each coefficient estimated in the model.

ever tried to test the impact, group origin may have on affiliated companies' chances of filing for bankruptcy. Therefore, in the second round of estimations, we particularly question whether foreign ownership protects more, or less companies from bankruptcy. Our findings, displayed in Table 5, suggest that domestic groups are more lenient towards their affiliated companies. In fact, companies controlled by domestic groups are shown to be about 40 percent less likely to file for bankruptcy, than companies controlled by foreign groups [26].

This result can be interpreted as a reaction to the fear of reputation loss for the group as a whole. Indeed, we consider that BGs may have incentives to support their distressed affiliates, especially since the bankruptcy of the latter is likely to damage their reputation, and consequently, hamper their access to external financing. Our finding is consistent with the result of Gopalan, Vikram, and Seru (2007) who underline that bankruptcy inside a BG is likely to induce distrust among investors, and particularly creditors. The authors further underline a significant drop in funding and investments levels for BGs, when one or more of their components file for bankruptcy. It also validates our third hypothesis where we implicitly assume that the external negative spillovers are more likely to be pronounced in domestic BGs after the bankruptcy of an affiliated company.

Financial Interlinkages. Besides, the role of intragroup financial transfers is proved to be significant in our estimation results. Columns two, and three of Table 5 suggest that, while the ratio of group transfers increases by 1 unit, the chances of entering a bankruptcy procedure for an affiliated company, decrease by almost 90%. The result suggests that intragroup linkages are a significant determinant of the resistance, BGs may have towards bankruptcy.

This finding is not surprising, since the failure of a company highly indebted to its group is likely to generate negative spillovers inside the group, all the more so when the amount of debt held is important. Here we allude to "domino effects", likely to occur after the bankruptcy of particular members in a BG. These are affiliates which hold high levels of financial commitments towards their BGs.

UCO's control influence

Results from Models (7) and (8) in Table 5 suggest that companies more distant from control positions are less likely to go bankrupt. OR of the variables "$Control2$" and "$Control3$" show that companies controlled at more than 50 percent by the UCO, have 100 percent more chances of filing for bankruptcy than companies minority controlled by their UCO.

As suggested by Johnson, La Porta, Lopez-de-Silanes, and Schleifer (2000), controlling shareholders inside BGS can have strong incentives to "siphon resources" out of companies in order to increase their own wealth. They use the term "tunneling" to describe the transfer of resources operated by controlling shareholders to their own benefits. In our paper, data we use do not allow us to make such interpretations. Our result however confirms that control concentration is detrimental to companies' economic performance, suggesting that dominant shareholders may have incentives to act in their own interests. It also confirms the results from French data reached by Hamelin (2011) who underlines that excess of control is likely to increase a company's performance sensitivity to industry shocks.

We conclude that the high probability of bankruptcy for companies with strong concentrated control could be the result of the discretionary power in the hands of the dominant shareholders.

[26] This result is reached after controlling for the same company characteristics used in the first round of estimations

In other words, we suggest that in case of badly performing companies, concentrated control have the full power to decide to eliminate them from the group, without any consideration for minority shareholders. This means that in a perspective of losses minimization, controlling shareholders can be encouraged to misuse their controlling power, and sharpen the difficulties of a distressed affiliate, specially when the latter do not have any prospect of recovery.

Conclusions and Discussion

In this paper we address an important and still scarcely explored topic: the business group-bankruptcy relationship. Unlike previous studies, we extend analysis beyond a simple exploration of the impact of group affiliation on bankruptcy, and study the influence of group characteristics over affiliated companies' bankruptcy risk.

Our empirical setting is a large sample of stand alone and group affiliated companies operating in the major industries of the French economy between 2009 and 2012. This period is particularly interesting to analyze, since it covers the years subsequent to the economic recession of 2008. Information gathered originate from two national private sources: *"BODACC"* and *"Diane"* which respectively allow us to identify bankruptcy filings for the years 2010 to 2012, and split our sample into two subsamples of stand alone and group-affiliated companies, using information on companies' ownership and control structure.

We run three rounds of binary logit estimations, and reach results which provide strong evidence on the significant impact, business group affiliation has on companies' bankruptcy. Our findings offer valuable theoretical and empirical contributions to both the business group and bankruptcy literature. First, it is shown that group affiliation and the probability of company's bankruptcy are not negatively related. Second, it is proved that both the potential external and internal negative spillovers are the main reasons why BGs may extend help for their weaker affiliates. And finally, it is highlighted that excess of control strongly increases the chances of bankruptcy of a group affiliated company.

On the group affiliation-bankruptcy relationship, we find that group affiliated companies does not benefit from higher protection against bankruptcy than their stand alone counterparts. Our estimation results suggest that companies operating in BGs have rather a higher risk of filing for bankruptcy in our sample. We assume that this result, which challenges the general adopted view in previous studies, can be primarily due to the studied period. In this sens, we consider that during economic downturns, BGs are already enough bearing the adverse general circumstances, so they might be incited to speed up the elimination of their "lame ducks". This interpretation is mainly based on the limited liability principle which governs BGs' interlinkages. In line with Bianco and Nicodano (2006), the limited liability principle inside BGs is likely to give rise to moral hazard problems, where controlling shareholders are able to make use of their limited liability in order to voluntarily push their distressed affiliates into bankruptcy.

Second, on the group affiliation-bankruptcy moderating factors, we particularly show that intra-group transfers to the benefit of affiliated companies highly influence their probability of bankruptcy. Our findings suggest that affiliated companies highly indebted towards their group are more likely to benefit from a protection against bankruptcy, due to the potential negative spillovers, they are likely to generate. Furthermore, we show that companies controlled by domestic groups have a lower risk of bankruptcy than companies controlled by foreign business groups. We consider that companies operating in the same country as their group influence more negatively the reputation of their whole group, in case of bankruptcy. In short, we imply that a BG is more likely to save its distressed

affiliate, all the more so when the bankruptcy of the latter may seriously impact the group as a whole.

Moreover, our empirical results add evidence to the literature on the excess of control, and companies' performance. Using information on the percentage of direct control rights held by the UCO in our sample-affiliated companies, we find that concentrated control increases the probability of bankruptcy of affiliated companies. We consider that the high probability of bankruptcy of companies with strong concentrated control is due to the discretionary power in terms of bankruptcy decision, held by the dominant shareholder.

Starting from these results, we can conclude that BG affiliation can be either a blessing or a liability: blessing for companies operating in highly interlinked groups, more vulnerable for companies mainly controlled by an UCO. By using the French case as an empirical setting, our study adds to the existing literature, as from the best of our knowledge, no previous study explored the potential effect of group affiliation on bankruptcy, during broad adverse economic conditions. Due to data limitations, we are not able to assert that our main finding, (that is, the observed group affiliation-bankruptcy relationship) is specific to the studied period, since we lack data on the pre-crisis period. A natural extension of our paper would then be to investigate the same issues in more stable economic conditions.

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Table 1
Sample Structure

Total Sample				
Bankrupt		**Still Operating**		**Total**
Number	Percent.	Number	Percent.	Number
15 821	25.48	46 259	74.52	62 080

Sub-Sample of Group affiliates				
Bankrupt		**Still Operating**		**Total**
Number	Percent.	Number	Percent.	Number
3 359	21.10	8 148	70.90	11 507

Table 2
Summary Statistics (Whole Sample: *n = 62 080*)

Variable	Mean	Min	Max	SD
Still Operating Companies				
Total Assets (ln)	5.55	0.00	17.73	1.72
Age (ln)	2.09	0.00	4.71	0.98
Liquidity	1.39	0.01	22.24	1.99
Leverage	0.68	0.03	5.34	0.46
Bankrupt Companies				
Total Assets (ln)	5.11	0.00	13.52	1.44
Age (ln)	1.76	0.00	5.24	0.95
Liquidity	0.54	0.01	20.31	0.66
Leverage	1.20	0.03	5.36	0.67
Total Sample				
Total Assets (ln)	5.43	0.00	17.73	1.66
Age (ln)	2.00	0.00	5.24	0.98
Liquidity	1.17	0.01	22.24	1.79
Leverage	0.81	0.03	5.36	0.57

Table 3
Summary Statistics (Subsample of BG companies: $n = 17\ 050$)

Variable	Mean	Min	Max	SD
Still Operating Companies				
Total Assets (ln)	6.89	0.69	17.73	1.88
Age (ln)	2.50	0.00	4.71	0.93
Liquidity	1.20	0.02	17.55	1.42
Leverage	0.65	0.03	3.64	0.33
Net intragroup debt	0.03	-0.55	0.91	0.14
Bankrupt Companies				
Total Assets (ln)	5.94	0.00	13.52	1.49
Age (ln)	2.03	0.00	4.71	0.95
Liquidity	0.54	0.02	6.16	0.41
Leverage	1.09	0.06	3.64	0.49
Net intragroup debt	0.03	-0.53	0.92	0.12
Total Subsample				
Total Assets (ln)	6.61	0.00	17.73	1.83
Age (ln)	2.36	0.00	4.71	0.96
Liquidity	1.01	0.02	17.55	1.25
Leverage	0.78	0.03	3.64	0.43
Net intragroup debt	0.03	-0.55	0.92	0.14

Table 4
Estimations of the Group Affiliation-Bankruptcy Relationship

	Model (1)	Model (2)	Model (3)
GroupDummy	1.78***	1.61***	1.37***
	(0.044)	(0.041)	(0.037)
TotalAssets (ln)	0.86***	0.88***	0.98***
	(0.005)	(0.006)	(0.008)
Age (ln)	0.75***	0.73***	0.83***
	(0.008)	(0.008)	(0.010)
Liquidity			0.48***
			(0.018)
Leverage			3.61***
			(0.164)
Industry dummies		Yes	Yes
Region dummies		Yes	Yes
Constant	1.18***	1.12**	0.30***
	(0.038)	(0.058)	(0.027)
Number of Observations	62,08	62,08	62,08
Pseudo R-squared	0.030	0.058	0.194
LL	-34196.744	-33208.485	-28398.038

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Table 5
Estimations of the Group Characteristics' Influence

	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
DomesticGroup	0.63***		0.64***		0.68***
	(0.038)		(0.039)		(0.043)
GroupDebt		0.13***	0.13***		
		(0.025)	(0.025)		
Control2[a]				2.26***	2.00***
				(0.225)	(0.202)
Control3[b]				2.03***	1.95***
				(0.197)	(0.189)
Total Assets (ln)	0.92***	0.86***	0.91***	0.90***	0.94***
	(0.016)	(0.014)	(0.016)	(0.015)	(0.017)
Age (ln)	0.86***	0.86***	0.87***	0.85***	0.86***
	(0.024)	(0.024)	(0.025)	(0.024)	(0.024)
Liquidity	0.39***	0.34***	0.35***	0.38***	0.40***
	(0.030)	(0.027)	(0.028)	(0.029)	(0.030)
Leverage	10.43***	10.58***	11.41***	10.32***	10.95***
	(1.571)	(1.605)	(1.758)	(1.545)	(1.661)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes
Constant	0.44***	0.66*	0.49***	0.24***	0.20***
	(0.103)	(0.153)	(0.118)	(0.062)	(0.053)
Observations	11,507	11,507	11,507	11,507	11,507
Pseudo R-squared	0.265	0.270	0.274	0.267	0.270
LL	-5103.826	-5074.666	-5046.399	-5094.163	-5074.356

a, b, *Control1* is the reference category

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10

Appendix
Appendix A Variables Definition

Variable	Definition
Bankruptcy	Dummy: Value= 1 if the company files for bankruptcy
GroupDummy	Dummy: Value =1 if company is affiliated to a business group
GroupDebt	(Net borrowing of affiliated company from the business group) / (Total Assets)
DomesticGroup	Dummy: Value =1 if affiliated company is controlled by a domestic group
Control1	Dummy: Value =1 if UCO direct control < 50 percent
Control2	Dummy: Value =1 if UCO direct control > 50 percent, and less than 90 percent
Control3	Dummy: Value =1 if UCO direct control >= 90 percent
Size	Log of Total Assets
Age	Log of Age at end of year t-1 before bankruptcy
Liquidity	(Current Assets - Inventory and W.I.P) / (Current Liabilities)
Leverage	(Total Debt) / (Total Assets)
Industry	Dummies for industry affiliation
Region	Dummies for Geographic Region

Appendix B Correlation Matrix for Main variables ($n = 62\ 080$)

	(1)	(2)	(3)	(4)	(5)	(6)
Bankruptcy	1					
GroupDummy	0.0411***	1				
	(0.000)					
Total Assets (ln)	-0.115***	0.343***	1			
	(0.000)	(0.000)				
Age (ln)	-0.143***	0.175***	0.385***	1		
	(0.000)	(0.000)	(0.000)			
Liquidity	-0.207***	-0.0353***	-0.0131**	0.109***	1	
	(0.000)	(0.000)	(0.001)	(0.000)		
Leverage	0.392***	-0.0151***	-0.249***	-0.183***	-0.403***	1
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

Appendix C Correlation Matrix for Group specific variables ($n = 17\ 050$)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Bankruptcy	1									
Total Assets (ln)	-0.235***	1								
	(0.000)									
Age (ln)	-0.223***	0.391***	1							
DomesticGroup	-0.171***	0.442***	0.208***	1						
	(0.000)	(0.000)	(0.000)							
GroupDebt	-0.00874**	-0.0728***	-0.0370***	-0.0283**	1					
	(0.349)	(0.000)	(0.000)	(0.002)						
Control1	-0.116***	0.244***	0.0997***	0.234***	-0.0334***	1				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
Control2	0.0553***	-0.148***	0.00311	-0.322***	0.0243**	-0.291***	1			
	(0.000)	(0.000)	(0.739)	(0.000)	(0.009)	(0.000)				
Control3	0.0235*	-0.0193*	-0.0692***	0.155***	-0.00128	-0.383***	-0.772***	1		
	(0.012)	(0.038)	(0.000)	(0.000)	(0.891)	(0.000)	(0.000)			
Liquidity	-0.238***	0.0494***	0.154***	0.0464***	-0.156***	0.0336***	-0.00550	-0.0170	1	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.555)	(0.068)		
Leverage	0.461***	-0.289***	-0.260***	-0.107***	0.178***	-0.0237*	0.0243**	-0.00774	-0.445***	1
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.011)	(0.009)	(0.407)	(0.000)	