How do insolvency codes affect a firm's investment?

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ABSTRACT

This paper studies which characteristics of the financial insolvency codes give rise to two well-known investment problems (underinvestment and overinvestment). The empirical evidence is obtained by estimating the q investment model which incorporates cash flow. Our results show a negative effect of ex-ante costs on investment. Furthermore, the sensitivity of investment to cash flow depends on the characteristics embodied in each code. Although those giving rise to underinvestment have a negative effect, the magnitude of this effect is greater for the characteristics referring to reorganization without creditors' consent, and the lack of control by creditors.

Key words: insolvency codes, investment, insolvency costs

GEL classification: G31, G33, G38

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1. Introduction

The aim of this paper is to analyse how insolvency codes affect a firm's investment. On the one hand, the cost of financial insolvency will be anticipated at the inception of the debt contract and will give rise to an underinvestment problem. On the other, the role of the insolvency code should be to reduce asymmetric information, hence if that is true, a good insolvency code could reduce the premium required by bondholders. Finally, another problem will be that lending creditors could reduce the amount lent to the company, and the company cannot take advantage of debt tax-shields.

Insolvency codes have to be written in order to minimize the financial distress costs. Like White (1996b), we classify financial distress costs depending on the point in time when they occur. That is: i) before it is known whether the firm will be financially distressed or not. ii) after the firm has became financially distressed; iii) after the bankruptcy filing. Taking into account that all firms face the first kind of costs, called ex-ante costs of financial insolvency, only some companies become financially distressed, and a small percentage of companies enter bankruptcy, the financial insolvency code have to engage in setting up incentives for healthy firms to avoid becoming financially distressed rather than provide help for companies in financial distress or bankruptcy.

In this context, White (1996b) argues that the ex-ante costs of financial insolvency are the most important source of bankruptcy costs because they apply to many firms. Therefore, the financial insolvency codes have to encourage healthy firms not to become financially distressed, instead of helping the companies in financial distress. In this sense, the financial insolvency codes have to establish a distribution of the assets of the firm ex-post that will serve as an incentive to economic agents to take the most efficient decisions ex-ante, since, as Berkovitch, Israel and Zender. (1997) argue, the distribution of the ex-post value plays an important role in establishing ex-ante incentives.

It is worthwhile to take into account that the main objective of the laws is to create incentives for the economic agents to take decisions that will increase social welfare. Therefore, financial insolvency codes have to be designed thinking of the decision that will be made by the economic agents that know this law instead of thinking of how we have to distribute the value of a financially distressed firm. That is, the financial insolvency code must not be a tool to solve social problems, such as unemployment or de-industrialisation,

since if countries use the financial insolvency code for this purpose, they will only introduce inefficiencies into the economic system, by sustaining inefficient firms and acting as a disincentive to create new efficient firms. Furthermore, this unsuitable use of the law could turn against their purpose. Kaiser (1996) reports that when the financial insolvency code attempts to give strong protection to employment, it does not facilitate maintaining firms as going concerns, and consequently it does not preserve employment either.

The approach of our paper is therefore to study how financial insolvency codes affect the efficiency of the economic system as a method that allows the allocation of the financial resources to the most suitable uses (investments). Strictly speaking, we investigate how insolvency codes affect a firm's investment. To reach this aim we analyse which characteristics of the financial insolvency codes of five well-developed countries (the United States, the United Kigdom, Germany, France and Spain) could give rise to distortions in a firm's investment. Furthermore, we classify which features give rise to underinvestment problems and which ones to overinvestment problems. We then develop an investment model that allows us to study how financial insolvency costs affect investment in different countries, and what effect the different characteristics embodied in the codes have on the sensitivity of investment to cash flow.

Our results indicate that there is a negative relationship between investment and ex-ante financial insolvency costs, and these costs are part of the specific effect of the investment undertaken in each country. Furthermore, we find that the characteristics embodied in a code are crucial determinants of the sensitivity of investment to fluctuations of cash flow, and the more characteristics embodied in a code giving rise to an underinvestment problem, the greater the sensitivity of investment to cash flow. Finally, we show that although the characteristics giving rise to underinvestment have the same negative effect on investment, those referring to the legal coverage for seeking protection from creditors by filing for reorganization without their consent and the lack of control by creditors when the firm files for reorganization are more relevant than the absolute priority rule and the automatic stay.

The remainder of the paper is organised as follows. Section 2 outlines the theory on why financial insolvency codes introduce inefficiencies in investment. In Section 3, we develop the econometric specification of the models estimated in the paper. Section 4 describes the data used and the estimation method of the models. In Section 5, we discuss the relation of investment with ex-ante insolvency costs and with insolvency codes, in the last case depending on their characteristics. Finally, Section 6 presents our conclusions.

2. Financial insolvency codes and investment inefficiencies

We focus our study on ex-ante financial insolvency costs, since they are borne by all firms, and they are those that the laws have to mitigate in order to introduce efficiency into the economic system of the country. White (1983) highlights as ex-ante financial insolvency costs those resulting from creditors' attempts to reduce their losses if bankruptcy occurs, and those resulting from managers' attempts (in the best interest of shareholders) to raise the expected return to equity by increasing the firm's risk. Therefore, the ex-ante costs arise from the interest conflicts between shareholders and stakeholders (mainly bondholders), when both take their decisions considering that there is a probability that insolvency may occur. In the last analysis, ex-ante insolvency costs arise because the probability of insolvency gives rise to distortions in the investment processes, as has been shown by Jensen and Meckling (1976), Myers (1977) and White (1980).

Consequently, we analyse the effects of financial insolvency codes on investment depending on the stakeholder that introduces the distortion. Panel A of Table I summarizes this analysis highlighting the stakeholder that introduces the distortion, the characteristic of the financial insolvency code that facilitates the distortion, the countries whose financial insolvency code have this characteristic, and the investment problem caused.

Cornelli and Felli (1997) study ex-ante insolvency costs focusing on the protection of the creditors' claims. They show that the allocation of the ownership rights to creditors and the protection of creditors' seniority assess the ex-ante efficiency of a financial insolvency code. In other words, they analyse two characteristics of financial insolvency codes that give rise to investment inefficiencies. We extend this analysis by identifying other features of financial insolvency codes, and explaining how these characteristics affect the firms' investment. To study these characteristics in-depth, we focus on the financial insolvency codes of five countries, codes which are well-known, as shown in Panel B of Table I, where we classify the relevant literature that describes these codes by country.

The first characteristic analysed is revenue efficiency. Cornelli and Felli (1997) define a financial insolvency code as revenue efficient if it maximizes the sum of all creditors' proceeds. They argue that if a code is not revenue efficient it will lead to inefficiencies, which give rise to an additional cost on the funds borrowed from creditors. Hence, there may exist positive net present value (NPV) projects that are not undertaken by the company, which is well-known in the financial literature as an underinvestment problem. Cornelli and Felli (1997) conclude that to get revenue efficiency an insolvency code requires the explicit allocation of the ownership rights of the firm before filing for reorganization. However, none

of the financial insolvency codes studied in our paper considers the allocation of ownership rights, hence all are classified as not revenue efficient.

The second characteristic analysed is the absolute priority rule. The French and Spanish insolvency codes violate the absolute priority of secured creditors (bondholders) ranking first in the distribution of proceeds other non-secured creditors, such as government and workers (see Ramos, 1993; Kaiser, 1996). In the US a violation of absolute priority also occurs, but in this case the violation is in favour of shareholders (see Weiss, 1990; Franks and Torous, 1994). This fact increases the risk of bondholders, who require a higher premium, thus giving rise to an underinvestment problem. Moreover, Bebchuk (2001) argues that this deviation from absolute priority has a negative effect on ex-ante decisions taken by shareholders. Absolute priority increases the bias of shareholders in favour of riskier investment projects. Therefore, shareholders undertaking this project increase the volatility of returns, since they obtain the increase in the benefits, whereas if large losses occur, these will be passed on to bondholders (Jensen and Meckling, 1976). This problem of asset substitution between shareholders and bondholders is another mechanism that leads to underinvestment.

Another well-known characteristic in financial literature is the automatic stay. Some insolvency codes impose an automatic stay (e.g. the US and France). In this case, the secured creditors (bondholders) know that in the future the automatic stay could prevent them from gaining possession of their security, hence they bear a higher risk level, and therefore require a higher premium. Consequently, some positive NPV projects may be forgotten. Thus, insolvency codes that include automatic stay give rise to an underinvestment problem.

In some countries (e.g. France and Spain) management can use the financial insolvency code to seek protection from creditors by filing for reorganization without the creditors' consent. The absence of any restrictions for going into reorganization allows management to delay the payment to bondholders of their money or collateral. This could have two outcomes. First, it may reduce the bargaining power of bondholders. Second, this delay could cause a decrease in available funds to pay to bondholders, since it could also facilitate either a disappearance or a loss of value of collateral. Consequently, when there are no restrictions for going into reorganization the bondholders suffer a loss of rights, hence they require a higher premium giving rise to an underinvestment problem.

The financial insolvency codes do not usually give the control to the creditors when the firm files for reorganization (e.g. France, Spain, the US and Germany). In these countries, creditors are not able to take decisions about the future of the company, since the debtor continues to manage the firm (see Franks and Torous, 1989; Ramos, 1993; Franks, Nyborg

and Torous, 1996; Kaiser, 1996; and White , 1996b). Therefore, the creditors runs a higher risk, and consequently requires a higher premium, giving rise to an underinvestment process.

Moreover, we consider the shareholders' attempts to raise the expected return to equity by increasing the firm's risk. In this case, an overinvestment problem arises, since the shareholders have incentives to undertake negative NPV projects, whenever the expected return will be high. However, this problem could be mitigated when the financial insolvency code treats managers harshly, as we explain below. As is well-known, managers are risk averse, hence they work harder if the financial insolvency code reduces the variability of their incomes. Therefore, managers may work harder when they are treated leniently, rather than harshly. In this context, assuming that the value of the firm depends on the managers' level of effort, the reduction in expected value of the firm under a financial insolvency code according to how managers are treated is called the punishment effect (see White, 1996b). Aghion, Hart and Moore (1992) argue that the punishment effect is high under financial insolvency codes that treat managers leniently, such as Chapter 11, whereas it is low or zero under codes that treat managers harshly. In the latter case we have the UK code, which replaces all management. In this context, we classify as lenient codes those where management stays in cases of financial insolvency (the US, France, Germany and Spain), and harsh codes those where management does not stay (the UK)[1]. Consequently, harsh codes increase the risk of managers, therefore these codes prevent managers from undertaking negative NPV projects, following the desires of the shareholders. Thus, the overinvestment problem will be greater in lenient codes.

3. Econometric specification of the model

In order to know how the financial insolvency codes affect investment, we use a well-known investment model, the q model. This is a common empirical specification, which emphasizes market valuation of the firm's assets as determinant of investment. Like Fazzari, Hubbard and Petersen (1988), we consider that investment depends on two functions.

Consequently, the general specification of our model would be as follows:

$$\left(\frac{I}{K}\right)_{it} = f\left(\frac{CF}{K}\right)_{i,t-1} + g(X)_{i,t-1} + \boldsymbol{n}_{it} \qquad \textbf{(1)}$$

where f is a function that depends on cash flow, and represents the potential sensitivity of investment to the fluctuations of cash flow, as the pecking order and the free cash flow theories

[1] La Porta, Lopes-de-Silanes, Shleifer, and Vishny (1998) provide a dummy variable that takes value 1 if management does not stay, and 0 otherwise.

indicate. The expected relationship between investment and cash flow is direct, since cash flow facilitates investment.

The sensitivity of investment to cash flow have to be controlled by another function *g*, which includes the remainder of the variables that explain a firm's investment, according to financial theory. That is, *X* represents the determinants of investment from the theoretical perspective. In our basic specification the vector *X* contains two variables, Tobin's q, since we use a q investment model, and a lag of the dependent variable to make our model dynamic. Then, *f* represents the sensitivity of investment to cash flow when investment opportunities are controlled. Thus, our basic specification would be

$$\left(\frac{I}{K}\right)_{it} = \beta_1\left(\frac{CF}{K}\right)_{i,t-1} + \beta_2 q_{i,t-1} + \left(\frac{I}{K}\right)_{i,t-1} + \eta_{it} \qquad \textbf{(2)}$$

where $(CF/K)_{i,t-1}$ is the cash flow, $q_{i,t-1}$ represents Tobin's q, and ν_{it} is an error term[2].

In our study, we are interested in knowing how the financial insolvency costs affect investment, hence we have extended our basic specification by incorporating another variable in function *g*, the ex-ante financial insolvency costs, $EAIC_{i,t-1}$. These costs have two components. First, the probability of insolvency, that is, the probability of the firm becoming financially distressed, which is measured as we explain in the Appendix. Second, the ex-post insolvency costs that the firm may bear if it goes into bankruptcy. That is, when a firm goes into bankruptcy there are some assets that loss their value. These assets are mainly the intangible assets including goodwill, hence these assets are a good proxy for ex-post insolvency costs, $EPIC_{i,t-1}$. Therefore, the ex-ante financial insolvency costs are obtained from the combination of both variables. That is $EAIC_{i,t-1}=PI_{i,t-1}*EPIC_{i,t-1}$, where PI is the probability of insolvency, which always takes values ranging from 0 to 1. Thus, the $EAIC_{i,t-1}$ variable takes the highest values when the $PI_{i,t-1}$ and the $EPIC_{i,t-1}$ are high, and the lowest values when the $PI_{i,t-1}$ is near to zero and $EPIC_{i,t-1}$ is low. Therefore, the $EAIC_{i,t-1}$ variable reflects the insolvency costs expected according to the probability of insolvency and the ex-post financial insolvency costs.

Consequently, our extended model including the ex-ante insolvency costs variable would be

$$\left(\frac{I}{K}\right)_{it} = \beta_1\left(\frac{CF}{K}\right)_{i,t-1} + \beta_2 q_{i,t-1} + \beta_3\left(\frac{I}{K}\right)_{i,t-1} + \beta_4 EAIC_{i,t-1} + \eta_{it} \qquad \textbf{(3)}$$

[2] The first subindex of the variables will refer to individuals, in this case firms, and the second to time, in this paper a business year.

This model allows us to pose our first hypothesis to study the relationship between investment and ex-ante financial insolvency costs.

Hypothesis 1. *The investment undertaken by firms is inversely related to the ex-ante financial insolvency costs they face.*

Assuming this first hypothesis, the main objective of our paper is to study how an insolvency code will have to be designed to mitigate the negative effect of ex-ante financial insolvency costs on investment. For this reason, we are interested in studying several countries which have different financial insolvency codes. Subsequently, our analysis poses a new hypothesis.

Hypothesis 2. *There is a country specific effect in the investment undertaken by firms, and this effect is less significant when we control investment including the ex-ante insolvency cost variable in the model*.

In order to test this second hypothesis, we enter several country dummy variables into the model. Then, the new model will be

$$\left(\frac{I}{K}\right)_{it} = f\left(\frac{CF}{K}\right)_{i,t-1} + g(X)_{i,t-1} + c_i + \eta_{it} \qquad \textbf{(4)}$$

where c_i are dummy variables that take value 1 if the firm *i* belongs to a specific country, and 0 otherwise. These dummy variables control whether firms' investment has a specific component in each country. A Wald test could then be used to check this effect, and whether or not this effect decreases if we control investment by including the ex-ante financial insolvency costs. In this latter case, it means that the ex-ante insolvency costs faced by firms is one variable specific to each country.

Consequently, assuming the previous two hypotheses, our econometric strategy is to study how the main characteristics of the financial insolvency codes affect investment. In the previous section we have discussed the main characteristics of financial codes that facilitate distortions in investment. These distortions are the well-known investment problems, underinvestment and overinvestment. This means that these features could discourage firms from undertaking investment, but they could also encourage investment. To develop our next empirical specification we have to classify the financial insolvency codes of the countries studied in this paper, i.e., the United States, the United Kingdom, Germany, France, and Spain. To do so, we construct several indices, which reflect the score obtained by each country as a result of the characteristics of its code described in Table I in the previous section. Table II displays the three indices constructed. The first is the underinvestment index

obtained by adding a point for each feature that facilitates underinvestment. In the same way, the second index, the overinvestment index is constructed by adding a point for each feature that encourages overinvestment. Finally, the investment index is the difference between both. This last index summarizes the previous two and reflects the most usual problem, underinvestment. We use this index to construct a dummy variable that indicates in which countries the financial insolvency codes introduce more distortions in investment. Thus, our hypotheses about codes are as follows.

Hypothesis 3. *The firms belonging to a country whose financial insolvency code incorporates most characteristics facilitating underinvestment have a greater sensitivity of investment to fluctuations of cash flow.*

Hypothesis 4. *The impact on investment is different depending on the characteristics of each code. Thus, financial insolvency codes have two kinds of characteristics: the first facilitate underinvestment processes, such as violations of the absolute priority rule, automatic stay, reorganization without creditors' consent, and lack of control by creditors on the reorganization process; the second encourage overinvestment processes, which occur in codes where management stays in cases of financial insolvency, called lenient codes.*

The econometric specification to test hypotheses 3 and 4 would be as follows.

$$\left(\frac{I}{K}\right)_{it} = (\beta_1 + \gamma_1 DC_i)\left(\frac{CF}{K}\right)_{i,t-1} + \beta_2 q_{i,t-1} + \left(\frac{I}{K}\right)_{i,t-1} + \eta_{it} \qquad \textbf{(5)}$$

where DC_i is a dummy variable that takes a value of 1 when the firm belongs to a country with an investment index higher than the mean, and 0 otherwise. Therefore, $\hat{a}_1$ is the coefficient for firms belonging to a country with an investment index lower than the mean, since DC_i is equal to 0; and $(\beta_1+\gamma_1)$ is the coefficient for firms belonging to a country with an investment index higher than the mean, for which DC_i is equal to 1. To check whether the $(\beta_1+\gamma_1)$ coefficient is significantly different from zero, we perform the linear restriction test whose null hypothesis is H_0:$\beta_1+\gamma_1=0$.

This specification could be applied for the remaining indices, and for studying each characteristic of the financial insolvency codes to test Hypothesis 4. In the latter cases, the dummy variable is constructed using the information in Table II.

4 Database and estimation method

4.1 Data

For our study we needed data from several well-developed countries, to be exact, the United States, the United Kingdom, Germany, France, and Spain. We therefore used an

international database, Compustat Global Vantage. We also included in our study other kinds of international data such as the growth of capital goods prices, the rate of interest of the short term debt, and the rate of interest of the long term debt, reported in the Main Economic Indicators published by the Organization for Economic Cooperation and Development (OECD).

For each country we constructed an unbalanced panel comprising companies for which the information was available for at least six consecutive years, during the period from 1990 to 1999. This condition is necessary in order to have a sufficient number of periods to test for second-order serial correlation, as Arellano and Bond (1991) pointed out. We extracted sufficient data for constructing large enough panel for four countries. These are: the United States, the United Kingdom, Germany, and France, but unfortunately the panel for Spanish companies was small, hence we used an alternative database. This database is from the CNMV (Spanish Security Exchange Commission). Unlike Compustat Global Vantage this database allows us to extract a large enough panel, but the CNMV does not contain the market value of the company shares. For this reason, the market value of the company was extracted from the Daily Bulletin of the MSE (Madrid Stock Exchange). Panel data were also unavailable in Compustat Global Vantage, for other G7 countries like Italy or Japan, because only a small number of observation periods are available. However, this does not constitute a handicap to our study because it contains a wide variety of institutional environments of well-developed countries.

We selected data from all available non-financial companies, which maintained their activity throughout the sample period from the *Global Vantage Industrial Active* archives. In order to avoid survival bias we also included companies from the *Global Vantage Industrial Research* archives, which contain data from companies that for some reason (bankruptcy, liquidation, or so on) were suspended from quotation. The structure of the panel, by number of annual observations per company, is given in Table III. This table for each country reflects the number of companies and the number of observations.

All companies in our sample are allocated to one of ten broad economic industry groups in accordance with the Economic Sector Code reported in Compustat Global Vantage, excluding code 5000 (Financial Services), since the financial companies constitute a specific problem in financial insolvency (see Table IV). Note that we lost the data for one year owing to the construction of some variables (see Appendix). The basic statistics for these variables are shown in Table V.

4.2 Estimation method

The models specified in Section 3 are estimated by using panel data methodology. Unlike cross-sectional analysis, panel data has a great advantage, since it allows us to control for individual heterogeneity. This is crucial for our models since firms are heterogeneous. Therefore, if we do not control for this heterogeneity, we run the risk of obtaining biased results, as shown in studies by Moulton (1986, 1987). We control for heterogeneity by modelling it as an individual effect, η_i. This individual effect is then eliminated by taking first differences of the variables. In this way, our error term has several components as we show in the following specification:

$$\left(\frac{I}{K}\right)_{it} = f\left(\frac{CF}{K}\right)_{i,t-1} + g(X)_{i,t-1} + \boldsymbol{h}_i + d_t + c_i + \boldsymbol{t}_{it} \qquad \textbf{(5)}$$

where: d_t measures the temporal effect with the corresponding dummy variables, so that we can control the effect of macroeconomic variables on firms' behaviour. c_i stands for the country effect measured using dummy variables to control the firms belonging to a country. These dummy variables are only entered into the models including several countries. Finally, $\hat{o}_{it}$ is the random disturbance.

All models are estimated by using the generalized method of moments (GMM), which allows us to control for problems of endogeneity by using instruments. In our case, we use all the right-hand side variables in the models lagged twice (or more) as instruments in order to improve efficiency. This strategy, suggested by Arellano and Bond (1991), consists of obtaining additional instruments using the orthogonality conditions that exist between lagged values of the right-hand side variables.

The estimation was carried out using DPD98 for GAUSS written by Arellano and Bond (1998). In order to check for potential mis-specification of the models we used the Sargan statistic of over-identifying restrictions, which tests for the absence of correlation between the instruments and the error term. Another specification test used is the m_2 statistic, developed by Arellano and Bond (1991), to test for lack of second-order serial correlation in the first-difference residuals. Finally, besides the aforementioned specification tests, all Tables provide two or three Wald tests. Thus, z_1 is a test of the joint significance of the reported coefficients; z_2 is a test of the joint significance of the time dummies; and z_3 is a test of the joint significance of the country dummies, hence this test is only performed in the models including several countries.

5. Results: Investment and financial insolvency

5.1 Investment and ex-ante financial insolvency costs

Before to studying the relationship between investment and ex-ante financial insolvency costs, we estimated our basic specification (equation 2) for all the countries included in this paper. The results are given in Table VI.

The first column I displays the results for US firms, which confirm the model specified in Section 3. That is, there is a dynamics in the model, since the lag of the dependent variable is significant, and cash flow and Tobin's q are positively related to investment. The relationship between Tobin's q and investment means that firms react by undertaking new investment when the market reveals valuable investment opportunities and is in agreement with the previous literature, such as Fazzari, Hubbard and Petersen (1988), Hayashi and Inoue (1991), Vogt (1994), Faroque and Ton-That (1995), Chapman, Junor and Stegman (1996) or Agung (2000), among others. Finally, the positive relationship between cash flow and investment stands for the sensitivity of investment to the fluctuations of cash flow. Hence, this result corroborates the pecking order and the free cash flow theories, and agrees with all the papers following Fazarri, Hubbard and Petersen (1988).

This model is well-specified since it passes all the specification tests mentioned in Section 4.2. That is, the Sargan test rejects the correlation between the instruments and the error term; and m_2 rejects the second-order serial correlation, and although m_1 shows that there is first-order serial correlation in the differenced residuals, this is not a specification problem since it is due to the transformation. The remaining columns display the results for the UK, German, French and Spanish firms, respectively. These results are quite similar to those commented about US firms, hence we can conclude that our basic specification is suitable for analysing the investment and ex-ante financial insolvency costs relationship.

Table VII provides the results of the model extended by incorporating our measure for the ex-ante financial insolvency costs. The first column displays the results for US firms, which for the variables commented above are really similar. The result for this new variable shows us that there is an inverse relationship between investment and ex-ante financial insolvency costs. This relation means that firms face ex-ante financial insolvency costs which discourage them from undertaking investment projects. Thus, the government could pass financial insolvency laws that mitigate this negative effect of ex-ante financial insolvency costs on investment. The results for the other countries are very similar to those commented above; in all countries the ex-ante financial insolvency costs affect the investment undertaken by firms negatively. These results are displayed in remaining columns for the UK, German

and French firms. Unfortunately, we cannot perform this model for Spanish firms, because of lack of data from the CNMV to proxy intangible assets including goodwill.

To sum up, the results given in Table VII reveal that our Hypothesis 1 is verified, since in all countries we have found a negative relationship between investment and ex-ante financial insolvency costs. This means that the latter discourages firms from undertaking investment. Therefore, in the next section we study what the government will have to do to mitigate this negative effect.

5.2 Investment and financial insolvency codes

In Section 5.1 we verified that the ex-ante financial insolvency costs negatively affect the investment undertaken by firms. Now, we study whether or not the government can do anything to mitigate this negative effect. To accomplish that, we perform our basic model including several country dummy variables. Table VIII provides the results of the basic model for all countries. The first column shows the results for the basic model for all countries without the country dummy variables. These results are similar to those obtained for each individual country. That is, cash flow and investment opportunities are directly related to investment. The results including the country dummy variables in the model are displayed in second column. The relationship for the abovementioned variables controlling country effects is the one commented previously, and it highlights the Wald test for the country dummy variables, which tells us that their joint significance is high. As we established in Hypothesis 2 then, the country specific effect is relevant in investment decisions.

To check the second part of Hypothesis 2, we extend our model by incorporating the ex-ante financial insolvency costs. As we explained in Section 4.1, we cannot construct this variable for Spanish firms, so these firms are removed in this analysis. The third column of Table VIII displays the basic model without Spain, the results being very similar to those for the full sample (first column). The same happens if we estimate our model including the country dummy variables without Spain (see fourth column). Finally, in the last column we give the results from extending the previous model by incorporating the ex-ante financial insolvency costs. These results again agree with our Hypothesis 2, showing a lower joint significance of the country dummy variables. It tells us that some part of the specific effect came from the different ex-ante insolvency costs faced by firms in each country.

In consonance with our previous results, let us now move on to the analysis of the effect of financial insolvency codes on investment. First, we analyse the whole codes using the index constructed in Table II. Thus, we perform the model in equation 5 using as a

dummy variable the investment index, i.e, DC_i is equal to 1 if the firm belongs to a country with an investment index higher than the mean, and 0 otherwise. The first column of Table IX shows the results from this model. These results indicate that the sensitivity of investment to the fluctuations of cash flow for firms with a high investment index (0.0465+0.0674=0.1139, which is significantly different from zero since the null hypothesis of the linear restriction test, t_1, is rejected) is greater than those with a low investment index (0.0465). These results mean that when the investment index is high the firm suffers from underinvestment processes, thus corroborating our Hypothesis 3, since the investment index is ruled by the underinvestment characteristics. Note that there are four characteristics that facilitate underinvestment processes, and only one that encourages overinvestment processes. In fact, if we replace the investment index by the underinvestment index the dummy variable obtained is the same, so the results using this index are also displayed in the first column of Table IX.

Next, we study more in-depth how each characteristic of financial insolvency codes affects on investment. We use the model in equation 5, but the dummy variable is constructed according to Table I. Thus, in order to consider the absolute priority rule,[3] DC_i takes a value of 1 when the firm belongs to a country whose financial insolvency code violates the absolute priority of secured creditors (France, Spain and the US), and 0 otherwise. This dummy variable is the same as those considering the investment index, so the results are in the first column of Table IX. We interpret this greater sensitivity of investment to cash flow in countries whose codes violate the absolute priority rule to be a consequence of two problems. Firstly, if insolvency codes allow some non-secured creditors to rank first in the distribution of proceeds, they will increase the risk of bondholders, who require a higher risk premium. Furthermore, this premium increases because if absolute priority is violated, it will increase the bias of shareholders in favour of riskier investment projects, that is the well-known problem of asset substitution between shareholders and bondholders. Both problems give rise to an underinvestment process.

The second characteristic we have studied is the automatic stay. In this case, we define DC_i as equal to 1 if the firm belongs to a country whose financial insolvency code imposes an automatic stay (the US and France), and 0 otherwise. As can be seen in the second column, the results show that automatic stay increases the sensitivity of investment to the fluctuations of cash flow, since firms belonging to countries with automatic stay have a

greater coefficient (0.0523+0.0487=0.1010, which is also significantly different from zero, see t_1) than the others (0.0523). The negative effect of automatic stay on investment is explained by the fact that the automatic stay could prevent bondholders from gaining possession of their security. Thus, they require a higher risk premium that gives rise to an underinvestment problem.

The third characteristic analysed is when the financial insolvency code can be used to seek protection from creditors by filing for reorganization without their consent. Thus, DC_i is equal to 1 if management can file for reorganization without the creditors´ consent (France and Spain), and 0 otherwise. The results for this new characteristic are provided in the third column. The coefficient for firms belonging to countries that allow filing for reorganization without the consent of the creditor are greater (0.0624+0.1543=0.2167) than the one for other companies (0.0624). Now, it is worthwhile to emphasize that in the previous model the coefficient corresponding to the characteristic of the insolvency code was usually twice the coefficient of the other firms; however, the coefficient of this variable more than triples the other. From our point of view, this fact indicates that when the code allows reorganizations without the creditors´ consent, the bondholders' risk increases substantially, and they require a higher premium, thus giving rise to an underinvestment problem.

Finally, the last characteristic that facilitates underinvestment is the lack of control by creditors when the firm files for reorganization. In this case, DC_i takes the value of 1 if the insolvency code does not give the control to creditors when the firm files for reorganization (France, Spain, the US and Germany), and 0 otherwise. The last column shows that the sensitivity of investment to cash flow is greater when the creditors do not control firms in reorganization (0.0473+0.0668=0.1141 versus 0.0473). In this scenario, the weight of the coefficient of firms with this characteristic is three times the coefficient of the other firms, i.e. it is greater than the violation of the absolute priority rule and the automatic stay, but it is lower than the reorganization without creditors´ consent. However, the negative consequences in the last case should be lower than when the code does not give control to creditors. To explain this result, we have to take into account that the codes that do not give the control to creditors are also lenient codes. Thus, the results in the last column are from a trade-off between the underinvestment problem occurring because these codes do not give the control to creditors when a firm files for reorganization, and the overinvestment problem encouraged when the management stays in cases of financial insolvency.

[3] Note we cannot study the revenue efficiency, since no financial insolvency code includes this characteristic, as

6. Conclusions

This paper tackles a new approach on financial insolvency codes. Our basic idea is that when passing economic laws the government have to be careful to avoid introducing inefficiencies into the economic system. Therefore, the insolvency codes have to encourage a healthy firm not to become financially distressed instead of merely helping the companies in financial distress. Consequently, we study the effect of insolvency codes on the investment undertaken by firms, since the economic literature establishes that depending on the characteristics of each code firms face ex-ante financial insolvency costs, giving rise to two well-known investment problems (underinvestment and overinvestment).

In all the countries we studied (the US, the UK, Germany, France and Spain) the ex-ante insolvency costs discourage firms from undertaking investment, hence the more the ex-ante insolvency costs faced by firms, the less the volume of investment undertaken by them. This means that governments could avoid these economic inefficiencies if they passed laws mitigating the ex-ante insolvency costs faced by firms. Note that these costs are part of the specific effect of the volume of investment undertaken in each country, since the magnitude of the effect of a financial insolvency code on investment depends on its characteristics.

If we analyse the characteristics of insolvency codes, we will find that most of them give rise to underinvestment problems. Therefore, these characteristics increase the sensitivity of investment to fluctuations of cash flow. Furthermore, the more characteristics embodied in a code giving rise to an underinvestment problem, the greater the sensitivity of investment to cash flow. The characteristics embodied in an insolvency code that gives rise to underinvestment processes are: violations of the absolute priority rule, automatic stay, reorganization without creditors' consent, and lack of control by creditors on the reorganization process, whereas those codes allowing management to stay in cases of financial insolvency are lenient and encourage overinvestment processes.

Although all the characteristics giving rise to underinvestment problems have the same negative effect on investment, the magnitude of this effect is different. Thus, the most relevant characteristics are those referring to legal coverage for seeking protection from creditors by filing for reorganization without their consent, and the lack of control by creditors when the firm files for reorganization. In contrast, the violation of the absolute priority rule and the automatic stay are less relevant.

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APPENDIX

- *Investment*

Investment is calculated according to Miguel and Pindado (2001).

$I_{it}=NF_{it}-NF_{it-1}+BD_{it}$.

where NF_{it}, is the net fixed assets and BD_{it} the book depreciation expense corresponding to year *t*.

- *Cash flow*

$CF_{it}=NI_{it}+BD_{it}+P_{it}$

where NI_{it} is the net income and P_{it} are the different provisions that the profit and loss account shows.

- *Replacement value of capital*

$$K_{it}=RF_{it}+(TA_{it}-BI_{it}-BF_{it}-BI_{it})$$

where RF_{it} is the replacement value of tangible fixed assets, TA_{it} is the book value of total assets, BI_{it} is the book value of inventories, BF_{it} is the book value of tangible fixed assets and BI_{it} is the book value of inventories. The last four terms were obtained from the firm's balance sheet and the first were calculated according to Perfect and Wiles (1994).

$$RF_{it} = RF_{it-1}\left[\frac{1+f_t}{1+d_{it}}\right] + I_{it}$$

for $t>t_0$ and $RF_{it0}=BF_{it0}$, where t_0 is the first year of the chosen period, in our case 1990. On the other hand, $d_{it}=D_{it}/BF_{it}$ and $f_t=(GCGP_t-GCGP_{t-1})/GCGP_{t-1}$, where $GCGP_t$ is the growth of capital goods prices reported in the Main Economic Indicators that is published by the Organization for Economic Cooperation and Development (OECD).

- *Tobin's q*

$$Q_{it} = \frac{MVE_{it} + PS_{it} + MVD_{it}}{K_{it}}$$

where MVE_{it} is the market value of common equity, PS_{it} is the book value of the firm's outstanding preferred stock, and MVD_{it} is the market value of debt, which is obtained as the sum of the market value of the short term debt ($BVSTD_{it}$) and the market value of long term debt ($MVLTD_{it}$). The former is proxied by the book value of the short term debt, and the latter is calculated according to the formulas described in Miguel and Pindado (2001).

- *Probability of insolvency*

In order to proxy the probability of insolvency, we follow the methodology developed by Pindado and Rodrigues (2003b). This methodology, like a recent application by Altman (1968) developed by Cleary (1999), uses as explanatory variables stock variables at the beginning of the period and flow variables of the period, both normalized by the replacement value of total assets at the beginning of the period instead of the book value used by Cleary (1999). Like Pindado and Rodrigues (2003a), this model is more parsimonious than the other models that use discriminant or logit analysis to obtain the probability of financial insolvency, PI_{it}. Consequently, the model for proxying the probability of financial insolvency is as follows:

$$\text{Prob}\,(Y>0) = \beta_o + \beta_1 EBIT_{it}/ K_{it-1} + \beta_2 FE_{it}/ K_{it-1} + \beta_3 AP_{it-1} / K_{it-1} + d_t + \eta_i + u_{it} \quad \textbf{(A.1)}$$

The dependent variable is a dichotomy variable that takes value one for financially distressed companies, and zero otherwise. Like Wruck (1990), Asquith, Gertner and Scharfstein (1994), Andrade and Kaplan (1998) and Whitaker (1999), we have classified a company as financially distressed whenever their Earnings Before Interests, Taxes, and Amortizations are lower than their financial expenses. The remaining variables included in the model are: $EBIT_{it}$ stands for Earnings Before Interests and Taxes, FE_{it} refers to financial expenses, AP_{it} is the Accumulated Profitability, and K_{it} stands for the replacement value of the total assets.

The econometric methodology used to estimate the model in equation A.1 can be summarized as follows. First, we developed the econometric specification of the model, reflected in equation A.1, according to the financial theory. Then, we estimated this model using panel data methodology, i.e. panel data model with discrete dependent variable, in order to check the robustness of the model by eliminating the unobservable heterogeneity. Finally, we used the robust model in cross section to include this unobservable heterogeneity in the probability of insolvency provided by the logit model. Note that the values of the probability of insolvency obtained range from 0 to 1, this being a suitable index to proxy the probability of insolvency that the stakeholders assign ex ante to each firm.

- *Ex-ante financial insolvency costs*

$$EAIC_{it}=PI_{it}*EPIC_{it}$$

where $EPIC_{it}$ stands for the ex-post financial insolvency costs proxied by the intangible assets including goodwill.

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Table I
Financial insolvency codes

This table deals with the financial insolvency codes of the five countries studied in this paper, i.e., United States, the United Kingdom, Germany, France, and Spain. Panel A summarizes the relationship between financial insolvency costs and investment inefficiencies depending on the stakeholder that introduces the distortion, the characteristic of the financial insolvency code that facilitates the distortion, the countries whose financial insolvency code have this characteristic, and the investment problem caused. Panel B classifies the relevant literature that describes these codes by country.

Panel A: Financial insolvency codes and investment inefficiencies

Stakeholder	**Characteristic**	**Countries**	**Investment problem**
Bondholder	No revenue efficiency	US UK France Germany Spain	Underinvestment
Bondholder	Violations of Absolute Priority	US France Spain	Underinvestment
Bondholder	Automatic Stay	US France	Underinvestment
Bondholder	Reorganization without creditors' consent	France Spain	Underinvestment
Bondholder	No control on reorganization process	US France Germany Spain	Underinvestment
Manager	Lenient code	US France Germany Spain	Overinvestment

Panel B: Relevant literature on financial insolvency codes

Country	**Papers**
The United States	Franks and Torous (1989, 1992, 1993), Franks, Nyborg and Torous (1996), Kaiser (1996) and White (1996a, 1996b)
The United Kingdom	Franks and Torous (1992, 1993), Franks, Nyborg and Torous. (1996) and Kaiser (1996)
Germany	Franks, Nyborg and Torous (1996), Kaiser (1996) and White (1996b)
France	Kaiser (1996) and White (1996b)
Spain	Ramos (1993) and Sanchez (1993)

Table II
Investment Index

The underinvestment index is obtained by adding a point for each feature that facilitates underinvestment. The overinvestment index is constructed by adding a point for each feature that encourages overinvestment. Finally, the investment index is the difference between both.

Country	**Underinvestment index**	**Overinvestment index**	**Investment index**
United States	4	1	3
United Kingdom	1	0	1
Germany	2	1	1
France	5	1	4
Spain	4	1	3
Mean	3.2	0.8	2.4

Table III

Structure of the panels by number of annual observations per company

To form part of a panel we required that the information be available for at least six consecutive years between 1990 and 1999. We have constructed an unbalanced panel comprising 1675 US (13350 observations), 487 UK (3482 observations), 186 German (1501 observations), 128 French (906 observations), and 133 Spanish (1073 observations) non-financial quoted companies.

Nº of annual observations per company	US		UK		Germany		France		Spain		Total	
	Nº of observations	Nº of companies	Nº of observations	Nº of companies	Nº of observations	Nº of companies	Nº of observations	Nº of companies	Nº of observations	Nº of companies	Nº of observations	Nº of companies
5	830	166	205	41	85	17	220	44	45	9	1385	277
6	1062	177	348	58	144	24	72	12	30	5	1656	276
7	1246	178	469	67	70	10	28	4	175	25	1988	284
8	1392	174	552	69	104	13	208	26	184	23	2440	305
9	8820	980	2268	252	1098	122	378	42	639	71	13203	1467
Total	13350	1675	3842	487	1501	186	906	128	1073	133	20672	2609

Table IV

Sample distribution by economic sector classification

The companies in the panels presented in Table III, for the 1991-1999 period, are allocated to one of ten broad economic industry groups in accordance with the Economic Sector Code (SIC), reported in Compustat Global Vantage, excluding the code 5000 (Financial Services). Consequently, the data reported are for 1675 US (13350 observations), 487 UK (3482 observations), 186 German (1501 observations), 128 French (906 observations), and 133 Spanish (1073 observations) non-financial quoted companies. The Total rows are obtained for the panel resulting of merging the data of the five countries.

Economic Sector Code (SIC)	US		UK		Germany		France		Spain		Total	
	Nº of observations	Nº of Companies	Nº of observations	Nº of Companies	Nº of observations	Nº of companies	Nº of observations	Nº of companies	Nº of observations	Nº of companies	Nº of observations	Nº of companies
Basic Materials	860	108	423	54	85	10	16	3	152	18	1536	193
Consumer – Cyclical	3306	412	1009	128	461	57	317	45	386	49	5478	691
Consumer – Non Cyclical	1524	191	489	60	276	34	137	19	227	28	2653	332
Health Care	3837	469	752	95	403	51	255	35	0	0	5247	650
Energy	2119	266	402	51	167	20	82	12	122	15	2892	364
Capital Goods	1321	163	576	75	85	11	99	14	136	17	2117	280
Technology	308	43	40	5	24	3	0	0	50	6	422	57
Communication and Transportation	175	23	151	19	0	0	0	0	0	0	326	42
Total	13350	1675	3842	487	1501	186	906	128	1073	133	20672	2609

Table V

Summary statistics for panels of each country.

$(I/K)_{i,t}$ is the investment undertaken by companies, $(CF/K)_{i,t}$ is the cash flow, $q_{i,t}$ is the Tobin's q, and $(EAIC)_{i,t}$ is the ex-ante insolvency costs. For each variable and country we report the values of the following statistics Mean, Standard Deviation, Maximum and Minimum. The last rows are obtained for the panel resulting of merging the data of the five countries: 1675 US (13350 observations), 487 UK (3482 observations), 186 German (1501 observations), 128 French (906 observations), and 133 Spanish (1073 observations) non-financial companies.

Country	Statistics	$(I/K)_{i,t}$	$(CF/K)_{i,t}$	$q_{i,t}$	$(EAIC)_{i,t}$
	Mean	0.0601	0.0645	1.6342	0.0069
USA	Standard Deviation	0.0847	0.1238	1.2919	0.0335
	Maximum	0.7312	1.1679	14.9613	0.7312
	Minimum	-1.6115	-3.5403	0.1624	0.0000
	Mean	0.0455	0.0812	1.5170	0.0013
UK	Standard Deviation	0.1122	0.0977	0.9559	0.0120
	Maximum	0.8466	0.5233	11.2866	0.2864
	Minimum	-3.1524	-1.2824	0.3015	0.0000
	Mean	0.0569	0.0767	1.2770	0.0019
Germany	Standard Deviation	0.0726	0.0650	0.8585	0.0089
	Maximum	0.5114	0.5541	11.5333	0.2064
	Minimum	-0.4521	-0.4975	0.3574	0.0000
	Mean	0.0445	0.0698	1.2517	0.0018
France	Standard Deviation	0.0613	0.0455	0.8684	0.0057
	Maximum	0.4425	0.2677	11.5291	0.0877
	Minimum	-0.7998	-0.2341	0.4972	0.0000
	Mean	0.0151	0.0473	1.1476	--
Spain	Standard Deviation	0.1468	0.0702	0.8443	--
	Maximum	0.7855	0.6135	13.7740	--
	Minimum	-1.5442	-0.4373	0.2067	--
	Mean	0.0541	0.0682	1.5441	0.0052
Total	Standard Deviation	0.0926	0.1113	1.1507	0.0284
	Maximum	0.8466	1.1679	14.9613	0.7312
	Minimum	-3.1524	-3.5403	0.1624	0.0000

Table VI

Results for the basic specification of the investment model for each country included in this paper.

The dependent variable is the investment undertaken by companies, $(I/K)_{it}$. $(CF/K)_{i,\ t-1}$, $q_{i,\ t-1}$ and $(I/K)_{I,\ t-1}$ are respectively, the lagged value of cash flow, Tobin's q and investment. The regressions are run using the companies described in Table III for each country. The remaining information for read this table is: i) Heteroskedasticity consistent asymptotic standard error in parentheses; ii) * indicates significance at the 1% level; iii) z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; iv) z_2 is a Wald test of the joint significance of the time dummy variables; asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; v) m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; vi) Sargan is a test of the over-identifying restrictions, asymptotically distributed as $\div^2$ under the null, degrees of freedom in parentheses.

	US	UK	Germany	France	Spain
$(CF/K)_{i,t-1}$	0.0330*	0.0873*	0.1066*	0.2549*	0.6636*
	(0.0119)	(0.0131)	(0.0135)	(0.0220)	(0.0247)
$q_{i,t-1}$	0.0067*	0.0288*	-0.0032	0.0019*	0.0248*
	(0.0013)	(0.0043)	(0.0014)	(0.0005)	(0.0020)
$(I/K)_{i,t-1}$	0.1085*	-0.0287*	0.0899*	0.0434*	-0.0484*
	(0.0153)	(0.0062)	(0.0116)	(0.0046)	(0.0051)
z_1	89 (3)	96 (3)	104 (3)	277 (3)	905 (3)
z_2	48 (7)	227 (7)	1077 (7)	1668 (7)	262 (7)
m_1	-7.711	-2.174	-5.057	-1.916	-3.939
m_2	0.648	-1.173	0.722	0.819	-1.971
Sargan	90.76 (81)	86.40 (81)	95.96 (81)	91.90 (81)	88.00 (81)

Table VII

Results for the model extended by incorporating the ex-ante financial insolvency costs.

The dependent variable is the investment undertaken by companies, $(I/K)_{it}$. $(CF/K)_{i,\,t-1}$, $q_{i,\,t-1}$, $(I/K)_{I,\,t-1}$ and $EAIC_{it}$ are respectively, the lagged value of cash flow, Tobin's q, investment and ex-ante insolvency costs. The regressions are run using the companies described in Table III for each country. The remaining information for read this table is: i) Heteroskedasticity consistent asymptotic standard error in parentheses; ii) * indicates significance at the 1% level; iii) z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; iv) z_2 is a Wald test of the joint significance of the time dummy variables; asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; v) m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; vi) Sargan is a test of the over-identifying restrictions, asymptotically distributed as $\div^2$ under the null, degrees of freedom in parentheses.

	US	UK	Germany	France
$(CF/K)_{i,t-1}$	0.0246*	0.0824*	0.1039*	0.2350*
	(0.0082)	(0.0094)	(0.0100)	(0.0144)
$q_{i,t-1}$	0.0063*	0.0285*	-0.0033	0.0032*
	(0.0012)	(0.0015)	(0.0015)	(0.0002)
$(I/K)_{i,t-1}$	0.1111*	-0.0343*	0.0672*	0.0316*
	(0.0145)	(0.0055)	(0.0061)	(0.0013)
$EAIC_{it}$	-0.0651*	-0.2200*	-0.3086*	-0.5579*
	(0.0241)	(0.0274)	(0.0610)	(0.0218)
z_1	98 (4)	796(4)	284 (4)	2619(4)
z_2	48 (7)	912 (7)	2876 (7)	13915(7)
m_1	-7.698	-2.154	-4.860	-1.904
m_2	0.696	-1.267	-0.828	-0.822
Sargan	110.72 (108)	126.18 (108)	122.81 (108)	109.80 (108)

Table VIII

Results for the model estimated for all countries depending on the country effects and the ex-ante financial insolvency costs.

The dependent variable is the investment undertaken by companies, $(I/K)_{it}$. $(CF/K)_{i,\,t-1}$, $q_{i,\,t-1}$, $(I/K)_{I,\,t-1}$ and $EAIC_{it}$ are respectively, the lagged value of cash flow, Tobin's q, investment and ex-ante insolvency costs. The regressions are run using the companies described in Table III for each country. The remaining information for read this table is: i) Heteroskedasticity consistent asymptotic standard error in parentheses; ii) * indicates significance at the 1% level; iii) z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; iv) z_2 is a Wald test of the joint significance of the time dummy variables; asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; v) z_2 is a Wald test of the joint significance of the time dummy variables; asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; vi) z_3 is a Wald test of the joint significance of the country dummy variables; asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; vii) m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; viii) Sargan is a test of the over-identifying restrictions, asymptotically distributed as $\div^2$ under the null, degrees of freedom in parentheses.

	Basic model for all countries	Basic model for all countries controlling country effects	Basic model without Spain	Basic model without Spain controlling country effects	Basic model without Spain controlling country effects and incorporating ex-ante costs
$(CF/K)_{i,t-1}$	0.0583*	0.0632*	0.0507*	0.0525*	0.0469*
	(0.0141)	(0.0142)	(0.0138)	(0.0137)	(0.0107)
$q_{i,t-1}$	0.0082*	0.0082*	-0.0089	0.0090*	0.0083*
	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0013)
$(I/K)_{i,t-1}$	0.0907*	0.0868*	0.0934*	0.0836*	0.0820*
	(0.0125)	(0.0124)	(0.0121)	(0.0119)	(0.0115)
$EAIC_{i,t-1}$					-0.0736*
					(0.0255)
z_1	110 (3)	108 (3)	119 (3)	107 (3)	116 (4)
z_2	173 (7)	171 (3)	188 (7)	158 (7)	151 (7)
z_3		57 (4)		58 (3)	49 (3)
m_1	-6.460	-6.464	-5.778	-5.691	-5.669
m_2	-0.984	-1.096	0.162	0.100	0.050
Sargan	123.3 (81)	121.8 (81)	116.26 (81)	111.79 (81)	148.27 (108)

Table IX

Results for the model estimated for all countries depending on the characteristic of the insolvency codes of each country.

The dependent variable is the investment undertaken by companies, $(I/K)_{it}$. $(CF/K)_{i,\,t-1}$, $q_{i,\,t-1}$, and $(I/K)_{I,\,t-1}$ are respectively, the lagged value of cash flow, Tobin's q, investment and ex-ante insolvency costs. DC_i is a dummy variable that in the first column takes value of 1 when the firm belong to a country with an investment index higher than the mean, and 0 otherwise. In the remaining columns this dummy variable is equal to 1 if the firm belongs to a country allowing automatic stay, reorganization without creditors' consent, and lack of control by creditors, respectively. The regressions are run using the companies described in Table III for each country. The remaining information for read this table is: i) Heteroskedasticity consistent asymptotic standard error in parentheses; ii) * indicates significance at the 1% level; iii) t_1 is the t-statistic for the linear restriction test under the following null hypothesis: $H_0 = \beta_1 + \gamma_1$; iv) z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; v) z_2 is a Wald test of the joint significance of the time dummy variables; asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; vi) z_3 is a Wald test of the joint significance of the country dummy variables; asymptotically distributed as $\div^2$ under the null of no relationship; degrees of freedom in parentheses; vii) m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; viii) Sargan is a test of the over-identifying restrictions, asymptotically distributed as $\div^2$ under the null, degrees of freedom in parentheses.

	Investment index / violation of absolute priority rule	Automatic stay	Reorganization without creditors' consent	Lack of control by creditors / Lenient code
$(CF/K)_{i,t-1}$	0.0465*	0.0523*	0.0624*	0.0473*
	(0.0095)	(0.0103)	(0.0143)	(0.0093)
$q_{i,t-1}$	0.0066*	0.0071*	0.0088*	0.0065*
	(0.0014)	(0.0014)	(0.0015)	(0.0014)
$(I/K)_{i,t-1}$	0.0925*	0.0904*	0.0836*	0.0939*
	(0.0113)	(0.0108)	(0.0109)	(0.0111)
$DC_{it}*(CF/K)_{i,t-1}$	0.0674*	0.0487*	0.1543*	0.0668*
	(0.0262)	(0.0202)	(0.0606)	(0.0255)
t_1	3.837	4.037	3.427	3.984
z_1	130 (4)	137(4)	141 (4)	137 (4)
z_2	144 (7)	151 (7)	166 (7)	134 (7)
z_3	50 (4)	53 (4)	55.(4)	49 (4)
m_1	-6.520	-6.502	-6.528	-6.536
m_2	0.993	-1.021	-1.185	-0.962
Sargan	209.07 (108)	186.48 (108)	159.91 (108)	198.15 (108)