

FINANCIAL CONSEQUENCES OF THE BANKRUPTCY LAW: EUROPEAN COMPARISON

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Abstract

The reaction of stock prices to bankruptcy filing announcements has been very frequently analysed in the financial literature. In the current work we adopt a different approach to that of the traditional event study, trying to determine if the reaction of the markets is conditioned by the orientation of the bankruptcy legislation that regulates cases of corporate insolvency. With this aim in mind, we undertake an analysis on a sample of firms in financial distress in France, Germany, Spain and the UK between 1990 and 2002. Our results lead us to conclude that the valuation of the firms' securities is indeed conditioned by the type of bankruptcy law. In addition, we find that firms under creditor-oriented systems (Germany before the 1994 reform and the UK) present more negative returns due to the transference of wealth from the shareholders to the bondholders of the firms.

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1. Introduction

The reaction of the financial markets when a firm in financial distress legally declares its situation and enters into bankruptcy proceedings has been the object of numerous studies, in which scholars try to analyse the motives explaining the market response to these situations¹. Using various methodologies, it appears evident that there is a negative reaction to bankruptcy filing announcements, in which as well as the negative informative signal that the insolvency announcement represents, the various mechanisms that the bankruptcy law stipulates in order to confront this situation also have an influence. In this regard, the different corporate insolvency codes are not homogeneous, varying significantly even among the most developed economies (Franks *et al.*, 1996; White, 1996; and Espina, 1999).

The current study has two objectives: in the first place, to analyse if the market value of the insolvent firm is affected by the orientation of the bankruptcy law of the country concerned; and second, to determine some of the factors encouraging wealth transference in countries with legislations oriented in a particular direction. With this aim in mind, and using a sample of firms in financial distress from France, Germany, Spain and the UK in the period between January 1990 and December 2002, we examine these different reactions in function of the established bankruptcy codes.

Our findings demonstrate greater loss of value for insolvent firms under creditor-oriented systems (such as Germany before the reform and the UK), while the valuation is less negative in countries with legislations whose objective centres on firm survival and debtor protection.

Insofar as bankruptcy law affects the financial decision-making of all firms – insolvent or otherwise – these results may suppose a movement of share financing towards systems that are more protective of debtors, while debt financing may head for countries whose systems are more protective of the interests of creditors. This may mean that firms that are more related with equity capital, such as technology firms or start-ups, may be incentivised to set up in countries with a

¹ See the work of Aharony *et al.* (1980), Clark and Weinstein (1983), Gilson *et al.* (1990), Rimbey *et al.* (1995), Ferris *et al.* (1996), Indro *et al.* (1999) and González Méndez and González Rodríguez (2000).

bankruptcy system that provides greater protection for their shareholders and allows them to obtain funds. This is an important aspect above all in the context of the European Union, where it should be borne in mind before possible attempts to homogenise the different bankruptcy codes are considered.

The rest of this work is structured as follows. In Section 2 we look briefly at the orientations of the bankruptcy systems in the countries of interest. Next, we describe the sample used and we subsequently carry out the empirical analysis. Finally in Section 5 we outline our main conclusions and suggest some implications deriving from them.

2. Orientation of bankruptcy systems

The treatment that the legislations of the different countries reserve for firms suffering insolvency problems is very heterogeneous, with a traditional distinction being recognised between systems oriented towards creditor protection and those that instead prioritise debtors and efforts to keep the firm running. In the current section we shall analyse in some detail the main differences between the bankruptcy codes of four countries – France, Germany, Spain and the UK² – focussing our attention on determining the main characteristics allowing us to define the orientation of their restructuring procedures, as well as on understanding the influence of the various mechanisms on the firms' financial decision-making – fundamentally on their decisions concerning indebtedness and investment. We do not examine the liquidation mechanisms established in each of the systems here³. In Table 1 we present the characteristics of the procedures analysed and in Table 2 we briefly outline their financial implications.

[INSERT TABLE 1]

[INSERT TABLE 2]

² The studies of these countries embrace six different bankruptcy proceedings, due to the modifications that have been implemented in recent years. Thus, we analyse the orientation of the old German legislation and the reform of 1994, which came into effect in 1999; the bankruptcy protection legislation in Spain and the new bankruptcy law of 2003, which came into effect in September 2004; the French bankruptcy law; and the code in force in the UK until 2003 and the modifications included in the Companies Law of 2002.

³ The liquidation procedures do not differ significantly in their orientations, in that they attempt to achieve the best possible liquidation of the company. Hence the differences between the various regulations are more technical and procedural than orientational.

The regulations of each country constitute a real declaration of intentions, insofar as they establish the objectives that the bankruptcy legislations pursue. However, in some cases the application of the different mechanisms may contradict the objective that is in principle sought after, so that it becomes essential to carry out a more detailed analysis of the regulations established throughout the process, including those that apply before the official entry into bankruptcy proceedings.

With this in mind we distinguish three stages that allow us to some extent to homogenise the phases in the four countries analysed⁴. These phases are summarised in Table 1 and now outlined.

1. **The bankruptcy declaration process**, in which we analyse the influence of the requisites demanded for entry into the procedure, the authority to file for bankruptcy and the incentives established for this to take place at the appropriate time.
2. **The control rights**, as far as the person exercising control is concerned, the possibilities of action and the degree of discretion of this person.
3. **The restructuring plan**, from the point of view of its formulation as well as its content and approval.

The first stage, which we label the bankruptcy declaration process, comprises all the measures relating to entry into bankruptcy proceedings. The sooner this occurs, the better it is, both for the creditors – who have more chance of recovering their loans – and for the firm itself – which is more likely to survive (White, 1996). However, we cannot forget that the executives of the firm do have incentives to delay entry into bankruptcy proceedings if this implies their loss of control or even dismissal, so that the legislation should establish a series of incentivising and/or penalising mechanisms to ensure that bankruptcy filing occurs at the most appropriate time.

⁴ The phases of the proceedings in each of the codes do not always coincide, so we have attempted to divide them up in such a way as to make the different legislations comparable and to accurately define the orientations of each system.

These mechanisms can be framed in three elements, comprising the requisites demanded for bankruptcy to be filed, the interested parties to which the law gives legal authority to make the declaration and certain penalising measures for cases of delayed declarations.

In all the legislations we have studied the firm is obliged to have insolvency problems – defined as the inability to meet its payment obligations. However, in order to anticipate the filing as far as possible, in some procedures declaration is allowed for firms in imminent danger of insolvency, such as the German reform of 1994, the new bankruptcy law of 2003 in Spain or the bankruptcy reform of the Companies Law in the UK. In addition, in the case of Germany bankruptcy filing is permitted when the firm is in a situation of overindebtedness⁵, although at the same time the firm must have sufficient assets to cover the costs accruing from the bankruptcy proceedings themselves.

In this respect, the most atypical case, which leads us on to the question of legal authority, is that of receivership in the UK, in which the only requirement for bankruptcy filing is defaulting on a specific secured loan. In this case, the creditor of that debt is the only party that can initiate bankruptcy proceedings, without even needing court approval. In the rest of the procedures, the debtor has the right – and in many cases the obligation – to file for bankruptcy. The fact that in many cases liquidation of the firm becomes inevitable because proceedings begin with the situation already irreversible means that in some cases other agents related to the firm have been permitted to request declaration. However, this does not necessarily improve the economic efficiency compared to bankruptcy filing by executives, and it has the added drawback that these agents have access to less information about the real situation of the firm than the management (Armstrong and Riddick, 2003).

⁵ We should point out that this concept led to important delays in the previous regulations, in view of the courts' difficulty in verifying the situation. This led to a more precise definition in the approved reform, whereby the debtor is not considered insolvent if it can still gain access to credit to meet its payment obligations (Gozalo, 1995).

Finally, on occasions debtors who intentionally delay entry into bankruptcy proceedings are penalised, with a deadline for the declaration being established, such as in the case of the old German law, the new Spanish code and the procedures in France and the UK.

The moment of the declaration cannot, however, be analysed only taking into account the legal stipulations regulating the entry mechanisms, since these will be closely linked with the rights and obligations that each party authorised to initiate proceedings will have throughout the whole process. We now look at the rest of the process.

The second stage has been defined as the stage of the control rights, since once the firm has entered bankruptcy proceedings, it becomes especially important to know who is going to exercise authority. The decision depends on whom the legislator wishes to protect most, which will in turn affect the valuation of the firm made by the creditors and the executives, as well as the degree of resistance sparked by the initiation of proceedings (Armstrong and Riddick, 2003).

In most countries the debtors remain in charge of the firms, although their actions are supervised by an administrator acting solely in the name of the court – in the case of the French system – or a mixture of judicial administrators and some representative of the creditors – in the case of the two German legislations and the Spanish code.

The UK is at the opposite extreme, where an external administrator always assumes control of the firm – although in receivership the administrator acts solely in the interest of the creditor that has named them, while in administration their responsibility is to all the firm's creditors.

Perhaps the most important question to study in this stage is that there are restrictions or possibilities that the law imposes on the conduct of the administrator of the firm, among which we should highlight automatic stay provisions and the possibility of obtaining senior debt.

As far as the automatic stay is concerned, the aim is to prevent the creditors from making their guarantees effective, with all the negative consequences that this would entail for firm continuity, since the sale of an asset that guaranteed a particular debt may mean the loss of a productive asset leading to immediate paralysis of the firm's operations, making any solution

involving its survival completely impossible. The existence of this suspension may improve the behaviour of firms managing to come out successfully from bankruptcy proceedings (Jayaraman *et al.*, 2001). The automatic stay means that a firm's entry into bankruptcy proceedings in fact acts as a protection from its creditors.

Another measure that makes it easier for the economically viable firm to survive is the possibility that some legislations provide to take on senior debt throughout the bankruptcy proceedings. With this, the intention is to allow the firm to obtain the funds it needs to maintain its operations enough time to come to an agreement with its creditors and avoid liquidation. Moreover, the possibility of gaining access to this type of financing improves the chances of survival, contributes to reducing information asymmetry between creditors and debtor and may cut the duration – and hence the costs – of the procedure (Carapeto, 2004; Elayan and Meyer, 2001; and Dahiya *et al.*, 2003).

Independently of who exerts control, the legal authority to decide if the restructuring procedure should continue or if the firm's situation forces it to enter into liquidation may condition the allocatory structure of the control rights over the firm. These mechanisms should prevent negotiations, in cases of advanced crises, that are doomed to failure from the start, or in contrast premature liquidations in systems with a tendency to protect *ex-ante* contracts (Van Hemmen, 1998). Thus, it is fundamental to distinguish to whom the legislation confers the power to take that decision.

The third phase focuses on the study of everything relating to the rehabilitation plan. In the first place, we should point out that receivership in the UK does not include any type of negotiation between creditors and the firm. Hence, in this case we cannot strictly speak of a restructuring plan, although the system does incentivise the sale of the firm throughout the process – a measure that is also permitted in the other legislations, although with more restrictions for its approval.

As a starting point, it is essential to refer to the right to present the restructuring plan, an aspect where we find two possibilities: on the one hand, that the proposal must be made by the bankruptcy administration; and on the other, that the debtor or creditors make it. The capacity of

the debtor to present preferentially their proposed plan – accompanied by their maintenance in charge of the firm – provides strong incentives for the continuity of the firm compared to its liquidation (Jayaraman *et al.*, 2001), although this advantage is less clear if the alternative proposition is made by an external expert rather than by the creditors.

With regards the contents of the plan, in some legislations limits are established that protect the interests of minority creditors, although this may in turn make it more difficult to reach an agreement, as well as limit their capacity to negotiate with the debtor. In this respect, in countries such as Spain and France there tend to be violations of the absolute priority rule in the payment of the credits, either in favour of privileged creditors such as the State or in favour of the shareholders. This harms creditors, who see how junior debts are satisfied while their credits lose value.

In spite of the bias that this type of situation supposes in favour of shareholders and against creditors as the negotiation unfolds, numerous authors have defended its utility in improving the firm managers' *ex-ante* decisions, both in terms of filing at the right time (Baird, 1991; Povel, 1999; and Berkovitch and Israel, 1999) and in terms of combating under-investment in the firm (White, 1989; and Gertner and Scharfstein, 1991). However, this type of measure may also lead to inefficient decisions by the firm management, especially in respect of excessively risky projects, the distribution of dividends or firm financing (Bebchuk, 2002).

In view of the above, we can sum up by saying that there are different philosophies trying to regulate the relations of the various parties with interest in the firm once it has entered the formal insolvency procedure.

On the one hand, we find legislations that confer substantial control to the debtor in the various phases of the process, which following the tradition of the US Chapter 11 attempt to protect the rights of the various stakeholders of the firm that do not intervene directly in the decisions taken in the bankruptcy process. Their protection is achieved indirectly by giving more rights to the debtor, under the assumption that the executives will act in the interest of the shareholders – who represent lower-priority rights – and hence will be incentivised to keep the firm running (Jayaraman *et al.*, 2001). Compared to this position, there is another tendency that confers decision

rights on these stakeholders throughout the procedure, or alternatively hands over all the responsibility to a court and external administrators, who will seek to satisfy all parties having interest in the insolvent firm.

Thus, we find that of the regulations studied here there are two, receivership in the UK and the old law in Germany, which present clear orientations in favour of the creditors, especially the senior creditors, while the bankruptcy protection law in Spain, the new regulation in Germany and the judicial agreement in France are more interested in firm continuity and debtor protection, although it is true that in the French case there is a practically total intervention by the court in all decisions taken⁶.

As we have seen, the rules of the procedures will imply financial consequences on the company value and on the efficiency of the decisions already taken. This fact can lead to a situation due to which two companies, with similar economical and financial estate, can have different market value, depending on the applicable bankruptcy law that rules the legal procedures in each case, once the company declares its situation of insolvency on the right legal way.

Thus, the first hypothesis that we propose to test is as follows:

Hypothesis 1: *“The market value of firms in financial distress differs depending on the characteristics of the corresponding bankruptcy law regulating the procedures applicable when firms legally declare their situation of insolvency”.*

It is necessary, then, to study how the bankruptcy regulations can affect the distribution of that value among the different parties of the process. In this way, we would expect that under creditor-oriented legislations there will be greater wealth transference, which reduces the market valuation of insolvent firms. The second Hypothesis that we propose to test is:

Hypothesis 2: *“The loss of value suffered by securities is greater in creditor-oriented systems, in which there is greater wealth transference towards the providers of borrowed funds; while*

⁶ We should point out that the modifications that have recently been made to the bankruptcy legislations of the countries of interest show us a trend in Europe towards the positions established in Chapter 11, in an attempt to avoid the liquidation of economically efficient firms. Paradoxically, in the US there is strong debate about the efficiency and advisability of maintaining this procedure.

in systems oriented towards firm survival there is less loss of value, due to the possibility of avoiding liquidation of economically viable firms”.

3- Characteristics and composition of sample

For the empirical analysis we used an international sample made up of 234 firms that were listed in the capital markets and that entered into bankruptcy proceedings between 1990 and 2002. In addition to Spain, we included France, Germany and the UK as the main EU economies with significant differences in their bankruptcy systems. Moreover, it is necessary to conduct the study over a wide time period to include insolvency situations in both expansionary and contractionary economic phases, thereby preventing the results from being distorted by a particular economic climate.

Of all the firms found, we only selected those that had not entered directly into a process of liquidation, since we do not intend to study this type of procedure in the current work, focussing instead on an analysis of the mechanisms of financial restructuring. Likewise, we also had to consider the existence of a specific legislation for certain sectors, so we excluded financial firms, which have their own regulation for cases of insolvency. The sample comprised a total of 234 firms, of which 46 are from France, 84 from Germany, 19 from Spain and 85 from the UK. The temporal sequence is shown in Table 3.

[INSERT TABLE 3]

As far as the sectorial distribution is concerned, and with a view to avoiding distortions in the analysis, we grouped the firms into three main sectors: industrial, technological and services. The sample is segmented as is shown in Table 4. The grouping was carried out following the guidelines established by the ISIC⁷ classification by activities, such that for all countries we have at least one firm from each sector, and these groups are sufficiently large for us to be able to draw relevant conclusions.

[INSERT TABLE 4]

⁷ International Standard Industrial Classification of All Economic Activities, the sectorial classification of activities established by the statistics division of the United Nations.

Having selected the firms to make up the sample, we required specific information in order to carry out the research. The share prices came from the Datastream database of the Thomson Financial Services Group. For Spain, the prices of the securities not listed on the continuous market were obtained from the Madrid Official Stock Exchange Bulletin. The economic-financial information also came from the Datastream database. However, this does not include the annual accounts of firms no longer listed, except in the case of UK firms, so that we consulted the Amadeus and Factiva databases to obtain the accounts data of firms that had ceased listing in France, Germany and Spain. Finally, we also used the annual accounts data provided by the Spanish Securities and Investments Board (CNMV) for the Spanish firms.

4. Effect of bankruptcy legislation on share returns

A firm's legal declaration of insolvency does not amount to totally unexpected news for investors. Its financial difficulties become evident gradually, so their effect should be studied sufficiently early for the analysis not to exclude any part of the investors' reaction. However, most studies dealing with the problem of predicting corporate insolvency find that predictions are not very reliable if data from more than two years prior to bankruptcy filing are used (Altman, 1968; Platt and Platt, 1990)⁸.

To test the hypotheses we carry out the analysis in two stages. In the first place, we test if, in the three years prior to the declaration of bankruptcy, the returns on the securities of the firms in financial distress are different in each country analysed. In a second stage, we test if these differences can be explained by the orientation of the bankruptcy legislation concerned, controlling for the effects of a series of factors specified in the model. In the German case it is necessary to make an adjustment controlling for its special situation as result of the profound transformation that has taken place in its bankruptcy code⁹.

⁸ Nevertheless, Aharony *et al.* (1980) use a longer time period preceding the declaration for their model of insolvency prediction, although it is true that their methodology is very different from that of the other authors.

⁹ This fact implies that when we make the comparisons we are in fact dealing with 5 regulations. Thus, we shall analyse if the returns on securities of firms in financial distress differ depending on whether they occur in France, Spain, the UK, Germany before 1999 or Germany since this date.

In the financial literature we find diverse works that attempt to analyse the market's reaction to the announcement of an insolvency situation. The methodology used is the event study, which allows researchers to detect significantly abnormal returns in the days around the declaration date. However, applying this methodology does have various disadvantages and it therefore becomes necessary to resort to another type of measure to examine the effect of insolvency declarations (Rimbey *et al.*, 1995). These authors sustain that this announcement is very rarely completely unexpected, so that the full impact of the financial difficulties is not centred on the date of the filing declaration, but rather spread out in the longer term.

Thus, in the current work we shall make use of an alternative measure of the long-term behaviour of securities of firms that have filed for bankruptcy, to test if the return on the shares differs depending on the type of bankruptcy legislation that the firm will face once the declaration is made.

A measure used in previous work is the cumulative average return (CAR). However, the fact that this measure does not have a lower bound can lead to returns of less than -100%, which is not rationally interpretable from an economic perspective. Its calculation is an approximation of the return on a portfolio in which a constant quantity is invested at the start of each period and where the funds are distributed equally among all the firms in the portfolio, so that it is necessary to withdraw flows when there are positive returns and add additional funds when negative returns are obtained (Clark and Weinstein, 1983). In the case of insolvent firms, the cumulative average returns will generally be negative, which would mean that additional funds were required. It would not be surprising therefore if their cumulative average losses exceeded 100% of the quantity initially invested.

To overcome these problems of interpretation, we shall assume a buy-and-hold investment strategy. This implies that for each firm i the shares are bought at the beginning and sold at the end of the period of reference, considering this end to be the month of bankruptcy filing. The return is calculated as follows:

$$BHR_{it} = \left[\prod_{t=0}^{T_j} (1 + R_{it}) \right] - 1$$

where:

BHR_{it} : return provided by a buy-and-hold strategy during the t months before the filing

R_{it} : return on security i t months before the filing date

T_j : month before filing in which purchase of securities is considered

Likewise, for a portfolio an average index is calculated for each country as follows:

$$BHAR_{jt} = \frac{1}{N_t} \left[\prod_{t=0}^{T_j} (1 + R_{it}) - 1 \right]$$

$$BHAR_{jt} = \frac{1}{N_t} \sum_{i=1}^{N_t} BHR_{it}$$

where:

$BHAR_{it}$: average return provided by firms of country j with buy-and-hold strategy during the t months prior to filing

N_t : number of firms included in the sample in country j in month t

The return calculated in this way complies with the property of limiting the loss, since in its results there is an underlying approximation to a portfolio in which, after the initial investment, funds are not added in the case of losses or withdrawn in the case of gains, so that the maximum quantity that can be lost is limited to the amount initially invested. This methodology has not been used very often¹⁰, although we can find it in the works of Clark and Weinstein (1983), Rimbey, Anderson and Born (1995) and Indro, Leach and Lee (1999).

¹⁰ We should also bear in mind that the majority of empirical studies approximating this type of analysis have concerned the North American market, and the application of event studies is facilitated in this case by the availability of stock prices subsequent to legal declaration of insolvency. However, in the European markets it is much more common to suspend listing upon initiation of bankruptcy proceedings, or even prior to declaration, which makes it difficult to obtain representative samples allowing use of this type of

The next step is to determine if the returns show statistically significant differences among the countries analysed. In the current work, where the samples differ in size, we apply an alternative distribution-free procedure known as the Kruskal-Wallis rank test, a non-parametric test for comparing differences in the medians of “n” different groups. In Table 5 we report the results obtained for the three years prior to the bankruptcy declaration.

[INSERT TABLE 5]

For each of the 36 months prior to the declaration date, the returns show statistically significant differences at a level higher than 99%, so that we can confirm the differential reactions of the investors among the countries. In addition, we have checked the differences between each pair of countries, using the non-parametric *U of Mann-Whitney* test with the following pattern of results¹¹: The loss of value in Germany after the reform differs statistically than the others countries in all the periods we have considered. Moreover, France and Spain in the one hand, and Germany and United Kingdom in other hand have homogeneous returns, and there are differences between both groups, specially in the two years prior the filing date. These results show how there are differences in the market reaction when insolvency problems appear. This first result requires a more complex analysis, which we will do in the next section, using a multivariate regression model.

Nevertheless, these results allow us to draw various conclusions. The most noteworthy is the particularly negative behaviour in Germany after the reform of its legislation in 1999, where we find a greater loss of value. However, of the 62 firms making up the sample for Germany since 1999, almost 63% (39 firms) belong to the technology sector, which may explain the special behaviour of their returns. In addition, only having 4 years available means that we do not have a temporal window unaffected by the economic cycle, so that the enormous falls reflected in the declaration date may be motivated by the deep crisis assailing the technology firms in all markets at the end of the 1990s and beginning of the new century. Thus, we find strong price rises at the

methodology. Thus, it is particularly useful to apply other types of alternative measure, which have on the other hand also been used in work involving US firms.

¹¹ We do not include these results because it needs the presentation of 9 additional tables, which do not contribute to improve the comments on text.

beginning of this 4-year period – on the back of the boom in the technology and Internet sector in the late 1990s – followed by an abrupt collapse in share prices at the end.

With respect to the rest of the countries, we can confirm that the greatest losses occur in firms in Germany and the UK, while the smallest loss of value occurs in French and Spanish firms. Likewise, we observe that the negative reaction occurs first in the UK and Germany before 1999, since the greatest loss of value occurs fully 36 months before the declaration. However, in France the greatest loss of value occurs only 30 months before the filing date.

The information presented in Table 5 allows us to determine when negative reactions on the part of investors occur. Thus, the loss of value does not occur gradually throughout the three-year period under analysis, but rather it is concentrated in the final 12 months before declaration. Of the total cumulative loss, the negative return of the final year supposes 84.40% of the total for the UK, 87.76% for Germany until 1999, 98.78% for Germany after 1999, 70.70% for Spain and 85.50% for France. These results are entirely logical, because the signs of deterioration in a firm's situation will be stronger the closer to the date when the decision to file for bankruptcy is made. Thus, if we look at the loss of value in the last year before initiation of bankruptcy proceedings, we see that the firms have a clear pattern: the greatest losses are generated in Germany and the UK (75.30% and 72.68% respectively), and the least in Spain and France (58.76% and 66.36%).

The calculation of the BHAR index implicitly assumes that at the beginning of each period the quantity invested in each firm is the same. This may mean that the values obtained when forming share portfolios present some discrepancies compared to the returns really obtained by means of the buy-and-hold strategy. To overcome this problem, a last measure of long-term return is applied that allows the results obtained to be weight-adjusted (Clark and Weinstein, 1983). Starting from the weighted average return for N_t firms listed in each month t of the form:

$$WAR_{jt} = \sum_{i=1}^{N_t} x_{it} R_{it}$$

where:

WAR_{jt} : weighted average return of the N_t firms of country j in month t

x_{it} : weight of firm i in the index during month t , calculated as follows¹²:

$$x_{it} = \frac{\prod_{t=1}^{t-1} (1 + R_{it})}{\sum_{i=1}^{N_t} \prod_{t=1}^{t-1} (1 + R_{it})}$$

where:

R_{it} : return of firm i in month t

N_t : number of listed firms in month t in country j

The weighted average return calculated according to this procedure is needed to calculate the Weighted Geometric Index, defined as follows:

$$WGI_{jt} = \prod_{t=0}^T (1 + WAR_{jt}) - 1$$

With this index we approximate the return obtained by investing one monetary unit at the beginning of period T and holding the investment until the end of the period under analysis.

In Table 6 we report the results, which show a similar pattern in the evolution of the returns for each country analysed, although we should point out that the differences – above all in the intervals closest to the declaration date – are more evident. Thus, this last measure more clearly shows the different behaviour of the shares of firms in countries with a bankruptcy code more protective of creditor interests compared to their behaviour under legislations favouring firm survival.

Hence, we see that in the last year before declaration the loss of value of the firms in countries with legislations favouring creditors is close to 80%, while in Spain and France this loss is only around 65%.

¹² Where the numerator represents the value of a monetary unit invested in firm i in month T and held until end of month $t-1$. That is, put simply: the numerator represents the value of firm i at moment $t-1$. On the other hand, the denominator is the sum across all N_t firms with returns during period t of the values of these firms until month $t-1$.

[INSERT TABLE 6]

4.1 Multivariate empirical analysis

The results obtained in the previous analyses show how investors react gradually, and how, between two and three years prior to the legal declaration of insolvency, the securities begin to lose value in the markets in all the countries considered in this research – a finding that mirrors the results obtained for the North American market by Aharony *et al.* (1980), Clark and Weinstein (1983), and Rimbey *et al.* (1995), among others.

Similarly, up to this point we have demonstrated that the behaviour is not the same in all the countries analysed, and both the moment that the loss of value begins, as well as the size of the loss, differ in function of the orientation of the bankruptcy system concerned. However, we cannot say that this differential behaviour is due solely and exclusively to the orientation of the bankruptcy system, so we shall run a multiple linear regression for cross-sectional data, applying the ordinary least squares (OLS) method. In this way we can decide if the loss of value in the year immediately prior to the formal declaration is associated with differences in the bankruptcy legislations concerned.

As dependent variable, we take the return offered using a buy-and-hold strategy for each share acquired 12 months before the legal declaration of insolvency and sold in the month in which the declaration occurs (BHR).

With regards the independent or explanatory variables, we use, in the first place, the orientation of the bankruptcy legislation in force at the moment of the declaration for each firm. Thus, we include a dummy variable (BNKRTLAW) that takes value 0 if the orientation centres preferentially on satisfying the interests of the creditors and 1 if it is more oriented to protect debtor rights. On the other hand, we include a series of variables providing an instrument to determine whether the observed differences can be explained by the different insolvency regulations. These are summarised in Table 7.

[INSERT TABLE 7]

The variables are classified into two groups. On the one hand, macroeconomic and/or legal variables, which affect all firms in each country equally. On the other, the variables that are specific to the firms, which only affect the entity to which they refer. The first group comprises four variables. The first of these is the market return (BHRM), which verifies that the negative returns observed are not due to general market movements. But it is also necessary to control for the effect of the economic cycle on the returns on the shares, since the negative returns may be worsened by an economic situation of general crisis. For this reason we include the annual GDP growth of the country of the firm in the year in which the declaration is made (GDPGrwth).

The third variable is the type of financial system in each country. Following Allen and Gale's (1995) classification, we have defined a dummy variable (FinancSyst) that takes value 0 if the system is market-oriented and 1 if it is bank-oriented. We opted to include this variable in view of the close relation that exists between the main source of financing, along with the availability of information, and the appropriate design of bankruptcy legislations (Berkovitch and Israel, 1999). In this way, the repercussions that the application of the bankruptcy proceedings have for the investors will not be the same if the main creditors are financial institutions – which moreover may participate in the capital of the firm itself – than if the creditors provide their resources through the capital markets.

Nevertheless, this dummy variable can be correlated to the one that identifies the type of bankruptcy law. The banking relative importance in each of the countries has been included in order to control the effect that this problem could provoke. This particular new variable, used as an alternative measure to control the influence of the type of the financial system, has been obtained as a ratio between banking assets and the gross national product (Allen & Gale, 2000), calculated in the previous year to the date of declarations of insolvency.

Finally, as a fourth general variable we include a factor capturing the efficiency of the legal system of the countries (EFJUDS), by means of the index presented by La Porta *et al.* (1998). This index evaluates the efficiency and integrity of the legal environment affecting the firm. It was developed by the ratings agency Business International Corp and takes values between 0 and 10,

with 10 representing the maximum level of efficiency. Including this variable complements the influence of the regulation on insolvency, since independently of the legislation in force it is necessary to ensure that these legal regulations are applied in practice by the competent courts.

As far as the control variables specific to each firm are concerned, the first is the sector, through three dummy variables taking values 1 or 0 in function of the sector to which the firm belongs (industrial, services or technological).

We also include firm size (Size), measured as the natural log of the total assets. The reaction of investors to the first signs of financial difficulties will not be the same in a large firm as in a small one, where the risk of liquidation is higher. Moreover, for the larger firms there is a possibility of negotiating privately with the creditors, which can result in their avoiding having to make the legal declaration of insolvency (Gilson *et al.*, 1990; Andrade and Kaplan, 1998). On the other hand, a larger size may also mean a more complex capital structure that increases problems of coordination among creditors (Betker, 1995). The existence of a large number of interested parties throughout the entire negotiation process in larger firms may lead to more severe problems of coordination, hindering the efficient reallocation of assets towards more profitable activities (Eberhart *et al.*, 1990; and Franks and Torous, 1994).

It is also necessary to include the possible repercussion of the degree of economic difficulty being faced by the firm, since the investors' reaction will not be the same if the insolvency problems are motivated by a temporary illiquidity than if the firm is encountering serious difficulties in generating resources – a situation endangering the viability of the enterprise (Chatterjee *et al.*, 1996). We therefore include a variable measuring the size of the earnings before interest, tax, depreciation and amortisation, divided by the total assets of the firm (EBITDA/TA).

Finally, it may be that the market valuation of the securities is also influenced by the firm's level of indebtedness, since the higher this is, the greater the perceived financial risk on the part of the investors and the more difficult it will be for the firm to survive (Gilson *et al.*, 1990; Asquith *et al.*, 1994). However, a higher level of indebtedness may also reduce insolvency costs (Jensen, 1989). If this is so, the appearance of financial difficulties occurs at a time when the value of the

firm is much higher than its liquidation value. This fact will facilitate private agreements and make formal declaration of insolvency less likely, since if this occurred it would occupy more of the executives' time and distract them from running the company, making them focus instead on the proceedings themselves. As variable measuring the level of indebtedness, we have used the total debt as a proportion of the total liabilities of the firm (Leverage).

Finally, we include in the model a variable (Germany2) that allows us to measure the particularly anomalous behaviour of the firms declaring insolvency in Germany after the reform came into effect, a behaviour uncovered in the first analysis. This is a dummy variable taking value 1 if the firm declared its situation of insolvency in Germany after 1 January 1999.

The general model is specified as follows:

$$\text{BHR}_i = \text{Alfa} + \text{Beta}_1\text{BHRM}_i + \text{Beta}_2\text{GDPGrwth}_i + \text{Beta}_3\text{BNKRTLAW}_i + \text{Beta}_4\text{FinancSyst}_i + \text{Beta}_5\text{EFJUDS}_i + \text{Beta}_6\text{Size}_i + \text{Beta}_7\text{EBITDA/TA}_i + \text{Beta}_8\text{Leverage}_i + \text{Beta}_9\text{Germany2}_i + \sum \text{Beta}_j\text{Sector}_j + \varepsilon_i$$

where the variables are defined in Table 7 and their descriptive statistics are presented in Table 8.

[INSERT TABLE 8]

The results obtained are reported in Table 9. We have estimated four different models, plus the replica of each including as control variable Germany2, which allows us, on the one hand, to confirm the impression gained from the earlier analysis with respect to the anomalous behaviour of these German firms; and on the other, to observe the effects that this may have on the rest of the estimated parameters.

We begin by estimating a model including just the general macroeconomic variables, to subsequently add the firm-specific variables. The models including the variable Germany2 present a higher correlation coefficient (R^2), with this variable being statistically significant in all the estimates carried out – making it clear that the behaviour of the firms in Germany since 1 January 1999 is indeed idiosyncratic.

The results allow us to confirm Hypothesis 1, concerning the influence that the orientation of the bankruptcy legislation has on investors' reactions to a firm's insolvency situation. This orientation is shown to be a significant variable in all the estimated models, with levels of confidence that generally exceed 95% and the estimated coefficient being positive in all cases. Thus, in the countries with a creditor-oriented legislation there is a greater loss of share value than in those whose regulations favour keeping the firm running, which likewise confirms Hypothesis 2. This may reflect the fact that in systems that prioritise compliance of firms' contracts with their creditors there is a greater transference of wealth from the shareholders to the creditors, while this may be less if the legislator tends to favour agreements that avoid the liquidation and extinction of the company.

[INSERT TABLE 9]

In addition to the type of bankruptcy legislation, there are other variables that affect the return on securities during the year prior to declaration, among which the most significant are market return (BHRM) and the type of financial system present in each country (FinancSyst). These two variables present stable results in all the estimated models, as much for their level of significance as for the sign and value of their estimated coefficients, which gives us an idea of how robust the models are.

As we expected, the returns on the shares show a direct relation with the market return in the same period, so that this variable can help us ensure that the differences observed in the returns are not caused by movements in the market occurring at the same time.

As far as the financial system is concerned, the returns have proved to be more negative in the continental systems than in the Anglo-Saxon ones. This appears to indicate that the shareholders perceive a greater appropriation of their wealth in systems in which the debt is concentrated in the hands of only a few better-informed creditors, so that the shareholders and executives can lose the advantage of their access to more and better information because of the reduction in information asymmetries with this type of creditor. This reaction may also be

explained by the relations between the most efficient bankruptcy orientation and the type of financial system regulating firms' main source of financing (Berkovitch and Israel, 1999).

The firm's sector of activity (Sector) also turns out to be a significant variable, where we can see, in general terms, that firms of the industrial or manufacturing sectors suffer lower losses of value. There may be various explanations for this finding. On the one hand, manufacturing firms possess more fixed assets, which may make it easier for them to reach agreements with creditors and hence avoid the liquidation of the company. In contrast, technological firms will not generally have such a solid asset structure, which may mean that their liquidation value does not even cover the debts contracted with their creditors, so that the loss of value for the shareholders may be greater. Likewise, these firms belong mostly to the new economy, supporting their market valuations in their future prospects, so that their chances of survival upon entering bankruptcy proceedings may be very limited. In addition, industrial sector companies with insolvency difficulties tend to represent a social problem, since their closure may cause serious unemployment in the area where they operate. Ignoring economic considerations and regardless of the provisions of the bankruptcy legislation concerned, public intervention may increase their chances of survival.

The final variable that is shown to be generally significant is firm size. From the results obtained we can conclude that the largest firms have had more negative returns in the year prior to declaration. In spite of the fact that in principle a larger size may give a firm more chance of survival, this evidence may be explained by the negative informative effect that financial difficulties provoke among investors, which may cause large firms with good market valuations to suffer falls in the share price the moment the first signs of distress appear, owing to concerns that the firm may have to enter bankruptcy proceedings. Moreover, it seems that the coordination problems between creditors – which are greater in larger firms – take on particular relevance in this type of situation. The result obtained in this case is similar to that of Indro *et al.* (1999), who find that smaller firms are more likely to post positive returns after entering Chapter 11 of the bankruptcy law in the US.

With regards the Wald test, this allows us to test the null hypothesis of absence of linear relation between the dependent variable and the independent variables; in all models the null hypothesis of linear independence between the variables is rejected at a level of confidence of more than 99%. Finally, we carried out the Ramsey test to determine whether the models omitted any statistically relevant variables. Of special interest in this respect is the fact that in the case of the most complete models – which include variables relating to all the firms – the results of the test allow us to accept the null hypothesis that they do not omit any relevant variables.

5. Conclusions

In the current work, we have demonstrated that markets come to different valuations of the shares of firms in financial distress depending on the orientation of the bankruptcy legislation applicable upon legal declaration of insolvency. From our analysis of a sample of firms with insolvency problems in France, Germany, Spain and the UK between the years 1990 and 2002, we have been able to observe how the valuation of securities varies depending on the type of legislation concerned. In addition to this differential reaction, we have also been able to confirm that in creditor-oriented bankruptcy systems there is a greater loss of value in the shares than occurs in the systems more favourable to firm survival and debtor protection. These findings add another element to the discussion about which system is the most appropriate, from a perspective that avoids the most doctrinal positions concerning the codification of this type of legislation. They may also prove of interest to the relevant authorities when deciding which orientation a bankruptcy law should take on, not only in those countries where reform of the system is being considered, but also in the context of the future legislative homogenisation in this area that may conceivably occur within the EU.

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Tables

Table 1: Characteristics of bankruptcy laws

Characteristics		Germany1 <i>Vergleichsverfahren</i>	Germany2 <i>Insolvenzordnung</i>	Spain <i>Suspension of payments</i>	Spain <i>Concursal law 2003</i>	France <i>Redressement Judiciaire</i>	United Kingdom <i>Administrative Receivership</i>	United Kingdom <i>Administration Enterprise Act 2002</i>
Aim of the procedure		- Firm's survival	- Creditors' satisfaction by firm's sale or survival	- Agreement with creditors to achieve firm's survival	- Achieve the survival - Give major flexibility to creditors	- Hierarchical - Survival - Employment - Payment to creditors	- Payment of creditor who begins the procedure - Do not disserve to the rest of creditors	- Hierarchical - Survival - Firm's sale - Realization of collateral
Declaration process	Solvency requirements	- Insolvency - Overindebted - Assets exceed proceeding cost	- Insolvency - Imminent Insolvency - Overindebted - Assets exceed proceeding cost -	- Insolvency	- Insolvency - Imminent Insolvency -	- Insolvency -	- Default on a specific obligations - Without court intervention	- Insolvency - Imminent Insolvency - Without court intervention
	Who can file?	- Debtor	- Debtor - Creditors - The Court	- Debtor -	- Debtor - Creditors -	- Debtor - Creditors - Employees - The court	- Secured creditors	- Debtor - Creditors
	Is file compulsory?	- Filing in 15 days - Bank responsible for hiding information - Civil and criminal penalties	-	-	- Filing in 2 months - Incentives to debtor and creditors	- Filing in 15 days - Civil and criminal penalties	-	- Responsible for delaying filing (disqualification) -
Firm's control	Who decides in first step	- The Court (with administration report)	- Creditors committee - It can cancelled by the court	- The court, previous referee's report	- The court, lie on information declared at filing	- The court, previous administrator's report	- Administrative receiver	- Administrator
	Control rights	- Debtor, supervised by the court or creditors committee	- Debtor, supervised by the court - Administrator designed by creditors or court	- Debtor supervised by referees	- Debtor supervised by administrators	- Debtor supervised by the court - Administrator designed by the court	- Administrator designed by a creditor (without court intervention)	- Administrator designed by the court
	Automatic stay	- Junior creditors	- Automatic Stay - Secured creditors (3 months)	- Junior creditors	- Automatic Stay - Secured creditors (1 year)	- Automatic Stay - All creditors	- No	- Automatic Stay - All creditors
	Available transactions	- Prior transactions avoidable -	- New financing has priority - Assets sales allowed - Prior transactions avoidable	- New financing has priority	- New financing has priority	- New financing has priority - Assets sales allowed - Prior transactions avoidable	- Assets sales allowed (if they are not collateral) - Receiver responsible for new debt	- New financing has priority - Administrator is not responsible for new debt - Realization of collateral
Restructuring plan	Preparation responsibility	- Debtor	- Debtor - Administrator, previous creditors' petition	- Debtor (priority) - Creditors	- Debtor (priority) - Creditors - Debtor anticipated proposal allowed -	- Administrator	-	- Administrator
	Time limits	- Must be presented at filing petition	-	- Must be proposed at filing petition	-	- 18 moths	-	- 12 months the whole procedure
	Content	- Do not allow credits substitution - Equal treatment of creditors of the same class - Do not affect secured creditors - Minimum payment required (35% 6 40%)	- Equal treatment of creditors of the same class - Liquidation, survival or sale are allowed	- Violation of Absolute priority rule - Agreement of survival or liquidation	- Content limited: - Payment > 50% and delays < 5 years - Violation of Absolute priority rule -	- Liquidation, survival or sale are allowed - Violation of Absolute priority rule	- Absolute priority rule - Firm's sale are allowed	- Liquidation, survival or sale are allowed - Absolute priority rule
	Plan approval and effects	- ½ creditors y ¾ credits value	- Majority in each class of creditors - Shareholders approval required for firm's structure changes	- Majority of creditors (3/4 o 3/5 of liabilities) - Debtor approval required - Do not affect secured creditors	- Majority of creditors	- The court	-	- Majority of creditors - Majority of Shareholders

Table 2: Financial implications of Bankruptcy laws

Stage of procedure	Actions allowed	Financial Implications
Declaration process	<ul style="list-style-type: none"> - Solvency requirements - Who can file? - Is file compulsory? 	<ul style="list-style-type: none"> - Improve probability of survival - Major payments to creditors - Agency problems with directors
Firm's control	<ul style="list-style-type: none"> - Who decides in first step - Control rights - Automatic stay - Available transactions 	<ul style="list-style-type: none"> - Over and underinvestment problems - Avoid creditor's opportunism outside the collective procedure - Avoid credit rationing problems - Information asymmetry reduction
Restructuring plan	<ul style="list-style-type: none"> - Preparation responsibility - Time limits - Content - Plan approval and effects 	<ul style="list-style-type: none"> - Creditors conflict of interest reduction - APR affect Investment, financing and dividends decisions

Table 3: Temporal sequence of the sample by countries

Year of filing	France	Germany	Spain	United Kingdom	TOTAL
1990	2	0	0	13	15
1991	1	0	1	16	18
1992	4	2	6	13	25
1993	6	2	4	4	16
1994	0	5	2	2	9
1995	3	0	1	3	7
1996	4	6	2	3	15
1997	3	4	1	3	11
1998	1	3	1	5	10
1999	2	4	0	6	12
2000	4	4	0	4	12
2001	7	22	0	7	36
2002	9	32	1	6	48
TOTAL	46	84	19	85	234

Table 4: Industry distribution by countries

Country	Sector			Total
	Industrial	Technological	Services	
France	16	13	15	44
Germany	26	41	16	83
Spain	14	2	3	19
United Kingdom	29	6	49	84
Total	85	62	83	230

Table 5: Buy and hold investment strategy returns

	United Kingdom		Germany1		Germany2		Spain		France		Kruskal-Wallis	
Month	N	BHAR _{it}	N	BHAR _{it}	N	BHAR _{it}	N	BHAR _{it}	N	BHAR _{it}	Chi-square	Asympt . Sig.
-36	55	-0.8611	18	-0.8580	30	-0.9053	16	-0.8311	29	-0.7761	14.657***	0.0055
-30	64	-0.8181	18	-0.8574	40	-0.9201	16	-0.8079	32	-0.7979	25.903***	0.0000
-24	74	-0.8085	19	-0.8307	52	-0.9298	17	-0.7562	39	-0.7135	40.735***	0.0000
-18	81	-0.7929	21	-0.8191	59	-0.9217	18	-0.6708	44	-0.7184	49.011***	0.0000
-12	85	-0.7268	22	-0.7530	62	-0.8943	19	-0.5876	46	-0.6636	45.248***	0.0000
-11	85	-0.7293	22	-0.7464	62	-0.8813	19	-0.5913	46	-0.6504	42.793***	0.0000
-10	85	-0.6957	22	-0.7501	62	-0.8886	19	-0.5982	46	-0.6257	49.812***	0.0000
-9	85	-0.6833	22	-0.7010	62	-0.8734	19	-0.5916	46	-0.6030	47.373***	0.0000
-8	85	-0.6724	22	-0.7150	62	-0.8606	19	-0.5565	46	-0.5594	46.815***	0.0000
-7	85	-0.6530	22	-0.6940	62	-0.8453	19	-0.5189	46	-0.6033	51.514***	0.0000
-6	85	-0.6067	22	-0.6982	62	-0.8310	19	-0.4836	46	-0.5854	51.589***	0.0000
-5	85	-0.5567	22	-0.6997	62	-0.8109	19	-0.4139	46	-0.5442	51.670***	0.0000
-4	85	-0.5055	22	-0.6917	62	-0.7703	19	-0.4088	46	-0.5338	46.436***	0.0000
-3	85	-0.4714	22	-0.6660	62	-0.7446	19	-0.3300	46	-0.4540	53.814***	0.0000
-2	85	-0.3924	22	-0.6178	62	-0.6850	19	-0.3302	46	-0.3783	44.188***	0.0000
-1	85	-0.3287	22	-0.5685	62	-0.6345	19	-0.3377	46	-0.3167	47.970***	0.0000
0	85	-0.1557	22	-0.3871	62	-0.4386	19	-0.2581	46	-0.2301	33.254***	0.0000

Signification level: *90%, **95%, ***99%.

Table 6: Weighted Geometric Index (WGI_{jt})

	United Kingdom		Germany1		Germany2		Spain		France	
Month	N	WGI _{jt}	N	WGI _{jt}	N	WGI _{jt}	N	WGI _{jt}	N	WGI _{jt}
-36	58	-0.8460	18	-0.8304	30	-0.9273	16	-0.7966	31	-0.7192
-30	64	-0.8408	18	-0.8249	40	-0.9352	16	-0.7729	32	-0.7788
-24	74	-0.8481	19	-0.8106	52	-0.9518	17	-0.7747	39	-0.7550
-18	81	-0.8476	21	-0.7973	59	-0.9474	18	-0.7018	44	-0.7227
-12	85	-0.8005	22	-0.7718	62	-0.9091	19	-0.6270	46	-0.6518
-6	85	-0.7066	22	-0.7371	62	-0.8613	19	-0.5154	46	-0.5386

Table 7: Variables of the model

INDEPENDENT VARIABLES OF THE MODEL	
Macroeconomic variables	
BNKRTLAW	Orientation of Bankruptcy law. Dummy variable that takes value 0 if the law is creditor-oriented and 1 if it is debtor-oriented.
BHRM	Market return in the year before filing, assuming a buy and hold investment strategy
GDPGrwth	GDP growth in the year before filing
FinancSyst	Type of financial system in each country. Dummy variable that takes value 0 if the system is market-oriented and 1 if it is bank-oriented.
BA/GDP	Relative importance of Banks in each country, measured as Banking assets- GDP ratio in the year before filing.
EFJUDS	Efficiency of judicial system (Index presented by La Porta <i>et al.</i> (1998))
Firm's specific variables	
Sector	Three Dummy variables taking value 0 or 1 in function of the sector to which the firm belongs (Industrial, technological and services).
Size	Size of the firm, measured as the natural log of the total assets
EBITDA/TA	Degree of economic difficulties.
Leverage	Firm level of leverage, measured as total debt-total liabilities ratio

Table 8: Summary Statistic

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
BHR	234	-0.7444	0.2423	-0.9945	0
BHRM	234	0.0002	0.2270	-0.3687	0.8785
GDPGrwth	234	1.0909	1.3634	-1.4664	4.3865
BA/GDP	234	1.8996	0.6868	0.9082	2.7557
EFJUDS	234	8.9434	1.0843	6.25	10
Size	179	11.2874	1.4873	7.6216	16.1579
EBITDA/TA	165	-0.0417	0.2662	-1.6572	0.3146
Leverage	165	0.6689	0.2737	0.05857	1.7259

Table 9: Empirical analysis results

	Model 1	Model 1a	Model 1b	Model 2	Model 2a	Model 2b	Model 3	Model 3a	Model 3b	Model 4	Model 4a	Model 4b
Muestra	234	234	234	230	230	230	230	230	230	165	165	165
BHRM	0.479 (11.13)***	0.380 (11.19)***	0.352 (4.34)***	0.401 (6.77)***	0.333 (5.55)**	0.296 (3.36)***	0.346 (5.38)**	0.333 (5.52)**	0.293 (3.23)***	0.304 (3.33)**	0.264 (3.88)**	0.196 (1.84)*
GDPGrwth	0.019 (1.02)	0.015 (0.69)	0.030 (2.30)**	0.023 (1.22)	0.018 (0.87)	0.032 (2.40)**	0.022 (1.21)	0.018 (0.86)	0.032 (2.26)**	0.036 (2.12)	0.030 (1.69)	0.044 (3.21)***
BNKRTLAW	0.161 (3.31)**	0.201 (22.02)***	0.183 (3.43)***	0.184 (4.57)**	0.216 (26.34)***	0.178 (3.18)***	0.116 (3.29)**	0.216 (19.21)***	0.168 (2.13)**	0.102 (2.65)*	0.140 (3.51)**	0.131 (2.06)**
FinancSyst	-0.127 (-25.68)***	-0.104 (-24.78)***		-0.141 (-16.75)***	-0.126 (-13.79)***		-0.179 (-13.23)***	-0.125 (-15.25)***		-0.082 (-2.87)*	-0.082 (-3.35)**	
BA/GDP			-0.128 (-3.49)***			-0.116 (-2.89)***			-0.113 (-2.56)**			-0.107 (-2.24)**
Technological				-0.059 (-3.25)**	-0.028 (-1.19)	-0.042 (-1.03)	-0.041 (-2.41)*	-0.028 (-1.19)	-0.042 (-1.02)	-0.065 (-5.31)**	-0.046 (-1.97)	-0.043 (-0.89)
Industrial				0.054 (1.75)	0.052 (1.82)	0.034 (0.92)	0.046 (1.42)	0.052 (1.81)	0.033 (0.88)	0.076 (2.13)	0.076 (2.47)*	0.057 (1.35)
EFJUDS							-0.0525 (-2.38)*	0.0005 (0.18)	-0.003 (-0.14)			
Size										-0.020 (-3.70)**	-0.018 (-2.54)*	-0.022 (-2.23)**
EBITDA/TA										0.053 (2.07)	0.038 (1.35)	0.060 (1.56)
Leverage										-0.023 (-0.27)	-0.024 (-0.28)	0.002 (0.03)
Germany2		-0.154 (-11.95)***			-0.134 (-7.24)***			-0.135 (-6.53)***			-0.098 (-2.92)*	
Constant	-0.772 (-39.05)***	-0.762 (-33.04)***	-0.633 (-12.47)***	-0.786 (-31.04)***	-0.778 (-27.17)***	-0.658 (-12.33)***	-0.255 (-1.10)	-0.784 (-19.53)***	-0.625 (-2.57)**	-0.559 (-5.83)***	-0.576 (-5.96)***	-0.430 (-3.01)***
R²	0.2033	0.2496	0.2251	0.2305	0.2626	0.2380	0.2483	0.2626	0.2381	0.2913	0.3107	0.3104
Wald's Test	13.03***	19.76***	15.69***	10.27***	15.03***	11.56***	10.40***	13.10***	10.29***	7.10***	8.27***	8.49***
Ramsey's Test	2.24 (0.040)**	2.28 (0.036)**	1.38 (0.250)	2.22 (0.042)**	2.44 (0.026)**	1.16 (0.3263)	2.72 (0.010)***	2.43 (0.027)**	1.14 (0.3337)	1.69 (0.171)	1.20 (0.311)	1.77 (0.1545)

Significance level: *90%, **95 %, ***99%. t- statistics between brackets