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EXPORTING AND CAPITAL INVESTMENT: ON THE STRATGIC BEHAVIOR OF EXPORTERS

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EXPORTING AND CAPITAL INVESTMENT: ON THE STRATEGIC BEHAVIOR OF EXPORTERS

Abstract

By exporting, firms sell in markets whose the business cycles are not perfectly correlated and so can be expected to have more stable cash flows. If companies are liquidity constrained, this stability of cash flows can provide exporters with certain advantages over firms that operate solely in a domestic market. For instance, under the existence of liquidity constraints, more stable cash flows should foster more stable capital investments. Moreover, the expectation of more stable future cash flows and the information signal from commencing exporting can lessen the severity of liquidity constraints for exporters compared to non-exporters. We test these arguments by examining a stratified representative sample of the Spanish manufacturing sector from 1990 to 1998. Our results suggest that exporters' cash flows and capital investments are more stable than non-exporters'. Moreover, we find that liquidity constraints are less binding for exporters than for non-exporters. The richness of our data allows us to examine alternative explanations for the results we present. We conclude by discussing the strategic implications of our findings for firms.

Key words: liquidity constraint, exporter, non-exporter, cash flow stability

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I. Introduction

Recent studies provide mounting evidence that the correlation between firm productivity and exporting is driven by productive firms becoming exporters and not by exporters increasing their productivity. This evidence is based on data from the United States (Bernard and Jensen, 1999), Taiwan and Korea (Aw and Huang, 1995), Colombia, Mexico, and Morocco (Clerides, Lach and Tybout 1998), and Spain (Delgado, Fariñas and Ruano, 1999). The inference from these findings is that exporting is an outcome of firm characteristics in addition to environmental conditions such as exchange rates and trade policy.

We expect that exporting is more than just an outcome because exporting can have an important effect on firm behavior. In particular, we argue that exporters will be better able to make strategic investments like capital expenditures compared to non-exporters. Exporters enjoy diversification benefits with respect to their cash flows if economic activity in the markets in which they sell is not perfectly correlated. This stabilization of sales has long been recognized in the internationalization literature and has been suggested as an advantage of engaging in international activity (*e.g.*, Hirsh and Lev, 1970).

If information asymmetries exist, external financial markets will not be as efficient as internal financial markets and firm investment decisions can become constrained by internal cash flow. This is referred to as the existence of liquidity constraints (*e.g.*, Fazzari, Hubbard, and Petersen 1988). The diversification benefit of selling in multiple nations should provide an exporter with more stable cash flows compared to a similar firm operating only in one market. As a result, we expect that exporting firms will have more stable capital expenditures compared to non-exporters. We also predict that when a firm becomes an exporter, the expectation of stable future cash flows and the information signal from commencing exporting can lessen the severity of liquidity constraints.

We empirically examine these predictions on a stratified representative sample of the Spanish manufacturing sector from 1990 to 1998. We compare the set of firms that exported over the entire sample period with those that did not export over the entire sample period and apply the methodology used to estimate the existence of firm liquidity constraints. We find

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that exporters' cash flows and capital investments are more stable than non-exporters'. In addition, we find that liquidity constraints are less binding for exporters compared to non-exporters. **The magnitude of these differences are economically important** We support these conclusions by finding a consistent pattern of results among the set of firms that switched their exporting status over the sample period.

The paper proceeds in the following manner. In the next section we further present our reasoning of how exporting can affect firms' capital investments. The following two sections describe the data and specify the research design and methodology. The fifth section presents the results and the final section concludes.

II. Exporting and Capital investment

Firm strategic decisions, such as capital investments, often involve the commitment of financial resources in the short run on the expectation of future positive returns. If capital markets are fully efficient and if information is freely available to all parties, then firms should be able to find external sources to finance profitable investment opportunities. However, if these conditions do not hold, external financing becomes unavailable or costly and firms' ability to make capital investments becomes constrained by their cash flow. The sensitivity of capital investment to firm cash flow is referred to as the existence of liquidity constraints.

An important difference between exporters and non-exporters is that exporters potentially benefit from sales stabilization (Hirsch and Lev, 1970). Sales stabilization is the diversification benefit that exporters realize because business cycles are not perfectly correlated across national markets. Therefore, firms that sell products in more than one country are more likely to have stable cash inflows compared to firms that operate in one country. If firms' abilities to make investments are constrained by their financial liquidity, then cash flow stability allows them a greater ability to make investments – especially during downturns in the domestic business cycle.

In addition, we expect exporting to provide two informational advantages that can mitigate liquidity constraints. First, the expectation of more stable cash flows provides greater assurances to external sources of funds that the firm will be able to service its obligations. This is because stable cash flows lower the chance that the firm will default should the domestic economy, or any one of its markets, enter a downturn. Moreover, due to the existence of fixed and sunk costs to commencing exporting as argued by the export hysteresis literature (*e.g.*, Baldwin, 1988; Roberts & Tybout, 1994; Campa, 1998), firms cannot costlessly or instantaneously commence exporting and diversify their cash flows during downturns in the domestic business cycle. However, having covered the fixed costs to commence exporting, firms can more easily shift sales to foreign markets during downturns in the domestic business cycle. Therefore, exporting provides information regarding the future stability of cash flows and increases the likelihood, everything else equal, that a firm can access external financing sources.

Second, exporting also sends a signal about firm "type." Research to date shows that exporters are more productive than non-exporters (*e.g.*, Bernard and Jensen, 1999; Clerides, Lach and Tybout, 1998; Aw and Huang, 1995; Delgado, Fariñas and Ruano, 1999). The intuition underlying the productivity-export association is that exporters require some sort of competitive advantage in order to effectively compete with indigenous firms in foreign

markets because there exist costs to exporting that include transportation and product adaptation. Assuming that firms engage in exporting with the expectation of generating profits, commencing exporting signals that they possess sources of competitive advantage. The possession of competitive advantage provides assurances that a company will be able to service its external financing because it possesses the means to successfully compete in the future.

To summarize, we make two predictions regarding how exporting affects firms' capital investments. First, we expect that exporters will have more stable cash flows, and hence more stable capital investments, than non-exporters. This stems from the diversification effect that exporters enjoy because they sell in multiple national markets where the business cycles are not perfectly correlated. Second, we expect that the information disseminated upon becoming an exporter reduces firms' liquidity constraints. The information is that the firm will have more stable expected future cash flows and that the firm possesses some source of competitive advantage.

III. Data

The data that we employ come from a longitudinal study of Spanish manufacturing firms started in 1990 with data collected annually through 1998. This project is directed by the Fundación Empresa Pública with financial support from the Spanish Ministry of Industry. The sample is representative of the population of manufacturing firms in the Spanish economy, although there is a difference in coverage depending on firm size. The sample covers the population of Spanish manufacturing firms with 200 or more employees in 1990. The sample also includes 4% of the population of firms with at least 10 employees but less than 200 employees. Small firms that drop out of the original sample are replaced each year by firms with similar characteristics from the population. The data consist of 2188 firms in 1990. Due to entry and exit, the resulting data set is an unbalanced panel of 3057 firms.

Spain provides an appropriate setting to test the relationships that we wish to examine. First, a large proportion of firms in the sample are exporters. Just over 46 percent of the 2188 firms in 1990 reported that they were exporters. Second, there is little direct investment by Spanish firms in this sample, making exporting the primary means of international diversification. Only 7 of these 2188 firms had foreign direct investments (0.03 percent of the sample). Third, during the sample period Spain went through an entire business cycle. Figure 1 presents quarterly GDP growth in Spain between 1990 and 1998. The sample period started with a growing economy, followed by a sharp recession in 1993 with negative GDP growth continuing until the first quarter of 1994, and then a recovery during the last years of the sample. This variance is useful in examining our arguments regarding sales stability over the business cycle.

The existence of an entire business cycle over the sample period, however, introduces a concern when making the comparisons that we propose. Due to the business cycle, a number of firms fail during the sample period. To limit the extent to which non-survivor bias affects our comparison of exporters to non-exporters, we first limit the data to the set of firms that are present in the sample for each year between 1990 and 1998. Therefore, all of the firms that we compare were able to survive the downturn in the Spanish economy in the mid 1990s. This restricts the sample to 1010 firms (of the 2188 in the 1990 sample). We further restricted the sample to those firms that reported capital expenditures in each year to further ensure comparability between groups of firms. This resulted in a usable sample of 746 firms.

IV. Research design and methodology

In its most simple form, the literature on investment liquidity constraints investigates whether there exists a positive correlation between company cash flows (*i.e.*, liquidity or internal financing) and investment. Should firms be liquidity constrained, we expect a positive correlation because companies require internal financing in order to make investments. Should firms not be liquidity constrained, we expect no correlation between these variables. Companies that are not liquidity constrained can go to external finance markets whenever they have an appropriate project and there will exist no correlation between cash flow and firm investment.

A concern in drawing conclusions from this relationship is that cash flow can capture effects other than liquidity constraints. In particular, cash flow might be correlated with high growth and investment opportunity. Therefore, a positive relationship driven by existing investment opportunities might be misinterpreted as a liquidity constraint.

To address this concern, the empirical literature has adopted two solutions. One has been to identify, *ex ante*, groups of firms that should be differentially affected by liquidity constraints and test if the sensitivity of investment to cash flow varies across these groups of firms in the predicted manner. To date firms have been classified by dividend payout ratios (Fazzari, Hubbard and Petersen, 1988), bond rating (Whited, 1992), membership in a keiretsu (Hoshi, Kasyap and Scharfstein, 1991), membership in a diversified firm (Lamont, 1997), temporal macroeconomic-credit conditions (Gertler and Hubbard, 1988; Kashyap, Lamont and Stein, 1994), and firm size (Gertler and Gilchrist, 1994; Gilchrist and Himmelberg, 1995).

The second solution, which has often been used in combination with the former, has been to control for firm investment opportunities in a regression equation. Following Hayashi (1982), a common approach has been to attempt to control for firms' marginal q (*i.e.*, the marginal change in firm value from an increase in investment). Hayashi shows that under the assumptions of perfect competition, constant marginal cost of investment, and efficient financial markets, a firm's marginal q equals average q (or Tobin's q). Therefore, many studies have included Tobin's q to empirically estimate the investment opportunity for a firm. The test for the presence of liquidity constraints uses panel data and estimates a regression of the general form:

$$I_{it}/K_{it-1} = \alpha + \gamma\pi_{it}/K_{it-1} + \beta q_{it-1} + d_t + \varepsilon_{it} \qquad [1]$$

I_{it} is investment by firm i in period t. K_{it-1} is the replacement cost of capital for firm i at the end of period t-1. π_{it} is the cash flow of firm i at time t. q_{it-1} is Tobin's q for firm i at time t-1, and d_t is a control for the period. An estimated coefficient of g greater than zero rejects the null hypothesis that firms are not liquidity constrained.

We follow a similar empirical strategy. However, we adapt this approach in a number of ways to fit the characteristics of our data. First, many of the firm-year observations in our sample show no capital investment. This reflects our ability to draw a representative sample of manufacturing firms within Spain, and not having to rely on data from large publicly traded companies. Because the investment variable only measures investment and does not measure the possibility that a firm actively removes capital stock, we have a censored dependent variable. Namely, under certain conditions we could imagine that the appropriate firm strategy would be to actively reduce capital stock; however, a zero level of capital investment would characterize this situation in these data. We therefore model

investment as an underlying latent variable whose value we do not observe unless it is positive. Given the censored nature of the dependent variable, we use a Tobit model to estimate how the independent variables affect the dependent variable.

Second, we do not use Tobin's q to measure firms' investment opportunities for the following reasons. The assumptions under which marginal q equals average q (*i.e.*, perfect competition, constant marginal cost of investment, and efficient financial markets) are unlikely to hold in our empirical context. For example, Morck, Yeung, and Yu (2000) find a high degree of synchronous stock price movements in Spain, which suggests limited transparency and firm-specific information in the capital market. Moreover, conceptually one of the key assumptions of this approach (*i.e.*, the existence of efficient capital markets) is exactly the proposition we are testing with respect to liquidity constraints; therefore, we do not want to assume its existence in the formulation of our empirical approach. Finally, the majority of firms in our sample are not publicly traded. As a result we are unable to measure the numerator in the Tobin's q formulation. In order to control for firm investment opportunities, we employ the following approach. We take advantage of the panel structure of our data and, following Gilchrist and Himmelberg (1995), we use firm lagged margin and sales growth to capture investment opportunities for each firm-year. In addition, we introduce a firm random-effect in our estimation to further control for firm differences in investment opportunity.

Third, we scale investment and margin by current sales, not replacement value of capital from the previous period. Scaling by sales allows us to sacrifice one less year in the formulation of our tests. More importantly, due to the additional data required to calculate the replacement value of capital, scaling by this variable reduces our sample size due to missing data values. In sensitivity analyses, our results do not qualitatively differ if we scale by replacement value of capital rather than sales.

Fourth, we use ΔGDP_t to measure time period effects in some specifications. We use the year dummy approach (*i.e.*, including the vector d_t) in other specifications.

Therefore, we estimate a random effects Tobit model of the following form:

$$I^*_{it}/S_{it} = \alpha + \gamma\pi_{it}/S_{it} + \beta_1\pi_{it-1}/S_{it-1} + \beta_2 S_{it-1}/S_{it} + \delta\Delta GDP_t + \nu_i + \upsilon_{it} \quad [2]$$

where,

$$I_{it}/S_{it} = 0 \quad \text{if } I^*_{it}/S_{it} <= 0 \quad [2a]$$

$$I_{it}/S_{it} = I^*_{it}/S_{it} \quad \text{if } I^*_{it}/S_{it} > 0 \quad [2b]$$

We model the firm specific error component (*i.e.*, ν_i) as being drawn from a normal distribution. We further analyze the existence of liquidity constraints by splitting the sample among groups of firms that *ex ante* we believe to have different liquidity constraints, and test whether their capital investment shows different sensitivity to cash flow. We discuss the means by which we split the data after describing the data that we employ.

Variable definitions:

Our dependent variable is firm capital investment, which is defined as the level of investment in plant and equipment for a given year. As previously discussed, we scale capital investment by sales. We multiply the resulting ratio by 100 to present this variable as a percentage.

The key independent variable that we use to measure the existence of the liquidity constraint is cash flow. We measure cash flow as a firm's margin, which is defined as value of sales and changes in inventories minus the cost of goods, personnel, and subcontracted services. We also scale this variable by sales and express it in percentages.

We measure exporting activity in two different ways. One is as a dummy variable that indicates whether or not a firm exports in a given year. The other is the percentage of total firm sales that stem from export sales.

We use two lagged variables to proxy for marginal q (*i.e.*, the set of investment opportunities available to the firm). These variables are the previous year's margin and inverse sales growth (S_{t-1}/S_t). We use the inverse of sales growth because this formulation employs the same denominator that we use to scale investment and cash flow. Because this variable is inverse sales growth, smaller values indicate greater growth in sales.

We also include one additional control variable, the level of firm debt. This is measured as the percentage of debt to total financing. Including this variable controls for the possibility of binding borrowing constraints. Namely, firms with high levels of debt financing might be unable to further access debt markets to finance investment. However, in less developed lending markets, this variable might measure access to debt instead of borrowing constraint. Namely, firms with no or little debt have restricted access to debt markets.

To capture business cycle effects, we use the following methods. First, we measure the change in inflation adjusted GDP from the previous year. These data are drawn from the *International Financial Statistics* and are coded in trillions of 1990 pesetas. Second, we include a vector of dummy variables to capture year effects.

Sub-sample definitions

Ex ante, we split the sample into sub-samples to perform the Tobit analysis. This allows us to better assess if our results are consistent with the existence of liquidity constraints versus alternative explanations.

Like most countries, many firms in Spain belong to larger business groups. We first split the sample into firms that responded in the survey that they were "integrated into a larger business group" and those that responded that they were not. We label these sub-samples as affiliated and unaffiliated, respectively. Our motivation is to isolate firms that have access to funds from other companies within their business group and are, therefore, likely to face lower liquidity constraints. Hoshi et al. (1991) support this split of the sample because they show that group firms in Japan were less liquidity constrained than independent firms. 216 of the 746 firms in our sample belonged to larger business groups.

We further split the set of unaffiliated firms into three groups: those that were exporters for the entire panel, those that were non-exporters for the entire panel, and those that switched exporting status during the panel. The number of firms in each sub-group is respectively: 164, 201, and 165. We perform this partitioning to isolate the liquidity constraint of exporters and non-exporters. With this split, we can compare firms that were exporters over 9 years to firms that were non-exporters over the same period.

Should we find differences, we can then examine the set of firms that changed export status to aid our assessment of whether our findings actually represent differences

associated with export status or other sources of firm heterogeneity. Moreover, we expect that the important factors that initiate the switch between exporting status include exchange rate changes and trade policy changes, which are largely exogenous to the firm.

Within the sub-sample of 165 firms that switch exporting status, we observe 279 separate switches. Therefore, many firms change their exporting status more than once. Although the median number of switches is one, the maximum is five and the mean is 1.69. Of the 279 switches of export status, 175 correspond to non-exporters becoming exporters and 104 correspond to exporters ceasing to export.

Descriptive statistics

Table 1 presents descriptive statistics for the four subgroups. Because we have panel data, Table 1A presents descriptive statistics of the mean value of the variables for firms. The upper number in each cell presents the mean value of the within-firm mean. Namely, we first take the average value of the variable for a firm across the years in the sample. We then average these values and present them in the table. The lower number, in brackets, presents the mean value of the within-firm standard deviation.

We turn first to columns 1 and 2, which present the data on the unaffiliated non-exporters and the unaffiliated exporters. With respect to variable means, exporters and non-exporters differ significantly in size. Consistent with the existing research, we find that exporters are larger than non-exporters. Exporters have on average 159 employees compared to non-exporters, which have 28 employees. We find that the level of investment, margin, and debt do not significantly differ between the two groups. However, we find that the average within-firm standard deviations of investment, margin, and debt are significantly larger for the non-exporters. Therefore, consistent with our expectation of sales stabilization, exporters have less variance in their cash flow and investment compared to non-exporters.

Column 3 presents the data for the unaffiliated firms that switched export status over the panel. In general, these firms have within-firm means and standard deviations that fall in-between the exporters and non-exporters. This is to be expected should these firms be in transition between the exporter and non-exporter groups. There are, however, two exceptions worth highlighting. The switching firms are more profitable and have a higher proportion of debt. This observation would be consistent with fixed and sunk costs to commencing exporting. Only profitable firms or firms that borrow money can offset the costs of commencing to export.

Finally, column 4 presents the data for the affiliated companies. These firms are much larger than the other firms in the sample. On average, these firms had an average number of 694 employees over the sample period. We find that these firms are more investment intensive than the unaffiliated firms. Moreover, they tend to be less profitable.

Table 1B presents the means and standard deviations for all of the firm-level variables that we employ in the regression analyses. The descriptive statistics are for the pooled cross-section. The sample sizes in this table represent the usable sample in the Tobit analyses. Due to missing values in the independent variables, we do not estimate balanced panels. The data item that caused the greatest reduction due to missing values was the debt variable. We found results that are consistent with the ones that we report if we dropped this variable and increased the sample size.

Turning to the data, we draw attention to one variable – the proportion of observations where investment (*i.e.*, the dependent variable) equals zero. This proportion is largest for the unaffiliated non-exporters (32 percent), lower for the unaffiliated exporters (13 percent), and in-between these observations for the unaffiliated switchers (23 percent). Only three percent of the observations for the affiliated firms have zero investment in a year. Given the large proportion of zeros in all categories except affiliated firms, we approach the estimation with the Tobit estimator. In sensitivity analysis that we do not report, we find results that are consistent with those that we present using GLS with fixed or random effects (1).

V. Tobit results

Columns 1 and 2 of Table 2 present the Tobit estimates for the unaffiliated non-exporting firms and the unaffiliated exporting firms, respectively. The variable of greatest interest is Margin/Sales. We find a positive significant coefficient estimate of this variable for the non-exporters and a non-significant effect of this variable for the exporters. Moreover, the magnitude of the marginal effect on the underlying latent variable is approximately six times greater for the non-exporters (2). This pattern of results is consistent with the non-exporters being liquidity constrained and the exporters not being liquidity constrained.

Column 3 of Table 2 combines these two sub samples in order to test the difference in the coefficient estimates by interacting the exporting dummy variable with Margin/Sales and DGDP. In column 3 we find a positive and significant effect of Margin/Sales, which is the marginal effect for the non-exporters. In addition, the magnitude of this effect is very similar to the one in column 1. We also find a negative and significant effect of Export*Margin/Sales in column 3, indicating that the exporters' investments are significantly less sensitive to their cash flows. The resulting marginal effect for the exporters is 0.009.

The effect of the sensitivity of investment to cash flow is economically significant for non-exporters. The estimated elasticity of investment/sales to changes in cash flow is 0.3. This implies that a positive shock of one standard deviation in cash-flow (a 12 percentage point increase in margin/sales) results in an increase of 1 percentage point of investment/sales greater than that implied for the firm if the firm were not liquidity constrained. Given that the average investment to sales ratio for these firms is 3.3, the additional volatility in investment due to one standard deviation in cash flow is on the order of 30 percent.

We also find a positive and significant effect of the Export variable in column 3, although there was no difference between exporters' and non-exporters' average capital investment in the summary statistics. The significant coefficient estimate suggests that exporters have higher levels of capital investment once we control for the other influences in the Tobit specification.

Turning to the control variables in columns 1 and 2, we find that both sets of firms' investments are sensitive to underlying growth in the Spanish economy. The positive and significant coefficient estimates of ΔGDP in both columns indicate such. Although the

(1) Due to the way we split the data, some of our specifications are inestimable with fixed effects.
(2) Given that our dependent variable is censored, we focus on the marginal effect of the underlying latent variable, which is the coefficient estimate.

magnitude and significance of the coefficient estimate for the exporting firms is greater than the non-exporters in column 1 versus column 2, the coefficient estimates are not significantly different as indicated by the interaction term Export*ΔGDP in column 3.

We find a similar pattern of results across columns 1 and 2 with respect to lagged margin. We include the lagged margin variable to control for investment opportunities. We find that past margin increases investment and the magnitude of the effect is larger for non-exporters. Also across columns 1 and 2, we find positive coefficient estimates of Debt/Total assets. The positive coefficient estimate does not suggest the existence of binding borrowing constraints. It suggests that there might be differences in access to debt. Firms that have access to debt can invest more than firms that cannot access debt. This is consistent with the existence of borrowing constraints. Finally, we find that sales growth increases investment for non-exporters. However, it decreases investment for exporters.

All told, the results in columns 1 through 3 are consistent with exporters being less liquidity constrained compared to non-exporters. To provide further insight into the validity of the pattern of findings, we examine the extent of liquidity constraint for the affiliated firms in column 4. As expected, we do not find evidence of liquidity constraint as evidenced by the significant negative coefficient estimate of cash flow. The negative estimate would be consistent with sharing of cash among business group members where struggling firms are provided with cash inflows from group firms and profitable firms have cash funneled to more needy group members. The negative coefficient estimate is not novel in the liquidity constraint literature. Hoshi et al. (1991) find such a relationship for the group of firms that are subsidiaries of larger Japanese keiretsu. Therefore, we find that investment sensitivity to cash flow varies across these three groups of firms in a way that is consistent with the existence of liquidity constraints.

Table 3 replicates the specifications found in Table 2 for the unaffiliated non-exporters, unaffiliated exporters, and affiliated firms. The difference is that we remove the DGDP variable and include the vector of year dummy variables in order to more flexibly estimate the year-to-year effects. Since we include a constant, 1991 is the omitted case. Across the three columns in Table 3, we find that the sensitivity of investment to cash flow is very similar in magnitude and significance level to that in column 2. The control variables also exhibit very consistent results.

We further explore the sensitivity of investment for these groups of firms to the domestic business cycle by using the year dummy coefficient estimates. The dummy variables capture the year-by-year influences after controlling for the firm variables in the equation and the random effect. In Figure 2, we graph the year effects for each group of firms (3). Comparing the three graphs in Figure 2, we see that the unaffiliated non-exporters show much more variability of investment in a manner related to the domestic business cycle, albeit with a two-year delay. The unaffiliated exporters show some sensitivity to the recession in 1993 and then large increases as the economy recovers. The graph for the affiliated firms shows the least sensitivity to the domestic business cycle. Although the curve declines in 1992, it stays relatively constant after that. To summarize these results, the sensitivity to the business cycle, once controlling for firm-effects, appears greater for unaffiliated non-exporters than unaffiliated exporters, and greater for these firms than for affiliated firms. This is consistent with a smoothing of investment facilitated by sales stabilization.

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(3) We base the graph values on the all coefficient estimates, not the just the ones that test significantly different from zero.

Although the evidence appears consistent with differences in liquidity constraints, it is possible that other firm differences, for which we are not controlling, drive the relationship between the sensitivity of investment and cash flow. Such variables could include economy-wide parameters such as exchange rates and trade integration of the economy or firm-specific characteristics such as productivity, location, or managerial efficiency. The presence of economy-wide variables should not result in any bias as long as the effects that these variables have on investment is the same for all firms in the sample. However, firm specific characteristics are likely to affect the investment behavior of firms differently. For this reason, we examine the group of unaffiliated firms that switch their exporting status. Examining the sensitivity of liquidity constraints to the change in export status allows us to assess if the difference is associated with the change in export status, which is what we argue, versus differences in firms' characteristics that we have as yet not controlled for.

Table 4 presents the analyses of the unaffiliated firms that switch export status. Column 1 presents our standard liquidity constraint estimation specification. Column 2 presents the same specification with the interaction terms Export*Margin/Sales and Export*ΔGDP. We present the results in column 1 in order to provide the comparison case to column 2, which tests our arguments. The addition of the interaction terms significantly increases the explanatory power of the model as indicated by the incremental χ^2 test. In column 2, we find that the main effect of Margin/Sales is positive and significant. This is consistent with the argument that these firms exhibit liquidity constraints in the periods when they do not export. The coefficient estimate of Export*Margin/Sales is negative and significant. This indicates that these firms are significantly less liquidity constrained in the periods in which they exported. The marginal effect of Export*Margin/Sales in the export periods is 0.038. In addition, the non-significant main effect of Export suggests that firms do not change the level of capital expenditure based on their export status. To summarize, in the sample of firms that switch their exporting status, we are able to replicate the pattern of liquidity constraints found in the samples of exporters and non-exporters.

Discussion

We argue that exporters will have less binding liquidity constraints compared to non-exporting firms. The results we present are consistent with this argument in that we find non-exporter's capital investments to be significantly more sensitive to their cash flows than exporters'. As with all studies that employ this approach to estimate liquidity constraints, it is possible that the relationship between cash flow and investment might capture effects other than liquidity constraints.

In the context of our study, we undertake the following efforts to mitigate the possibility of these alternative explanations. First, we include a set of variables in each Tobit regression model to control for investment opportunities. Moreover, we include firm random effects to capture sources of firm heterogeneity that we do not include in the regression model. We chose to include random effects rather than fixed effects due to the fact that we are working with a representative sample of firms which is not exhaustive of the population from which we will want to draw inferences and conclusions. Our results are not sensitive to the inclusion of fixed rather than random effects. Second, we split the sample into three groups of firms that we believe *ex ante* will have differing liquidity constraints: unaffiliated non-exporters, unaffiliated exporters, and affiliated firms. We find a pattern of relationship between cash flow and investments across these three groups that is consistent with the existence of liquidity constraints.

Third, we examine the sensitivity of cash flow to investment in a sub-sample of firms that changed their exporting status over the sample period. This is an important test because the previous efforts could not rule out that there was some unmeasured underlying difference among the groups of firms. However, tracking firms that switched groups over the sample period allows us to better assess if the difference between exporters and non-exporters is associated with the switch. Due to the nature of group definitions in many other liquidity constraint studies, it has not been possible to have firms switch among groups. For example, there is no variation in keiretsu groups in Hoshi et al. As a result, we believe the ability to examine the group of firms that switch export status is a strength of our study. When we examine the firms that switch export status, we find results that are consistent with our expectations. The sensitivity to cash flow lessens when firms become exporters. This test helps reduce the possible alternative explanations to effects that change in conjunction with export status changes.

We perform one final analysis to assess if the change in liquidity constraint is associated with the switch in exporting status. We examine the set of unaffiliated exporters and assess if investment sensitivity to cash flow is a function of the percentage of firm sales from exports. In results that we do not report in this paper, we find that investment sensitivity to cash flow does not vary by the percentage of export sales although the coefficient estimates are signed as we would expect. We also re-examined the specifications that we presented in Table 4 by replacing the export dummy variable with the percentage of firm sales from exports. We find continued support for the conclusions that we draw. However, the results are not as strong as when we use the export dummy variable. Combined, these results suggest that the switch to exporting is what drives the results rather than changes in the level of exporting, given that a firm is already an exporter. This is consistent with our arguments of why an exporter would have less binding liquidity constraints versus a non-exporter. Finally, we replicated all of our results normalizing the investment, margin and sales variables by the replacement value of capital rather than sales. Although this decreases our sample size significantly due to missing observations in the replacement value of capital variable, we find results that are consistent with those reported above.

Before concluding, we want to highlight the benefits and limitations of our sample and its ability to contribute new insights to the literature on liquidity constraints. We believe that our sample offers many advantages. First, our data is based on a representative sample of the Spanish manufacturing sector. It is not limited to publicly traded firms. Thus, we include in our sample a substantial number of firms that do not appear in many other studies of this topic. For example, while previous studies have split the sample by firm size to assess the potential for liquidity constraints, our sample includes firms so small that they would not have been sampled in previous studies. Second, we examine these issues in an economy where the level of firm-specific information on publicly traded companies is less than in the United States. Third, we are able to observe switching over time in export status. These characteristics of our sample potentially heighten the ability to observe the relationship we explore because they introduce variation in the characteristics of firms in an institutional environment that make the underlying drivers more pronounced. Moreover, these characteristics aid our ability to rule out alternative explanations. Nevertheless, our sample also has important limitations. Most important, we have excluded from the sample exiting firms. Most of the firms that exit are small firms, with limited growth and investment potential (Delgado et al. 1999). These firms are the most likely to be liquidity constrained. Moreover, because non-exporters are smaller firms these firms are likely to be non-exporters. Therefore, to the extent that the exclusion of these firms biases the results, the bias should be towards rejecting the presence of liquidity constraints. Finally, given the specifics of our data and the Spanish situation, we recognize that our results might not be fully generalizable outside of this context.

VI. Conclusion

To date, the evidence suggests that exporting is an outcome. For instance, it appears that productive firms become exporters and this drives the correlation between exporting and productivity. This suggests that the causality goes from an existing firm characteristic, being productive, to a strategic outcome, exporting.

We, however, argued that exporting has also an important impact on certain firm behavior such as capital investment. In particular, we expect that the stabilization of cash flows that results from selling in countries with imperfectly correlated business cycles allows exporting firms to have more stable capital investments. Moreover, we expect that commencing exporting signals information that mitigates liquidity constraints faced by the firm. This information includes the expectation of more stable future cash flows and the indication that the firm possesses some source of competitive advantage.

We find evidence, using a sample of Spanish firms followed over nine years, that exporters' capital investments and cash flows have lower variation than non-exporters. In addition, we find that after controlling for many firm factors, non-exporters' investments tend to vary more with the domestic business cycle, although there appears to be some lag. Most interestingly, we find evidence that exporters are less liquidity constrained than non-exporters.

Our results highlight that exporting is more than an outcome. They suggest that exporting allows firms to undertake actions that they might otherwise be unable to do. In this paper, we show evidence that exporters have advantages over non-exporters when financing their capital investments. This result has important implications when considering the strategic value of exporting for a firm. The potential benefit in the ability to make future capital investments highlights a payoff that many potential exporters might not consider when assessing the return associated with the costs of commencing exporting. Finally, our results suggest that exporters might be able to use their advantage in access to financing for capital investment, at the expense of their domestic competitors, to improve their competitive position whenever local market conditions are weak.

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Table 1. Descriptive Statistics

A. Mean values of within-firm means and mean values of within-firm standard deviations [in brackets]

	1. Unaffiliated Non-exporters	2. Unaffiliated Exporters	3. Unaffiliated Switchers	4. Affiliated
$Investment_t/Sales_t$ (percentages)	3.23 [4.24]	3.44 [3.11]	3.33 [3.53]	4.42 [3.65]
$Margin_t/Sales_t$ (percentages)	9.75 [9.47]	10.74 [7.48]	11.08 [8.91]	9.25 [7.87]
$Debt_t$/Total $assets_t$ (percentages)	52.42 [12.79]	54.12 [10.68]	58.31 [11.37]	55.07 [10.29]
Employees (Number)	26.89 [4.34]	159.02 [21.55]	59.33 [11.21]	694.18 [123.26]
Sales (1000's pesetas)	465919.70 [126785.10]	2462807.00 [584252.90]	1311747.00 [287647.50]	$1.74x10^7$ [4523269]
n	201	164	165	216

B. Means and standard deviations (in parentheses) for panel

	1. Unaffiliated Non-exporters	2. Unaffiliated Exporters	3. Unaffiliated Switchers	4. Affiliated
$Investment_t/Sales_t$	3.32 (7.32)	3.45 (4.94)	3.36 (5.65)	4.46 (7.14)
Proportion of obs. with zero $investment_t$	0.32	0.13	0.23	0.03
$Margin_t/Sales_t$	9.70 (12.72)	10.72 (10.67)	11.16 (14.10)	10.14 (12.42)
$Sales_{t-1}/Sales_t$	1.00 (0.41)	0.96 (0.22)	0.96 (0.25)	0.95 (0.29)
$Margin_{t-1}/Sales_{t-1}$	9.94 (13.55)	11.37 (11.13)	11.62 (14.40)	10.29 (13.30)
$Debt_t$/Total $assets_t$	52.04 (24.63)	54.05 (22.71)	58.02 (23.14)	54.34 (22.25)
Employees	27.72 (48.90)	160.33 (284.34)	60.10 (148.19)	647.12 (1468.48)
n	1516	1298	1278	1624

Table 2. Dependent variable: Investment/sales
Tobit with firm random-effects (t-statistics in parentheses)

	1. Unaffiliated Non-exporters	**2. Unaffiliated Exporters**	**3. Unaffiliated Exporters and non-exporters**	**4. Affiliated**
Margin/Sales	0.084*** (3.71)	0.014 (0.87)	0.081*** (4.57)	-0.035** (1.86)
ΔGDP	0.438* (1.63)	0.780*** (5.21)	0.456** (2.17)	0.314** (1.66)
Export			1.547*** (2.47)	
Export*Margin/Sales			-0.072*** (2.59)	
Export*ΔGDP			0.297 (0.99)	
$Sales_{t-1}/Sales_t$	-1.510* (1.52)	1.262** (0.61)(0.90)	(1.80) 0.374	-0.479 (0.61)
$Margin_{t-1}/Sales_{t-1}$	0.070*** (3.37)	0.023* (1.51)	0.054*** (4.10)	0.029** (1.72)
$Debt_t$/Total $assets_t$	0.021** (1.67)	0.012* (1.43)	0.019*** (2.46)	0.006 (0.55)
Constant	-0.837 (0.61)	-0.286 (0.30)	-1.011 (1.22)	3.33*** (3.43)
ρ	0.151***	0.244***	0.172***	0.138***
$\chi 2$ test of the coefficients	42.71***	35.72	82.34***	8.37
n	1516	1298	814	1624
Number of firms	201	164	365	216

* p< 0.1, ** p<0.05, *** p<0.01 (one-tailed tests)

Table 3. Dependent variable: Investment/sales
Tobit with firm random-effects

	1. Unaffiliated Non-exporters	**2. Unaffiliated Exporters**	**3. Affiliated**
Margin/Sales	0.082*** (3.61)	0.020 (1.18)	-0.033** (1.77)
$Sales_{t-1}/Sales_t$	-1.903** (1.77)	1.291** (1.81)	0.019 (0.03)
$Margin_{t-1}/Sales_{t-1}$	0.070*** (3.34)	0.028** (1.88)	0.020 (1.21)
$Debt_t$/Total $assets_t$	0.022** (1.72)	0.013** (1.57)	0.002 (0.19)
Constant	0.828 (0.61)	-0.196 (0.85)	7.310*** (7.05)
1992	-0.881 (0.91)	0.304 (0.56)	-2.730*** (4.15)
1993	-1.234 (1.25)	-0.414 (0.76)	-3.646*** (5.46)
1994	-1.321* (1.35)	0.416 (0.75)	-3.819*** (5.73)
1995	-2.465** (2.48)	0.422 (0.77)	-3.754*** (5.70)
1996	-0.652 (0.50)	0.441 (0.81)	-3.167*** (4.82)
1997	0.450 (0.46)	1.090** (2.01)	-3.691*** (5.63)
1998	-0.074 (0.08)	2.79*** (5.17)	-3.270*** (4.99)
ρ	0.153***	0.245***	0.147***
$\chi 2$ test of the coefficients	52.57***	54.97***	58.33***
n	1516	1298	1624
Number of firms	201	164	216

(t-statistics in parentheses)

* p< 0.1, ** p<0.05, *** p<0.01 (one-tailed tests)

Table 4. Dependent variable: Investment/sales
Tobit with firm random-effects

	1. Unaffiliated Switchers	**2. Unaffiliated Switchers**
Margin/Sales	0.070*** (3.91)	0.110*** (4.44)
ΔGDP	0.579*** (2.95)	0.892*** (3.27)
Export		0.526 (0.70)
Export*Margin/Sales		-0.072*** (2.33)
Export*ΔGDP		-0.513 (1.27)
$Sales_{t-1}/Sales_t$	-1.470** (1.72)	-1.404** (1.65)
$Margin_{t-1}/Sales_{t-1}$	0.035** (2.31)	0.035** (2.28)
$Debt_t$/Total $assets_t$	-0.005 (0.51)	-0.004 (0.41)
Constant	2.032** (1.71)	1.587 (1.27)
ρ	0.199***	0.208***
$\chi 2$ test of the coefficients	45.01***	57.36***
Incremental $\chi 2_{(3)}$		12.35***
n	1278	1278
Number of firms	165	165

(t-statistics in parentheses)

* p< 0.1, ** p<0.05, *** p<0.01 (one-tailed tests)

Figure 1. Spanish Quarterly GDP growth 1990 – 1998

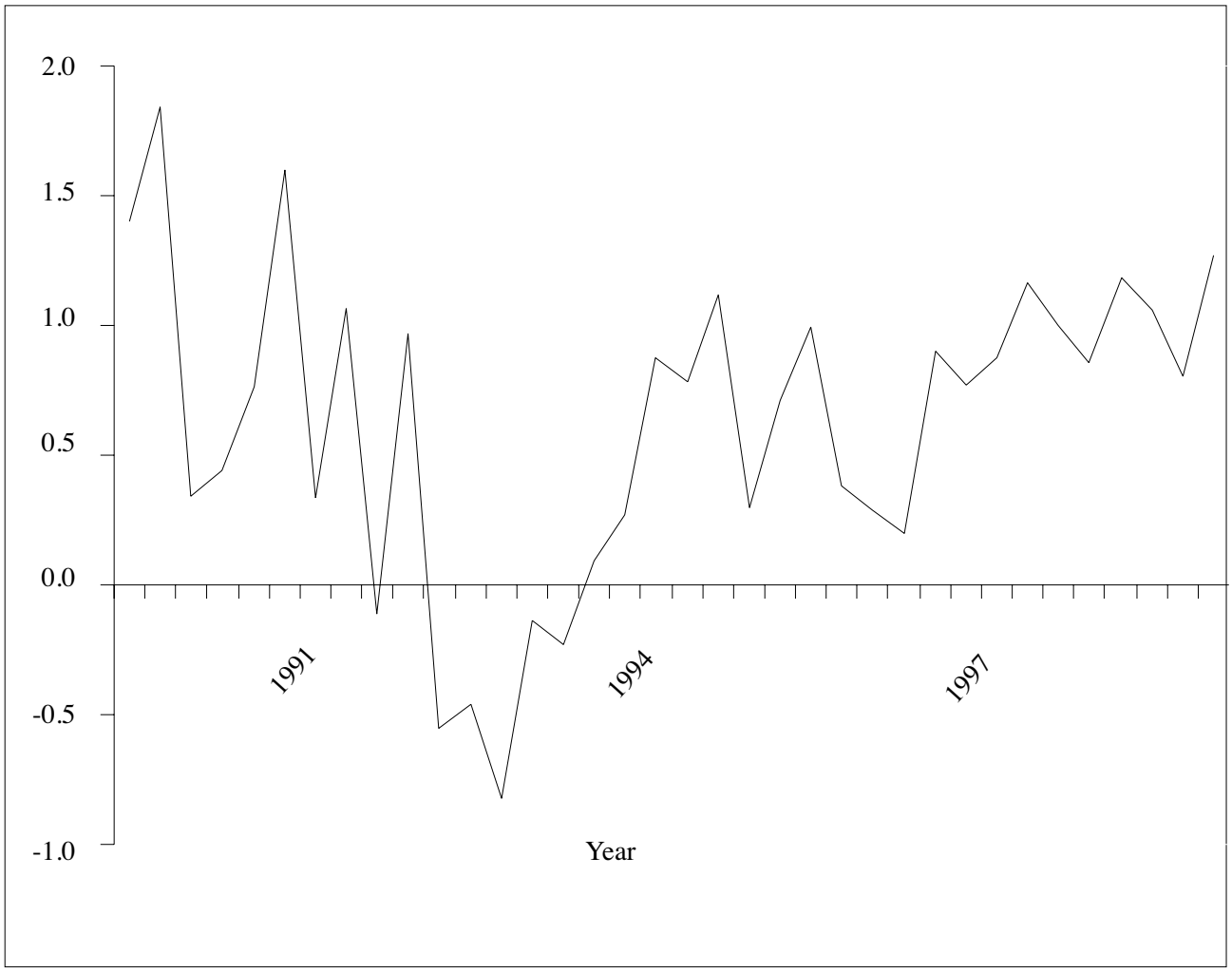

Figure 2: Year effects from Table 3