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NOTE DI LAVORO

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The effect of debt overhang on the investment decisions of Italian and Spanish firms

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Abstract

We show how debt overhang affects corporate investment in Italy and Spain. For both countries we define three main indicators of debt overhang - one for the long term (leverage ratio), and two for the short term (debt to EBITDA ratio and interest burden to EBITDA ratio) - and observe their behaviour during the Great Recession. In both countries, there is an ongoing corporate deleveraging process, and particularly in Spain where investment recovery is more relevant. Using firm-level data to estimate a dynamic model of investment we find that an increase in indebtedness does not necessarily affect investment negatively, rather its effects are slightly positive, while an increase in the indicators for short term indebtedness drives investment downwards. These results are similar for both Italy and Spain. However, we find differences between the two countries when we split the sample into high-leveraged and low-leveraged companies. In Italy the positive effect of leverage on investment is significantly smaller for high-leveraged firms. Moreover, the deterioration in the short term indebtedness indicators in the case of highly-leveraged firms has a stronger negative effect on investment compared to its effect on low-leveraged firms. Conversely, in the case of Spain the results for high and low-leveraged companies are not significantly different.

JEL classification: E22; G32; L60

Keywords: corporate debt, investment, leverage, error correction model, Great Recession

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1 Introduction and related literature

In the period before the financial crisis, as a result of low interest rates and abundant liquidity, Italian and Spanish non-financial corporations increased their financial debt considerably, and particularly their debt levels with banks. This investment financing has positively influenced GDP growth and potential output. At the onset of the financial crisis, investment demand collapsed as a consequence of a dramatic drop in sales, higher interest rates, greater credit constraints and higher levels of uncertainty.

Italian and Spanish non-financial corporations represent an interesting case study for two reasons: (i) during the crisis their investment suffered much more than that of the other main EMU countries, (ii) despite a very recent deleveraging process, both economies are characterized by high leverage ratios, with the highest firm leverage in the main countries, being observed in Italy. The deterioration of corporate financial conditions has perhaps contributed to the reduction in investment through demand and supply effects. In the first case, firms decided to reduce investment spending because the debt and interest burdens were compromising business activity and the possibility to request new loans; in the second case, the banks influenced the firms' decisions because the banks themselves were being forced to improve their financial conditions and achieve stricter capital ratios.

The aim of this paper is to evaluate whether firms' financial conditions influenced their investment demand. The empirical literature shows that the accelerator effect (i.e. firm sales perspectives) generally is the principal driver of investment demand although the role of the user cost of capital is not negligible (Chirinko, 1993). The latter is one of the channels through which monetary and fiscal policy acts on both investment demand and economic growth. According to Modigliani and Miller (1958), in a perfect capital market, the firm's capital structure does not affect investment demand. However, New-Keynesian theory holds that the financial constraints related to financial market imperfections can give rise to an external financing premium, suggesting the need to consider other indicators such as internal liquidity (pre-tax profits). Hence, debt overhang, which increases corporate vulnerabilities, could affect negatively investment decisions and delay business cycle improvement (Bernanke and Gertler, 1989).

Recent empirical work based on firm-level data analyzes the effects of debt overhang on investment decisions with mixed results. Kalemli-Özcan et al. (2015) find that debt overhang for European firms, measured as total debt over firm earnings, contributed to almost half of the decline in investment-to-capital ratio during the financial crisis, with this effect becoming more relevant after the sovereign debt crisis. Goretti and Souto (2013) employ industry-level data for selected euro area countries over the period 2000-2011 and show that balance sheet positions influenced investment demand asymmetrically. In particular, they find a negative effect of debt to equity, and a negative effect of the interest payments. However, with a low debt-to-equity ratio, the effect of borrowing on investment demand becomes positive. The estimates conducted by Lawless et al. (2014) on Irish firm data reveal that debt positively affects investment while the debt to turnover ratio has a negative effect.

In our analysis we use different indicators of indebtedness in order to take account of the level of debt, and the ability of firms to generate cash flows to repay it. When the economy is growing and/or expectations are favourable high levels of debt can be considered sustainable for both corporations and banks. We measure debt overhang using three indicators: leverage ratio (calculated as financial debt over the sum of financial debt and equity), the financial debt to EBITDA ratio, and the interest burden to EBITDA ratio, where EBITDA stands for earnings before interest, taxes, depreciation and amortization. Each of these indicators provides different information regarding debt sustainability. Leverage ratio generally identifies debt sustainability in the long term, while the other two indicators measure sustainability in the short-medium term. The higher the financial debt to EBITDA, the harder it is for the firm to repay debt, while interest rate burden to EBITDA measures the firm's vulnerability in its current activity (De Socio and Michelangeli, 2015).

Our analysis is in two steps. First, we observe aggregate data on investment and indebtedness indicators in Italian and Spanish non-financial corporations. Second, we focus on the determinants of firm-level investment decisions, and use balance sheet data (ORBIS, by Bureau Van Dijk) to estimate the effects of debt overhang. More specifically, we include indebtedness indicators in a standard dynamic equation - error correction model - of firm-level investment, where the optimal value of capital depends on output and user cost of capital.

To our knowledge, this is the first study of firm-level investment which combines such a range of indebtedness indicators with a structural equation; previous studies enter indebtedness indicators in static investment equations to measure the effect of debt overhang. It is also the first attempt to provide a country vs. country analysis to evaluate the effects of indebtedness on investment.

Our study shows that the leverage ratio positively influences investment demand from Italian and Spanish firms, while the debt to EBITDA and interest burden to EBITDA have a negative effect. These results seem to confirm that financial debt is the most important source of financing for investment, and indicate that a higher debt does not compromise investment when it is accompanied by an increase in cash flow. We found also that the reaction of investment to a change in the indebtedness indicators depends on the level of leverage ratio: the higher the leverage ratio, the stronger the impact of our indebtedness indicators on investment.

This paper is organized as follows. Section 2 compares Italy, Spain and Germany according to investment trends and indebtedness indicators. We use Germany as our benchmark in order to highlight the particularity of Italy and Spain. Section 3 presents the firm-level analysis, and describes the dataset, the model and the estimators used. Section 4 comments on the main findings from the econometric analysis and section 5 concludes. All the data sources employed and how the variables of interest were constructed are provided in the Appendix.

2 Investment and corporate debt during the crisis

2.1 Investment in Italy, Spain and Germany

The financial crisis hit real gross fixed investment in all the industrialized countries to some degree. Among the main Euro area countries, Italy and Spain experienced the most severe slumps. In Italy non-financial corporation investment collapsed by 19%[1] between 2007 and 2009 (Figure 1), followed by a slight increase over the following two years. However, the sovereign debt crisis at the end of 2011 triggered further falls in the following few years, and in 2014 the pre-crisis peak was still around 28% below that level. Spain was even more badly affected during the financial crisis. As opposite to Italy, after the sovereign debt crisis investment jumped. Although the gap between the pre-crisis and the latest available value has narrowed, it is still at around 20%. In contrast, in Germany the reduction in investment during the financial crisis was much lower, and the gap with the 2007 level had been closed.

In Italy the deterioration in investment had a negative effect on potential output of the non-financial sector because the amount of investment was not sufficient to replace the capital depreciation. In Spain, the effect on potential output was different because net investment always remained positive, although progressively lower since 2007.

To assess the extent to which this investment dynamic might be dependent on the construction cycle, which presents very different features compared with the other tangible investment, we analyse national accounts data since an asset-type breakdown of institutional sector data is not available. Although these data are not completely comparable with institutional sector data since they account for the entire economy (including households, government and financial services), if we focus on total investment excluding non-residential constructions, its trend is very close to that of non-financial corporations taken from institutional sector data.

In the case of Italy, investment in machinery, transport and non-residential constructions in 2014 was 31% lower then the pre-crisis level, with construction providing a negative contribution of 16 percentage points (pp) (Figure 2). Also machinery and transport contributed negatively 14.6 pp, while intangible investment contributed positively 0.5 pp. In Spain, construction was the principal driver of the decline in investment (-19 pp), and there was a negative contribution of 6.6 pp from other tangible investment (Figure 3). As in Italy, the intangible investment profile was counter-cyclical, providing a positive contribution of 2 pp. The recovery of investment started in 2013 but did not immediately include construction, whose negative trend reversed only in 2015. While machinery-equipment and transport investment has almost reached its pre-crisis level, investment in construction is still far from that (extremely high) level. In Germany, the construction dynamics have been very different; the high increase after the reunification was followed by a long period of contraction, and when the global crisis hit the construction cycle was only just normalizing (Figure 4). Thus, investment in business construction contributed positively to investment growth in 2007-2014. Also the contribution of intangible invest-

[1]Since annual accounts of non-financial corporations are expressed at current prices, we deflated them using national account deflator of total investment (excluding residential constructions).

ment was positive, with only investment in machinery and transport responsible for a negative contribution, although small.

2.2 Indebtedness indicators in Italy, Spain and Germany

If we consider indebtedness indicators, the firms in these three countries show large differences, and despite some worsening at the beginning of the crisis, Germany is better positioned.

On the eve of the crisis, Spain had the highest leverage values (Figure 5) followed by Germany and Italy. However, intensive borrowing by Italian non-financial corporations on the one hand, and debt reduction among German corporations on the other, reversed the ranking, with Italy overtaking Germany to take second place. Italy's leverage ratio reached a peak in 2012, approaching the level in Spain. The sovereign debt crisis represented the starting point of the deleveraging process for Italian and Spanish firms but was faster in Spain, whose leverage ratio in 2014 was back to the level observed in 2007, while in Italy it was some 5 pp higher.

It is useful to analyse the evolution of the leverage ratio in terms of the contribution of each component: financial debts and equity (valued at market prices). Figure 6 shows that in Italy borrowing increased over time, reaching a maximum on the eve of the global crisis and slackening from 2009 to 2012. Since then bank loans have started to decline, driving financial debt down. Also in Spain (Figure 7) the contribution of financial debt to leverage ratio profiles was positive and more relevant than in Italy up to the sovereign debt crisis. Subsequently, bank loans fell, steering the deleveraging process. In Germany (Figure 8) the leverage dynamic was very different, with financial debt providing a negligible contribution to it: the highest values in 2002 and 2008 were determined not by an increase in debt but by a decrease in equity.

Figure 9 shows the EBITDA to financial debt ratio which is used to evaluate debt sustainability in the short run. In Italy it suffered a slight deterioration in the period 2007-2014 (from 29.5% to 24.1%) mainly due to the contraction of EBITDA. In the same period, in Spain the EBITDA to financial debt ratio increased from 15.3% to 20.5%, led by the reduction in bank loans occurred from 2011. In Germany the level of this indicator was higher (almost double) and its dynamic was characterized by more variability with two reductions in 2009 and in 2013. Despite the recovery, however, in 2014 the ratio was around 2 pp lower than the value in 2007.

The interest burden to EBITDA ratio (Figure 10) confirms the high level of indebtedness of Spanish corporations and the low level of German ones. Italy was in a mid-position up to 2013 after which time it became the country with the highest level of interest burden to EBITDA.

3 Data and methodology

3.1 Firm-level data

The firm-level data are extracted from Orbis (Bureau Van Dijk). It provides balance sheet and income statement data for both financial and non-financial firms for around 100 countries. We are interested in accounting data of Italian and Spanish non-financial firms, excluding real estate and agricultural ones, from 2006 to 2014. To avoid problems of data reliability we retain only firms with an annual turnover of at least 2 million euros.

To compare the dynamics of fixed investment in Spain and Italy we define investment rate as the ratio of current real investment to lagged stock of real capital.[2] Figures 11 and 12 show the evolution of the investment rate by industries (manufacturing, constructions and services) in Italy and Spain for the period 2007 to 2014. During that period Italian firms had a higher average investment rate than Spanish firms. Among the three main one-digit industries, in both countries manufacturing firms show the highest investment rate. Although the dynamics look similar for all three industries it is evident that the investment rate gap between manufacturing and construction increased over the period. In both countries, the investment rate shows a double dip in the financial and the sovereign debt crises, however, as confirmed by aggregate data, firm-level data suggest that investment recovery is stronger in Spain than in Italy.

Firm size seems to be relevant to the investment dynamics during the recession (Figures 13 and 14). In both countries, the investment rate among small firms was in line with that of the medium and large firms up to 2009, after which it changed and in 2014 was clearly lower than the investment rates in medium and large firms.

To investigate the effect of the indebtedness indicators on investment decisions more deeply, we focus on manufacturing, the industry with the highest investment rates, and observe the distribution of firms by leverage ratio (Figures 15 and 16). In both Italy and Spain the share of manufacturing firms with no financial debt increased between 2007 and 2014. On the other side, the share of firms with high leverage decreased, showing that the deleveraging process which occurred during the recession was well distributed.

Figures 17 and 18 show the link between leverage and the investment rate. In both Italy and Spain higher leverage was accompanied by a lower investment rate. However it is interesting that, with the exception of Italy in 2007, firms with no financial debt show a lower average investment rate than firms with contained leverage.[3]

To estimate the effects of the different degrees of financial stability on firm-level investment we select a sample of manufacturing firms. After treatment for missing values and outliers (see Appendix for sample selection), we obtain two unbalanced panels of 9 years for each country where every firm is observed for at least 6 consecutive years.[4] The

[2] More details on the construction of our variables are provided in the Appendix.

[3] The exception of Italy in 2007 was perhaps due to sufficient internal funds to finance investment; however, this availability diminished as the recession progressed.

[4] For this reason the firms which ceased activity within the estimation period may be underrepresented.

Italian panel contains 13,550 firms (78,709 observations over 9 years), and the Spanish panel 3,732 firms (19,338 observation over 9 years). Table 1 reports summary statistics of the variables for the two samples. In relation to the leverage ratio[5] between 2007 and 2014, firm-level data show reductions for both Italy and Spain.[6] The debt to EBITDA ratio follows the same dynamic in both countries increasing by around 3-4 pp between 2007 to 2014. For Spanish firms the interest burden to EBITDA ratio in 2014 is similar to the value before the financial crisis while for Italian firms its value is lower than in 2007.

3.2 Empirical model

According to neoclassical investment theory, the optimal capital stock depends positively on the level of output, and negatively on the user cost of capital. To evaluate the adjustment process to the optimal value of capital we use an error correction model (ECM) (Bond and Van Reenen, 2007; Antonietti et al., 2015). Starting from this structure we include the three indebtedness indicators described above. The estimation equation is as follows:

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_1 \Delta y_{i,t} + \beta_2 \Delta y_{i,t-1} + \gamma_1 (k-y)_{i,t-2} + \gamma_2 uck_{t-1} + \\ + \delta_1 \frac{D_{i,t-1}}{A_{i,t-1}} + \delta_2 \frac{D_{i,t-1}}{EB_{i,t-1}} + \delta_3 \frac{IB_{i,t-1}}{EB_{i,t-1}} + \mu_i + \theta_t + \epsilon_{i,t} \quad (1)$$

where, for each firm i and each year t, I is real gross fixed investment, K is real capital stock, y is the log of real sales, k is the log of real capital stock, uck is the 2-digit industry-specific log of the user cost of capital, D is the stock of financial debt, A is the sum of financial debt and equity, EB is EBITDA, IB is interest burden, μ_i is the firm-specific fixed effect, θ_i is the year fixed effect, and $\epsilon_{i,t}$ is the idiosyncratic error component. The log of capital to sales ratio $(k-y)$ is the error correction term and γ_1 (whose sign is expected negative) indicates the speed of adjustment to the optimal level of capital. In Appendices A.4 and A.5 we describe the methodology adopted to construct the capital stock at the firm-level and the user cost of capital at the sectoral-level.

Since the lagged dependent variable is correlated with the firm-specific fixed effects, ordinary least square (OLS) estimations are expected to be upward biased. Using a fixed effects (FE) estimation could solve the problem but the within-transformation of the lagged dependent variable then would be correlated with the within transformation of the error idiosyncratic component, biasing the estimates downward (Judson-Owen, 1999). First differencing the equation is an alternative technique to elide firm-specific fixed effects, however, the explanatory variables become endogenous. To obtain consistent estimates of the first-differenced ECM it is necessary to instrument the endogenous variables as suggested by Arellano and Bond (1991). Their method, which they

[5] The difference in the value of equity between balance sheet data and aggregate data could be due to the fact that the former is evaluated at the book value and the latter at the market value.

[6] Note that our sample does not include the construction sector which is characterized by high financial indebtedness.

call "difference-GMM", finds suitable instruments for the endogenous first-differenced explanatory variables among the lagged levels of the same endogenous variables.[7] Blundell and Bond (1998) developed this technique further and proposed the so-called "system-GMM" which also uses lags of first differences of the endogenous variables to instrument them in levels.[8]

4 Empirical results

The results of the baseline equation using the estimation techniques described above, are presented in Table 2 for Italian corporations and Table 3 for Spanish corporations. All specifications include year and size dummies. As expected, the GMM coefficients (columns 3-4 in both tables) are between the OLS (columns 1) and the fixed effects (columns 2) estimates. The results obtained from the one-step difference-GMM (columns 3) technique are in line with those obtained using the one-step system-GMM estimator (columns 4). The p-values reported in the last three rows of both tables indicate that the instruments are valid.[9] Since the system-GMM estimator is expected to improve efficiency of the estimation (Arellano and Bover, 1995), we show and comment only on the system-GMM estimates of equation (1).

The results of the baseline estimates (columns 4) show that (with the exception of the current turnover growth rate) all the coefficients are statistically significant, and as expected, investment reacts positively to the lagged growth rate in sales, and negatively to the lagged user cost of capital. The significance of the latter suggests that the economic policy influenced the investment demand through interest rates and taxation. The coefficient of the error correction term is negative, and in the case of Italy its value implies that it takes around eight years for capital stock to adjust completely to the target level. In the case of Spain, capital stock equilibrium takes more time (around 14 years).[10]

Tables 4 and 5 extend our basic model to include the indebtedness indicators. To reduce the risk of simultaneity bias, these variables enter the estimation equation in lags. Difference-in-Hansen test confirms they are exogenous.[11] The estimates show that deterioration of the indebtedness variables does not always lead to reduced investment; it depends on the variables used to evaluate the debt overhang. The lag of leverage ratio

[7] In our difference-GMM estimation all the available lags (from the 2nd onwards) of investment rate, turnover growth and the error correction term are used as instruments for the first-differenced ECM equation.

[8] In our system-GMM estimation all the available lags of the first-differenced investment rate, turnover growth and error correction term are used as instruments for the ECM equation in levels.

[9] Consistent with the assumptions, the Arellano-Bond AR(1) test indicates a significant 1st order serial correlation and the AR(2) test detects no 2nd order serial correlation. The Hansen J statistic tests the validity of the so-called "overidentifying restrictions": under the null, the instruments chosen as a group are exogenous, as required to obtain unbiased estimates.

[10] Bond et al. (2015) found more than 10 years for manufacturing firms in Italy in the period 1993-2013.

[11] The difference-in-Hansen test, also known as "C test", is used to evaluate the exogeneity of a subset of instruments: under the null the specified variables are proper instruments (Hayashi, 2000). We performed this test for the subset of all lagged indebtedness indicators included in each specification (find p-values in the last row of the tables). We also estimated equation (1) using double-lagged values of indebtedness indicators, and obtained similar results (we do not show them here).

has a positive effect on investment demand and is robust to the inclusion of either debt to EBITDA (columns 2), or interest payments to EBITDA (columns 3), or both (columns 4). However, if debt to EBITDA and interest burden to EBITDA are entered separately the effects are negative and significant (columns 2 and 3). When both short term indebtedness indicators are included (columns 4) debt to EBITDA loses its significance. In light of these results we can say that leverage in the period considered represented an opportunity for firms to invest, confirming the importance of this source of investment financing for Italian and Spanish companies. Nevertheless, debt overhang had a negative effect on investment when we consider the variables measuring the ability to repay it in the short run.

We also estimate the reaction of investment to the indebtedness indicators, classifying firms on the basis of leverage ratio using the median as the threshold.[12] In the case of Italy (Table 6), the sign of the coefficients of leverage ratio for both groups of firms is still positive but is significantly higher for corporations with lower leverage ratios (column 1). If we distinguish between the effects of each financial indicator interacting with the dummies for high-leveraged and low-leveraged firms, we observe that debt to EBITDA is negative and significant only for firms with high leverage (column 2). The same occurs when splitting interest burden to EBITDA (column 3). When we include all indebtedness indicators in interaction with high/low-leverage dummies (column 4), the difference between the two groups is statistically significant only for leverage and debt to EBITDA ratio. In the case of Spain (Table 7) we find no statistically significant difference between firms with leverage ratios above and below the threshold.

5 Conclusions

Before the financial crisis, Italian and Spanish non-financial corporate debt increased considerably, providing a source for business activity and investment. The crisis deteriorated firm's growth perspectives and, as a consequence, their investment activity. At the same time, the banks limited access to credit exacerbating the lack of liquidity for firms. The high dependence on bank loans and the collapse in demand produced problems of excessive indebtedness. Debt overhang can be measured using indebtedness indicators, such as leverage (which proxies for long run solvency) or indicators that measure short run firm solvency (debt to EBITDA or interest burden to EBITDA ratios).

We performed a two-step analysis using these indicators to estimate the effect of debt overhang on investment for the cases of Italy and Spain. In the first step, we observed aggregate data on investment and indebtedness indicators for Italian and Spanish non-financial corporations. In the second step, we estimated an ECM to evaluate the effect of debt overhang on investment using balance sheet data of manufacturing firms.

Both Italy and Spain suffered an investment slump during the financial crisis; however, after the sovereign debt crisis the investment trends in these countries have diverged, showing a decline in Italy, and a recovery in Spain. The upturn in investment in Spain was based on machinery-equipment and transport. In Italy, it was not until 2015 that

[12]Median values of the leverage distribution (only firms reporting financial debt in their balance sheets are considered in the distribution) is 0.4 for Italy and 0.3 for Spain.

non-construction investment began to show slight signs of recovery. In terms of indebtedness, both Italy and Spain have been involved in a process of deleveraging since the onset of the sovereign debt crisis. However, their leverage ratio in 2014 was still higher in comparison with the most important EMU countries.

Our estimates show that in the period 2007-2014 real sales and the user cost of capital were not the only determinants of the investment decisions made by Italian and Spanish manufacturing firms. In both countries, financial conditions mattered. According to our empirical results, investment reacts positively to an increase in the (lagged) leverage ratio and negatively to an increase in shorter term debt overhang indicators. Our analysis suggests that an increase in the leverage ratio is a stimulus to investment, especially if the increased debt does not compromise short term solvency.

We found evidence also that in Italy the effects of debt overhang indicators on investment vary according to the level of indebtedness: an increase in leverage for high-leveraged firms drives investment less than an increase in leverage for low-leveraged firms. Similarly, a deterioration in the short term indebtedness indicators for high-leveraged firms has a stronger negative effect on investment than a similar deterioration for low-leveraged firms.

The deleveraging process which occurred following the sovereign debt crisis is likely to influence investment demand negatively in the long run, particularly in the case of Italian firms. In fact, the high share of non-performing loans (NPL) in total loans is likely to influence the credit supply conditions for years to come. However, the measures implemented in the last few months are expected to mitigate the effects of the deleveraging process. Indeed, the recent expansionary monetary policies combined with the activity of "Atlante", a private fund which is helping reduce the burden of NPLs on Italian banks' balances, are expected to ease firms' access to credit and spur investment recovery.[13]

A Data appendix

A.1 Data sources

Annual accounts of non-financial corporations from Eurostat
National accounts from Eurostat
Firm-level data from Orbis, Bureau Van Dijk Electronic Publishing
Corporate taxation from Istat (Italy) and ZEW (Spain)
Interest rates from ECB

[13]Launched on 11 April 2016, this fund provides resources to help Italian banks manage NPLs. Atlante will invest in two types of asset: (i) shares in banks required by the supervisory authority to increase their capital, and (ii) tranches of bad debt securitizations. Atlante's aim is also to encourage development of the NPL market, which continues to suffer the consequences of Italy's protracted and deep recession.

A.2 Firm-level variables

Investment (I): gross fixed investment at constant prices. Calculated as the difference between current fixed assets and the previous year's fixed assets plus amortization. A 2-digit sector investment deflator was used to chain its value to 2010 prices.

Capital stock (K): net fixed capital stock at constant prices. Calculated using the perpetual inventory method (see below). A 2-digit sector capital stock deflator was used to chain its value to 2010 prices.

Turnover (Y): total sales at constant prices. A 2-digit sector output deflator was used to chain its value to 2010 prices. User cost of capital (UCK): opportunity cost of investment. Calculated using the appropriate formula (see below). 2-digit sector output and investment deflators were used in the formula.

User cost of capital (UCK): opportunity cost of investment. Calculated using the appropriate formula (see below). 2-digit sector output and investment deflators were used in the formula.

Financial debt (D): total financial debt at current prices. Calculated as the sum of loans and debt securities.[14]

Equity (E): equity at current prices.

EBITDA (EB): Earnings before interest, taxes, depreciation and amortization at current prices. Calculated as the difference between total value of production and total production costs (labour costs included).

Interest burden (IB): financial burdens at current prices.

Variables definition

Investment rate: $\frac{I_t}{K_{t-1}}$

Turnover growth: $ln(Y_t) - ln(Y_{t-1}) = y_t - y_{t-1} = \Delta y_t$

Capital to sales ratio: $ln\left(\frac{K_t}{Y_t}\right) = ln(K_t) - ln(Y_t) = k_t - y_t$

User cost of capital: $ln(UCK_t) = uck_t$

Leverage: $\frac{D_t}{D_t+E_t} = \frac{D_t}{A_t}$

Debt to EBITDA ratio: $\frac{D_t}{EB_t}$

Interests to EBITDA ratio: $\frac{IB_t}{EB_t}$

High leverage ($Hlev$): dummy equal to 1 if the leverage ratio is higher than the median and 0 otherwise

Low leverage ($Llev$): dummy equal to 1 if the leverage ratio is lower than the median and 0 otherwise

[14]De Socio and Finaldi Russo (2016) show that in the Orbis dataset the share of firms with no debt may be overrepresented since financial liabilities can be also reported in other entries where their value is not clearly identifiable.

A.3 Sample selection

To obtain the two samples for the estimation we followed the same procedure for both countries. We selected only firms whose ISIC rev.4 classification code was within the span 10-33 (the manufacturing firms). We then dropped all firms with missing value for our variables of interest - except for investment rate and turnover growth in the first year of observation when missing values are inevitable). We also excluded firms in the top annual investment rate decile and those with a negative investment rate. We excluded observations with extreme levels of turnover growth, leverage, debt to EBITDA ratio and interest to EBITDA ratio. We retained only firms observed for 6 consecutive years at least. The final datasets for Italy and Spain are unbalanced panels of, respectively 13,550 firms (78,709 observations) and 3,732 firms (19,338 observations).

A.4 Calculation and revaluation of capital stock revisiting the perpetual inventory approach

Italian and Spanish companies report the stocks of fixed assets in their balance sheets at their book values, i.e. the amount paid to purchase the investment good, without considering any price changes occurred. In order to calculate net real firm capital stock it is necessary to conduct a revaluation of the fixed assets reported. We treated the stock of net capital indicated by the firms using the perpetual inventory method which is a technique commonly employed for this purpose.

1. We individuated the average lifetime of a fixed investment good: average depreciation rate is 6% for both Italy and Spain, thus we assume an average lifetime of a fixed investment good of 16 years.

2. We calculated each firm's residual capital stock lifetime in the first year of observation dividing the stock of fixed assets by the yearly book value amortization. We then subtracted this latter value from the average lifetime calculated in step 1, and obtained an estimate of each firm's capital stock age.

3. Firm's capital stock age calculated in step 2 required correction to allow for the fact that accounting/fiscal depreciation is faster than effective/economic depreciation (Bond et al., 1997). Following Gaiotti and Generale (2001), we halved the value of firm-specific capital's age if it was below or equal to 8, or reduced it by 4 years if it was higher than 8.

4. We deflated the firm's reported net fixed assets in the first year of observation according to its effective-economic age estimated in step 3. We assumed that the firm's gross capital stock was accumulated by equal amounts of investment each year. This implies that older investment goods are amortized for a higher share compared to newer ones, and that firm's net capital stock receives a higher contribution from the investment in the most recent years. Thus, when deflating net fixed assets in the first year of observation we assign progressive weights to the deflators: lower for the earliest years and higher for the most recent years. Following this, we built the revaluated net real capital stock for the first year of observation.

5. Net real capital stock for subsequent years was calculated using the usual formula:

$$K_{i,t} = K_{i,t-1}\left(\frac{p_t^I}{p_{t-1}^I}\right) + I_{i,t} - AM_{i,t} \tag{2}$$

where, for each firm i and each year t, K is net real stock of capital, p^I is investment deflator, I is gross fixed investment at constant prices and AM is amortization.

A.5 Calculation of the user cost of capital

The general formula for the real user cost of capital (UCK), the minimum return that a firm expects from investment, is the following:

$$UCK_t = \frac{p_t^I}{p_t^O}\frac{(r_t - \pi_t + \delta)(1 - \tau_t F_t)}{1 - \tau_t} \tag{3}$$

where τ is the statutory corporate tax rate, p^I and p^O denote, respectively, investment and output prices, π is the inflation rate of producer prices (excluding energy and food), r is the market interest rate, F is the present value of depreciation allowances per unit of investment and δ is the economic depreciation rate. The user cost of capital depends positively on the real interest rate, the relative price of investment to output $\left(\frac{p_t^I}{p_t^O}\right)$ and the economic depreciation rate. It decreases with the present value of the fiscal depreciation allowances.

It should be noted that the effect of corporate taxation on the user cost of capital is ambiguous because capital depreciation and the interest burden are deductible from the tax base. In this simple definition in the extreme case of F equal to 1, taxation is neutral with respect to the user cost of capital.

Following Deveraux and Griffith (1998), the formula was changed to take account of changes to the structure of taxation and temporary fiscal incentives for purchasing investment. The user cost of capital was calculated in two different formulations distinguishing between whether firms were financed by debt or by equity (Bresciani and Giannini, 2003; Bonucchi et al., 2015). The separate measures for the user cost of capital for companies financed by equity and companies financed by debt are aggregated on the basis of a simple average.

The user cost of capital was calculated for both Italy and Spain at the macro level, only output and investment prices were considered at the 2-digit sectorial level. The investment price p^I was measured by the deflator on total investment excluding residential constructions. Incentives are considered only in the definition of the Italian user cost of capital. Temporary incentives were also introduced for Spain but do not apply to whole economy only to particular regions, and it is beyond the scope of this study to focus on geographical aspects. The depreciation rate is considered to be constant over the period of analysis.

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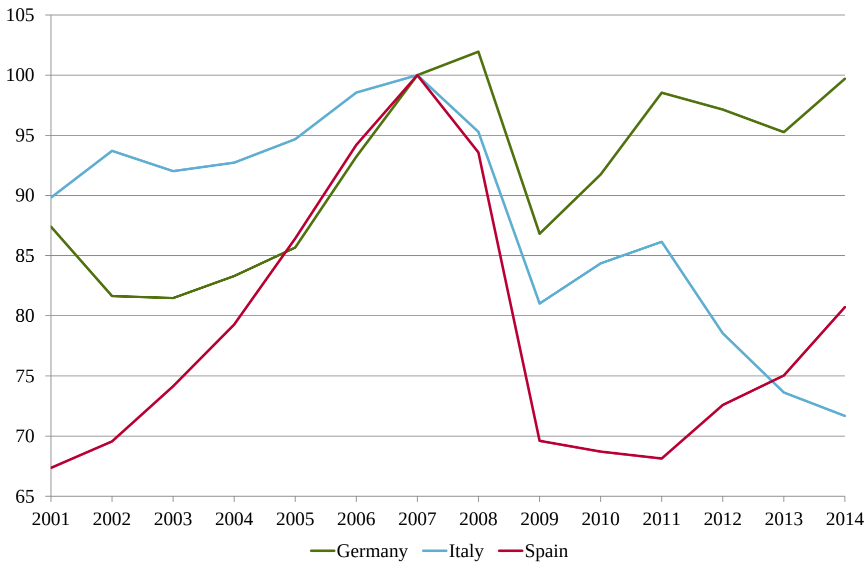
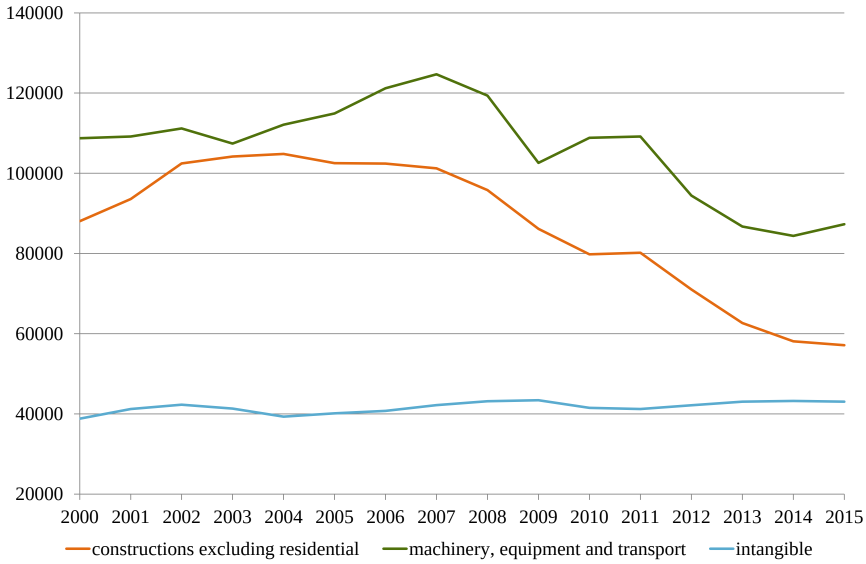
Figures and Tables

Figure 1: Non-financial corporate investment (2005=100, constant prices)



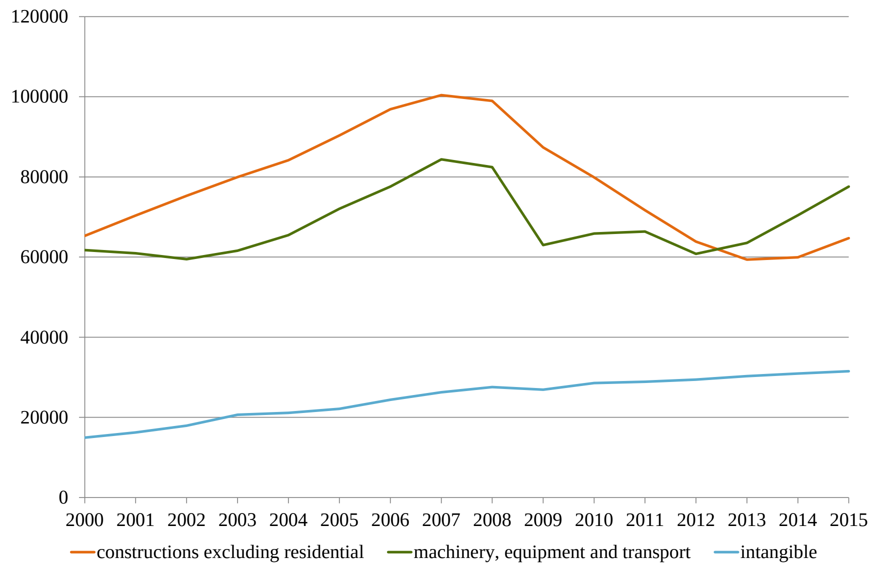
Source: Eurostat, institutional sectors

Figure 2: Italy : investment by asset type (million euros - chained volumes, 2010)



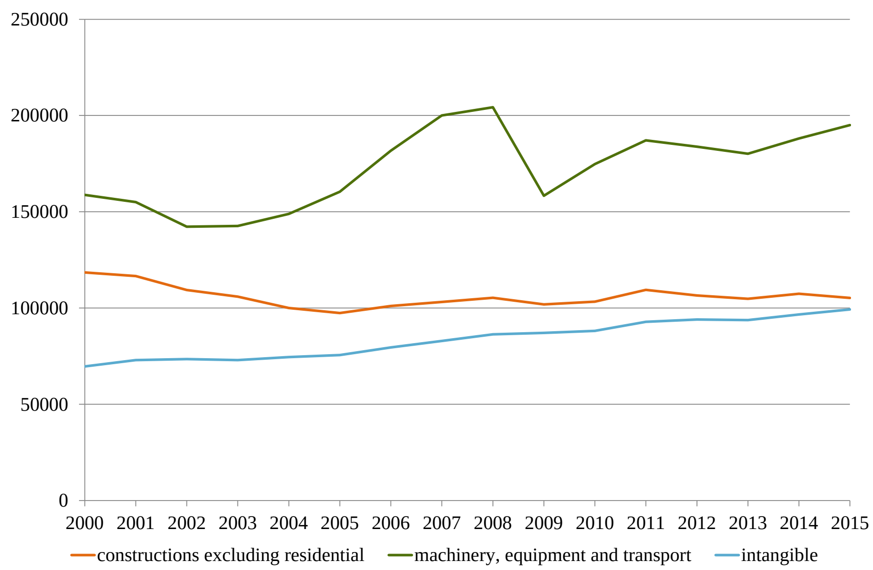
Source: Eurostat, national accounts

Figure 3: Spain: investment by asset type (million euros - chained volumes, 2010)



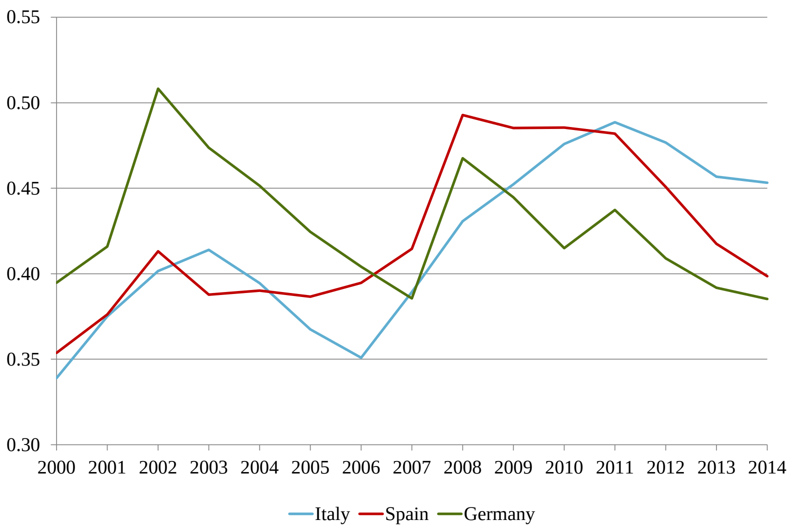
Source: Eurostat, national accounts

Figure 4: Germany: investment by asset type (million euros - chained volumes, 2010)



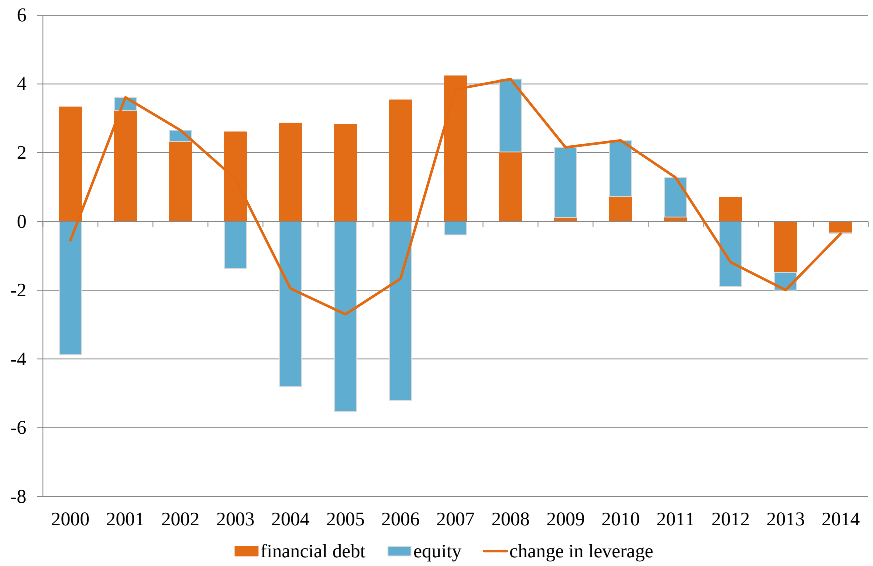
Source: Eurostat, national accounts

Figure 5: Non-financial corporate leverage ratio



Source: Eurostat, institutional sectors

Figure 6: Italy: change in leverage and contributions of debt and net equity (pp)



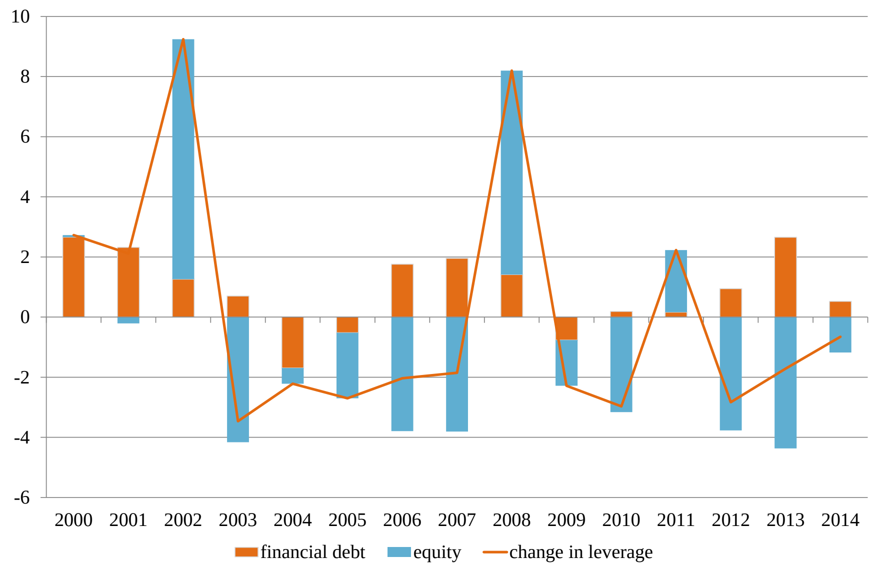
Source: Eurostat, institutional sectors

Note: contributions to leverage growth are positive if financial debt increases or its sum with equity decreases, and vice versa.

Figure 7: Spain: change in leverage and contributions of debt and net equity (pp)

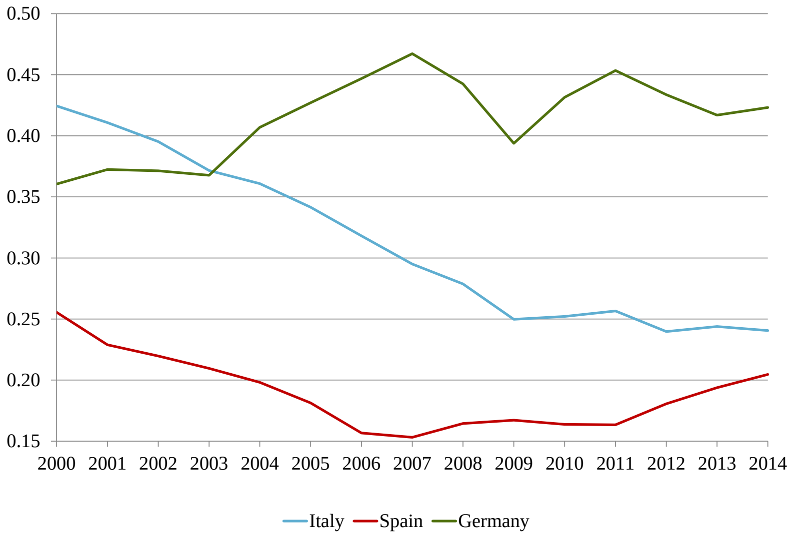
Source: Eurostat, institutional sectors
Note: contributions to leverage growth are positive if financial debt increases or its sum with equity decreases, and vice versa.

Figure 8: Germany: change in leverage and contributions of debt and net equity (pp)



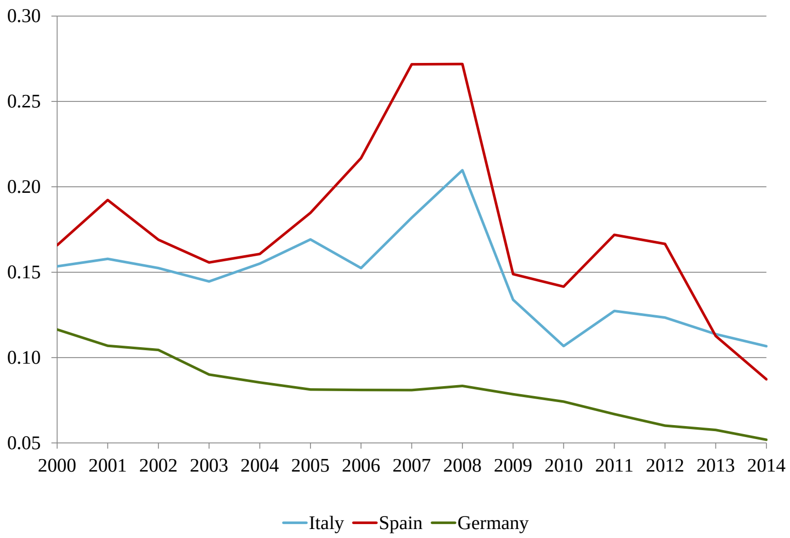
Source: Eurostat, institutional sectors
Note: contributions to leverage growth are positive if financial debt increases or its sum with equity decreases, and vice versa.

Figure 9: Non-financial corporate EBITDA to financial debt ratio



Source: Eurostat, institutional sectors

Figure 10: Non-financial corporate interest burden to EBITDA ratio



Source: Eurostat, institutional sectors

Figure 11: Italy: investment rate by industry

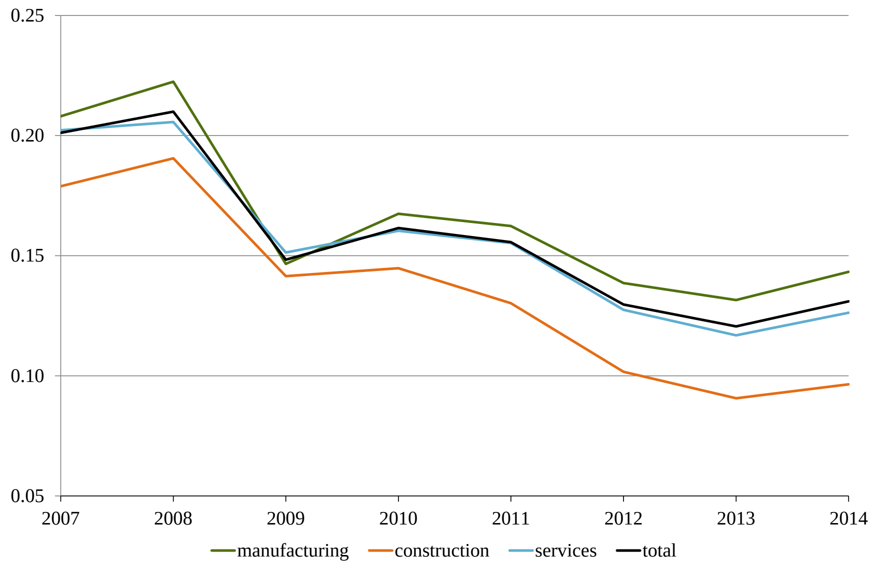
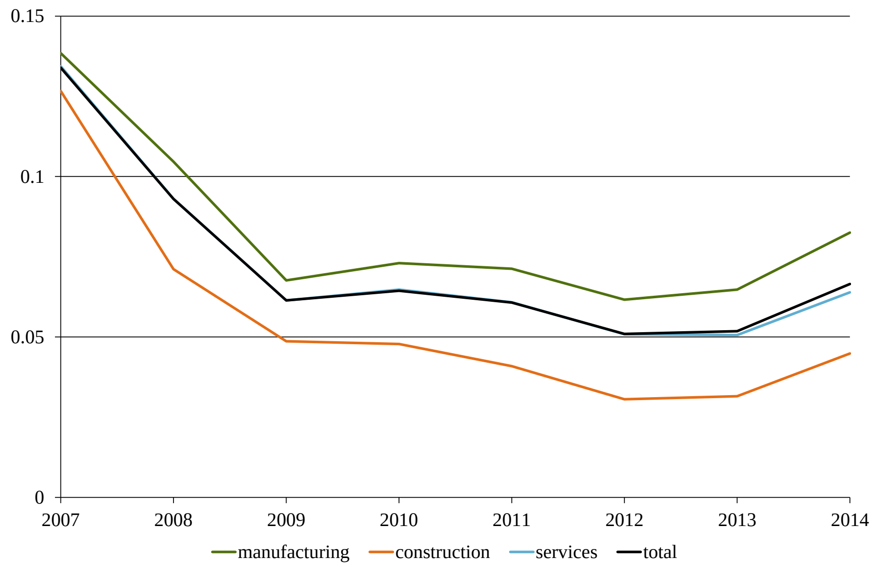


Figure 12: Spain: investment rate by industry



Source: Orbis

Figure 13: Italy: investment rate by class size

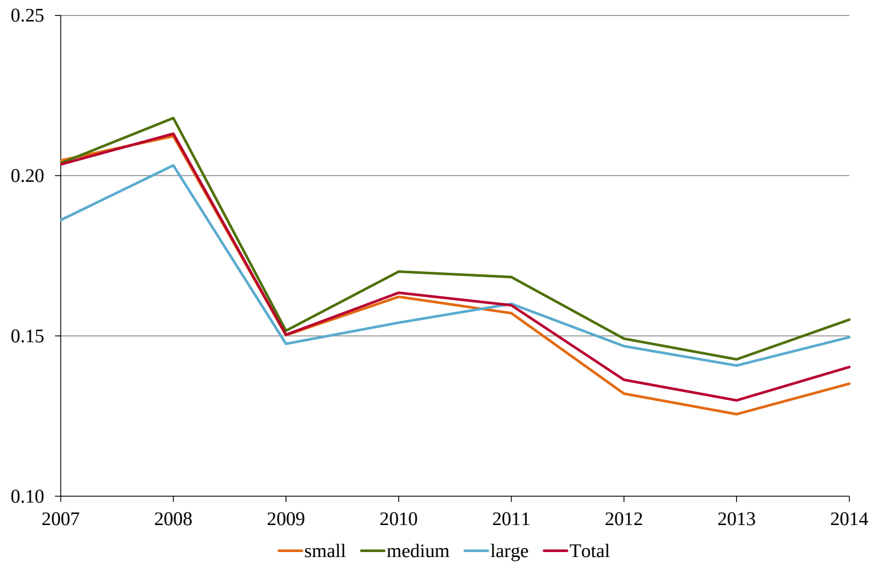
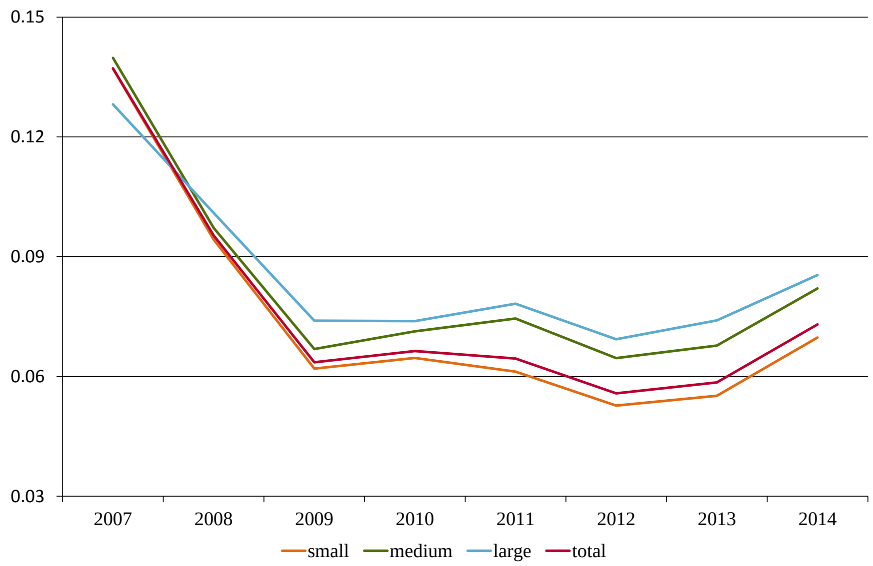


Figure 14: Spain: investment rate by class size



Source: Orbis

Figure 15: Italy: distribution of leverage in the manufacturing sector

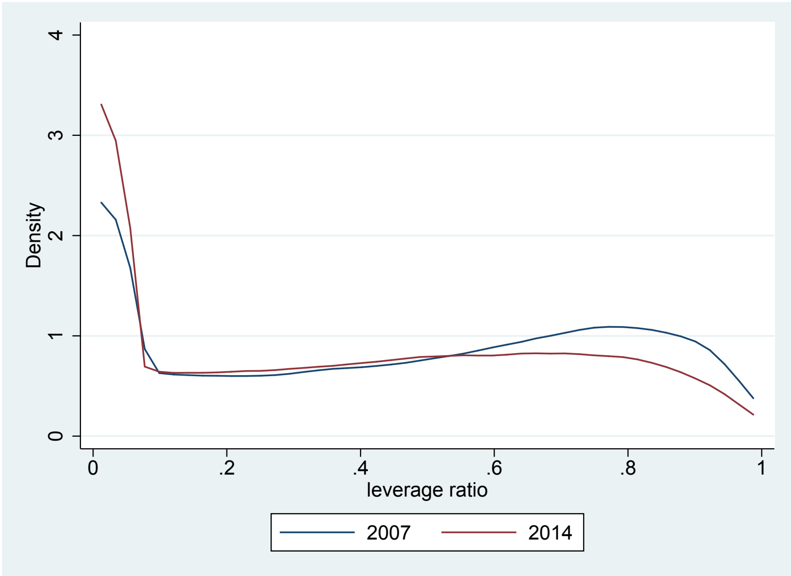
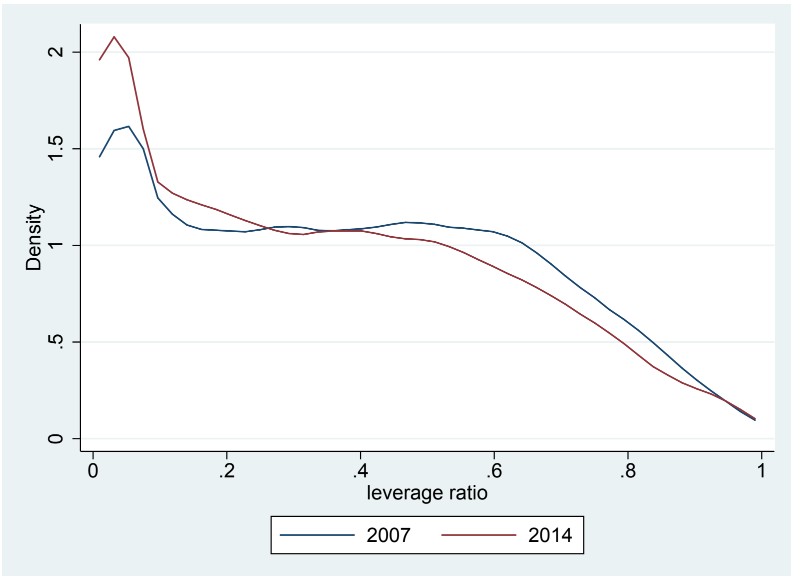


Figure 16: Spain: distribution of leverage in the manufacturing sector



Source: Orbis

Figure 17: Italy: investment rate by leverage class in the manufacturing sector

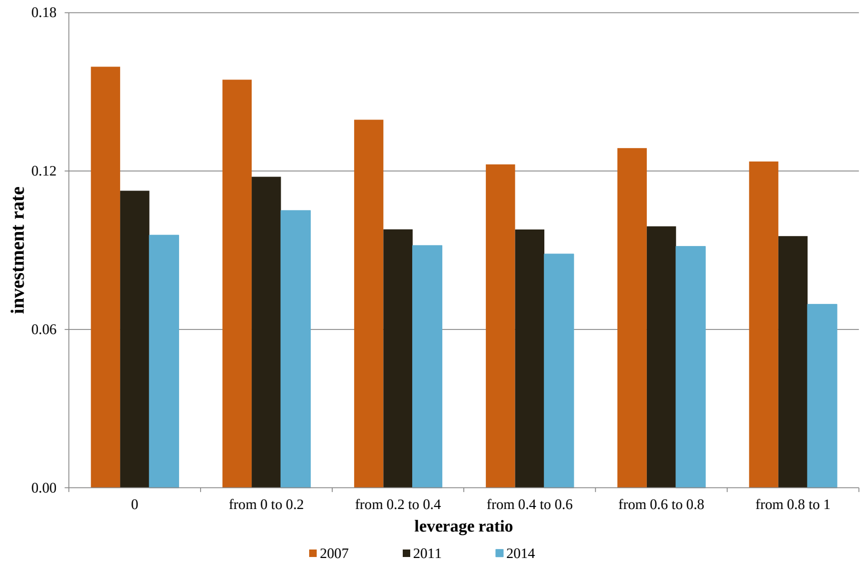
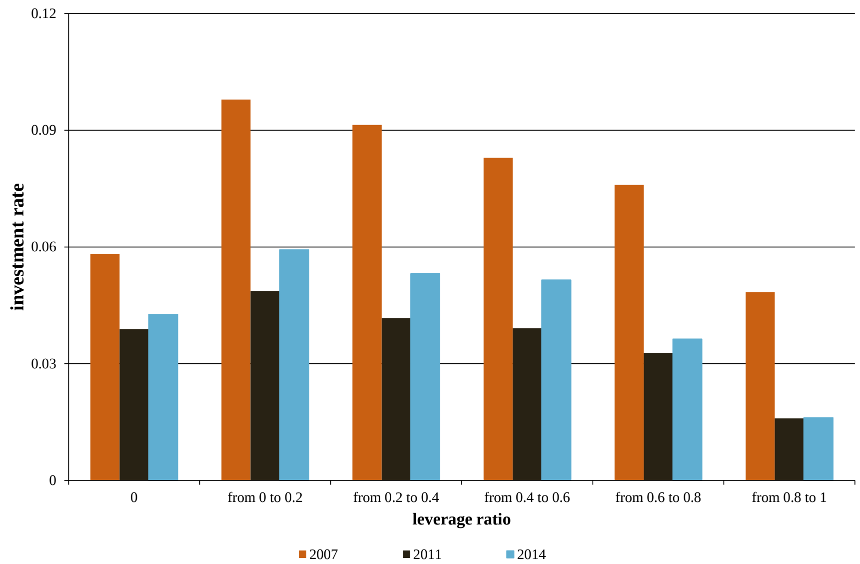


Figure 18: Spain: investment rate by leverage class in the manufacturing sector



Source: Orbis

Table 1: Descriptive statistics of the estimation sample

	Italy		Spain	
	2007	2014	2007	2014
Investment rate	0.215	0.156	0.146	0.094
Turnover growth	0.076	0.030	0.063	0.053
User cost of capital	20.03	20.54	20.32	20.58
Leverage ratio	0.348	0.255	0.339	0.267
Debt to EBITDA	1.749	2.008	2.280	2.783
Interest burden to EBITDA	0.130	0.101	0.148	0.144
Number of observations	11,605	10,898	1,844	2,653
Number of panel observations	78,709		19,338	
Number of panel firms	13,550		3,732	

Source: Orbis, Bureau Van Dijk
Note: sample mean values. See Appendix for the variables definition.

Table 2: Italy: ECM for investment rate. Baseline estimates

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_1 \Delta y_{i,t} + \beta_2 \Delta y_{i,t-1} + \gamma_1 (k-y)_{i,t-2} + \gamma_2 uck_{t-1} + \mu_i + \theta_t + \epsilon_{i,t}$$

	OLS (1)	FE (2)	GMM-diff (3)	GMM-sys (4)
$\frac{I_{i,t-1}}{K_{i,t-2}}$	0.171***	-0.266***	-0.069*	-0.043**
	(0.004)	(0.005)	(0.035)	(0.019)
$\Delta y_{i,t}$	0.120***	0.205***	0.069	0.035
	(0.004)	(0.004)	(0.043)	(0.028)
$\Delta y_{i,t-1}$	0.095***	0.258***	0.161***	0.134***
	(0.003)	(0.005)	(0.034)	(0.017)
$(k-y)_{i,t-2}$	-0.046***	-0.313***	-0.153***	-0.122***
	(0.001)	(0.005)	(0.039)	(0.019)
uck_{t-1}	-0.010	-0.149***	0.089	-0.097*
	(0.024)	(0.027)	(0.058)	(0.051)
constant	0.148**	0.074		0.344**
	(0.071)	(0.083)		(0.139)
Observations	78,709	78,709	65,305	78,709
R-squared	0.174	0.208		
Arellano-Bond AR1			0.000	0.000
Arellano-Bond AR2			0.614	0.726
Hansen J			0.303	0.196

Source: Orbis, Bureau Van Dijk
Note: Standard errors in parentheses are consistent in the presence of heteroskedasticity and autocorrelation. Time and size dummies included. P-value shown for AR1 test, AR2 test and Hansen J test.
Significance levels: *=10%, **=5%, ***=1%

Table 3: Spain: ECM for investment rate. Baseline estimates

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_1 \Delta y_{i,t} + \beta_2 \Delta y_{i,t-1} + \gamma_1 (k-y)_{i,t-2} + \gamma_2 uck_{t-1} + \mu_i + \theta_t + \epsilon_{i,t}$$

	OLS (1)	FE (2)	GMM-diff (3)	GMM-sys (4)
$\frac{I_{i,t-1}}{K_{i,t-2}}$	0.227***	-0.152***	0.039	0.048*
	(0.008)	(0.009)	(0.037)	(0.029)
$\Delta y_{i,t}$	0.050***	0.093***	0.019	0.003
	(0.004)	(0.005)	(0.034)	(0.030)
$\Delta y_{i,t-1}$	0.049***	0.122***	0.071**	0.081***
	(0.004)	(0.005)	(0.032)	(0.021)
$(k-y)_{i,t-2}$	-0.014***	-0.144***	-0.057*	-0.066***
	(0.001)	(0.005)	(0.034)	(0.022)
uck_{t-1}	-0.014	-0.093***	-0.026	-0.043*
	(0.009)	(0.013)	(0.031)	(0.024)
constant	0.077***	0.185***		0.167***
	(0.026)	(0.037)		(0.058)
Observations	19,338	19,338	15,648	19,338
R-squared	0.144	0.115		
Arellano-Bond AR1			0.000	0.000
Arellano-Bond AR2			0.926	0.749
Hansen J			0.182	0.224

Source: Orbis, Bureau Van Dijk
Note: Standard errors in parentheses are consistent in the presence of heteroskedasticity and autocorrelation. Time and size dummies included. P-value shown for AR1 test, AR2 test and Hansen J test.
Significance levels: *=10%, **=5%, ***=1%

Table 4: Italy: ECM for investment rate. The effect of debt overhang

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_1 \Delta y_{i,t} + \beta_2 \Delta y_{i,t-1} + \gamma_1 (k-y)_{i,t-2} + \gamma_2 uck_{t-1} + \\ + \delta_1 \frac{D_{i,t-1}}{A_{i,t-1}} + \delta_2 \frac{D_{i,t-1}}{EB_{i,t-1}} + \delta_3 \frac{IB_{i,t-1}}{EB_{i,t-1}} + \mu_i + \theta_t + \epsilon_{i,t}$$

	(1)	(2)	(3)	(4)
$\frac{I_{i,t-1}}{K_{i,t-2}}$	-0.042**	-0.037*	-0.041**	-0.038*
	(0.019)	(0.020)	(0.019)	(0.020)
$\Delta y_{i,t}$	0.033	0.038	0.038	0.040
	(0.028)	(0.027)	(0.028)	(0.027)
$\Delta y_{i,t-1}$	0.134***	0.128***	0.130***	0.128***
	(0.017)	(0.018)	(0.017)	(0.018)
$(k-y)_{i,t-2}$	-0.123***	-0.118***	-0.121***	-0.118***
	(0.019)	(0.020)	(0.019)	(0.020)
uck_{t-1}	-0.095*	-0.089*	-0.090*	-0.088*
	(0.051)	(0.051)	(0.051)	(0.051)
$\frac{D_{i,t-1}}{A_{i,t-1}}$	0.031***	0.050***	0.045***	0.054***
	(0.007)	(0.005)	(0.005)	(0.005)
$\frac{D_{i,t-1}}{EB_{i,t-1}}$		-0.003**		-0.002
		(0.001)		(0.001)
$\frac{IB_{i,t-1}}{EB_{i,t-1}}$			-0.062***	-0.048***
			(0.016)	(0.011)
constant	0.325**	0.310**	0.322**	0.317**
	(0.137)	(0.136)	(0.135)	(0.136)
Observations	78,709	78,709	78,709	78,709
Arellano-Bond AR1	0.000	0.000	0.000	0.000
Arellano-Bond AR2	0.662	0.608	0.655	0.623
Hansen J	0.219	0.235	0.263	0.263
Difference-in-Hansen	0.749	0.502	0.235	0.421

Source: Orbis, Bureau Van Dijk

Note: one-step system-GMM estimates. Standard errors in parentheses are consistent in the presence of heteroskedasticity and autocorrelation. Time and size dummies included. P-value shown for AR1 test, AR2 test, Hansen J test and Difference-in-Hansen test of joint exogeneity of indebtedness indicators.

Significance levels: *=10%, **=5%, ***=1%

Table 5: Spain: ECM for investment rate. The effect of debt overhang

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_1 \Delta y_{i,t} + \beta_2 \Delta y_{i,t-1} + \gamma_1 (k-y)_{i,t-2} + \gamma_2 uck_{t-1} + \\ + \delta_1 \frac{D_{i,t-1}}{A_{i,t-1}} + \delta_2 \frac{D_{i,t-1}}{EB_{i,t-1}} + \delta_3 \frac{IB_{i,t-1}}{EB_{i,t-1}} + \mu_i + \theta_t + \epsilon_{i,t}$$

	(1)	(2)	(3)	(4)
$\frac{I_{i,t-1}}{K_{i,t-2}}$	0.044	0.049	0.044	0.045
	(0.030)	(0.030)	(0.029)	(0.030)
$\Delta y_{i,t}$	0.004	0.005	0.009	0.009
	(0.030)	(0.030)	(0.030)	(0.030)
$\Delta y_{i,t-1}$	0.085***	0.081***	0.080***	0.079***
	(0.022)	(0.022)	(0.021)	(0.021)
$(k-y)_{i,t-2}$	-0.070***	-0.067***	-0.068***	-0.067***
	(0.024)	(0.024)	(0.023)	(0.023)
uck_{t-1}	-0.043*	-0.040*	-0.037	-0.036
	(0.024)	(0.024)	(0.023)	(0.023)
$\frac{D_{i,t-1}}{A_{i,t-1}}$	0.022*	0.028***	0.052***	0.053***
	(0.012)	(0.011)	(0.015)	(0.013)
$\frac{D_{i,t-1}}{EB_{i,t-1}}$		-0.001**		-0.000
		(0.000)		(0.000)
$\frac{IB_{i,t-1}}{EB_{i,t-1}}$			-0.088***	-0.085***
			(0.012)	(0.014)
Constant	0.154***	0.148***	0.140***	0.138***
	(0.055)	(0.054)	(0.052)	(0.052)
Observations	19,338	19,338	19,338	19,338
Arellano-Bond AR1	0.000	0.000	0.000	0.000
Arellano-Bond AR2	0.754	0.733	0.903	0.896
Hansen J	0.251	0.262	0.283	0.284
Difference-in-Hansen	0.412	0.610	0.690	0.800

Source: Orbis, Bureau Van Dijk
Note: one-step system-GMM estimates. Standard errors in parentheses are consistent in the presence of heteroskedasticity and autocorrelation. Time and size dummies included. P-value shown for AR1 test, AR2 test, Hansen J test and Difference-in-Hansen test of joint exogeneity of indebtedness indicators.
Significance levels: *=10%, **=5%, ***=1%

Table 6: Italy: ECM for investment rate. High and low-leveraged firms

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_1 \Delta y_{i,t} + \beta_2 \Delta y_{i,t-1} + \gamma_1 (k-y)_{i,t-2} + \gamma_2 uck_{t-1} + \\ + \delta_{1a} Hlev \times \frac{D_{i,t-1}}{A_{i,t-1}} + \delta_{1b} Llev \times \frac{D_{i,t-1}}{A_{i,t-1}} + \delta_{2a} Hlev \times \frac{D_{i,t-1}}{EB_{i,t-1}} + \delta_{2b} Llev \times \frac{D_{i,t-1}}{EB_{i,t-1}} + \\ + \delta_{3a} Hlev \times \frac{IB_{i,t-1}}{EB_{i,t-1}} + \delta_{3b} Llev \times \frac{IB_{i,t-1}}{EB_{i,t-1}} + \mu_i + \theta_t + \epsilon_{i,t}$$

	(1)	(2)	(3)	(4)
$\frac{I_{i,t-1}}{K_{i,t-2}}$	-0.038*	-0.039*	-0.039*	-0.039*
	(0.020)	(0.020)	(0.020)	(0.020)
$\Delta y_{i,t}$	0.042	0.040	0.041	0.041
	(0.027)	(0.027)	(0.027)	(0.027)
$\Delta y_{i,t-1}$	0.128***	0.129***	0.129***	0.129***
	(0.018)	(0.018)	(0.018)	(0.018)
$(k-y)_{i,t-2}$	-0.118***	-0.119***	-0.119***	-0.119***
	(0.020)	(0.020)	(0.020)	(0.020)
uck_{t-1}	-0.089*	-0.094*	-0.091*	-0.092*
	(0.051)	(0.052)	(0.052)	(0.052)
$\frac{D_{i,t-1}}{A_{i,t-1}}$		0.063***	0.069***	
		(0.005)	(0.005)	
$Hlev \times \frac{D_{i,t-1}}{A_{i,t-1}}$	0.055***			0.062***
	(0.005)			(0.006)
$Llev \times \frac{D_{i,t-1}}{A_{i,t-1}}$	0.103***			0.092***
	(0.013)			(0.011)
$\frac{D_{i,t-1}}{EB_{i,t-1}}$	-0.002*		-0.001	
	(0.001)		(0.001)	
$Hlev \times \frac{D_{i,t-1}}{EB_{i,t-1}}$		-0.003***		-0.002**
		(0.001)		(0.001)
$Llev \times \frac{D_{i,t-1}}{EB_{i,t-1}}$		0.002		-0.001
		(0.002)		(0.002)
$\frac{IB_{i,t-1}}{EB_{i,t-1}}$	-0.044***	-0.047***		
	(0.012)	(0.011)		
$Hlev \times \frac{IB_{i,t-1}}{EB_{i,t-1}}$			-0.097***	-0.058***
			(0.015)	(0.015)
$Llev \times \frac{IB_{i,t-1}}{EB_{i,t-1}}$			-0.013	-0.035**
			(0.018)	(0.014)
constant	0.317**	0.326**	0.322**	0.318**
	(0.136)	(0.139)	(0.137)	(0.138)
Observations	78,709	78,709	78,709	78,709
Arellano-Bond AR1	0.000	0.000	0.000	0.000
Arellano-Bond AR2	0.586	0.602	0.619	0.591
Hansen J	0.248	0.254	0.251	0.248
Difference-in-Hansen	0.398	0.504	0.344	0.534

Source: Orbis, Bureau Van Dijk
Note: one-step system-GMM estimates. Standard errors in parentheses are consistent in the presence of heteroskedasticity and autocorrelation. Time and size dummies included. P-value shown for AR1 test, AR2 test, Hansen J test and Difference-in-Hansen test of joint exogeneity of indebtedness indicators.
Hlev: dummy equal to 1 if leverage ratio is higher than the median and 0 otherwise.
Llev: dummy equal to 1 if leverage ratio is lower than the median and 0 otherwise.
Significance levels: *=10%, **=5%, ***=1%

Table 7: Spain: ECM for investment rate. High and low-leveraged firms

$\frac{I_{i,t}}{K_{i,t-1}} = \alpha_1 \frac{I_{i,t-1}}{K_{i,t-2}} + \beta_1 \Delta y_{i,t} + \beta_2 \Delta y_{i,t-1} + \gamma_1 (k-y)_{i,t-2} + \gamma_2 uck_{t-1} +$
$+ \delta_{1a} Hlev \times \frac{D_{i,t-1}}{A_{i,t-1}} + \delta_{1b} Llev \times \frac{D_{i,t-1}}{A_{i,t-1}} + \delta_{2a} Hlev \times \frac{D_{i,t-1}}{EB_{i,t-1}} + \delta_{2b} Llev \times \frac{D_{i,t-1}}{EB_{i,t-1}} +$
$+ \delta_{3a} Hlev \times \frac{IB_{i,t-1}}{EB_{i,t-1}} + \delta_{3b} Llev \times \frac{IB_{i,t-1}}{EB_{i,t-1}} + \mu_i + \theta_t + \epsilon_{i,t}$

	(1)	(2)	(3)	(4)
$\frac{I_{i,t-1}}{K_{i,t-2}}$	0.045	0.045	0.045	0.045
	(0.030)	(0.030)	(0.030)	(0.030)
$\Delta y_{i,t}$	0.010	0.009	0.009	0.010
	(0.030)	(0.030)	(0.030)	(0.030)
$\Delta y_{i,t-1}$	0.079***	0.079***	0.079***	0.080***
	(0.021)	(0.021)	(0.022)	(0.022)
$(k-y)_{i,t-2}$	-0.067***	-0.067***	-0.067***	-0.067***
	(0.023)	(0.023)	(0.023)	(0.023)
uck_{t-1}	-0.036	-0.036	-0.036	-0.036
	(0.023)	(0.023)	(0.023)	(0.023)
$\frac{D_{i,t-1}}{A_{i,t-1}}$		0.054***	0.052***	
		(0.013)	(0.016)	
$Hlev \times \frac{D_{i,t-1}}{A_{i,t-1}}$	0.054***			0.048***
	(0.014)			(0.014)
$Llev \times \frac{D_{i,t-1}}{A_{i,t-1}}$	0.060***			0.065***
	(0.020)			(0.020)
$\frac{D_{i,t-1}}{EB_{i,t-1}}$	-0.000		-0.000	
	(0.000)		(0.000)	
$Hlev \times \frac{D_{i,t-1}}{EB_{i,t-1}}$		-0.000		-0.000
		(0.001)		(0.001)
$Llev \times \frac{D_{i,t-1}}{EB_{i,t-1}}$		-0.000		-0.000
		(0.000)		(0.000)
$\frac{IB_{i,t-1}}{EB_{i,t-1}}$	-0.085***	-0.085***		
	(0.014)	(0.014)		
$Hlev \times \frac{IB_{i,t-1}}{EB_{i,t-1}}$			-0.083***	-0.072***
			(0.018)	(0.022)
$Llev \times \frac{IB_{i,t-1}}{EB_{i,t-1}}$			-0.087***	-0.096***
			(0.012)	(0.013)
constant	0.137***	0.138***	0.139***	0.139***
	(0.052)	(0.052)	(0.052)	(0.052)
Observations	19,338	19,338	19,338	19,338
Arellano-Bond AR1	0.000	0.000	0.000	0.000
Arellano-Bond AR2	0.901	0.895	0.900	0.921
Hansen J	0.284	0.284	0.283	0.277
Difference-in-Hansen	0.907	0.839	0.834	0.770

Source: Orbis, Bureau Van Dijk
Note: one-step system-GMM estimates. Standard errors in parentheses are consistent in the presence of heteroskedasticity and autocorrelation. Time and size dummies included. P-value shown for AR1 test, AR2 test, Hansen J test and Difference-in-Hansen test of joint exogeneity of indebtedness indicators.
Hlev: dummy equal to 1 if leverage ratio is higher than the median and 0 otherwise.
Llev: dummy equal to 1 if leverage ratio is lower than the median and 0 otherwise.
Significance levels: *=10%, **=5%, ***=1%