Financial health, exports, and firm survival: Evidence from UK and French firms*

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Abstract

We use firm level data to assess the role of exporting in the link between financial health and firm survival. The data are for the UK and France. We examine whether firms at different stages of export activity (starters, exiters, continuers, switchers) react differently to changes in financial variables. In general, export starters and exiters experience much stronger adverse effects of financial constraints for their survival prospects. By contrast, the exit probability of continuous exporters and export switchers is less negatively affected by financial characteristics. These relationships between exporting, finance and survival are broadly similar in the British and French sub-samples.

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Introduction

It is by now well accepted that there is a link between the financial health of a firm and its export activity. Studies such as Minetti and Zhu (2011), Berman and Hericourt (2010), Forlani (2010) and Muuls (2008) show that firms' export decisions are negatively affected by liquidity constraints, while Greenaway et al. (2007) and Bellone et al. (2010) also look at the impact export activity has on the financial health of the firm.[1] Here, Greenaway et al. (2007) find, based on UK data, that exporting improves firms' financial health while Bellone et al. (2010) do not find any evidence for this in their French firm level data. Bricongne et al. (2011) show that financing constraints during the recent crisis worsened the export position of French constrained firms, however, their overall effect on trade was limited.

Financial health is also an important determinant of firm survival. For example, Zingales (1998) shows convincingly, using data for the US trucking industry that highly leveraged firms are less likely to survive, even when controlling for other observable firm characteristics. Similar evidence has been produced for other industries and countries, see, for example, Bunn and Redwood (2003) for UK manufacturing and services industries and Musso and Schiavo (2008) for French manufacturing firms. Clementi and Hopenhayn (2006) incorporate the link between financial constraints and plant exit in their theoretical model of firm dynamics.

What is less well researched is the role firm heterogeneity, in terms of exporting, may play in the finance-survival nexus. While Greenaway et al. (2008) provide evidence that exporters are more likely to survive than comparable other firms, they do not consider a possible role of access to finance. To our knowledge the only study that does examine the possible relationship between exporting, financial health and firm survival is Bridges and Guariglia (2008). They look at the impact of financial constraints on firm survival,

[1] These empirical studies are generally motivated by recent theoretical work in the heterogenous firm tradition. For example, Chaney (2005) shows that being an exporter provides a signal that the firm is wealthy and liquid enough to pay the sunk cost to enter the foreign market. Manova (2008) expands on this by showing how financial constraints matter for countries' export patterns, using a heterogeneous firm type model.

distinguishing between exporters and non-exporters.

We contribute to this strand of literature by investigating whether the expected negative impact of financial constraints (lack of access to external finance) on firm survival depends on the export status of a firm. We are not only concerned with exporting per se, but rather dig deeper and distinguish a number of different types of firms. First, there are "continuous non-exporters" which never engage in export markets. This is our baseline comparison group. Second, there are firms that start to export during our sample period, these are termed "export starters". Third, there are those that stop exporting but still operate in domestic markets, we term this group "export exiters". Firms that enter and exit the export market more than once are regarded as a separate group and termed "export switchers". Finally, there are those firms that export continuously, these are "continuous exporters".

Such a distinction may be important, as not all exporters are the same, in particular (from our point of view) with regard to their need of external finance. To fix ideas, consider a model of firm's decisions to export which involve sunk costs of export entry and exit, as in Roberts and Tybout (1997) or Baldwin (1988), which introduces hysterisis in the export decision. Export starters are firms that enter export markets. They have to overcome the sunk costs of exporting, such as setting up distribution networks, customizing products for foreign markets etc. Hence, these are firms that may have to rely heavily on external finance for their operations. Export exiters leave the export markets. One reason for doing so may be a deterioration in their financial position.[2] It is likely that there are sunk costs of exit (costs to close down operations in the foreign market), which may exacerbate any financial constraints that the firm faces in their home operations. Compared to these two types of firms, continuous exporters are firms that are successful on the export markets and that are financially healthy (see Greenaway et al. (2007)). These firms may, hence, have little need for external finance. Export switchers, finally, are firms that are associated with high levels of flexibility and adaptability (Harris and Li (2010)) which also suggests good financial health

[2]Girma et al. (2003) show that firms that exit from export markets are smaller in terms of employment and output, and less productive than continuous exporters, which is in line with this conjecture.

and, hence, less susceptibility to financial constraints.

Due to these differences in the need for access to finance, our working hypothesis is that, relative to the comparison group of non-exporting firms, export starters and exiters may be more responsive to financial constraints for survival, while we would expect the opposite for firms that always export or those that switch status frequently. The main goal of our paper is to provide empirical evidence for this.

This is not only of academic interest but also highly relevant for policy, in particular, but not only, in the wake of the recent financial crisis. If access to finance is the sole determinant of survival, then government policy concerned with firm exit needs to target financial markets and institutions. If the export status of firms also matters in this relationship, then government policy needs to think very carefully about any moves towards more protectionism or any export promotion strategies.[3] From an economic policy point of view, understanding firms' survival is important, as exit, survival and growth of firms are important aspects of industry dynamics, forming the competitive landscape in an economy.

We study this issue using firm level panel data for two countries, namely the United Kingdom and France. The use of data for two countries allows us to be more confident about the external validity of our results and avoid drawing conclusions that are very specific to one country. Both countries are among the largest exporters in the EU. While both countries share similarities (in particular being members of the EU), there are also differences. Perhaps the most important one in our context being the difference in financial institutions. It is well documented that the UK has a more "market-based" and France a more "bank-based" approach to company finance (Benito (2005); Bond et al. (2003); Carlin and Mayer (2000) and Rajan and Zingales (2003)).[4] It is therefore important to see whether our results are

[3]For example, if "good" firms self select into exporting, but, as we show in the empirics, export starters may be more prone to financial constraints, increasing their failure probability, then this selection effect may be suboptimal.

[4]A discussion of the principal differences between the two structures is given in Rajan and Zingales (2003). Data from the World Development Indicators (November 2008 version) show that the average stock market capitalization, as measured by stock market capitalization over GDP, for the two countries is 1.5 for the UK and 0.8 for France. Also, using our firm level data we find that the ratio of short term debt to total debt as a proxy for bank dependence has a median of 0.98 for France and 0.82 for the UK. This lends support to

robust and observable in both countries, or whether they are specific to one particular country.

Our approach is to model empirically the probability of firm survival conditional on a number of firm characteristics (and controls) using a hazard model. The analysis uses data from Amadeus, a firm-level dataset which is particularly suited to our work, since it provides comparable data for European countries. It provides detailed financial information for the two countries that we use to calculate a number of indicators that proxy for the financial health of firms.[5] We look in detail at the export status of a firm, in particular whether a firm is an export starter, exiter, continuous exporter, switchers or continuous non-exporter. The sample period is 1998 to 2005.

Our empirical results show that the impact of access to finance on firm survival indeed differs depending on a firm's export status. In general, export starters and exiters experience much stronger adverse effects of financial constraints for their survival prospects. By contrast, the hazard of failure of switchers and continuous exporters is less negatively affected by financial variables. This might be due to their good financial health and established reputation in the exporting market. Further, we find that these results are broadly similar for British and French firms, suggesting that the findings are not specific to one particular country with certain institutional characteristics. The results are robust to a number of changes in the econometric specifications.

The rest of the paper is organised as follows. Section I describes the data, introduces the variables to be used in the econometric analysis and provides some descriptive statistics. Section II presents the econometric methodology and section III discusses the estimation results. Section IV reports the robustness checks. Section V concludes the paper.

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the idea that financial institutions in the two countries are different.

[5]Amadeus is complemented by the Zephyr database which is used to identify firms that are mistakenly coded as "dead" in the former data due to mergers and acquisitions.

I Data and summary statistics

To investigate the link between firms' financial shape and their survival prospects, we focus on two large European export countries, namely France and the United Kingdom. According to Mayer and Ottaviano (2007), France and the UK are the second and the third biggest European exporters.[6] In our dataset 67% of French firms export whilst 44% of the UK firms are exporters. The figure for France is in line with Bellone et al. (2010) and Mayer and Ottaviano (2007) who show that French exporters are 62% and 65%, respectively. A common characteristic of our dataset (Amadeus) and their French data is that not only small and medium sized firms are included in our sample but also large that are more likely to export.[7] As for our UK sample, the percentage of exporting firms is higher than Mayer and Ottaviano (2007) and lower compared to Greenaway et al. (2007). Both papers employ the Fame data with the former to find that 28% of the UK firms to export their products and the latter 62%.

We use data from company accounts recorded in the Amadeus database and data on mergers and acquisitions from the Zephyr database, both distributed by Bureau Van Dijk.[8] Amadeus is a pan-European financial database that includes firm-level accounting data in standardized financial format for balance sheet items, profit and loss items, and financial ratios.[9] In addition to financial information, Amadeus also assigns companies a four-digit NACE Rev. 1 code which we use to classify firms and construct industry dummy variables. Our sample is limited to firms that operate in the manufacturing industry.[10] The sample

[6]Germany, the largest exporter in Europe, cannot be investigated due to a lack of exporting data in the Amadeus database.

[7]Eaton et al. (2004) show that only 21% of the manufacturing firms export. A possible explanation is that their French data are nearly comprehensive and contain many more small firms who are less likely to export.

[8]To be included in Amadeus companies must satisfy at least one of the following criteria: i) turnover greater than 15 million EUR; ii) number of employees greater than 150; iii) total assets greater than 30 million EUR.

[9]In some cases, sales data for UK firms are missing in Amadeus. In these cases, we rely on the Fame database (as used by, e.g., Greenaway et al. (2007)) - also distributed by Bureau Van Dijk - to extract information for our sample.

[10]Firms are allocated to one of the following nine industrial groups: food, drink and tobacco; textiles,

period is 1998-2005.

One distinctive characteristic of our dataset is that it provides information on unlisted companies. In particular, our data reveal that 99.9% of firms are not publicly quoted. This feature of the data allows for a wide degree of variation across observations in our sample. Having such detailed financial data on two large EU exporters, the UK and France, is of particular importance for the comparison of their survival prospects given the high degree of heterogeneity across firms in terms of size. Looking at the quartile distribution of various size measures in Table 1, we observe the variation over firms in terms of real sales, real total assets and number of employees. The median UK and French firm has an average of 187 and 151 employees which falls in the small and medium-sized enterprise category of the European Commission.[11] As for the level of assets and turnover, figures reveal that firms are mainly large in size. Finally, it is worth noting that throughout the turnover distribution French firms display higher values than UK firms.

In order to model firm survival we need a reliable indicator of firm death. As in, e.g., Bridges and Guariglia (2008) and Bunn and Redwood (2003), we define a firm as failed (dead) in a given year if its company status is that of receivership, liquidation, or dissolved.[12] One concern with that definition is that it may falsely classify a firm into one of those three categories due to a takeover or merger. In order to avoid this problem we also employ the Zephyr database to identify firms that merged with another firm but that are mistakenly coded as 'dead' in the Amadeus data. This ensures that our indicator variable has been accurately constructed to capture firms that failed and did not exit the sample due to mergers and acquisitions.

We employ a number of firm-specific and financial indicators as covariates in the empir-

clothing, leather and footwear; chemicals and man made fibres; other minerals and mineral products; metal and metal goods; electrical and instrument engineering; motor vehicles and parts, other transport equipment; mechanical engineering; and others (Greenaway et al. (2007)).

[11]Enterprises qualify as small and medium-sized (SMEs) if the number of employees are between 50 and 250 and turnover or balance sheet total are between €10 and €50 mill. and €10 and €43 mill. respectively.

[12]Note that we only define a firm dropping out of the database as exit if the company status also falls into one of those three categories. Otherwise, it is a right censored observation. Also note that, in what follows, we use the terms failure and survival interchangeably.

ical analysis. The first one is the coverage ratio ($COVERAGE$), or cash flow on interest payments. This measures the extent to which cash flow is sufficient to pay for financial costs and is therefore related to credit worthiness. The coverage ratio has been used in earlier studies (see Gertler and Gilchrist (1994) and Guariglia (1999)) as a measure of the balance sheet strength; the higher the coverage ratio, the stronger the balance sheet. We expect to find a negative impact of coverage on the probability of firm failure.

Our second financial characteristic is leverage ($LEVERAGE$) which is measured as the firm's short-term debt to assets ratio. A high leverage ratio is associated with a worse balance sheet situation. This may increase moral hazard and adverse selection problems, and lead to the inability of firms to obtain external finance at a reasonable cost. Farinha and Santos (2006), Bridges and Guariglia (2008) and Zingales (1998) argue that higher leverage results in higher failure probabilities. Should this effect prevail, one would expect a negative relationship between leverage and the probability of survival. Yet, some authors argue that the probability of obtaining external finance increases for firms with high leverage (see Dennis and Mihov (2003)). A high rate of leverage can be seen as an indicator of a good credit standing and high borrowing capacity of firms. Also, Nickell et al. (1997) suggest that high levels of debt or high interest payments act as a disciplining device on managers and therefore improve company performance. One would therefore expect a positive relationship between leverage and the probability of survival. In any case, we expect financial leverage to significantly affect the firm's probability of survival.

In addition to financial indicators, we are interested in examining the impact of exporting activity on the likelihood of survival. There is evidence that exporters are more financially healthy compared to non-exporters and face higher probabilities of survival (Greenaway et al. (2007), Bellone et al. (2010) and Greenaway et al. (2008)). However, the role of heterogeneity among exporters has not been investigated in much detail, and this is what we do in this paper. Hence, we split firms into export starters, exiters, switchers, continuous exporters

and continuous non-exporters.[13]

Specifically, *Export Starters* are those firms that export in t, but not in previous years i.e. t-1 and t-2 etc, *Export Exiters* are defined as those firms that exported in t-1 and t-2 but not in t. The *continuous Exporters* are defined as those firms that export throughout the sample. The *Switcher Exporters* are firms that enter and exit the export market several times. The $continuous\ non-exporters$ are those firms that never export in our data. We would expect that continuous exporters have the lowest probabilities of exiting, as these are the most financially healthy group of firms (Greenaway et al. (2007)). All other things equal, export starters should also have low exit probabilities, as these are also healthy firms that were able to overcome the sunk costs of exporting. Switchers are more flexible firms which are capable of changing their export status frequently. Therefore, their likelihood of failure should also be low. Export exiters and non-exporters may be the firms with the highest failure probabilities.

As suggested by e.g., Audretsch and Mahmood (1995), Mata and Portugal (1994) and Dunne et al. (1988), we also control in the empirical model for firm size and age. $SIZE$ is the firm's real sales at time t.[14] We also include $SIZE^2$ to allow for non-linearities in the size-survival relationship. Furthermore, we include a variable defined as the current age (AGE) of firm i at time t and its square (AGE^2).

Numerous studies have recognized that productivity is one of the most important determinants of firm survival (see Hopenhayn (1992) among others). We construct labour productivity as sales per employee.[15] We anticipate more productive firms to be more likely to survive. Table 2 presents the empirical predictions of the effects of our covariates on firms failure.

In order to clean our data we apply selection criteria that are common in the literature,

[13]Amadeus data do not provide information on exports at the product level or export destinations.

[14]To check the robustness of our results we use two alternative measures of size such as real total assets and the number of employees. Our results remain largely unaffected.

[15]We were not able to estimate the total factor productivity using the methodology suggested by Levinsohn and Petrin (2003) due to missing data for the French sample.

and exclude companies that did not have complete records on our explanatory variables, and firm-years with negative sales. To control for the potential influence of outliers, we excluded observations in the 0.5 percent from the upper and the lower tails of the distribution of the regression variables. These cut-offs are aimed at eliminating extraordinary firm shocks, or coding errors. Next, we delete from our sample firms that report only consolidated accounts, to avoid double-counting firms and subsidiaries or operations abroad. For most firms in Amadeus, unconsolidated statements are reported and consolidated accounts are provided when available. Our final panel has an unbalanced structure with a total of 26,320 annual observations (firm-years) on 3,566 UK firms and 33,996 observations on 4,826 French firms.

Tables 3 and 4 present descriptive statistics for the UK and French data respectively. Means and standard deviations of the main variables of interest are reported for the entire sample (column 1), for surviving firms and failed firms (columns 2 and 3). Further, the p-values of a test for the equality of means of surviving and failed firms are presented in column 4. For the UK sample, 379 out of 26,320 firm-years were recorded as failed whereas for the French sub-sample 1,435 out of 33,996. We observe that the percentage of firm failure is higher for French firms (4.2%) compared to their UK counterparts (1.4%).[16]

Looking at the size measures (employment and sales), we observe that overall there appear to be statistically significant differences between surviving and failed firms. We observe that surviving firms are in general older and more productive. Regarding the financial variables, surviving firms are less indebted (leverage) and more creditworthy (coverage). Mean differences are statistically significant in all cases but one (coverage for the UK sample).[17] In most cases these differences between surviving and failed firm-years are similar for both countries. In terms of exporting we find that there is a higher share of continuous exporters and export starters among surviving firms, although the difference for export starters is not

[16]While these numbers may appear to be low, they are in line with previously reported UK evidence (see Bridges and Guariglia (2008); Bunn and Redwood (2003) and Lennox (1999)).

[17]Due to the sizeable differences in the standard deviations of financial indicators between the two samples, we standardize the variables across the samples to get the same variances. Therefore, all econometric estimations are based on standardized variables.

statistically significant in the UK sample.

Table 5 takes a different angle on descriptive statistics and shows how the mean values of our financial variables and the failure dummy differ within exporting groups. Starting with the rate of failure, it is apparent that exiters and non-exporters are more likely to fail followed by starters and switchers. Continuers face the lowest rate of failure compared to other groups. Looking at the p-values from tests of equality of means shows that the differences between continuers and starters or exiters, respectively, are statistically significant. Looking at the leverage variable, starters, switchers and exiters are more likely to be indebted than non-exporters and continuers. Comparing the first three columns we note that firms which continuously export have lower debt than starters and exiters and this difference is statistically significant. As for coverage, continuers appear to be more creditworthy, however, the differences between the first three groups are statistically significant for the French firms only.

Three points can be highlighted from these preliminary statistics. First, a firm's financial health appears to be correlated with the survival probability. Second, being engaged in exporting activity is significantly associated with better survival prospects. Third, the financial health of firms and the exporting status are interrelated. Based on our data, there appears to be a distinction between the financial position of continuers and other groups. In the following sections we provide formal econometric evidence to account for the confounding effects of financial and other factors that may influence the incidence of firm survival.

II Econometric Methodology

To evaluate the differential effects of financial status and exporting activity on the likelihood of survival we use a complementary log-log model (cloglog), a discrete time version of the Cox proportional hazard model.[18]

[18]To capture the particular nature of the dataset, given that it is collected on a yearly basis, the cloglog model is more appropriate than the standard Cox model. See Jenkins (2005) for an excellent overview of

The assumption of the proportional hazard model is that the hazard ratio depends only on time at risk, $\theta_0(t)$ (the so-called baseline hazard) and on explanatory variables affecting the hazard independently of time, $exp(\beta' K)$. The hazard ratio is then given by:

$$\theta(t, K) = \theta_0(t) exp(\beta' K) \tag{II.1}$$

The discrete-time hazard function, $h(j, K)$, shows the interval hazard for the period between the beginning and the end of the j^{th} year after the first appearance of the firm. This hazard rate, which is the rate at which firms fail at time t given that they have survived in $t-1$, takes the following form:

$$h(j, K) = 1 - exp[-exp(\beta' K + \gamma_j)] \tag{II.2}$$

where we are particularly interested in identifying the β parameters, which show the effect of the explanatory variables incorporated in vector K on the hazard rate.[19]

We set out a benchmark model to estimate how firms' survival prospects are affected by their financial conditions and the different facets of exporting activity using the set of exporting status dummies:

$$h(j, X) = 1 - exp[-exp(\beta_0 + \beta_1 X + \beta_2 Y + \beta_3 Z + \gamma_j)] \tag{II.3}$$

where X is a vector of exporting dummies which consists of $starters$, $continuers$, $exiters$ and $switchers$. The reference category is the group of firms that never export. The direct effect of exporting groups is judged from the sign and significance of the coefficient β_1. Y, denotes the vector of financial variables $leverage$ and $coverage$. Both variables capture different aspects of the financial health of a firm. This is also confirmed by the low correlation

complementary log-log and proportional hazard models.

[19] $gamma_j$ is the log of the difference between the integrated basline hazard evaluated at the end and the beginning of the interval. It, thus, captures duration dependence. We do not impose any restrictions on these parameters, rather we estimate a full set of $gamma_j$ time dummies.

values between the pair (-0.077 and -0.121 for the UK and French sample respectively). The sign and significance of β_2 shows the importance of financial health on firms' survival. Finally, vector Z incorporates firm level controls *size*, $size^2$, *age*, age^2 and *labour productivity*. In addition, our model includes a full set of time, industry and interactions between time and industry dummies. The latter controls for industry-specific shifts across the time period.

The main aim of the paper is to assess whether the response to financial characteristics varies with the exporting status of firms. To test this hypothesis we modify equation $II.3$ to contain interaction terms between variables proxying for different aspects of exporting activity and financial indicators. Therefore, we interact vector X with vector Y. This yields the following empirical model which will be the main focus of the paper:

$$h(j, X) = 1 - exp[-exp(\beta_0 + \beta_1 X + \beta_2 X * Y + \beta_3 Y + \beta_4 Z + \gamma_j)] \qquad \text{(II.4)}$$

The sign and significance of the interacted terms reveal whether the impact of access to finance on firm survival differs for starters, exiters, switchers and continuous exporters. Note that all regressors are lagged by one period (t-1) in order to reduce endogeneity concerns.

III Econometric Results

Firm Survival and Exporting Activity

In order to provide a benchmark we begin the econometric analysis by estimating equation (II.3) separately for the UK and French samples. The results are presented in Table 6. The predicted probability of exit, evaluated at the mean of the independent variables, is 1.46% and 3.98% for the UK and France, which are close to the actual exit rates reported in the summary statistics. The first two columns of the Table present the direct effect of the financial variables without considering export, and columns 3 and 4 report the impact of exporting and financial health. In all cases, leverage is found to exert a positive effect

on the hazard of failure. This result is in line with previous evidence that high levels of debt would increase moral hazard and asymmetric information problems, and would lead to a higher probability of failure (see Farinha and Santos (2006), Bridges and Guariglia (2008) and Zingales (1998)). The coefficients on coverage are negative. This result gives support to the idea that firms that are able to repay debts by using their cash flow, are more creditworthy (see Gertler and Gilchrist (1994) and Guariglia (1999)) and, hence, are expected to achieve higher survival probabilities (or lower exit probabilities).

Considering the impact of exporting status on survival we observe that starters, switchers and continuous exporters attract negative and highly significant coefficients. In other words, being in one of those three groups of firms is associated with significantly lower exit probabilities. Export exiters, however, are more likely to exit than the reference group of non-exporters. This is the case for both countries. These findings are in line with expectations: Export starters and continuous exporters are highly efficient firms that operate in international markets. Export switchers are firms that are capable of switching their export status easily and, therefore, are associated with higher levels of flexibility and adaptability (Harris and Li (2010)). By contrast, firms that exit the export market have many of the characteristic of firms that exit the industry completely, and export market exit is likely to reduce firm productivity (Girma et al. (2003)).[20]

In order to illustrate the economic significance of the point estimates we use the example of export starters. The coefficients suggest that the probability of failure is decreasing by 68% for UK firms and by 57% for French firms, ceteris paribus, following a switch from continuous non-exporters (the base category) to export starters. This is equivalent to a reduction in the predicted exit probability by around 1 percentage point in the UK and 2.27 percentage points in France.[21],[22]

[20]Tests for the equality of the coefficients on the exporting dummies across the two samples are presented at the foot of the Table. We find that the differences between the coefficients are statistically significant with the only exception being the coefficient on export starters.

[21]This is calculated at the mean exit probability of 1.46%, using the exponentiated coefficient: 1-exp(-1.139) =0.68, (0.68*1.46)=1%

[22]The coefficients on exiters and switchers are very high for the UK sample. This may be caused by the

Our results confirm the importance of distinguishing between different exporting groups in order to evaluate their survival prospects. Exporters might be productive and efficient firms compared to non-exporters however, our finding show variations in the probability of survival of different exporting statuses with exiters to be more likely to fail. Moving to the impact of leverage and coverage, we find that these remain statistically significant in both samples.

The interaction between exporting and finance

In this section we set out to investigate the main concern of this paper, namely, whether firms with different exporting status exhibit different effects of financial variables on their survival probabilities. A priori, we would expect changes in firms' financial conditions to make export starters more vulnerable, as they have to incur additional payments to cover the sunk entry costs. A similar outcome is expected for firms exiting the export market, as these may be expected to be in poor financial health and additionally face costs of exit. As for continuous exporters, these are generally firms that are financially healthy and, hence, their prolonged participation in the foreign market may be expected to shield them from unexpected financial changes. Finally, switchers are firms that enter and exit the market several times and therefore the entry and exit cost might not affect their decisions to operate abroad. If they are financially sound firms we would expect changes in their financial position to have a less important impact on their survival chances.

In order to look at these issues we estimate variants of equation (II.4) where we interact our financial variables with the export status dummies (starters, continuous, exiters, switchers). The interaction gauges the change in the response to financial variables for each export group relative to the reference category, continuous non-exporters. The empirical results for both countries are reported in Table 7 and a test for equality of coefficients in Table 8. In

small number of observations for both groups. Hence, we need to be careful in interpreting the magnitude of the results for these two groups.

columns 1 to 4 we estimate equation (II.4) including our financial indicators, leverage and coverage in succession, and in columns 5 to 6 we include them jointly.

We start with Table 7 columns 1 and 2. Note, firstly, that we obtain similar coefficients as in Table 6 for our control variables and export dummies. Also, the magnitude and statistical significance of the interaction terms are similar across both samples. The tests for equality of coefficients in Table 8 suggest significant differences only for the interaction of leverage with continuous exporters; this effect is stronger in the UK sample.

In terms of financial variables, the positive and statistically significant coefficients on the interaction of leverage with the starters dummy indicate that export starters are more responsive to increases in debt in terms of their probability to exit. In other words, compared to non-exporters, changes in debt have stronger negative effects on the survival probabilities of starters exporters. This is in line with the idea that sunk start-up costs have increased the debt obligations of export starters so a further rise in their debt level strongly deteriorates their survival prospects. Results are similar for exiting firms. They are likely to be in a bad financial shape therefore it might be difficult to extend their debt while existing debt will become burdensome due to liquidity problems. This corroborates preliminary statistics discussed in Section I, Table 5. By contrast, the coefficients on leverage for continuous exporters are negative and statistically significant. This implies that continuous exporters are less negatively affected by leverage. This is not surprising given previous evidence that continuous exporters have a better financial status compared to other firms (Greenaway et al. (2007)). We find similar results for export switchers, as expected.

Moving to columns 3 and 4, it appears that there is no statistically significant difference in the link between coverage and survival for continuous non-exporters (base category) and export starters, exiters or switchers. For all cases, increases in coverage are associated with lower exit probabilities. This suggests that coverage, as a measure of creditworthiness, improves a firms' survival probabilities, irrespective of the export status. The only exception is the group of continuous exporters, where we find a negative and statistically significant

coeffcient on the interaction terms. This points to the idea that an increase in coverage improves the survival of continuous exporters strongly since high coverage ratio, a proxy for the strength of the balance sheet, indicates a lower external finance premium and better financial health. This only holds for the UK sample, however. The probability of survival for French continuers displays no difference with the survival prospects of the continuous non-exporters.[23]

In columns 5 and 6 of Table 7 we report estimates of the equation (II.4) where both financial variables are included at the same time. The sign and significance of the coefficients on the interaction terms remain unchanged for both countries.

Overall, hence, the results in this table emphasise the differential effects of financial variables on survival probabilities for export starters, exiters, switchers, and continuous exporters. Further, our findings indicate that there are no notable differences in the behaviour of French and UK exporters apart from continuers.

IV Robustness Checks

In this section we provide a series of robustness checks. As we show, our results are robust to changes in the model specification, and endogeneity.

Additional control variables

To start with, we estimate an alternative model where leverage and coverage are additionally interacted with firm size. This is done in order to make sure that the interaction terms of financial variables and exporting do not merely pick up interaction effects between financial health and firm size. The results are reported in Table 9, columns 1 and 2.[24] We can see

[23]The difference between the UK and France is in line with two findings in the literature. Bellone et al. (2010) use French data and find that exporting does not increase a firm's liquidity position, while Greenaway et al. (2007) find that this is the case for UK data similar to ours.

[24]To save space, Tables 9-11 only show the coefficients on our financial indicators and the interactions terms. Results on $size$, $size^2$, age, age^2, productivity and the constant are not reported for brevity. Full estimates are available upon request.

that overall our findings do not change compared to Table 7 (columns 5 and 6).

In a further robustness check we include a number of additional control variables that have been previously found important to explain the firm's probability of survival. We include two firm-specific characteristics, namely, a dummy for subsidiaries to control for the benefits of being a member of a group (see Disney et al. (2003)) and a foreign ownership dummy to control for firms' ownership status (see Görg and Strobl (2003)).[25] Both foreign ownership and group status may be correlated with financial variables, as both types of firms may be better able to use internal funds. Hence, controlling for these may be important to identify the relationship between finance and survival. Furthermore, we include the capital intensity of the industry to control for time varying industry effects which may be correlated with the financial situation at the industry level.[26] Our firm-specific variables are interacted with leverage and coverage to fully control for changes in the financial condition of firms. Estimates are reported in columns 3 and 4 of Table 9. Importantly, results on the financial variables, export dummies and their interactions remain largely unchanged in terms of sign and statistical significance.

Next, we interact firm age with the exporting status variables. Age of a firm has been used in the literature as an alternative indicator of financial constraints (e.g., Carpenter and Guariglia (2008)). In order to ensure that our results are not driven by age, we re-estimate Equation II.4 including these additional interaction terms. Columns 5 and 6 of Table 9 show that even after controlling for firm age the results on interacted leverage and coverage are very similar both quantitatively and qualitatively for all types of exporting status to those presented in Table 7.

In a further specification we re-estimate Equation II.4 by including the squared terms for leverage and coverage in order to check for non-linearities in the finance - survival relationship. Our aim is to confirm that our main results do not change even after controlling

[25]To proxy for ownership we use a dummy variable ($FOREIGN-OWNED$) which is equal to 1 if the share of foreign ownership in a firm's equity exceeds 25%.

[26]We define capital intensity ($CAPITAL-INTENSITY$) as the ratio of capital over the total number of employees at the industry-level (calculated at the 4-digit level).

for the potential non-linear behaviour of our financial indicators. Comparing our results in Table 9 (columns 7 and 8) with those shown in Table 7 we observe that our findings are very similar. Exceptions are the coefficients on the interaction of export starters and leverage, which are now statistically insignificant.

External Finance Dependence

Manova (2008) shows that firms belonging in certain industries (Electric machinery, machinery and equipment, glass and products, drugs, petroleum and coal products) require more external finance in order to engage in exporting. This is also confirmed by Rajan and Zingales (1998) who argue that the same industries depend heavily on external finance primarily due to technological reasons. In order to account for differences between the two samples in terms of size and financial characteristics we control explicitly for interaction terms between sector-specific financial dependence and our financial variables. Table 10 shows interactions between leverage and coverage with the external finance dependence dummy.[27]

Results in Table 10 are similar to those in Table 7 (columns 5-6), showing that the financial position of the firm will affect the hazard of failure of different exporting statuses. However, the distinction between high and low external finance dependent firms shows that the balance sheet health of exporters in high-tech industries is of great importance for their survival prospects. In particular, exporters in industries with high external financial need react more strongly to changes in leverage and coverage.

Alternative financial variables

So far we have used leverage and coverage as proxies for the financial position of firms. We now replace those two variables with fixed assets and cash flow and re-estimate our model to check that our results do not significantly change. Cash flow has been used as a measure

[27]The dummy $High$ is equal to one if the firm is operating in one of the following industries: Electric machinery; machinery and equipment; glass and products; drugs; petroleum and coal products, and zero otherwise.

of financial strength in the firm dynamics literature (see Spaliara (2009), Guariglia (2008), Clementi and Hopenhayn (2006) and Bond and Van Reenen (2006) for a survey). We expect firms with high levels of internal funds to be more likely to survive than firms with low levels of retained earnings. In Table 11 we show that changes in the level of cash flow will positively affect the survival of firms and in particular starters and continuers. The remaining two groups do not face significantly different survival prospects from the base category (non-exporters). The sign of the coefficients on fixed assets point in the same direction however the significance of the results is weak. We conclude that cash flow is a better indicator of firms' financial health for our purposes.

Instrumental variables

A final robustness check deals with the potential endogeneity of the export and financial variables in our model. While this concern may be mitigated by the use of regressors evaluated at time t-1 in our model, and by the inclusion of additional control variables in the robustness checks, we also go one step further and use instrumental variables techniques. To do this, we estimate an instrumental variables probit model as described in Wooldridge (2010). The estimation of probit models with continuous endogenous explanatory variables involves two steps: i) run the OLS regression for each endogenous variable on the instrumental variables and all other exogenous regressors and save the residual terms, and ii) estimate a probit model by including the residual terms from step (i) in the list of regressors. Two and three lags of our financial variables are used as instruments. The residual terms are correction terms for the endogeneity problem, and jointly statistically significant coefficients can be taken as evidence in favour of the hypothesis that instrumented variables are endogenous.

Table 12 illustrates the results when we take into account the endogeneity concerns. We see that our findings are in line with previously reported results in Table 7. Further, the tests for the joint significance of the endogeneity-correction terms show that the hypothesis of exogeneity is rejected in all cases. In order to test the validity and the relevance of

our instruments we estimate a linear instrumental variables model using the same set of instruments as in the two-step IV model. The Sargan test statistic of the overidentifying restrictions reported at the bottom of the Table, suggests that our instruments are valid. Further, the Anderson canonical correlation test statistic rejects the null and suggests that the model is identified therefore the instruments are correlated with the endogenous variables. Thus, we can conclude that our main results are not biased due to endogeneity of regressors.

V Conclusion

We use firm level data for the UK and France to investigate the link between a firm's financial health, its export activity and survival. In particular, we look at whether firms at different stages of export activity (starters, continuers, exiters, switchers) react differently to changes in financial variables. This may be expected as starters and exiters face potentially heavy costs of entering or exiting foreign markets and may, therefore, be financially constrained. Firms that continuously export, by contrast, can be expected to have good financial health (see Greenaway et al. (2007)). Similarly, switchers are expected to be less susceptible to financial constraints due to their flexibility and adaptability in international markets (see Harris and Li (2010)).

Our empirical results show that the impact of access to finance on firm survival indeed differs depending on a firm's export status. In general, export starters and exiters experience much stronger adverse effects of financial constraints for their survival prospects. By contrast, the likelihood of failure of continuers and switchers is less affected by financial variables. This might be due to their good financial health and established reputation in the exporting market. Further, we find that these results are broadly similar for British and French firms, suggesting that the findings are not specific to one particular country with certain institutional characteristics. The results are robust to a number of changes in the econometric specifications. Hence, our results clearly show that export activity matters for

the finance-survival relationship.

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Table 1: Detailed Statistics of Size Variables

	UK Employees (1)	UK Real Assets (2)	UK Real Sales (3)	French Employees (4)	French Real Assets (5)	French Real Sales (6)
25%	94	115.10	79.77	79	93.23	157.92
50%	187	249.04	157.82	151	169.76	263.77
75%	382	686.79	346.28	283	381.74	537.1
Observations	21061	23350	13610	25252	28766	28653

Notes: The table presents the median and the upper and lower quartiles of three size measures.

Table 2: Empirical Predictions of the Effects of our Covariates on Firms Failure

Covariates	Literature	Prediction
Leverage	Zingales (1998); Farinha and Santos (2006) and Bridges and Guariglia (2008)	Positive relationship between leverage and the prob. of failure
	Nickell et. al (1997) and Dennis and Mihov (2003)	Negative relationship between leverage and the prob. of failure
Coverage	Gertler and Gilchrist (1994) and Guariglia (1999)	Negative impact of coverage on the prob. of firm failure
Exports	Greenaway et al. (2008) and Bridges and Guariglia (2008)	Exporting firms are less likely to fail
Size;*Age*	Mata and Portugal (1994); Audretsch and Mahmood (1995); Dunne et al. (1988) and Clementi and Hopenhayn (2006)	Large and old firms are less likely to fail
LabourProductivity	Hopenhayn (1992) and Clementi and Hopenhayn (2006)	Productive firms face a lower prob. of failure

Notes: The Table presents the expected signs of the empirical models.

Table 3: Summary Statistics for UK Firms

	Total Sample (1)	Surviving Firms (2)	Failed Firms (3)	Diff. (4)
Fail	0.014	0.000	1.000	
	(0.119)	(0.000)	(0.000)	
Real Sales	354.634	353.582	245.041	0.000
	(578.751)	(564.542)	(241.923)	
Age	29.487	29.553	24.937	0.000
	(26.831)	(26.867)	(23.773)	
Leverage	0.489	0.488	0.518	0.072
	(0.259)	(0.258)	(0.279)	
Coverage	1.025	1.037	0.760	0.168
	(3.608)	(3.637)	(2.896)	
Productivity	136.749	137.227	94.688	0.000
	(191.597)	(192.225)	(117.597)	
Starters Exporters	0.044	0.045	0.036	0.412
	(0.207)	(0.208)	(0.188)	
Continuous Exporters	0.348	0.352	0.068	0.000
	(0.476)	(0.477)	(0.253)	
Exiters Exporters	0.033	0.033	0.037	0.678
	(0.178)	(0.179)	(0.188)	
Switchers Exporters	0.013	0.018	0.010	0.123
	(0.221)	(0.222)	(0.188)	
Continuous non − Exporters	0.173	0.171	0.213	0.119
	(0.407)	(0.408)	(0.432)	
Observations	26,320	25,941	379	

Notes: The table presents sample means. Standard deviations are reported in parentheses. The p-values of a test of the equality of means are reported in column 4. *Fail* is a dummy that equals 1 if a firm fails in year t, and 0 otherwise. Real sales are expressed in thousands of pounds. *Leverage* measured as the firm's short-term debt to assets ratio. *Coverage* is defined as the ratio of the firm's cash flow over its interest payment. *Productivity* denotes labour productivity defined as sales per employee. *Starters* are those firms that exported in t, but not in previous years. *Exiters* are defined as those firms exiting the exporting market. The *continuous exporters* are defined as those firms that export in all sample years. *Switchers* are firms that enter and exit the export market several times. The *continuous non − exporters* are defined as those firms that never export over the sample period. The time period is 1998-2005.

Table 4: Summary Statistics for French Firms

	Total Sample (1)	Surviving Firms (2)	Failed Firms (3)	Diff. (4)
Fail	0.042	0.000	1.000	
	(0.200)	(0.000)	(0.000)	
Real Sales	552.641	548.74	547.255	0.946
	(820.874)	(815.452)	(739.582)	
Age	21.150	21.193	20.075	0.061
	(21.199)	(21.192)	(21.436)	
Leverage	0.540	0.537	0.616	0.000
	(0.194)	(0.193)	(0.188)	
Coverage	0.324	0.327	0.246	0.000
	(0.875)	(0.883)	(0.646)	
Productivity	280.715	309.419	279.514	0.000
	(252.759)	(257.027)	(252.514)	
Starters Exporters	0.193	0.202	0.145	0.000
	(0.399)	(0.401)	(0.353)	
Continuous Exporters	0.412	0.451	0.317	0.000
	(0.496)	(0.497)	(0.465)	
Exiters Exporters	0.095	0.098	0.087	0.581
	(0.367)	(0.367)	(0.362)	
Switchers Exporters	0.020	0.021	0.019	0.004
	(0.140)	(0.141)	(0.108)	
Continuous non − Exporters	0.094	0.093	0.180	0.000
	(0.295)	(0.290)	(0.383)	
Observations	33,996	32,561	1,435	

Notes: The table presents sample means. Standard deviations are reported in parentheses. The p-values of a test of the equality of means are reported in column 4. Also see notes to Table 3.

Table 5: Statistics by Exporting Status

UK Sample								
	Starters	Continuers	Exiters	Diff.(1)-(2)	Diff.(1)-(3)	Diff.(2)-(3)	Switchers	Non-Exporters
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fail	0.012	0.002	0.016	0.002	0.449	0.008	0.010	0.017
	(0.108)	(0.053)	(0.126)				(0.101)	(0.131)
Leverage	0.537	0.507	0.534	0.000	0.785	0.002	0.538	0.508
	(0.250)	(0.237)	(0.238)				(0.246)	(0.266)
Coverage	1.079	1.141	0.993	0.681	0.642	0.225	1.006	1.143
	(3.602)	(3.860)	(3.357)				(3.379)	(3.951)
Observations	1680	9169	867				358	4537
French Sample								
	Starters	Continuers	Exiters	Diff.(1)-(2)	Diff.(1)-(3)	Diff.(2)-(3)	Switchers	Non-Exporters
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fail	0.031	0.025	0.040	0.004	0.005	0.000	0.036	0.079
	(0.173)	(0.158)	(0.196)				(0.188)	(0.270)
Leverage	0.546	0.532	0.548	0.000	0.556	0.000	0.546	0.573
	(0.189)	(0.187)	(0.188)				(0.190)	(0.211)
Coverage	0.253	0.303	0.213	0.000	0.847	0.000	0.215	0.641
	(0.301)	(0.695)	(0.314)				(0.305)	(1.692)
Observations	5998	14041	3244				732	3206

Notes: The table presents sample means. Standard deviations are reported in parentheses. Columns 4-6 present p-values of a test for the equality of means for starters, continuers and exiters. Also see notes to Table 3.

Table 6: Baseline Model

	UK	France	UK	France
	(1)	(2)	(3)	(4)
Starters			-1.139***	-0.847***
			(-3.85)	(-4.73)
Continuers			-2.802***	-0.961***
			(-8.14)	(-11.92)
Exiters			15.657***	0.376*
			(38.91)	(1.80)
Switchers			-31.466***	-0.463*
			(-67.71)	(-1.79)
Leverage	0.304***	0.424***	1.348***	2.000***
	(3.02)	(11.04)	(3.58)	(10.46)
Coverage	-0.582*	-0.067*	-0.159*	-0.091*
	(-1.85)	(-1.67)	(-1.91)	(-1.78)
Size	0.621	1.199 ***	1.189*	1.264***
	(0.93)	(4.19)	(1.67)	(4.34)
$Size^2$	-0.051	-0.111***	-0.095	-0.115***
	(-0.91)	(4.29)	(-1.56)	(-4.37)
Age	-0.031***	-0.009**	-0.007	-0.009**
	(-2.77)	(-2.60)	(-0.55)	(-2.49)
Age^2	0.001	0.001**	-0.001	0.001**
	(1.28)	(2.17)	(-0.55)	(2.15)
Productivity	-0.002	0.002	-0.003*	0.002**
	(-1.56)	(2.65)	(-1.67)	(2.26)
Constant	-5.25***	-6.297***	-7.281***	-7.005***
	(-2.67)	(-7.98)	(-3.36)	(-8.49)
Observations	7,316	20,088	7,316	20,088
$Log-likelihood$	-551.9	-3220.4	-481.2	-3134
Test of equality				
Starters Exporters			0.397	
Continuous Exporters			0.000	
Exiters Exporters			0.000	
Switchers Exporters			0.000	

Notes: The dependent variable is a dummy equal to one if a firm fails in year t, and zero otherwise. Robust z-statistics are presented in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Time dummies, industry dummies and time dummies interacted with industry dummies were included in the model. Table presents the p-values of a test for the equality of the coefficients on starters, continuers, exiters and switchers for the UK and French samples. Also see notes to Table 3.

Table 7: Exporting and Finance

	UK (1)	France (2)	UK (3)	France (4)	UK (5)	France (6)
Lev	0.417***	0.558***			0.399***	0.583***
	(4.34)	(11.41)			(3.78)	(11.11)
*Lev * Start*	0.844***	0.700***			0.810**	0.748***
	(2.93)	(3.77)			(2.53)	(3.53)
*Lev * Cont*	-0.658***	-0.246***			-0.917***	-0.274***
	(-4.85)	(-3.10)			(-5.53)	(-3.27)
*Lev * Exit*	0.728***	0.265			0.710**	0.199
	(2.99)	(1.14)			(2.53)	(0.89)
*Lev * Switch*	-1.238***	-1.043***			-1.192***	-1.133***
	(-3.55)	(-3.70)			(-3.34)	(-3.87)
Cov			-0.841*	-0.240**	-0.750*	-0.114
			(-1.69)	(-2.39)	(-1.71)	(-1.56)
*Cov * Start*			0.189	-1.577	0.178	-0.363
			(0.80)	(-1.09)	(0.81)	(-0.24)
*Cov * Cont*			-9.125***	0.130	-9.711***	0.147
			(-7.00)	(0.68)	(-7.85)	(0.95)
*Cov * Exit*			0.048	-2.102	0.086	-1.677
			(0.24)	(-1.43)	(0.44)	(-1.35)
*Cov * Switch*			0.776	1.133	0.678	0.044
			(1.34)	(0.64)	(1.30)	(0.03)
Starters	-1.432***	-1.060***	-1.351***	-1.260***	-1.681***	-1.088***
	(-4.53)	(-5.94)	(-4.88)	(-3.39)	(-5.22)	(-2.81)
Continuers	-2.216***	-0.823***	-5.110***	-0.977***	-5.122***	-0.822***
	(-8.35)	(-9.69)	(-10.82)	(-11.75)	(-11.09)	(-9.28)
Exiters	15.203***	0.307	14.827***	-0.097	14.337***	-0.044
	(35.64)	(1.42)	(37.35)	(-0.25)	(33.44)	(-0.12)
Switchers	-30.801***	-0.098	-29.605***	-0.168	-28.914***	-0.139
	(-62.74)	(-0.37)	(-67.02)	(-0.36)	(-61.14)	(-0.29)
Size	1.083	1.266***	1.026	1.024***	1.204*	1.324***
	(1.61)	(4.52)	(1.49)	(3.63)	(1.70)	(4.56)
$Size^2$	-0.095	-0.117***	-0.084	-0.098***	-0.096	-0.121***
	(-1.63)	(-4.60)	(-1.44)	(-3.87)	(-1.59)	(-4.61)
Age	-0.006	-0.009***	-0.009	-0.009**	-0.006	-0.009**
	(-0.56)	(-2.58)	(-0.78)	(-2.51)	(-0.46)	(-2.53)
Age^2	-0.001	0.001**	-0.001	0.001**	-0.001	0.001**
	(-0.41)	(2.07)	(-0.50)	(2.25)	(-0.62)	(2.16)
Produc.	-0.003**	0.002**	-0.002	0.004***	-0.002*	0.003**
	(-2.02)	(2.02)	(-1.61)	(3.72)	(-1.66)	(2.32)
Constant	-6.250***	-6.030***	-6.175***	-5.194***	-6.908***	-6.214***
	(-3.18)	(-7.82)	(-3.06)	(-6.56)	(-3.28)	(-7.75)
Observations	10,300	20,580	7,316	20,088	7,316	20,088
$Log-likelihood$	-576.6	-3204	-483.1	-3179	-474.6	-3111

Notes: The dependent variable is a dummy equal to one if a firm fails in year t, and zero otherwise. Robust z-statistics are presented in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Time dummies, industry dummies and time dummies interacted with industry dummies were included in the model. Also see notes to Table 3.

Table 8: Test for the Equality of Coefficients Based on Results in Table 7

	UK-France (1)-(2)	UK-France (3)-(4)	UK-France (5)-(6)
$Lev * Start$	0.672		0.871
$Lev * Cont$	0.008		0.000
$Lev * Exit$	0.167		0.152
$Lev * Switch$	0.662		0.898
$Cov * Start$		0.211	0.723
$Cov * Cont$		0.000	0.000
$Cov * Exit$		0.147	0.161
$Cov * Switch$		0.853	0.684
$Starters$	0.303	0.669	0.237
$Continuers$	0.000	0.000	0.000
$Exiters$	0.000	0.000	0.000
$Switchers$	0.000	0.000	0.000

Notes: The p-values of a test statistic for the equality of the coefficients are presented. Also see notes to Table 3.

Table 9: Robustness-Additional Control Variables

	UK (1)	France (2)	UK (3)	France (4)	UK (5)	France (6)	UK (7)	France (8)
Lev	0.129	0.291***	0.439***	0.454***	0.425***	0.583***	0.774***	0.587***
	(0.67)	(3.42)	(2.99)	(7.95)	(4.04)	(11.11)	(3.11)	(10.13)
Lev^2							-0.420**	-0.013
							(-2.55)	(-0.38)
*Lev * Start*	0.946*	0.786***	0.763**	0.679***	0.394	0.756***	-0.011	-0.256
	(1.92)	(3.58)	(2.03)	(3.14)	(1.00)	(3.52)	(-0.05)	(-1.40)
*Lev * Cont*	-1.100***	-0.283***	-0.945***	-0.263***	-1.016***	-0.274***	-1.226***	-0.248***
	(-6.09)	(-3.30)	(-5.55)	(-3.14)	(-5.87)	(-3.27)	(-4.11)	(-3.05)
*Lev * Exit*	0.723*	0.242	0.777**	0.183	0.464	0.198	1.192**	1.127***
	(1.93)	(1.06)	(2.53)	(0.87)	(1.32)	(0.87)	(2.41)	(4.63)
*Lev * Switch*	-1.412***	-1.164***	-1.333***	-1.047***	-0.767*	-1.136***	-0.427	-0.984***
	(-2.71)	(-3.88)	(-3.30)	(-3.63)	(-1.81)	(-3.82)	(-1.58)	(-5.79)
Cov	-0.335	0.029	-0.800**	-0.214*	-0.776*	-0.114*	-0.638	-0.196*
	(-0.75)	(0.32)	(-1.99)	(-1.71)	(-1.72)	(-1.67)	(-1.00)	(-1.92)
Cov^2							-0.205	0.009
							(-1.05)	(0.73)
*Cov * Start*	-0.004	-0.725	0.209	-0.535	-0.163*	-0.313	1.063	0.114
	(-0.01)	(-0.49)	(0.40)	(-0.33)	(-1.78)	(-0.20)	(1.46)	(0.89)
*Cov * Cont*	-10.318***	0.151	-9.164***	0.088	-0.204***	0.002	-10.390***	-0.235**
	(-5.30)	(1.08)	(-6.76)	(0.52)	(-4.01)	(0.46)	(-7.82)	(-2.43)
*Cov * Exit*	0.190	-1.605	0.316	-1.803	1.006	-1.704	1.306	0.109
	(0.70)	(-1.21)	(0.76)	(-1.41)	(1.12)	(-1.38)	(1.46)	(0.95)
*Cov * Switch*	0.498	0.290	0.537	0.101	-0.025	0.018	-0.565	-0.164
	(0.71)	(0.17)	(1.03)	(0.05)	(-0.04)	(0.01)	(-0.90)	(-0.54)
Starters	-1.533***	-1.227***	-1.583***	-1.095***	-1.682***	-1.065***	-1.941***	-0.898*
	(-5.13)	(-3.20)	(-5.59)	(-2.69)	(-5.20)	(-2.63)	(-4.32)	(-1.81)
Continuers	-5.299***	-0.828***	-4.959***	-0.785***	-2.266***	-0.855***	-3.037***	-0.771
	(-8.56)	(-9.07)	(-10.63)	(-8.77)	(-2.90)	(-7.27)	(-11.18)	(-0.64)
Exiters	14.172***	-0.120	14.421***	-0.016	16.789***	-0.046	4.168***	-0.299
	(29.40)	(-0.31)	(33.90)	(-0.04)	(28.06)	(-0.12)	(19.90)	(-0.35)
Switchers	-28.213***	-0.006	-28.993***	-0.195	-31.497***	-0.094	-8.386***	0.345
	(-45.55)	(-0.01)	(-59.27)	(-0.40)	(-38.46)	(-0.19)	(-31.42)	(0.33)
*Size * Lev*	0.078*	0.057***						
	(1.96)	(4.44)						
*Size * Cov*	-0.050	-0.025						
	(-1.23)	(-1.38)						
Subsidiaries			-1.142***	-1.442***				
			(-3.74)	(-14.42)				
Foreign Owned			0.627***	-0.430***				
			(2.66)	(-4.07)				
Capital Intensity			-0.072	-0.143***				
			(-0.99)	(-2.85)				
*Lev * Subsid.*			0.377**	0.214**				
			(2.12)	(2.46)				
*Lev * For.Own.*			-0.472**	0.044				
			(-2.32)	(0.45)				
*Cov * Subsid.*			-0.175	0.205				
			(-0.28)	(1.62)				
*Cov * For.Own.*			0.224	0.177				
			(0.63)	(1.54)				
*Age*Start*					-0.259***	-0.000		
					(-5.47)	(-0.04)		
*Age*Cont*					-0.204***	0.002		
					(-4.19)	(0.47)		
*Age*Exit*					-0.236***	0.000		
					(-5.20)	(0.03)		
*Age*Switch*					0.262***	-0.003		
					(5.45)	(-0.29)		
Observations	5,079	19,211	7,316	20,092	7,316	20,088	7,316	21,274
Log − likelihood	-289.7	-2891	-459.7	-2951	-455.0	-3110	-470.6	-3313

Notes: The dependent variable is a dummy equal to one if a firm fails in year t, and zero otherwise. Robust z-statistics are presented in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Time dummies, industry dummies and time dummies interacted with industry dummies were included in the model. Columns 1-2 present additional interactions for leverage and coverage with size. Columns 3-4 include the foreign ownership and the group dummies and their interactions with leverage and coverage. Columns 5-6 present interactions with the age variable and columns 7-8 include the squared terms for leverage and coverage. Also see notes to Table 3.

Table 10: Robustness- External Finance Dependence

	UK	France
	(1)	(2)
Lev	0.399***	0.583***
	(3.75)	(11.12)
$Lev * Start * High$	1.247**	1.072***
	(2.37)	(5.21)
$Lev * Start * (1 - High)$	-0.386	-0.088
	(-1.45)	(-0.14)
$Lev * Cont * High$	-1.045***	-0.300**
	(-4.96)	(-2.31)
$Lev * Cont * (1 - High)$	-0.783***	-0.254***
	(-5.85)	(-2.66)
$Lev * Exit * High$	1.095***	0.024
	(3.37)	(0.08)
$Lev * Exit * (1 - High)$	-0.466**	0.352
	(-2.30)	(1.17)
$Lev * Switch * High$	-1.676***	-0.297
	(-3.13)	(-0.44)
$Lev * Switch * (1 - High)$	0.033	-1.466***
	(0.11)	(-4.36)
Cov	-0.749	-0.107
	(-1.60)	(-1.50)
$Cov * Start * High$	0.143	-3.478
	(0.18)	(-1.26)
$Cov * Start * (1 - High)$	0.079	1.199
	(0.36)	(0.88)
$Cov * Cont * High$	-10.434***	-0.336***
	(-8.02)	(-2.93)
$Cov * Cont * (1 - High)$	-5.977*	-0.280
	(-1.84)	(-0.52)
$Cov * Exit * High$	0.285	-3.942***
	(0.83)	(-2.71)
$Cov * Exit * (1 - High)$	-0.022	-0.217
	(-0.11)	(-0.15)
$Cov * Switch * High$	0.536	3.867
	(0.66)	(1.32)
$Cov * Switch * (1 - High)$	0.799	-1.992
	(1.48)	(-1.17)
$High$	0.021	0.398**
	(0.07)	(2.22)
$Starters$	-1.778***	-0.987***
	(-4.25)	(-2.75)
$Continuers$	-4.774***	-0.872***
	(-8.41)	(-7.83)
$Exiters$	13.948***	-0.015
	(34.35)	(-0.04)
$Switchers$	-28.186***	-0.270
	(-60.90)	(-0.59)
$Observations$	7,316	20,088
$Log - likelihood$	-471.3	-3097

Notes: The dependent variable is a dummy equal to one if a firm fails in year t, and zero otherwise. Robust z-statistics are presented in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Time dummies, industry dummies and time dummies interacted with industry dummies were included in the model. The dummy $High$ is equal to one if the firm is operating in one of the following industries: Electric machinery; machinery and equipment; glass and products; drugs; petroleum and coal products, and zero otherwise. Also see notes to Table 3.

Table 11: Exporting and Finance, Alternative Financial Variables

	UK	France
	(1)	(2)
Cf	-0.209**	-0.629***
	(-2.56)	(-4.57)
$Cf * Start$	-2.384*	-0.376**
	(-1.89)	(-2.22)
$Cf * Cont$	-0.708***	-0.303*
	(-4.16)	(-1.67)
$Cf * Exit$	0.154	0.047
	(0.68)	(0.06)
$Cf * Switch$	-1.299	0.581
	(-1.14)	(0.75)
$Fixed$	-0.237	-0.385**
	(-0.90)	(-2.13)
$Fixed * Start$	-0.369	0.052
	(-0.39)	(0.48)
$Fixed * Cont$	-1.552**	0.204
	(-2.14)	(0.92)
$Fixed * Exit$	-0.809	1.157
	(-0.64)	(1.22)
$Fixed * Switch$	1.465	-0.623
	(1.64)	(-0.65)
$Starters$	-1.017***	-0.896***
	(-5.35)	(-5.10)
$Continuers$	-2.546***	-0.878***
	(-5.72)	(-9.38)
$Exiters$	14.989***	0.527**
	(29.13)	(2.03)
$Switchers$	-30.411***	-0.447
	(-54.84)	(-1.48)
$Observations$	9,123	20,413
$Log-likelihood$	-458.7	-3213

Notes: The dependent variable is a dummy equal to one if a firm fails in year t, and zero otherwise. Robust z-statistics are presented in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Time dummies, industry dummies and time dummies interacted with industry dummies were included in the model. Cf denotes the cash flow which is the sum of after tax profit and depreciation and $Fixed$ is the fixed assets variable. Also see notes to Table 3.

Table 12: Robustness- IV

	UK	France
	(1)	(2)
Lev	0.306***	0.429***
	(3.97)	(6.11)
$Lev * Start$	0.230**	0.630***
	(2.44)	(2.93)
$Lev * Cont$	-0.643***	-0.277***
	(-5.91)	(-3.02)
$Lev * Exit$	0.082	0.264
	(0.87)	(0.84)
$Lev * Switch$	-0.521***	-1.033***
	(-6.06)	(-2.78)
Cov	-0.333*	-0.158**
	(-1.69)	(-2.23)
$Cov * Start$	-0.112	-1.657
	(-0.84)	(-0.67)
$Cov * Cont$	-12.291***	0.313
	(-7.06)	(1.44)
$Cov * Exit$	0.018	2.102
	(0.19)	(1.47)
$Cov * Switch$	0.501	3.111
	(1.20)	(1.19)
$Starters$	-1.941***	-0.845*
	(-4.32)	(-1.79)
$Continuers$	-3.037***	-0.488***
	(-11.18)	(-6.75)
$Exiters$	4.168***	-0.299
	(19.90)	(-0.35)
$Switchers$	-8.386***	0.345
	(-31.42)	(0.33)
Obs	4,856	8,684
$Log-likelihood$	-273.0	-1154
$P-values\ of$		
$test\ statistics$		
$Exogeneity\ test$	0.000	0.000
$Sargan\ Test$	0.227	0.353
$Anderson\ test$	0.021	0.000

Notes: The dependent variable is a dummy equal to one if a firm fails in year t, and zero otherwise. The specification was estimated using instrumental variable technique for probit models. Robust z-statistics are presented in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Time dummies, industry dummies and time dummies interacted with industry dummies were included in the model. Two and three lags of our financial variables are used as instruments. The Sargan statistic is a test of the overidentifying restrictions and the Anderson canonical correlation test statistic is a test for the relevance of the instruments. Also see notes to Table 3.