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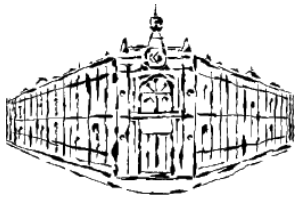
Andrew Benito and Ignacio Hernando



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Extricate:
Financial Pressure and Firm Behaviour in Spain

Andrew Benito* Banco de España

Ignacio Hernando† Banco de España

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*Banco de España Research Department, Alcalá 50, 28014 Madrid, Spain. Tel: +34 91 5277. E-mail: andrew.benito@bde.es

†Banco de España Research Department, Alcalá 50, 28014 Madrid, Spain. Tel: +34 91 338 5186. E-mail: hernando@bde.es

Abstract:

This paper examines financial pressure facing Spanish companies. A number of stylised facts regarding the financial performance and financing decisions of Spanish firms are first presented for the period 1985-2000 using repeated annual cross-sections of around 5,000 manufacturing and retail firms. (i) In periods of general financial fragility, most notably during the recession of 1993, the experience of the most financially vulnerable companies is even more distressed than movements in aggregate or average figures would suggest (ii) the burden of borrowing costs has declined for most companies in the mid-/late-1990s, but particularly for those at the top of the distribution (iii) the cross-sectional distribution of indebtedness across firms has remained remarkably stable but (iv) this conceals significant variation in debt ratios for individual firms.

Using panel data methods, the effects of financial pressure associated with servicing debt on a number of aspects of corporate behaviour are then examined, namely fixed investment, employment (both permanent and temporary), inventories and dividend policies. Our results quantify the responsiveness of each of these responses to financial pressure experienced by firms in Spain. Quantitatively large effects of financial pressure on investment and employment are estimated, although these work through more quickly in the case of fixed investment. The effects on employment are found to be larger and work through more quickly in the case of temporary than permanent employment. We also find significant effects on inventory investment and dividend payments confirming these additional mechanisms of adjustment by companies in Spain in response to financial pressure.

1 Introduction

The financial performance and financing decisions of firms as well as their responses to financial pressure are important to both the effects of monetary policy through the corporate sector and the stability of the financial system. This paper aims to describe aspects of the financial fragility associated with the corporate sector in Spain and consider how companies adjust to variations in financial pressure. The paper thereby address these twin concerns of understanding the monetary transmission mechanism and financial stability as they operate through the corporate sector in Spain.

In a mechanical sense, a key channel for the operation of monetary policy through the corporate sector is by altering borrowing costs. Monetary policy thereby imposes, or alleviates, financial pressure on firms. But in a behavioural sense, relatively little is known about how this affects firms and the actions taken by companies as a response. Adjustment by companies can potentially involve a wide range of activities with the most prominent relating to their investment decisions, human resource policies and financial policies. Nickell and Nicolitsas (1999) also consider the question of how financial pressure affects firms, motivated by an interest in how monetary policy operates. This paper broadens the types of corporate responses to financial pressure considered by Nickell and Nicolitsas (1999), providing evidence on this subject for firms in Spain.

Grouping these behavioural responses to financial pressure under the three main categories above, this paper examines adjustment to financial pressure through investment decisions in the form of fixed and inventory investment, through human resource policies in the form of effects on levels of employment at the firm and through financial policies, in the form of dividend payments. To this end, the paper employs data on a large panel of Spanish firms, consisting of financial information on approximately 5,000 companies over the period 1985 to 2000 collected by the Banco de España. One appealing feature of these data is the coverage of both quoted and non-quoted company sectors.

The remainder of the paper is organised as follows. Section 2 presents descriptive information of the cross-sectional distribution of financial variables providing an overall assessment of financial pressure experienced by the Spanish corporate sector over the 1985 to 2000 period. Section 3 discusses alternative methods of corporate adjustment to financial pressure in the context of balance sheet adjustment. Section 4 describes the data and estimation methods whilst section 5 presents the estimation results considering the sensitivity of different aspects of Spanish corporate behaviour, namely fixed investment, inventories, employment (both permanent and temporary staff) and dividends, to financial pressure. Section 6 concludes.

2 Preliminary data analysis: Stylised facts

Through its links with the banking system and financial markets, the financial performance and financing decisions of firms play an important role in the stability of the financial system (eg. Bernanke and Campbell, 1988). In this context, developments among the more financially vulnerable firms might be considered more influential compared to that of more typical firms. Deterioration in the financial fragility of some

firms may generate risks and these may not be completely offset by improvements in conditions among other firms. This section presents preliminary data analysis of the sample of Spanish manufacturing and retail firms. The data are presented in primarily graphical form to illustrate variation in the cross-sectional distributions of outcomes and how these have varied over time in Spain. A number of indicators of the financial performance and financial policies are presented along with certain outcomes that are potential responses of corporates to financial pressure. This provides a precursor to the more formal analysis of how companies respond to financial pressure.

A useful starting point is to consider a measure of the burden of servicing debt. This consists of a flow borrowing ratio defined as the ratio of interest payments on debt to the company's cash flow. This is a useful indicator of financial pressure experienced by companies for several reasons. Banks appear to attach significant attention to this variable as an indicator of financial health of a company and where bank lending is subject to financial covenants these are often stated in terms of this variable. In our econometric analysis to follow, and also following Nickell and Nicolitsas (1999), this will be our central measure of financial pressure.

The cross-sectional distribution of this variable and how it varies over time is shown in Figure 1. Different percentiles (ie. the 10th, 25th, 50th, and 75th) in the cross-sectional distribution in each year are illustrated. The experience of the median company (the 50th percentile) is indicative of the typical Spanish company in each year, whilst the higher percentiles indicate the experience of those companies experiencing most financial pressure. Figure 1 therefore illustrates variation over time and over companies in levels of short-term financial pressure.

Consider the typical company in Spain first. Its interest payments relative to cash flow fell during the mid-1980s but then began to increase at the end of the 1980s before again declining as growth resumed following the recession of the early 1990s. Variation in this ratio reflects a combination of variation in interest rates, company profitability and indebtedness. The variable peaked in 1993 from which point it has declined steadily. An important finding from Figure 1 is that as interest rates and the burden of servicing debt has fallen from the mid-1990s, the implied reduction in financial pressure has been felt throughout the cross-sectional distribution of firms in Spain and indeed, is most strong for the more financially vulnerable. At the 75th percentile of the distribution, the borrowing ratio has fallen from 0.91 in 1993 to 0.33 in 2000. This is a positive development for financial stability associated with the corporate sector in Spain. This also contrasts with the experience during the recession, at its deepest in 1993, when the financial pressure of the most vulnerable companies had increased relative to the more typical companies suggesting that aggregate data on debt burdens at the time understated the vulnerability of the most fragile companies and hence the system as a whole.

Figure 2 turns to the denominator in the financial pressure term, that is cash flow, which is here normalised on the total assets of the company. There are two key observations from Figure 2. First, cash flow is clearly procyclical as we would expect. At the median, cash flow declined from 13.7% in 1988 to 7.3% in 1993, from which point it has since recovered steadily reaching 12.4% in 2000. Second, the experience of the median firm understates variation at other points in the cross-sectional distribution,

both upper and lower tails. For financial stability issues it is the lower tail that is more relevant and here (ie. at the 10th percentile) cash flow fell from 2.1% in 1988 to –7.0% in 1993.

Figure 3 considers the operating profit margin of the firm, normalising post-tax profits on sales. An interesting contrast emerges between this measure of profitability and that in Figure 2 or related measures of return on assets. Again margins appear to be procyclical. But whereas profitability at both the lower and upper tails of the distribution fall during the recession of 1993, in terms of margins it is the fall at the lower tail that is more pronounced. This reflects the margins/volumes trade-off that companies face. Whilst companies at the lower tail appear to be sacrificing margins, companies at the top of the distribution appear to be trying to maintain their margin-often an indicator of market power-at the price of accepting lower volumes during the recession. In the period since 1995 there is no evidence of a decline in margins at the lower tail, however. This contrasts with results found for an earlier study of (quoted) UK firms, where a pronounced increase in dispersion and decline in profitability at the 10th percentile of the distribution was found (Benito and Vlieghe, 2000).

How does the cross-sectional distribution of corporate indebtedness vary over this period? Debt is an important indicator of the financing decisions of firms. Although it may have some desirable properties, the commitment to service debt is often felt to increase the exposure of the system to future shocks. The distribution of the variable is illustrated in Figure 4 which normalises company debt on total assets. Figure 4 shows remarkable stability in the cross-sectional distribution of indebtedness of firms. It should be noted that stability in the company-level cross-sectional distribution can be consistent with aggregate movements in a variable and in variation for individual companies. For instance, the aggregate data which corresponds to that in Figure 4 indicate an increase in indebtedness from 25.8% in 1997 to 30.2% by 2000. This is accounted for by large firms increasing their debt levels. The stability of the cross-sectional distribution of indebtedness among Spanish firms also contrasts with findings for UK quoted firms where a marked increase in dispersion in recent years has been found (Benito and Vlieghe, 2000).

Variations in financial pressure are expected to give rise to adjustments by companies by way of response. This paper will investigate these responses but an inspection of trends in a number of these possibilities can be presented here.

The cross-sectional distributions of investment, both fixed and in the form of inventory accumulation, are also considered in Figures 5 and 6, respectively. Investment is procyclical as expected. In particular it declines in the recession of 1993 and especially so at the top of the cross-sectional distribution, namely at the 90th percentile. Inventory investment displays considerable cross-sectional variation in each year. Each point in the cross-section shown in Figure 6 displays a similar form of procyclical variation over the time period.

Employment growth at the median firm varies relatively little during the sample period, but becomes negative for the only time during the period in 1993 (Figure 7). This disguises more significant variation at both the upper and lower tails of the distribution, which shows even stronger declines in the recession of 1993 which coincided with increases in the financial pressure of borrowing costs, as shown above.

The final dimension of corporate behaviour we consider is an aspect of its financial policy, namely the dividend payment. Figure 8 shows the ratio of the company dividend to its total assets. A majority of firms in Spain in each year pay no dividend. Figure 8 shows that amongst those firms that do pay a dividend, the level of the dividend declines as the aggregate Spanish economy weakened in the early 1990s, and then subsequently increased as the economy averaged from recession in 1994.

This descriptive analysis has shown that movements across the cross-sectional distribution of Spanish firms in each of the variables to be examined in more detail below, namely fixed and inventory investment, employment and dividends, is procyclical. This variation also coincides with movements in the financial pressure term, the borrowing ratio. A key aspect of the analysis to follow will be to consider whether, and to what extent, financial pressure in the form of the burden of borrowing costs and the level of indebtedness of the firm, affects each of these decisions at the individual company-level.

3 Economic background[1]

This section provides some further economic background to the analysis of corporate adjustment to financial pressure that will follow. One way of motivating the study of these outcomes is to view them as means for companies to adjust their balance sheets (eg. Benito and Young, 2002). Corporate responses to financial pressure can be thought of as bound together by the sources and uses of funds budget constraint. The budget constraint can be written in terms of its end-of-period net debt as:

$$B_{t+1} = B_t + P_t^I I_t + D_t - (1-\tau)(\Pi_t - r_t^B B_t) - N_t \tag{1}$$

where B is the stock of net debt, τ is the corporate tax rate, P^I is the price of investment goods (net of tax allowances), I is the volume of gross investment which can be thought of as including investment in inventories. D is the dividend, Π is nominal profits, r^B is the interest rate paid on corporate debt, and N is the value of new equity capital. This expression states that debt increases when outlays on investment and dividends are less than receipts from post-tax profits and new equity. The budget constraint can be expressed as a difference equation in the level of gearing of the firm, normalising debt on the beginning-of-period capital stock.

$$b_{t+1} = \frac{(1+(1-\tau)r_t^B)}{(1+g)} b_t + d_t + i_t - (1-\tau)\pi_t - n_t \tag{2}$$

where lower case letters denote shares of the capital stock and g is its growth rate. This equation is dynamically unstable when the post corporate tax interest rate $(1-\tau)r_t^B$ is greater than the growth rate, g.[2] In this case, either dividends d_t, investment i_i, profitability π_t, or new equity funds n_t, need to vary sufficiently to prevent the debt stock and gearing b_t, rising or falling without limit.

[1] This section draws on Benito and Young (2002).

[2] The interest rate is greater than the growth rate in a dynamically efficient economy. While tax deductibility may mean that $(1-\tau)r_t^B < g$ for tax-paying companies, this is unlikely to be the case for tax exhausted companies and those who face a significant premium on their borrowing costs.

Consider each of these terms in turn. Firms already maximising profits should not, in principle, be able to increase the rate of profit π_t, in response to balance sheet pressures. But, in practice, Nickell and Nicolitsas (1999) find significant effects of financial pressure on employment, with smaller effects on wages and productivity. These can be interpreted as suggesting financial pressure affects corporate decisions in such a way that companies are placed under greater pressure to improve company profitability π_t.[3] These decisions are attempts to relax the budget constraint by improving company profitability. The employment effects considered by Nickell and Nicolitsas (1999) will be considered below. One useful advantage of our dataset in this context is the ability to distinguish between effects on permanent and temporary contract staff.

In the absence of taxes, asymmetric information or agency problems, the Modigliani-Miller theorem would hold and the optimal investment rate would be independent of financing considerations. A large number of studies however, have found evidence of significant cash flow effects on investment, which could also be indicative of financial pressure-type effects (eg. Fazzari *et al.* 1988), although not effects associated with the cost of servicing debt. Benito and Young (2002) find significant effects from the financial pressure of servicing debt on fixed investment for a panel of UK firms.

Inventory investment can be considered in a similar vein as fixed investment, at least for manufacturing and trade (wholesale and retail) firms. An important means by which monetary policy is expected to operate through the corporate sector is through its influence on the cost of financing inventory investment (see Bank of England Monetary Policy Committee, 1999, p.7), one of the main costs of holding inventories. As noted by Blinder and Maccini (1991) and Kashyap *et al.* (1994) however, there has been scant empirical evidence of such effects. Ramey and West (1999, p.907) also note that none of the studies they review, all of which use aggregate data for the US, find evidence of an interest rate effect on inventories.

Under the Modigliani-Miller conditions, the debt stock would be stabilised by changes in dividend payments or new equity capital, although this would not affect company valuations. Since the sample of companies we will examine below will be largely non-quoted we will not consider new equity issues as a form of corporate response. Instead the response of the company's financial policy will be considered in the form of its dividend payment. Both underlying indebtedness and the financial pressure associated with its servicing are expected to be significantly related to the level of dividend. It has long been noted however, that companies appear reluctant to cut their dividend, having a preference to maintain their dividend at what they believe is a sustainable level (Lintner, 1956). This suggests that there are adjustment costs associated with altering the dividend which may make companies reluctant to flex the payout in response to financial pressure.

The above discussion frames adjustment by firms in terms of their attempts to maintain a stable underlying debt or gearing position. Also associated with this position is the short-term financial pressure associated with the servicing of this debt. The latter is the focus of Nickell and Nicolitsas (1999), who examine the impact of the (flow) borrowing ratio (the ratio of the firm's interest payments to its cash flow)

[3] In a related study, Nickell *et al.* (1997, p.783) infer that "some firms appear to be doing more [profit] maximising than others".

on the employment, wage growth and productivity outcomes noted above. Nickell and Nicolitsas (1999) show that the net worth of the company (the ratio of its debt to present value of its profits) can be approximated by the ratio of interest payments to profits, to be considered below, less an effect from inflation eroding the burden of debt. An emphasis on adjustment with respect to this borrowing ratio measure of financial pressure can also partly be justified by reference to the activities of banks, who attach great emphasis on this indicator or its reciprocal (interest cover), as a measure of the financial health of a company. Where bank lending is subject to financial covenants these are often stated in terms of interest cover so that companies, managers in particular, become particularly averse to increases in financial pressure of this form and may be expected to take actions that avert the threat of bankruptcy. As noted by Nickell and Nicolitsas (1999) this requires a certain amount of organisational slack and the notion that perhaps due to specific human capital, managers are more concerned about failure than shareholders. For many, these are not controversial assumptions.

The estimation analysis to follow will consider the responsiveness of each of the following outcomes to measures of the financial pressure facing a company: fixed investment, inventory investment, employment and dividend payments.

4 Data and Estimation

4.1 Data

The data employed are derived from an annual survey of non-financial firms conducted by the Central Balance Sheet Office of the Banco de España (see Banco de España, 2000). This is a large scale survey used extensivley by the Bank of Spain to inform its assessment of the Spanish corporate sector. In terms of gross value added the survey respondents jointly represent around 35 per cent of the total gross value added of the non-financial corporate sector in Spain. This paper employs data for the period 1985 to 2000 for which the coverage of the survey has been relatively stable. We impose a restriction that the firm has at least 10 employees. For the estimation analysis, it is also required that there are at least 4 consecutive time-series observations per company. This produces an unbalanced sample of 4,919 non-financial companies with between 4 and 16 annual observations per company (see Data Appendix).

Table 1 presents median values for the different variables used in our analysis for subsample periods. The most important aggregate variation observed in (pro)cyclical variables such as fixed and inventory investment and cash flow reflects the recession in Spain, the trough of which was experienced in 1993. Also clear from Table 1 is the declining burden of debt-servicing apparent in the late 1990s. A median value for the borrowing ratio term br, of 0.333 and 0.314 for 1989-92 and 1993-96, respectively compares to a figure of 0.154 for 1997-2000. This reduction primarily reflects reductions in nominal interest rates and the entry of Spain into the European Monetary Union.[4]

[4]Nominal short-term interest rates in Spain were in the range 12 to 16 per cent (annual averages) in the period from 1985 to 1990 from which point they were reduced steadily to reach 4 per cent by 2000 with Spain being one of the euro area economies at January 1st 1999.

4.2 Estimation methods

The basic estimation approach is to consider a range of corporate outcomes and relate each to financial pressure where the latter is measured by the financial pressure associated with servicing debt and also the underlying net debt position of the company. For the continuous variables, the estimation method consists of the GMM-System estimator proposed by Arellano and Bover (1995) and examined in detail by Blundell and Bond (1998). These models control for fixed effects with the estimator being an extension of the GMM estimator of Arellano and Bond (1991) and estimates equations in levels as well as in first-differences. Where there is persistence in the data such that the lagged levels of a variable are not highly correlated with the first difference, also estimating the levels equations with a lagged difference term as an instrument offers significant gains, countering the bias associated with weak instruments (see Blundell and Bond, 1998). Several variables display high levels of serial correlation. The estimation method requires the absence of second order serial correlation in the first differenced residuals for which the test of Arellano and Bond (1991) is presented (labelled M_2).

In the case of examining dividend payments most companies in the Spanish data do not pay a dividend (see Table 1). This indicates that the previous methods for continuous variables are unlikely to be appropriate. Hence in the analysis of dividends, we consider the propensity for an individual company, in a particular year to omit a dividend. To this end random effects probit models are estimated, which control for company-specific unoberservables through a random effects component (see Arulampalam, 1999; Honoré, 2002).

5 Estimation and results

5.1 Fixed investment

Table 2 reports estimation results for fixed investment. The models estimated are error-correction models which specify a target level of the capital stock, as well as short-run dynamics. The specification adopted has been favoured, among others, by Bond *et al.* (1999) in a study of investment of British and German firms.[5] The financial variables considered are the financial pressure term, br_{it-1} measuring the burden of servicing debt, a cash flow term, $(CF/K)_{it-1}$ and the term $((B-m)/K)$, capturing the net indebtedness of the company. Assuming long-run constant returns to scale and subsuming the depreciation rate into the unobserved firm-specific effects, we obtain the following specification for the investment rate:[6]

[5] Bond *et al.* (1999) emphasise that these types of models tend to produce more reasonable parameters than more stuctural models, such as Q models which may be significantly affected by measurement error. In any case, a Q model is not available here since most of the Spanish firms are not quoted such that the usual Q variable could not be constructed.

[6] See Bond *et al.* (1999) for details on the derivation of the investment model. In addition, the hypothesis of long-run constant returns to scale was tested in a more general specification of the investment equation and could not be rejected.

$$\left(\frac{I}{K_f}\right)_{it} = \alpha_i + \beta_1 \left(\frac{I}{K_f}\right)_{it-1} + \beta_2 \Delta y_{it} + \beta_3 \Delta y_{it-1} + \beta_4 \left(k_f - y\right)_{it-2} \qquad (3)$$
$$+\beta_5 br_{it-1} + \beta_6 \left(\frac{CF}{K}\right)_{it-1} + \beta_7 \left(\frac{B-m}{K}\right)_{it-1} + \gamma_t + \varepsilon_{it}$$

where i indexes companies i=1...N and t indexes years, t=1...T. Δ denotes a first difference, I/K_f is the investment rate, y is the log of real sales. α_i are company-specific fixed effects, K_f is fixed capital stock measured at replacement cost (and k_f its natural log); K represents total assets of the firm, used to normalise cash flow, CF and net debt $(B-m)$.[7] γ_t are time effects that control for macroeconomic influences on fixed investment common across companies and ε_{it} is a serially-uncorrelated, but possibly heteroskedastic error term. The coefficients β_2 and β_3 indicate the short-run responsiveness of fixed investment to sales growth, whilst the coefficient β_4 indicates the speed of adjustment of the capital stock towards its desired level.

Column 1 reports the results of the basic specification without financial variables. The error-correction term is correctly signed but is not significant and implies a slow speed of adjustment. The sales growth terms are positive and significant and their magnitude is comparable to that obtained in similar studies. There is no evidence of second order serial correlation.[8] We then consider adding the financial variables to the basic specification. First, column 2 adds the borrowing ratio term br_{it-1}, finding a significantly negative and well-determined effect. This suggests that the financial pressure of debt servicing plays an important role in influencing investment levels of firms. In column 3, the cash flow term $(CF/K)_{it-1}$ is significantly positive consistent with studies of investment for other countries although we do not wish to address here the issue of whether such cash flow effects pick up financial constraints or the use of cash flow as a proxy for investment opportunities. Instead the focus of attention is on the responsiveness of investment to variations in borrowing costs, through the financial pressure term, br_{it-1}.

When considering both the borrowing ratio and the cash flow terms in column 4, the borrowing ratio variable remains highly significant, the lagged variable having a 't-ratio' of -4.9, while the cash flow term loses its significance. This result reinforces the perception of the important role of the borrowing ratio to explain investment behaviour and provides strong evidence in favour of a monetary policy effect on investment at the company-level, at least in the short-term, through the induced changes in the costs of debt servicing.

[7] We prefer total assets to fixed capital stock to normalise these variables since our sample includes a large number of relatively small companies for which fixed capital stock may be a poor indiciator of their scale. Nevertheless the correlations with variables defined using alternative measures of capital stock are high. Some analysis of the sensitivity of the results to varying this did not suggest the results were sensitive to this factor.

[8] Here, the Sargan test typically returns a value in excess of the standard critical value, although the M_2 statistic indicates the key condition for instrument validity holds. On the basis of Monte Carlo analysis, Blundell *et al.* (2000) report that the Sargan test tends to over-reject in the context of this estimator. Consistent with this, Nickell and Nicolitsas (1999) also report significant Sargan test statistics for all of their regression equations.

In addition to the relation between corporate decisions and the financial pressure term br, that is influenced directly by monetary policy, the paper is also concerned with how companies may adjust in the light of balance sheet pressures associated with the underlying level of indebtedness or gearing. The debt term $(B-m)/K_{it-1}$, considered in place of the borrowing ratio term, br_{it-1} in column 4, finds this being significant with a coefficient (robust standard error) of -0.111 (0.025). This suggests that, consistent with the motivation presented in the previous section, a high level of debt can lead to balance sheet adjustment in the form of companies deferring or foregoing investment projects (see also Vermeulen, 2002 for an industry-level study). This is a direct channel of adjustment in addition to that associated with increases in financial pressure, br, discouraging the accumulation of debt.[9]

It seems reasonable to suppose however, that the effect of a change in the financial pressure of servicing debt might depend on the level of debt that the firm has. We consider this possibility next, distinguishing between those firms with relatively high net debt (that is, above the median value in that year) and those with relatively low levels of net debt. The associated dummy variables are interacted with the borrowing ratio term to produce the specification reported in column 7 of Table 2. We find evidence supporting this hypothesis, with a test of the restriction that the effects at high and low levels of debt being equal, rejected at the 5 per cent level (t-value=2.60; p-value=0.000).

5.2 Inventory investment

The specification for inventory investment borrows mainly from Guariglia (1999) (see also Kashyap *et al.* 1994, and Benito, 2002) again supplemented by the same set of financial variables: the borrowing ratio term, br_{it-1}, a cash flow term, $(CF/K)_{it-1}$ and the variable $((B-m)/K)_{it-1}$, proxying the net indebtedness of the company. The specification takes the following error-correction format:

$$\begin{aligned} \Delta h_{it} &= \alpha_i + \beta_1 \Delta h_{it-1} + \beta_2 \Delta y_{it} + \beta_3 \Delta y_{it-1} + \beta_4 (h-y)_{it-1} \\ &\quad + \beta_5 br_{it-1} + \beta_6 \left(\frac{CF}{K}\right)_{it-1} + \beta_7 \left(\frac{B-m}{K}\right)_{it-1} + \gamma_t + \varepsilon_{it} \end{aligned} \tag{4}$$

h and y denote the logarithms of real inventories, and real sales, respectively, α_i are company-specific fixed effects on inventory investment and the remaining notation follows from that described above.[10] The coefficients β_2 and β_3 indicate the short-run responsiveness of inventory investment to sales growth, whilst the coefficient β_4 indicates the speed of adjustment of inventories towards the long-run (unit-elasticity) relationship between inventories and sales. Evidence in favour of the long-run relationship between

[9] In fact, when including the three financial variables (borroiwng ratio, cash flow and net indebtedness) simultaneously, both the borrowing ratio and net indetedness terms remain significant (see column 6).

[10] This specification is similar to expression (3) for fixed investment, the main difference being that in expression (4) the error correction term is lagged one period instead of two. Both expressions are reparametrizations of an autorregresive distributed lag model of the variables in levels. For inventory investment we have chosen this specification because it is the standard in the previous literature and because it provides a slightly higher speed of adjustment.

inventories can be found by inspecting a cross-plot of log(inventories) against log(sales). The least squares slope coefficient fit to these data is 0.96.

Table 3 summarises our results for the inventories equation. Column 1 reports the results for the baseline equation without financial variables. The coefficients on the sales growth terms indicate that at the company-level inventory investment is procyclical. The coefficient on the error-correction term β_4 although negatively signed is rather low and the implicit speed of adjustment is significantly smaller than a number of previous studies. We note however, that our estimate is somewhat sensitive to the inclusion of the lagged dependent variable.[11] Regarding the relationship between inventories and sales in the short- and long-run the results confirm the two main stylised facts of inventories highlighted by Ramey and West (1999), that inventory investment is procyclical and inventories are highly persistent.

We then analyse the role of the financial variables in explaining the behaviour of inventories. First, as reported in column 2, the borrowing ratio has a significant negative effect on inventories. This suggests that companies respond, at least in part, to financial pressure by significantly altering their level of inventories and that increases in borrowing costs affect firm behaviour through this channel. In column 3, the cash flow term is significantly positive consistent with studies on the effect of financial constraints on inventory investment (see, among others, Carpenter *et al.* 1994, Kashyap *et al.* 1994).

When adding both the borrowing ratio and the cash flow terms in column 4, the cash-flow variables remains significant, with a 't-ratio' of 3.1. However, the borrowing ratio term is not significant at conventional levels with a 't-ratio' of around -1.1. Thus, it seems that the cash-flow term is picking up part of the financial pressure type effects. A related interesting result concerns the distinction between financial pressure effects on inventory investment when debt is high compared to that when net debt is at low levels (column 7). Even when controlling for cash flow, debt-servicing costs affect inventory growth at high debt levels, with a coefficient (robust standard error) on an interaction term between br_{it-1} and above median debt dummy of -0.043 (0.021). The corresponding term where net debt is at or below the median is -0.003 (0.022). Finally, when equation (4) is supplemented by the term $((B-m)/K)$, capturing the net indebtedness of the company, this term does not turn out to be significant (see column 5). The same outcome is observed when including the three financial variables in column 6. Thus, the level of debt does not seem to affect the behaviour of inventories, although its servicing cost does, at least for firms with a relatively high level of debt.

5.3 Employment

The specifications for the level of employment initially borrow from Nickell and Nicolitsas (1999), who find evidence of relatively large effects from financial pressure on employment in a sample of quoted UK firms. They show that the basic specification can be derived from a standard labour demand model, supplemented with the financial variable, br_{it-1}.

[11] Although we prefer to include the term Δh_{it-1}, its omission is associated with an increase in the estimate (robust standard error) of β_4 to -0.119 (0.014).

Consider the results for total company employment first, presented in Table 4. The estimation results for the company-level terms in the form of twice-lagged (log) employment, capital stock, wage growth and lagged wage are all intuitive. Each of these terms is well-determined. Nickell and Nicolitsas (1999) also note that since the estimating equation already conditions on capital stock, the role for br_{it-1} is not reflecting a cost of capital effect on employment. This borrowing ratio term, br_{it-1}, attracts a significantly negative coefficient of -0.069, that is also well-determined with robust standard error of 0.006. Moreover this result, indicating the response of companies to financial pressure by reducing employment levels, is robust to the addition of a control for cash flow in column 2, which itself attracts a significantly positive coefficient.

One experiment conducted by Nickell and Nicolitsas (1999) is to add a control for firm output through the log of real sales. This is considered to investigate the robustness of any significant financial pressure effect rather than to arrive at a preferred specification. We consider this, adding the term y_{it} to the specification that also includes the cash flow term. This leads to a notable decline in the point estimate on the borrowing ratio term but br_{it-1} retains its significance, with a coefficient (robust standard error) of -0.023 (0.007). It should also be remembered that our analysis is partial in nature in the sense that for instance, effects from financial pressure on wage growth could be expected which would help offset the employment effects considered here. Finally, we consider the potential role for debt in influencing employment levels through the introduction of the net debt term $(B-m)/K_{it-1}$ in place of br_{it-1}. We find no evidence consistent with Sharpe (1994) that highly indebted companies hoard labour to a lesser extent. We conclude however, that there is ample evidence of financial pressure effects on Spanish firms' employment levels.

In examining the effects of financial pressure, a significant advantage of the present Banco de España dataset is the ability to distinguish between permanent and fixed-term/temporary contract staff. The introduction of fixed-term/temporary contracts in Spain in 1984 was a major policy initiative representing an attempt to improve labour market flexibility in an economy with high and persistent unemployment and where employment protection legislation had traditionally been strong. Temporary contracts in Spain involve much lower, if any, severance payments and termination is not subject to appeal (see Dolado *et al.* 2002). This should imply effects of financial pressure on temporary employment that are stronger and operate more quickly than in the case of permanent employment where the incentive to hoard labour will be greater due to higher turnover costs.[12] Moreover this policy has had a major impact on employment relationships in Spain. By 2000, staff on temporary contracts represented one-third of the employed workforce.[13] Separate results for permanent and temporary

[12] It may be that there are differences in productivity between permanent and temporary workers which mean that temporary workers experience a stronger burden of adjustment to financial pressure. However, this is by no means clear. Moreover, strictly it would be differences in any wedge between productivity and wages that would be the relevant factor in this context.

[13] In the mid-1990s, policy has aimed to moderate the appeal of temporary contracts but the proportion of employees on such contracts in Spain remained at around 30 per cent through the 1990s (Dolado *et al.* 2002). In our data the proportion of total employment on temporary contracts is somewhat lower than this, at 20 per cent in 2000, owing to greater coverage of larger companies where the incidence of temporary contracts is lower.

contract staff are presented in Table 4. For the specification which includes the separate control for cash flow, the coefficient (standard error) for permanent employment is -0.031 (0.009), smaller in absolute size than the effect of financial pressure estimated on temporary employment at -0.068 (0.037), although the point estimates are not sufficiently well-determined to be significantly different from one another. Omitting the separate control for cash flow (as in Nickell and Nicolitsas (1999)), results in a coefficient (standard error) on the financial pressure term br_{it-1} of -0.047 (0.008) for permanent employees and -0.111 (0.034) in the case of temporary employees. The estimation of separate permanent and temporary employment regressions generates three further intuitive results of interest.[14] First, permanent employment is more persistent than is temporary employment, which we would expect almost by definition. Second, the wage elasticity of employment demand is larger (in absolute value) in the case of temporary employees. For temporary employment, the long-run wage elasticity is estimated at -1.54, compared to an an estimate of -0.57 in the case of permanent employees, both reasonable estimates relative to the extant literature.[15] Third, the effect of cash flow is also found to be more significant in the case of temporary employment, with a coefficient (standard error) of 0.150 (0.054) for temporary employment comparing to 0.055 (0.016) for permanent employment. Our results in terms of permanent versus temporary workers sheds further light on the effects of financial pressure on the corporate sector. It also suggests that the introduction of temporary contracts in Spain has enhanced the ability of firms to respond to financial pressure.

5.4 Dividend payment

We now consider how might financial pressure affect a firm's dividend payment. In our sample of Spanish firms the majority of observations involve the firm not paying a dividend. These companies therefore have foregone the option of using the dividend further to respond to financial pressure. But the decision to omit the dividend payment may itself be a response to financial pressure, *inter alia,* and this is the form of response to financial pressure through the dividend policy that we focus on here.

Specifically, we estimate random effects probit models for the propensity for a firm to omit a dividend in a particular year. The specifications borrow from Benito and Young (2001). The propensity to omit is a function of the firm's cash flow (CF/K), its rate of investment (I/K_f), the level of net debt ($(B-m)/K$), scale (log real sales, y) and the financial pressure term (br) of Nickell and Nicolitsas (1999). All regressors are lagged one period. The random effects term controls for firm-specific unobserved heterogeneity assumed randomly distributed across firms and year effects control for common macroeconomic effects. The specification reflects an amalgam of forces. The key relations between dividends and cash flow and investment would be expected under a hierarchy of finance model in which cash flow is the marginal source of funds for investment. Since dividends are paid as the residual between cash flow and investment

[14] We found no evidence of differences in the borrowing ratio effect between relatively high- and low-indebted companies.

[15] Nickell and Nicolitsas (1999) note estimates of long-run wage elasticities (for overall rather than temporary employment) as large as -1.5 with their own estimate being -0.76.

this implies an inverse relation between the propensity to omit and the firm's cash flow and a positive relation with the firm's investment. Such a hierarchy of funds could include that arising for reasons of tax discrimination (eg. Auerbach and Hassett, 2000; Benito and Young, 2001) and/or asymmetric information (Myers and Majluf, 1984). As noted in Section 3 the use of dividends as an adjustment to high levels of debt could also be expected, implying a positive relation between the propensity to omit the dividend and the firm's indebtedness. The control for scale is included as larger firms may be more likely to employ the dividend as a means of controlling agency costs. The financial pressure term *br*, is then considered both alongside the debt term and in place of it.

The results accord with the intuition described above. The propensity to omit a dividend payment is declining in the cash flow of the firm and increasing in the firm's investment. The cash flow term attracts a coefficient (standard error) of -0.679 (0.090), whilst that on investment is 0.054 (0.028), in the specification that includes the borrowing ratio term br_{it-1}, alongside the net indebtedness term $(B-m)/K_{it-1}$. Both of these two terms are individually significant and positively signed, indicating that financial pressure in the form of a high level of debt on the balance sheet and high borrowing costs relative to cash flow, significantly increase the probability that a company will omit a dividend. The marginal effects are also reported in Table 5. The propensity to omit is above all, sensitive to cash flow and the borrowing ratio. A 10 percentage point increase in the former raises the probability of omitting a dividend by 0.013 (ie. -0.130/10). An increase in financial pressure equivalent to an increase in the nominal interest rate from 5 to 8 percentage points (implying an increase at the mean of *br* of 0.22) is estimated to imply an increase in the probability of omission of 0.099. Relative to a mean rate of omission of 0.66, the latter is an appreciable effect. The marginal effects associated with investment and net debt are quantitatively smaller. Since *br* is itself a function of the level of debt, the second specification in Table 5 omits the net debt term. This does little to alter the estimates obtained.

The final specification reported considers whether the financial pressure effect on the propensity for a firm to omit a dividend payment itself depends on the level of net indebtedness, distinguishing between observations where net debt is relatively high and relatively low. The results support such an inference, with a marginal effect of debt estimated at 0.50, where debt is relatively high compared to that of 0.41, where debt is low. This difference is statistically significant ($\chi^2(1) = 43.29$; p-value=0.000).

We now compare more directly the various effects estimated on the continuous firm decisions considered above, namely fixed and inventory investment and employment, again distinguishing between permanent and temporary employees. Figure 9 depicts the responses of the real variables described above to an increase in financial pressure equivalent to an increase in the official interest rate for 1 year from 5 to 6 percentage points.[16] This is equivalent to a modest tightening in monetary policy that we use to illustrate the nature of the responses from the various forms of firm behaviour. The change in financial pressure is estimated to result in a reduction in (the volume

[16] These responses are based on our preferred specifications, those including both the borrowing ratio and the cash flow terms: column 4 in Tables 2 and 3 for fixed and inventory investment, respectively; and columns 2, 5 and 7 in Table 4 for total, permanent and temporary employment, respectively.

of) fixed investment of around 10 per cent, in inventory investment (ie. the change in the stock of inventories) of 1.5 per cent and in employment of 0.4 per cent in the first year.[17] For this transitory change in financial pressure, the long-run effect in each case is zero. The profiles over time are also of interest reflecting the different persistence properties of the firm decisions. Whereas the effects on fixed and inventory investment work through quickly, with a bounce-back in inventory investment to ensure the return to the long-run inventories/sales relationship, a much slower response is apparent for employment which is much more persistent. The distinction between permanent and temporary employees is also of interest with a larger and quicker effect on temporary employment evident. How do the employment effects compare to those of Nickell and Nicolitsas (1999) for UK firms? Nickell and Nicolitsas (1999) considered the long-run effect of an increase in financial pressure equivalent to an increase in interest rates from 5 to 8 per cent, finding a 10 per cent employment response. For the same permanent change in financial pressure, our estimates imply an effect for permanent and temporary employment estimated as 5.5 and 8.4 per cent respectively, when controlling for cash flow, or 8.0 per cent and 13.8 per cent when omitting the separate cash flow control as in Nickell and Nicolitsas (1999).[18]

6 Conclusion

This paper has aimed to assess a number of means by which companies in Spain respond to financial pressure, using a large-scale company-level panel dataset for the period 1985-2000. The analysis has examined what are quite conceivably the most important aspects of adjustment by firms covering several real and financial activities. In providing such an analysis, a further aim has been to provide a comparison of the sensitivity of these outcomes in order to identify the dimensions of corporate behaviour that bear the strongest burden of adjustment to financial pressure. The analysis has also shed light on how, by altering the financial pressure experienced by firms in servicing their debt, monetary policy may operate through the corporate sector.

A number of real decisions appear to be influenced by financial pressure. We have identified significant effects of financial pressure on fixed investment, inventories, employment–distinguishing between both permanent and temporary employment–and, as a financial response, the probability that the company will pay a dividend. This set of results broadens the types of corporate behaviour considered by Nickell and Nicolitsas (1999) and helps identify the range of responses undertaken by firms in Spain to the experience of financial pressure.

[17] We emphasise that this supposed increase in the official policy rate is used as an aid for interpreting the financial pressure effects we have estimated. Any change in the official policy rate would have important general equilbrium effects through such channels as the exchange rate which we do not consider.

[18] We consider the notion of a permanent increase in financial pressure (or the policy rate of interest) less intuitively appealing than an increase that lasts for only one year.

Table 1: Sample medians

		1985-88	1989-92	1993-96	1997-2000
I/K_f	investment	0.130	0.108	0.080	0.121
Δh	inventory investment	0.007	-0.010	0.002	0.039
N	employment	75	55	44	45
N^P	employed (permanent)	67	45	34	35
N^T	employment (temporary)	1	4	6	6
Δw	wage growth	0.012	0.021	0.006	0.006
$(D=0)$	dividend omission	0.588	0.623	0.740	0.691
br	borrowing ratio	0.278	0.333	0.314	0.154
CF/K	cash flow	0.133	0.108	0.101	0.125
$(B-m)/K$	net indebtedness	0.254	0.214	0.202	0.191
m/K	liquidity	0.063	0.045	0.044	0.050
Δy	sales growth	0.033	-0.019	0.018	0.047
Y	real sales (1995 prices)	9419.4	7171.6	6306.4	6452.5
observations		8,507	11,308	10,941	9,281

Notes: Tables reports sample medians with the exception of dividend omission $(D=0)$ which reports the sample proportion of dividends omissions.

Table 2: Fixed investment

$(I/K_f)_{it}$	[1]	[2]	[3]	[4]	[5]	[6]	[7]
$(I/K_f)_{it-1}$	0.022 (0.017)	0.008 (0.016)	0.017 (0.016)	0.003 (0.016)	0.009 (0.016)	-0.001 (0.016)	0.002 (0.016)
Δy_{it}	0.302 (0.121)	0.227 (0.097)	0.258 (0.117)	0.207 (0.097)	0.269 (0.107)	0.205 (0.091)	0.194 (0.091)
Δy_{it-1}	0.055 (0.026)	0.065 (0.026)	0.051 (0.027)	0.069 (0.026)	0.072 (0.026)	0.082 (0.025)	0.072 (0.025)
$(k-y)_{it-2}$	-0.019 (0.021)	-0.039 (0.020)	-0.023 (0.022)	-0.045 (0.020)	-0.039 (0.021)	-0.055 (0.019)	-0.048 (0.020)
br_{it-1}		-0.113 (0.019)		-0.101(0.021)		-0.095 (0.021)	
CF/K_{it-1}			0.101 (0.042)	0.037 (0.047)	0.082 (0.041)	0.022 (0.046)	0.031 (0.047)
$(B-m)/K_{it-1}$					-0.111(0.025)	-0.092 (0.024)	
$(brX(B-m)/K^{high})_{it-1}$							-0.124 (0.023)
$(brX(B-m)/K^{low})_{it-1}$							-0.075 (0.023)
year effects	yes	yes	yes	yes	yes	yes	yes
M_2	0.299	0.237	0.290	0.235	0.260	0.226	0.227
Instruments	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1
Sargan	0.051	0.000	0.010	0.001	0.021	0.003	0.005
companies	4,919	4,919	4,919	4,919	4,919	4,919	4,919
observations	30,199	30,199	30,199	30,199	30,199	30,199	30,199

Notes: Estimation by GMM-SYSTEM estimator using the robust one-step method (Blundell and Bond, 1998; Arellano and Bond, 1998). Sargan is a Sargan Test of over-identifying restrictions. M_2 is a test of second-order serial correlation in the first-differenced residuals. Asymptotic robust standard errors reported in parentheses. Instruments as stated.

Table 3: Inventory investment

Δh_{it}	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Δh_{it-1}	-0.092 (0.012)	-0.097 (0.012)	-0.092 (0.012)	-0.095 (0.011)	-0.091 (0.011)	-0.093 (0.011)	-0.094 (0.010)
Δy_{it}	0.453 (0.094)	0.479 (0.083)	0.404 (0.086)	0.431 (0.078)	0.386 (0.079)	0.398 (0.073)	0.417 (0.074)
Δy_{it-1}	0.052 (0.017)	0.048 (0.017)	0.046 (0.017)	0.045 (0.017)	0.045 (0.017)	0.045 (0.017)	0.045 (0.017)
$(h-y)_{it-1}$	-0.074 (0.011)	-0.071 (0.011)	-0.069 (0.010)	-0.068 (0.010)	-0.068 (0.010)	-0.067 (0.010)	-0.068 (0.010)
br_{it-1}		-0.047 (0.017)		-0.021 (0.020)		-0.021 (0.019)	
CF/K_{it-1}			0.120 (0.030)	0.108 (0.034)	0.123 (0.030)	0.108 (0.034)	0.103 (0.034)
$(B-m)/K_{it-1}$					0.003 (0.019)	-0.005 (0.018)	
$(brX(B-m)/K^{high})_{it-1}$							-0.043 (0.021)
$(brX(B-m)/K^{low})_{it-1}$							-0.003 (0.022)
year effects	yes	yes	yes	yes	yes	yes	yes
M_2	0.404	0.393	0.398	0.380	0.402	0.385	0.388
Instruments	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1	t-2...t-4, Δt-1
Sargan	0.002	0.000	0.000	0.000	0.001	0.000	0.001
companies	4,919	4,919	4,919	4,919	4,919	4,919	4,919
observations	30,199	30,199	30,199	30,199	30,199	30,199	30,199

Notes: see Table 2.

Table 4: Employment

	Total employment				Permanent employment		Temporary employment	
n_{it-1}	0.962 (0.015)	0.968 (0.015)	0.891 (0.016)	0.970 (0.015)	0.868 (0.024)	0.864 (0.024)	0.818 (0.013)	0.820 (0.013)
n_{it-2}	-0.056 (0.012)	-0.055 (0.011)	-0.061 (0.011)	-0.058 (0.012)	0.010 (0.018)	0.010 (0.018)	0.008 (0.012)	0.007 (0.012)
k_{it}	0.061 (0.005)	0.055 (0.004)	0.030 (0.005)	0.054 (0.005)	0.065 (0.006)	0.069 (0.006)	0.111 (0.014)	0.113 (0.015)
Δw_{it}	-0.635 (0.051)	-0.601 (0.049)	-0.600 (0.044)	-0.602 (0.050)	-0.253 (0.069)	-0.264 (0.075)	-1.173 (0.192)	-1.329 (0.206)
w_{it-1}	-0.133 (0.020)	-0.112 (0.019)	-0.147 (0.020)	-0.106 (0.020)	-0.069 (0.029)	-0.082 (0.029)	-0.269 (0.084)	-0.345 (0.089)
br_{it-1}	-0.069 (0.006)	-0.047 (0.007)	-0.023 (0.007)		-0.031 (0.009)	-0.047 (0.008)	-0.068 (0.037)	-0.111 (0.034)
CF/K_{it-1}		0.074 (0.013)	0.050 (0.012)	0.109 (0.012)	0.055 (0.016)		0.150 (0.054)	
$(B-m)/K_{it-1}$				0.007 (0.007)				
y_{it}			0.119 (0.009)					
year effects	yes	yes	yes	yes	yes	yes	yes	yes
M_2	0.680	0.762	0.138	0.773	0.371	0.358	0.589	0.591
Instruments	t-2..t-4, Δt-1	t-2..t-4, Δt-1	t-2..t-4, Δt-1	t-2..t-4, Δt-1	t-2..t-4, Δt-1	t-2..t-4, Δt-1	t-2..t-4, Δt-1	t-2..t-4, Δt-1
Sargan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
companies	4,919	4,919	4,919	4,919	4,919	4,919	4,919	4,919
observations	30,199	30,199	30,199	30,199	30,199	30,199	30,199	30,199

Notes: see Table 2.

Table 5: The propensity to omit a dividend

	coeff (s.e.)	marginal effect	coeff. (s.e)	marginal effect	coeff. (s.e.)	marginal effect
CF/K_{it-1}	-0.679 (0.090)	-0.130	-0.731 (0.090)	-0.140	-0.735 (0.089)	-0.141
I/K_{it-1}	0.054 (0.028)	0.010	0.080 (0.027)	0.015	0.074 (0.027)	0.014
$(B-m)/K_{it-1}$	0.328 (0.046)	0.063				
br_{it-1}	2.354 (0.068)	0.451	2.493 (0.066)	0.476		
$(brX(B-m)/K^{high})_{it-1}$					2.617 (0.069)	0.500
$(brX(B-m)/K^{low})_{it-1}$					2.137 (0.084)	0.409
y_{it-1}	-0.341 (0.016)	-0.065	-0.333 (0.016)	-0.064	-0.335 (0.016)	-0.064
year effects	yes		yes		yes	
log-likelihood	-13,959.528		-13,985.783		-13,964.35	
ρ	0.689 (0.007)		0.690 (0.007)		0.689 (0.007)	
companies	4,919		4,919		4,919	
observations	35,118		35,118		35,118	

Notes: The table reports maximum likelihood estimates for random effects probit models of the propensity to omit a dividend. ρ indicates the proportion of the total variance accounted for by the panel component.

The marginal effects of a unit change on the probability of observing y_{it}=1 are evaluated at the means of the data and are calculated as $\frac{d[prob(y=1|x)]}{dx_k} = \phi\left(\overline{x}\beta\sqrt{1-\rho}\right)\left(\sqrt{1-\rho}\beta_k\right)$where $\phi(\cdot)$ is the standard normal density function, $\overline{x}$ is the vector of mean characteristics, β the vector of coefficient estimates with β_k the coefficient estimate on regressor x_k (see Arulampalam (1999)).

A 1 unit change in a financial ratio represents 100 percentage points.

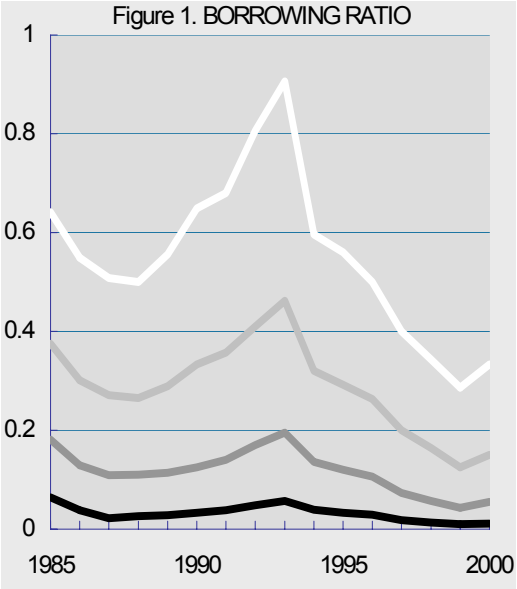


Figure 1. BORROWING RATIO
1
0.8
0.6
0.4
0.2
0
1985
1990
1995
2000

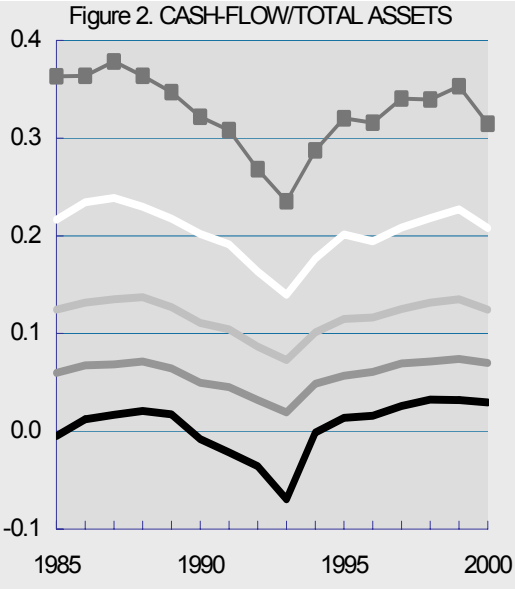


Figure 2. CASH-FLOW/TOTAL ASSETS
0.4
0.3
0.2
0.1
0.0
-0.1
1985
1990
1995
2000

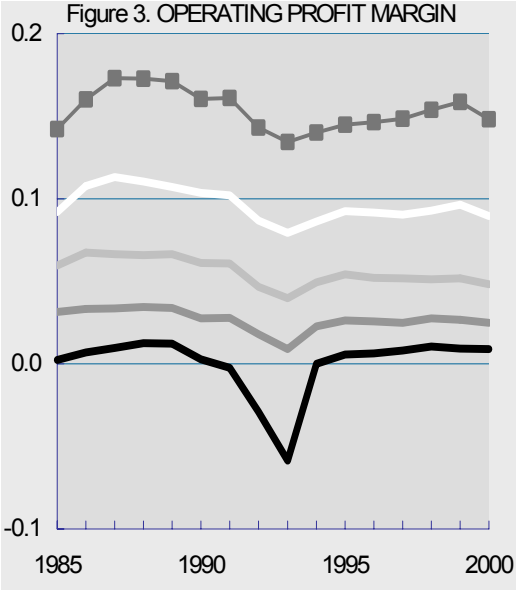


Figure 3. OPERATING PROFIT MARGIN
0.2
0.1
0.0
-0.1
1985
1990
1995
2000

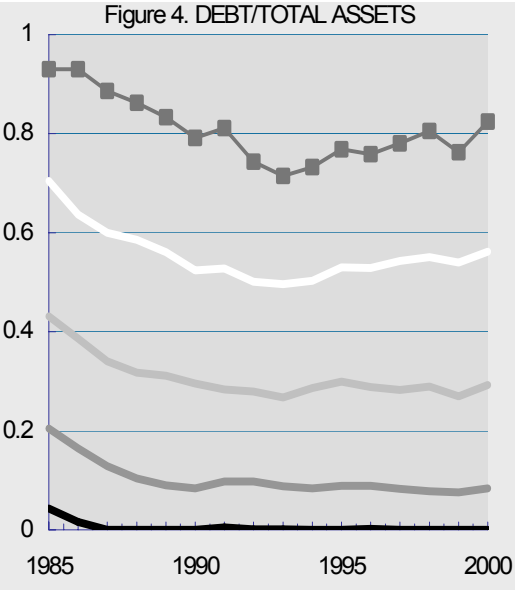
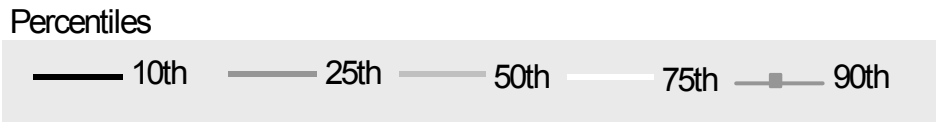


Figure 4. DEBT/TOTAL ASSETS
1
0.8
0.6
0.4
0.2
0
1985
1990
1995
2000


Percentiles
10th
25th
50th
75th
90th

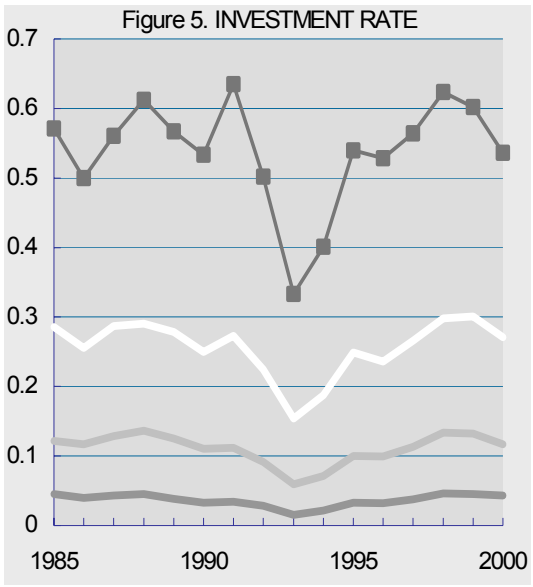


Figure 5. INVESTMENT RATE
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1985
1990
1995
2000

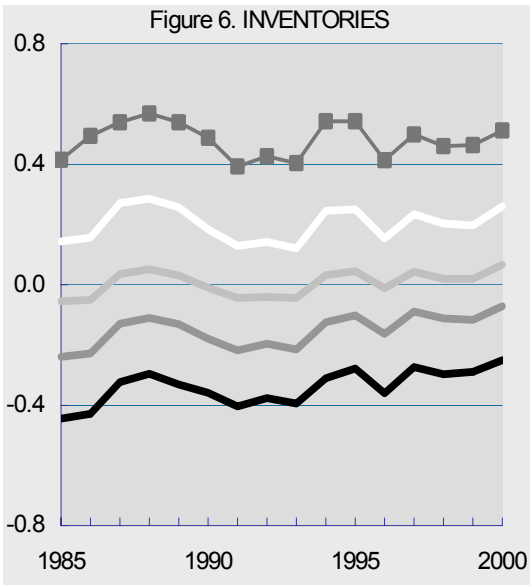


Figure 6. INVENTORIES
0.8
0.4
0.0
-0.4
-0.8
1985
1990
1995
2000

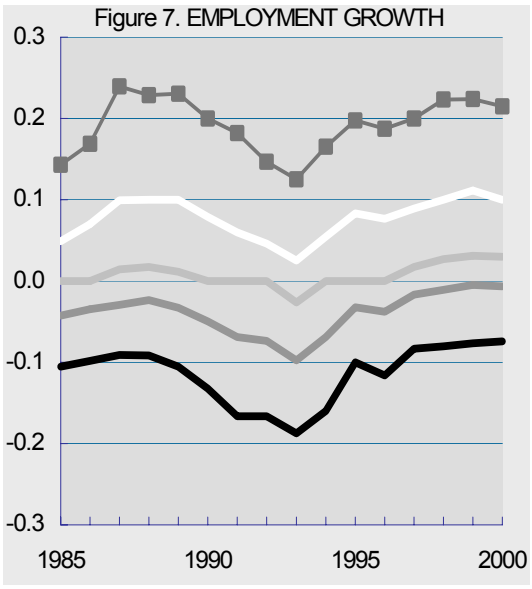


Figure 7. EMPLOYMENT GROWTH
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
1985
1990
1995
2000

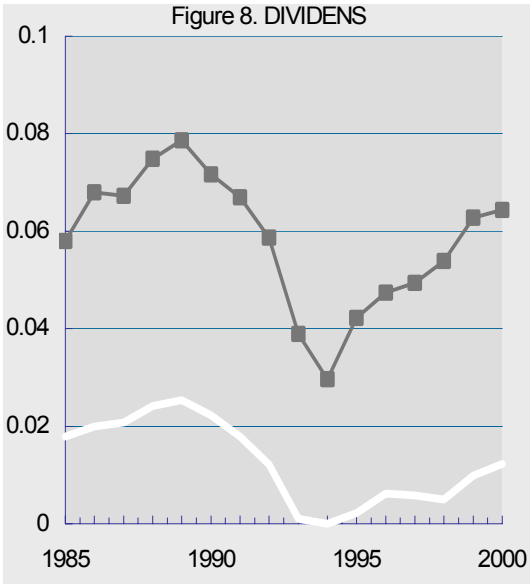


Figure 8. DIVIDENS
0.1
0.08
0.06
0.04
0.02
0
1985
1990
1995
2000

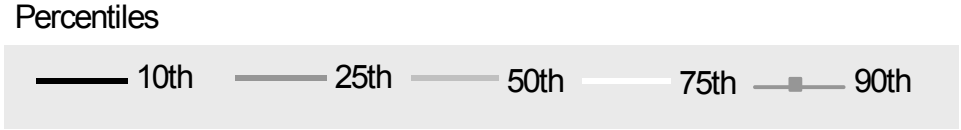
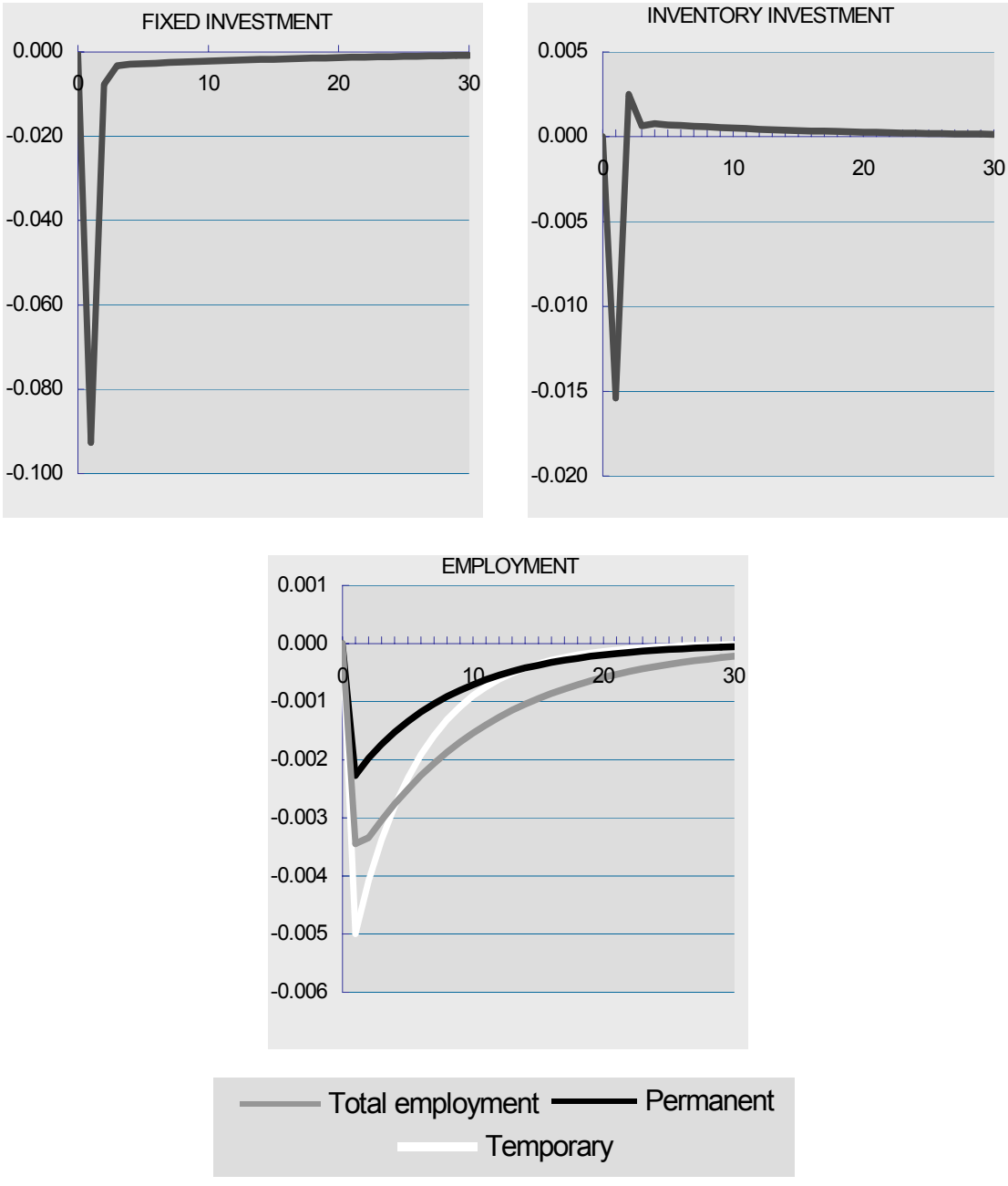

Percentiles
10th
25th
50th
75th
90th

Figure 9: Firm responses to a transitory increase in financial pressure (1)



(1) Effects of an increase in the borrowing ratio equivalent to an increase in nominal interest rate from 5 to 6 percent.

Data Appendix

Details of the dataset for Spanish companies can be found in Banco de España (2000).

Table A.1 tabulates the number of time-series observations per company.

Table A.1: Panel structure

No. of records	4	5	6	7	8	9	10
Companies	899	758	617	437	359	282	224
No. of records	11	12	13	14	15	16	Total
Companies	227	223	217	210	150	316	4,919

Borrowing ratio (br)
Interest payments divided by gross cash flow (ie. before interest and taxes). Where companies have a negative value for the denominator their borrowing ratio is set equal to 1.

Net Debt ($(B-m)/K$)
Total outstanding debt less cash and equivalent divided by total assets, K (see below).

Cash flow (CF)
Post-tax profit plus depreciation of fixed assets.

Capital stock (K_f)
Fixed assets at replacement cost (calculated by the Balance Sheet Office (CBA) of the Bank of Spain).

Total assets (K)
This is given by the sum of fixed assets at replacement cost K_f and working capital less provisions.

Employment (N)
Total number of employees. The data also distinguish between the number of permanent and temporary employees.

Average company wage (W)
Total employee remuneration divided by number of employees.

Dividend
Ordinary dividend paid.

Investment (I)
Purchase of new fixed assets.

Inventories (H)
Total inventories deflated by the GDP deflator.

Liquidity (m)
Cash plus equivalent assets.

Real Sales (Y)
Total company sales, deflated by the GDP deflator.

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