Financial Constraints, Global Engagement, and Firm Survival in the UK: Evidence from Micro Data

by

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Abstract

Financial constraints have been found to play an important role on various aspects of firm behavior. Yet, their effects on firm survival have been largely neglected. We use a panel of 61496 UK firms over the period 1997-2002 to study the effects of financial variables on firms' failure probabilities, differentiating firms into globally engaged and purely domestic. Estimating a wide range of specifications, we find that lower collateral and higher leverage result in higher failure probabilities for purely domestic than for globally engaged firms. This can be seen as evidence that global engagement shields firms from financial constraints.

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1. Introduction

Financial constraints have been found to play an important role in various aspects of firm behavior, such as determining their investment in fixed capital, inventories, and R&D (see Hubbard, 1998; and Bond and Van Reenen, 2006, for surveys). Most studies in this literature have used firm-level data to estimate investment equations augmented with financial variables such as cash flow, and interpreted a high sensitivity of investment to these variables as a proxy for a high degree of financing constraints faced by firms. A financially constrained firm, for which it is difficult or too expensive to obtain external finance, will in fact only invest if it has sufficient internal funds, and will invest more (less) the higher (lower) its cash flow[1]. Higher sensitivities were generally found for firms that were *a priori* more likely to face financing constraints, such as small, young firms, and firms with low dividend payouts and high levels of indebtedness.

Yet, surprisingly, the effects of financial constraints on firm survival have been largely neglected in the literature: only a handful of papers have included financial variables in equations modelling survival probabilities (Bunn and Redwood, 2003; Fotopoulos and Louri, 2000; Vartia, 2004; Zingales, 1998)[2]. Using data from a wide range of countries, they found a significant association between financial variables and firms' survival probabilities. Yet, none of these studies exploited firm heterogeneity to better understand this link. This paper seeks to fill this gap. Specifically, we analyze for the first time the effects of financial variables on firm survival probabilities, differentiating firms into globally engaged and purely domestic. We consider two dimensions of global engagement. The first is based on whether the firms are foreign owned, and the second on whether they export[3]. Differentiating the effects of financial variables on survival probabilities for globally engaged and domestic firms is motivated by a number of recent empirical papers, which argue that global engagement may shield firms from financial constraints, and consequently improve their performance. Using data for the UK, Guariglia and Mateut (2005), for example, find that small, young, and risky firms that are globally engaged exhibit lower sensitivities of inventory investment to financial variables than their domestic counterparts. This makes them less financially constrained, as they do not have to

[1] This view has been challenged by Kaplan and Zingales (1997), Cleary (1999), and Cummins et al. (2006).
[2] Throughout the paper, we use the terms survival and failure interchangeably, keeping in mind that one is the flip side of the other.
[3] A number of papers (Bernard and Sjöholm, 2003; Görg and Strobl, 2003) have looked at the direct effects of global engagement on firm survival. However, their main focus is on multinationals' voluntary exit from a market, which takes place by shifting production from one country to another in the presence of adverse shocks in the host country. Contrary to theirs, our analysis mainly focuses on firms' death as a consequence of failure (involuntary exit).

rely as much on internal funds to finance inventory investment[4]. Similarly, using data from various emerging markets, Desai et al. (2007) document that, contrary to their purely domestic counterparts, affiliates of multinational firms are able to expand output after severe depreciations when both growth opportunities and financial constraints arise. Finally, focusing on Indonesia, Blalock et al. (2004) show that following the 1997 East Asian financial crisis which led to a strong currency devaluation, only foreign-owned exporters were able to significantly increase their investment. Although the global engagement-induced improvements in plant performance documented by these authors are likely to translate themselves into increases in their chances of survival, none of these studies have explicitly tested whether global engagement affects firm survival, by shielding firms from liquidity constraints. This is the objective of this paper.

The main reasons why global engagement may shield firms from liquidity constraints can be summarized as follows. First, globally engaged firms have access to both internal and international financial markets, which allows them to diversify their sources of financing and the associated risks. In particular, foreign owned firms can access credit through their parent company and thus insure themselves against liquidity constraints (Desai et al., 2004). Second, foreign owned firms typically enjoy less bankruptcy risk and adopt international standards faster in terms of product quality. Consequently, they find it easier to gain access to domestic banks (Colombo, 2001; Harrison and McMillan, 2003). Third, being dependent on demand from foreign countries, exporting firms are tied less to the domestic cycle, and less subject to those financial constraints induced by tight monetary policy and recessions at home[5]. This may lead to a more stable cash flow for exporters compared to non-exporters, which in turn is likely to lead to a relaxation of the liquidity constraints for the former, as a more stable cash flow provides greater assurances to lenders that the firm will be able to service its obligations (Hirsch and Lev, 1971; Campa and Shaver, 2002; Garcia-Vega and Guariglia, 2007). Finally, given the presence of sunk costs that need to be met when entering foreign markets for the first time (Robets and Tybout, 1997), being an exporter also provides a signal that the firm is sufficiently productive to generate enough profits in foreign markets to recover the sunk costs. This increases the likelihood that the firm will be able to service its external debt, and further relaxes the liquidity constraints that it faces (Campa and Shaver, 2002).

[4] Also see Greenaway et al. (2007), who using the same UK data limited to the manufacturing sector, find that exporters typically exhibit better financial health than non-exporters.
[5] This argument relies on the assumption that business cycles are not perfectly coordinated across countries.

If global engagement indeed shields firms from financing constraints, then we would expect failure probabilities of globally engaged firms to be less sensitive to financial variables than those of purely domestic firms. We test this hypothesis using a panel of 61496 UK firms over the period 1997-2002. Our choice of the UK is motivated by two considerations. First, this country ranks high in terms of global engagement: it is the fifth largest exporter of manufacturing goods globally and the second largest host of multinational enterprises. Second, to the best of our knowledge, virtually no other study has looked at the links between global engagement and firm survival probabilities in the UK.

We find that when firms are divided according to whether they are globally engaged or purely domestic, lower collateral and higher leverage result in higher failure probabilities for the latter. This supports our hypothesis that global engagement shields firms from liquidity constraints. Our results are robust to estimating Logit and Cox proportional hazard models; to controlling for the biases induced by rare event data and for unobserved heterogeneity; and to including in our sample only those firms established after 1996 (newly established firms). For the latter firms, the results are also robust to considering the two dimensions of global engagement (exporting and being foreign owned) separately.

The remainder of this paper is organized as follows. In Section 2, we present our baseline specification. Section 3 describes our data, and provides some descriptive statistics. Section 4 presents our main empirical results and a range of robustness tests. Section 5 concludes.

2. Baseline specification

We initially estimate the following Logit model for the probability of firm failure ($FAIL_{it} = 1$) on the pooled data set[6]:

$$\Pr(FAIL_{it} = 1) = F(X_{it}'\beta) \qquad (1)$$

where X_{it}' is a matrix of characteristics of firm *i* at time *t* with coefficients β.

As in 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[7]. Since more than 75

[6] Lennox (1999a) and Bernard et al. (2006) also estimated Logit models of firm survival. On the other hand, Zingales (1998), Lennox (1999a), Bernard and Jensen (1999, 2007), and Bunn and Redwood (2003) estimated Probit models. All our results were robust to using a Probit instead of a Logit in estimation.

percent of our failed firms were either in liquidation or in receivership, we can say that our main focus is on firms' death as a consequence of bankruptcy, not voluntary exit.

Our X_{it}' matrix includes measures of the firm's age (Age_{it}), size ($Size_{it}$), and profitability ($Profitability_{it}$); a dummy indicating whether the firm is part of a group ($Group_i$); and financial variables ($Leverage_{it}$ and $Collateral_{it}$) interacted with dummies indicating whether the firm is globally engaged (GE_{it}) or purely domestic (1-GE_{it}). $Size_{it}$ represents the size of firm *i* at time *t*, measured in terms of the logarithm of its total real assets. Since firms typically enter the market at a small size relative to their minimum efficient scale, we expect exit rates to be decreasing in size (Audretsch and Mahmood, 1995)[8]. $Profitability_{it}$ is measured as the firm's profit margin, i.e. the ratio of its profits before interests and tax to its total assets. It is included as a proxy for the firm's efficiency (Bunn and Redwood, 2003)[9]. We expect more profitable firms to be less likely to fail. $Group_i$ is a dummy variable equal to 1 if the firm is part of a group (UK or foreign), and 0 otherwise[10]. It is included, following Disney et al. (2003), and is expected to have a negative effect on the probability of firm failure: group firms are likely to have better access to capital markets and to respond more quickly to shocks than single firms due to better information processing. $Leverage_{it}$ and $Collateral_{it}$ are financial variables proxying respectively for the degree of indebtedness of the firm, and its degree of collateralization, similar to those used by Fotopoulos and Louri (2000). Specifically, $Leverage_{it}$ represents the firm's short-term debt to assets ratio; and $Collateral_{it}$, its collateral ratio, given by the ratio of the firm's tangible to total assets[11].

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[7] Liquidation and receivership are two types of reorganization procedures, which can take place when a company becomes insolvent. In liquidation, the assets of the company are sold so as to meet the claims of creditors. In receivership, the receiver can decide whether it is in the creditors' interests to sell the company's assets. Generally, it is in the creditors' interests to liquidate if the liquidation value of the company exceeds its going concern value (Lennox, 1999b). As in Bunn and Redwood (2003) and Lennox (1999b), exits by takeover are not included in our definition of failure, as takeovers may be regarded as a sign of success rather than failure.

[8] We think that current size is a better predictor of a firm's survival chances than size at start-up because it captures a firm's ability to adapt to a changing competitive environment (Mata and Portugal, 1994). Our results were robust to replacing current size with initial size.

[9] Bernard and Jensen (2007) have emphasized the role of productivity on firm survival. We did not include a measure of productivity in our estimating Equation due to data problems: information on employment is in fact missing for a large number of observations. We are convinced, however, that profitability, which we included in all our regressions, is a good proxy for productivity.

[10] A company is said to be part of a group if it is a subsidiary of one or more (UK or foreign) holding companies. A drawback of this variable is that it is time-invariant: the information only refers to the latest year available for each firm.

[11] Our results were robust to using alternative measures of indebtedness, such as the firm's total (short- and long-term) debt to assets ratio, or its total liabilities to total assets ratio. They were also robust to considering a broader measure of collateral given by the firm's tangible assets plus inventory stock over its total assets. The results based on these different financial variables are not reported for brevity, but are available upon request.

Especially for firms *a priori* more likely to face financing constraints and during recessions, being highly leveraged increases moral hazard and adverse selection problems, and leads to the inability of firms to obtain external finance at a reasonable cost. High leverage is in fact associated with an unhealthy balance sheet. Also considering that servicing a high debt may become obstructive for the operation and eventually for the existence of firms, we expect highly leveraged firms to be less likely to survive (Fotopoulos and Louri, 2000). On the other hand, we expect firms with a high collateral ratio to experience lower probabilities of failing. The higher this ratio, the more collateralized and committed firms are, and the less likely they are to face financing constraints. Assets that are more tangible sustain in fact more external financing because tangibility increases the value that can be recaptured by creditors if borrowers default (Carpenter and Petersen, 2002b; Braun and Larrain, 2005). As in the financing constraints literature, we interpret higher sensitivities of firms' survival probabilities to these financial variables as an indicator of a higher level of financing constraints faced by firms: the more financially healthy a firm is, the less its leverage and collateral will impact on its probability of failure.

Given that our objective is to verify whether there is a differential effect of the financial variables on the failure probabilities of globally engaged and purely domestic firms, we interact our financial variables as follows: $Leverage_{it}*[1-GE_{it}]$; $Leverage_{it}*[GE_{it}]$; $Collateral_{it}*[1-GE_{it}]$; and $Collateral_{it}*[GE_{it}]$, where GE_{it} is a dummy variable equal to 1 if the firm is globally engaged, and 0 otherwise. This exercise is motivated by Guariglia and Mateut (2005), Desai et al. (2007), and Blalock et al. (2004), according to which global engagement improves firms' performance by shielding them from financial constraints. If this hypothesis were true, financial variables should have a weaker effect on globally engaged firms' probabilities of failure, compared to domestic firms': the coefficients and marginal effects associated with $Leverage_{it}*[1-GE_{it}]$ and $Collateral_{it}*[1-GE_{it}]$ should be larger than those associated with $Leverage_{it}*[GE_{it}]$ and $Collateral_{it}*[GE_{it}]$[12].

Our X_{it}' matrix also includes a full set of industry dummies, as well as a full set of time dummies to control for business cycle effects[13]. Since the average length of time

[12] Instead of using interaction terms, we could estimate our Logit Equation separately for globally engaged and purely domestic firms. Our chosen approach is preferable as it allows us to gain degrees of freedom and to take into consideration the fact that firms can transit between the globally engaged and purely domestic states. All our results were robust to estimating separate regressions for globally engaged and purely domestic firms. These results are not reported for brevity, but are available upon request.

[13] Our full set of industry dummies is made up of 24 dummies, which are described in the Appendix. Only 23 of these dummies were included in our regressions. Our results were robust to replacing the industry dummies

between the final annual report of a failing company and its entry into bankruptcy is usually 14 months (Lennox, 1999a), our regressors are evaluated at time *t*. Yet, all our results were robust to using lagged regressors.

3. Main features of the data and summary statistics

3.1 The dataset

We construct our dataset from the profit and loss and balance sheet data gathered by the Bureau Van Dijk in the *Financial Analysis Made Easy* (*FAME*) database[14]. More than 99 percent of the firms included in this dataset are not traded on the stock market, or are quoted on other exchanges such as the Alternative Investment Market (*AIM*) and the Off-Exchange (*OFEX*) market. Unquoted firms are more likely to be characterized by adverse financial attributes such as a short track record, poor solvency, and low real assets compared to quoted firms, which are typically large, financially healthy, long-established companies with good credit ratings.

Our dataset provides information on companies over the period 1997-2002. The firms in our dataset operate in the entire economy[15]. We excluded companies that changed the date of their accounting year-end by more than a few weeks, so that the data refers to twelve month accounting periods. Firms that did not have complete records on assets, profitability, and the financial and global engagement variables that we included in our regressions were also dropped. Finally, to control for the potential influence of outliers, we excluded observations in the one percent tails for each of the regression variables. Our panel therefore comprises of a total of 253151 annual observations (firm-years) on 61496

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with industry-specific variables commonly used in the firm survival literature, such as the investment rate, the employment growth rate, the median firm size (to proxy for the minimum efficient scale of the industry), and a Herfindahl index measured in terms of firms' employment shares (to proxy for the level of competition in the industry). Our results were also robust to using a more disaggregated set of 56 industry dummies, reflecting the two-digit UK SIC codes.

[14] We only selected firms that have unconsolidated accounts: this ensures that the majority of the firms in our dataset are relatively small. Moreover, it avoids the double counting of firms belonging to groups, which would be included in the dataset if firms with consolidated accounts were also part of it. It has to be noted that UK accounting regulations have reporting exemptions for some variables for the smaller firms. Although our analysis is confined to the sub-sample which reports the required information, we believe that a sufficiently large portion of the economy is covered by our dataset. Also see Bunn and Redwood (2003) who used the *FAME* dataset to study business failures in the UK.

[15] A number of studies that looked at the effects of financing constraints on firm behavior excluded from their analysis financial, insurance, real estate, and public administration companies (Cleary, 1999; Bunn and Redwood, 2003; Cleary et al., 2004). All our results were robust to excluding these companies from our sample. These results based on the restricted sample are not reported for brevity, but are available upon request.

companies, covering the years 1997-2002. It has an unbalanced structure, with the number of years of observations on each firm varying between 1 and 6[16].

Following Mata et al. (1995), Audretsch and Mahmood (1995), Fotopoulos and Louri (2000), Bernard and Sjöholm (2003), and Disney et al. (2003), we subsequently limit our analysis to newly established firms, that is to all cohorts of firms established between 1996 and 2002. The rationale for this is that, otherwise, of those firms born before 1996, only those that survived long enough to still be alive in 1996 would be observed, leading to a sample selection bias. Our shorter panel comprises of a total of 27900 annual observations (firm-years) on 9420 companies, covering the years 1997-2002.

3.2 Summary statistics

Table 1 refers to the full sample and presents means and standard deviations of the main variables likely to influence company failure, for all firm-years in our sample (column 1), for surviving firm-years and failed firm-years (columns 2 and 3), and for globally engaged and purely domestic firm-years (columns 4 and 5)[17]. Table 2 presents similar information for the sample of newly established firms. Focusing on Table 1, we can see that out of our 253151 firm-years, 4475 (1.77 percent) were recorded as failed. This figure is consistent with Bunn and Redwood (2003) and Lennox (1999a). Furthermore, without holding other factors constant, surviving firm-years are generally larger than failed firm-years, where size is measured in terms of total real assets. Surviving firm-years are also older and more likely to be part of a group (UK or foreign). Coming to global engagement, surviving firm-years are more likely to be globally engaged than their failed counterparts (35 percent of the surviving firm-years are globally engaged compared to 28 percent of their domestic counterparts). Yet, because the probability of exporting is similar across the two groups (37-38 percent), it is the foreign ownership dimension of global engagement that seems to drive this result (24 percent of the surviving firm-years are foreign owned, versus 10 percent of their domestic counterparts). Regarding the financial variables, failed firm-years display lower collateral ratios (0.25) and higher leverage ratios (0.31) than surviving firm-years (for which the ratios are respectively 0.30 and 0.25).

When firm-years are differentiated across globally engaged and purely domestic firms (columns 4 and 5), we can see that the former are larger, more likely to be part of a

[16] See the Appendix for more information on the structure of our panel and complete definitions of all variables used.

[17] The variance-covariance matrix of the main variables used in estimation is presented in Table A1 in the Appendix.

group, and less likely to fail than their domestic counterparts. Both types of firm-years display similar levels of collateral (22-24 percent), and leverage (31-33 percent).

A similar broad picture emerges if we limit ourselves to the sample of newly established firms (Table 2). Surprisingly, however, in this smaller sample, we observe that surviving firm-years are slightly younger than failed ones. Moreover, compared to their domestic counterparts, globally engaged firm-years display lower levels of collateral (0.24 versus 0.33) and higher levels of debt (0.43 versus 0.31). Considering that they are larger, and characterized by a lower incidence of death (1.2 percent) than their domestic counterparts (1.8 percent), their high leverage and low collateral could stem from their ability to borrow much, without the need to post high collateral.

In the next Section, we will analyze the link between financial variables and failure probabilities, conditional on other firm characteristics. A stronger link will be interpreted as evidence of stronger financing constraints.

4. Empirical results

4.1 Main empirical results

Our empirical results are reported in Table 3 (for the full sample) and Table 4 (for the sub-sample of newly established firms). Column 1 of both Tables sets out the results of estimating Equation (1) using a pooled Logit specification[18]. The results suggest that for the full sample, there is a negative and significant association between firms' age and their probability of failure, while for newly established firms, the association is positive. A number of theoretical papers (e.g. Jovanovic, 1982; Hopehayn, 1992) have devised models of company failure, and argued that the hazard of exit should fall with age as firms use their experience of market signals to learn about their own (previously unknown) productivity. In line with these models, a number of empirical papers have generally found that younger firms are more likely to fail (e.g. Audretsch and Mahmood, 1995; Mata and Portugal, 1994; Disney at al., 2003). Our different finding for the sample of newly established firms is likely to be driven by the small size of the sample[19]. Furthermore, as expected, for both our samples, larger firms and firms that are part of a group are less likely to die. In line with

[18] The standard errors are adjusted to allow for clustering for each individual company. We also estimated a more general version of our Equation, which contained the global engagement dummy in addition to its interactions with the financial variables. Because the dummy generally attracted a poorly determined coefficient, we excluded it in the reported specifications. The inclusion of the dummy did not alter any of the results.

[19] Adding a quadratic term in age resulted in a poorly determined coefficient and did not alter this finding.

Bunn and Redwood (2003), when the full sample is considered, the profit margin displays a negative and significant association with the probability of failure. Yet, when only newly established firms are considered, this variable appears to have little or no impact on survivorship. Once again, this result is likely to be driven by the small size of the sample.

Coming to the financial variables, we can see that, in the full sample, they play a statistically significant effect both on the domestic and globally engaged firms' failure probabilities (Table 3). Yet, the effects are always larger (in absolute value) for the former. The marginal effects (not reported for brevity) suggest that increasing the leverage ratio by one standard deviation, would raise the probability of failure of a domestic firm by 0.18 percentage points, and that of a globally engaged firm, by 0.10 percentage points. Similarly, raising the collateral ratio by one standard deviation would reduce a domestic firm's probability of failure by 0.28 percentage points, while the corresponding probability of a globally engaged firm would only be reduced by 0.17 percentage points[20].

For the sample of newly established firms (Table 4), the financial variables only affect domestic firms' chances of survival: increasing these firms' leverage ratio by one standard deviation, would raise their probability of failure by 0.12 percentage points, while raising their collateral ratio by one standard deviation would reduce their probability of failure by 0.36 percentage points. These findings support our hypothesis that global engagement affects UK firms' survival probabilities by making them less vulnerable to financial constraints. It is in line with Guariglia and Mateut (2005) who, using the *FAME* dataset limited to the manufacturing sector, measured liquidity constraints as the sensitivity of firms' inventory investment to financial variables, and found that only the inventory investment of those small, young, and risky firms, which are purely domestic responds to changes in financial variables. Thus, although newly established globally engaged firms display higher leverage and lower collateral than their domestic counterparts, these attributes do not seem to affect their failure probabilities. In the case of foreign owned firms, this could be due to the fact that even if they display high debt and/or low collateral, these firms can always obtain funds from their parent company, which increases their probability of survival. In the case of exporters, it could be due to the signalling effect that having paid the sunk export market entry costs, these firms must be sufficiently productive to generate enough profits in foreign markets to recover the sunk costs. This signalling

[20] The *p*-value associated with a χ^2 test aimed at testing the hypothesis of whether the coefficients associated with leverage (collateral) are equal at foreign and domestic firms is 0.0016 (0.00), suggesting that the hypothesis can be rejected.

effect is likely to attenuate the adverse effects of high levels of debt and/or low levels of collateral, therefore increasing these firms' chances of survival.

In all regressions, the coefficients associated with the time and industry dummies (not reported in the Table) are generally significant, indicating that business cycle and industry-specific effects matter[21].

4.2 Robustness tests

We now check whether our results are robust to using a Cox proportional hazard model and a rare-events Logit model in estimation; to controlling for unobserved heterogeneity; to including time dummies interacted with industry dummies; and to considering the two dimensions of global engagement (exporting and being foreign owned) separately.

Cox proportional hazard specification

Estimating the hazard of exit using a Cox proportional hazard specification complements the Logit specification as it models both the event of failure and the time it takes a firm to fail. Specifically, we estimate the determinants of the hazard of firm failure, $\lambda_i(t)$, which represents the instantaneous rate at which firm *i* fails at time *t* given that it was 'alive' at time *t*-1 using a proportional hazard model of the form:

$$\lambda_i(t) = \lambda_0(t)\exp(X'_{it}\beta) \qquad (2)$$

where $\lambda_0(t)$ is the baseline hazard, and X_{it}' is a matrix of explanatory variables with coefficients β, similar to those used in the Logit specification. Since we are not interested in investigating the underlying shape of the baseline hazard, but in understanding the effect financial and global engagement variables have on the firm's hazard of exit, Cox's (1972) partial likelihood approach provides a convenient way of estimating the parameters β

[21] We also attempted a Logit specification, in which we included the leverage ratio, our measure of collateral, and the global engagement dummy as separate regressors. We found that the leverage ratio attracted a positive and strongly significant coefficient (0.222; standard error: 0.096), while collateral attracted a negative and precisely determined coefficient (-1.021; standard error: 0.232). The coefficient associated with the global engagement dummy, on the other hand, was poorly determined (0.045; standard error: 0.136), suggesting that global engagement does not directly affect firms' survival probabilities. These results are not reported for brevity, but are available upon request.

without having to specify a functional form for the baseline hazard, $\lambda_0(t)$. This estimation method has been widely used in the literature on firm survival[22].

In both Tables 3 and 4, column 2 reports the estimates of Equation (2)[23]. It should be noted that, in this case, age could not be entered in the model directly, as it is collinear with the baseline hazard. We have therefore replaced it with cohort dummies. The coefficients on the latter (not reported for brevity) were, however, poorly determined. Regarding the other explanatory variables, the results are consistent with those reported in the Logit specification in column 1 of both Tables. In particular, for both samples, we observe a strong negative relationship between collateral and the exit hazard for domestic firms, and a strong positive relationship between the leverage ratio and their exit hazard. A higher collateral and a lower leverage ratio are therefore associated with a longer survival time for domestic firms. In the full sample (Table 3), the financial variables also significantly affect the survival rates of the globally engaged firms, but their effects are always smaller (in absolute value) than the corresponding effects for domestic firms. In contrast, in the sample of newly established firms, globally engaged firms' survival times are not affected by financial variables (Table 4).

Correcting for the biases induced by rare events

Since the rate of firm failure in our analysis is small (1.77 percent in the full sample, and 1.55 percent in the sample made up of newly established firms), it could potentially be classified as a rare event. One consequence of this is that our Logit regression may underestimate the probability of this rare event. We check whether our results are robust to correcting for this bias, using the procedures suggested in King and Zeng (2001a, 2001b) for generating approximately unbiased and lower-variance estimates of Logit coefficients and their variance-covariance matrix correcting for rare events. Our corrected results, reported in column 3 of Tables 3 and 4, are similar to those outlined for the Logit specification in column 1[24]. This suggests that having a small rate of firm failure is not a significant source of bias.

[22] See for instance Mata et al. (1995); Audretsch and Mahmood (1995); Fotopolous and Louri (2000); Bernard and Sjöholm (2003); Disney et al. (2003); and Vartia (2004).

[23] In Tables 3 and 4, the slightly smaller number of observations in column 2 compared to column 1 is due to the fact that the Cox proportional hazard model controls for ties, i.e. for observations with identical duration. Also note that the estimates reported in column 2 of Table 3 are likely to suffer from the sample selection bias due to the fact that those firms born and dissolved before the start of the sample are excluded.

[24] These results were obtained using the *relogit* command in Stata.

Correcting for unobserved heterogeneity

Although all the models we have estimated so far include firm-specific covariates, it is unlikely that they can account for all observation-specific effects. Not taking proper account of unobserved heterogeneity may bias the results and lead to misleading inferences being made about the effect the explanatory variables have on the likelihood of failure. Column 4 of Tables 3 and 4 presents the results of a random-effects Logit model, which controls for unobserved effects[25]. We can see that the signs and significance of the coefficients associated with the main variables included in our regression do not change once unobserved heterogeneity is taken into account. Specifically, both our financial variables only affect the survival probabilities of the domestic firms in the sample made up of newly established firms. On the other hand, in the full sample, they affect the survival probabilities of both domestic and globally engaged firms, the effects for the former being always larger.

Including time dummies interacted with industry dummies

Since there could be shifts in expectations, which could affect firms' survival probabilities, and could be due to changes in industry-level conditions, such as industry demand shocks, or industry-wide technology changes (Carpenter and Petersen, 2002), in addition to the standard time dummies defined at the aggregate level, which remove cyclical variation common to the entire economy, we check whether our results are robust to including time dummies interacted with industry dummies. These dummies are aimed at controlling for those industry-specific shifts in expectations. The results are reported in column 5 of Tables 3 and 4. Once again, we can see that the signs and significance of the coefficients associated with the main variables included in our regression do not change.

[25] The random-effects Logit model requires that firm-specific unobserved effects are uncorrelated with the regressors, which might not be a plausible assumption in our context. Alternatively, one could use a conditional fixed effects Logit model (Chamberlain, 1980). An advantage of this method of estimation is that it allows the regressors and the firm-specific component of the error term to be correlated. However, a contribution to the likelihood only arises from those groups of firms that exhibit a change in status (here, from alive to dead), and the group of firms that exhibit no change in status are discarded. In our case, this would mean a significant loss of observations, and require belief that all the information needed for estimation is contained in the remaining data. Other disadvantages of the conditional Logit estimator are that only the time-varying variables are included, and so the precision of those variables with negligible variance across time would be compromised.

Considering the two dimensions of global engagement separately

In our analysis so far, we have considered a firm as being globally engaged if it exports and/or is foreign owned: the two dimensions of global engagement were considered jointly. Motivated by our finding in Tables 1 and 2, according to which the higher proportion of globally engaged firms found among the surviving group seems to be driven by the foreign owned dimension of global engagement, we now question whether our results also hold for each of the two dimensions individually. Column 6 of Tables 2 and 3 reports the pooled Logit estimates, where $EXPORT_{it}$ (a dummy variable equal to 1 if firm *i* exports at time *t*, and 0 otherwise) is used as our measure of global engagement. Specifically, the following interaction terms are included: $Leverage_{it}*[1-EXPORT_{it}]$; $Leverage_{it}*[EXPORT_{it}]$; $Collateral_{it}*[1-EXPORT_{it}]$; $Collateral_{it}*[EXPORT_{it}]$. In column 7, the dummy $FOREIGN_i$ (equal to 1 if firm *i* is foreign-owned, and 0 otherwise) is used[26], and the following interaction terms are included: $Leverage_{it}*[1-FOREIGN_i]$; $Leverage_{it}*[FOREIGN_i]$; $Collateral_{it}*[1-FOREIGN_i]$; $Collateral_{it}*[FOREIGN_i]$.

Interestingly, in column 6 of Table 4, which refers to the newly established firms, our measure of size no longer attracts a statistically significant coefficient. However, our profitability measure does. These findings could arise because $EXPORT_{it}$ has a large number of missing values, making the sample size much smaller in column 6 compared to the other columns. In both columns 6 and 7 of Table 4, it is evident that financial variables only affect the survival probabilities of the domestic firms. Thus, for newly established firms, our main result that global engagement shields firms from liquidity constraints also holds separately for the two dimensions of global engagement that we have considered[27].

The results are weaker for the full sample. Columns 6 of Table 3 shows in fact that when global engagement is measured in terms of participation to export markets, both financial variables exert an effect of similar magnitude at globally engaged and purely domestic firms[28]. When global engagement is measured in terms of foreign ownership, on the other hand, leverage only affects domestic firms, while collateral affects both (column 7 of Table 3). Although the coefficient on collateral is higher in absolute value for the foreign

[26] Note that, like $Group_i$, $FOREIGN_i$ is time-invariant.

[27] We also estimated specifications including $EXPORT_{it}$ / $FOREIGN_i$ as separate regressors, in addition to the interaction terms. The global engagement dummies always attracted poorly determined coefficients. Furthermore, in order to determine whether the lack of time dimension in the $FOREIGN_i$ variable biases the results, we have estimated our Equation in which $FOREIGN_i$ is used as our global engagement measure, based on the last year available for each firm: our main results were unchanged. These estimates are not reported for brevity, but are available upon request.

[28] The *p*-value associated with a χ^2 test aimed at assessing whether the impact of collateral is equal at foreign and domestic firms is in fact 0.409. The corresponding *p*-value for leverage is 0.645.

owned firms (-0.94) compared to the domestic ones (-0.69), the difference between the two coefficients is not statistically significant[29].

5. Conclusions

We have used a panel of newly established UK firms over the period 1997-2002 to study the effects of financial variables on survival probabilities, differentiating firms into globally engaged and purely domestic. Specifically, we have estimated a Logit model for the probability of firm failure augmented with financial variables, which were interacted with dummies indicating whether firms are globally engaged or purely domestic. We performed our estimations separately on our full sample of firms, and on a sub-sample made up of newly established firms only. We found that, for domestic firms, lower collateral and higher leverage always result in higher failure probabilities, while financial variables either do not significantly affect the survival probabilities of globally engaged firms, or exert a smaller impact on them. These results were robust to using a Cox proportional hazard model; to controlling for the potential biases induced by rare events and unobserved heterogeneity; and to including time dummies interacted with industry dummies. For newly established firms, they were also robust to considering the two dimensions of global engagement (exporting and being foreign owned) separately. We can conclude that, in the UK, global engagement affects firms' survival probabilities by shielding them from financial constraints. These findings may have policy relevance. They suggests that export promotion policies and policies providing incentives to Foreign Direct Investment could be helpful, reducing the level of financial constraints faced by firms, and indirectly enhancing their survival probabilities.

[29] The *p*-value associated with a χ^2 test aimed at assessing whether the impact of collateral is equal at foreign and domestic firms is in fact 0.210.

Appendix: Data

Structure of the unbalanced panel: full sample

Number of observations per firm	Number of firms	Percent
1	7306	2.89
2	15954	6.30
3	23682	9.35
4	29748	11.75
5	44155	17.44
6	132306	52.26
Total	253151	100.00

Structure of the unbalanced panel: newly established firms

Number of observations per firm	Number of firms	Percent
1	1797	6.44
2	4436	15.90
3	6627	23.55
4	6228	22.32
5	5110	18.32
6	3702	13.27
Total	27900	100.00

Table A1 presents the variance-covariance matrix of the main variables used in our regressions. Table A2 presents descriptive statistics relative to this longer data sample.

Definitions of the variables used

Total assets: sum of the firm's fixed (tangible and intangible) assets and current assets. Current assets are defined as the sum of stocks, work-in-progress inventories, trade and other debtors, cash and equivalents, and other current assets.

Group: dummy variable equal to 1 if the firm is part of a group, and 0 otherwise. A company is said to be part of a group if it is a subsidiary of one or more holding companies (UK or foreign)[30].

Profitability: ratio of the firm's profits before interest and tax to its total assets.

Leverage: firm's short-term debt to total assets ratio. Short-term debt includes the following items: bank overdrafts, short-term group and director loans, hire purchase, leasing, and other short-term loans, but it is predominantly bank finance.

Collateral: ratio of the firm's tangible assets to its total assets.

EXPORT: dummy variable equal to 1 if the firm exports a positive amount.

FOREIGN: dummy equal to 1 if the firm is foreign owned, and 0 otherwise. To be considered as foreign owned, the share of foreign ownership in a firm's equity must exceed 24.99 percent. Actual data on the share of foreign ownership in a firm's equity are only available for a very limited number of observations.

GE: dummy variable equal to 1 if the firm is globally engaged, and 0 otherwise. A firm is considered as globally engaged in a given year if it exports and/or is foreign owned.

Deflators: all variables are deflated using the aggregate GDP deflator.

Details about our 24 industry dummies

IND1: Manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment (SIC 27; 28).

IND2: Manufacture of coke, refined petroleum products and nuclear fuel (SIC 23).

IND3: Manufacture of chemicals and chemical products; manufacture of rubber and plastic products (SIC 24; 25).

IND4: Manufacture of machinery and equipment not elsewhere classified (SIC 29).

IND5: Manufacture of office machinery and computers; manufacture of electrical machinery and apparatus not elsewhere classified; manufacture of radio, television, and communication equipment and apparatus; manufacture of medical, precision, and optical instruments, watches, and clocks (SIC 30, 31, 32, 33).

IND6: Manufacture of motor vehicles, trailers, and semi-trailers; manufacture of other transport equipment (SIC 34; 35).

[30] Information about whether a firm is part of a group or is foreign owned are only provided in the last year of observations available for each firm. We therefore assume that a firm which was part of a group or foreign owned in its last available year was part of a group or foreign owned throughout the period in which it was observed. Given the short sample that we analyze, this is a reasonable assumption.

IND7: Manufacture of food products and beverages; manufacture of tobacco products (SIC 15; 16).

IND8: Manufacture of textiles; manufacture of wearing apparel, dressing, and dying of fur; tanning and dressing of leather, manufacture of luggage, handbags, saddlery, harness, and footwear (SIC 17; 18; 19).

IND9: Manufacture of wood and products of wood and cork, except furniture, manufacture of articles of straw and plaiting materials; manufacture of pulp, paper, and paper products, publishing and printing; publishing, printing, and reproduction of recorded media; manufacture of furniture, manufacture not elsewhere specified (SIC 20; 21; 22; 36).

IND10: Construction (SIC 45).

IND11: Land transport, transport via pipelines; water transport; air transport; supporting and auxiliary transport activities, activities of travel agencies (SIC 60; 61; 62; 63).

IND12: Post and telecommunications (SIC 64).

IND13: Sale, maintenance and repair of motor vehicles and motorcycles, retail sale of automotive fuel; retail trade except of motor vehicles and motorcycles, repair of personal and household goods (SIC 50; 52).

IND14: Mining of coal and lignite, extraction of peat; extraction of crude petroleum and natural gas, service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores; mining of metal ores; other mining and quarrying (SIC 10; 11; 12; 13; 14).

IND15: Agriculture, hunting and related service activities; forestry, logging and related service activities; fishing, operation of fish hatcheries and fish farms, service activities incidental to fishing (SIC 01; 02; 05).

IND16: Hotels and restaurants, (SIC 55).

IND17: Wholesale trade and commission trade, except of motor vehicles and motorcycles (SIC 51).

IND18: Financial intermediation, except insurance and pension funding; insurance and pension funding, except compulsory social security; activities auxiliary to financial intermediation (SIC 65; 66; 67).

IND19: Real estate activities; renting of machinery and equipment without operator and of personal and household goods (SIC 70; 71).

IND20: Computer and related activities; research and development (SIC 72; 73).

IND21: Public administration and defence, compulsory social security; education; health and social work; sewage and refuse disposal, sanitation and similar activities; activities of membership organisations not elsewhere classified (SIC 75; 80; 85; 90; 91).

IND22: Recreational and sporting activities (SIC 92).

IND23: Other business activities (SIC 74).

IND24: Recycling; electricity, gas, steam and hot water supply; collection, purification, and distribution of water; other service activities; private households with employed persons (SIC 37; 40; 41; 93; 95).

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Table 1. Summary statistics: full sample

	Total sample	Surviving firm-years	Failed firm-years	Globally engaged firm-years	Purely domestic firm-years
	(1)	(2)	(3)	(4)	(5)
$FAIL_{it}$	0.018	0.00	1.00	0.013	0.020
	(0.132)	(0.00)	(0.00)	(0.12)	(0.14)
Age_{it}	21.382	21.442	17.696	21.671	21.226
	(20.41)	(20.46)	(17.08)	(21.19)	(19.97)
$Group_i$	0.613	0.619	0.347	0.877	0.472
	(0.49)	(0.48)	(0.48)	(0.33)	(0.50)
Real assets$_{it}$	242.542	245.294	89.653	364.331	176.686
	(1091.79)	(1099.23)	(511.47)	(1322.88)	(936.97)
Log of real assets$_{it}$	3.768	3.778	3.213	4.292	3.484
	(1.55)	(1.55)	(1.26)	(1.57)	(1.46)
Profitability$_{it}$	0.074	0.075	-0.001	0.053	0.086
	(0.20)	(0.20)	(0.29)	(0.22)	(0.19)
$Leverage_{it}$	0.252	0.250	0.310	0.309	0.334
	(0.32)	(0.32)	(0.38)	(0.36)	(0.30)
$Collateral_{it}$	0.300	0.301	0.249	0.236	0.220
	(0.29)	(0.28)	(0.24)	(0.24)	(0.29)
GE_{it}	0.351	0.352	0.276	1.00	0.00
	(0.48)	(0.48)	(0.45)	(0.00)	(0.00)
$EXPORT_{it}$	0.378	0.378	0.370	0.761	0.00
	(0.48)	(0.48)	(0.48)	(0.43)	(0.00)
$FOREIGN_i$	0.234	0.236	0.102	0.760	0.00
	(0.42)	(0.42)	(0.30)	(0.43)	(0.00)
Observations	253151	248676	4475	88846	164305

Notes: The Table reports sample means. Standard deviations are presented in parentheses. The subscript *i* indexes firms, and the subscript *t*, time, where *t*=1997-2002. $FAIL_{it}$ is a dummy variable equal to 1 if firm *i* failed in year *t*, and 0 otherwise. $Group_i$ is a dummy variable equal to 1 if firm *i* is part of a group (UK or foreign), and 0 otherwise. $Profitability_{it}$ is measured as firm *i*'s profit margin at time *t*, i.e. the ratio of its profits before interests and tax to its total assets. $Leverage_{it}$ is calculated as the firm's short-term debt to assets ratio. $Collateral_{it}$ is given by the ratio of the firm's tangible assets to its total assets. GE_{it} is a dummy variable equal to 1 if the firm is globally engaged, and 0 otherwise. $EXPORT_{it}$ is a dummy variable equal to 1 if firm *i* exports at time t, and 0 otherwise; and $FOREIGN_i$ is a dummy variable equal to 1 if firm *i* is foreign-owned, and 0 otherwise.

Table 2. Summary statistics: newly established firms

	Total sample	Surviving firm-years	Failed firm-years	Globally engaged firm-years	Purely domestic firm-years
	(1)	(2)	(3)	(4)	(5)
$FAIL_{it}$	0.015	0.00	1.00	0.012	0.018
	(0.123)	(0.00)	(0.00)	(0.11)	(0.13)
Age_{it}	2.595	2.580	3.515	2.535	2.633
	(1.49)	(1.49)	(0.99)	(1.51)	(1.47)
$Group_i$	0.677	0.681	0.395	0.922	0.523
	(0.47)	(0.47)	(0.49)	(0.27)	(0.50)
Real assets$_{it}$	245.389	248.050	76.563	324.729	195.38
	(1254.88)	(1264.01)	(293.13)	(1413.04)	(1141.23
Log of real assets$_{it}$	3.515	3.524	2.932	3.974	3.226
	(1.73)	(1.73)	(1.41)	(1.68)	(1.70)
Profitability$_{it}$	0.010	0.010	0.020	-0.047	0.046
	(0.44)	(0.44)	(0.49)	(0.47)	(0.43)
$Leverage_{it}$	0.354	0.354	0.374	0.428	0.308
	(0.52)	(0.51)	(0.60)	(0.57)	(0.47)
$Collateral_{it}$	0.296	0.297	0.201	0.241	0.330
	(0.31)	(0.31)	(0.23)	(0.27)	(0.33)
GE_{it}	0.387	0.388	0.291	1.00	0.00
	(0.49)	(0.49)	(0.45)	(0.00)	(0.00)
$EXPORT_{it}$	0.298	0.298	0.302	0.626	0.00
	(0.46)	(0.46)	(0.46)	(0.48)	(0.00)
$FOREIGN_i$	0.309	0.311	0.175	0.865	0.00
	(0.46)	(0.46)	(0.38)	(0.34)	(0.00)
Observations	27900	27467	433	10786	17114

Notes: The Table reports sample means. Standard deviations are presented in parentheses. The subscript *i* indexes firms, and the subscript *t*, time, where *t*=1997-2002. Also see *Notes* to Table 1.

Table 3. Financial variables, global engagement, and firms' survival: full sample

	Pooled Logit model	Cox proportional hazard model	Rare-events Logit model	Random-effects Logit model	Pooled Logit model with time dummies interacted with industry dummies	Pooled Logit model $GE_{it}=EXPDUM_{it}$	Pooled Logit model $GE_{it}=FOREIGN_{it}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age_{it}	-0.008***		-0.008***	-0.008***	-0.008***	-0.006***	-0.009***
	(0.001)		(0.010)	(0.001)	(0.001)	(0.001)	(0.001)
$Group_i$	-1.248***	-1.181***	-1.247***	-1.248***	-1.250***	-1.325***	-1.160***
	(0.04)	(0.036)	(0.039)	(0.037)	(0.039)	(0.048)	(0.040)
$Size_{it}$	-0.075***	-0.128***	-0.075***	-0.075***	-0.077***	-0.094***	-0.071***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.015)	(0.012)
$Profitability_{it}$	-1.265***	-1.180***	-1.265***	-1.265***	-1.267***	-1.386***	-1.284***
	(0.066)	(0.055)	(0.066)	(0.060)	(0.066)	(0.083)	(0.066)
$Leverage_{it}*(1-GE_{it})$	0.509***	0.352***	0.510***	0.509***	0.521***	0.301***	0.524***
	(0.044)	(0.040)	(0.044)	(0.046)	(0.045)	(0.059)	(0.041)
$Leverage_{it}*GE_{it}$	0.222***	0.227***	0.224***	0.222***	0.219***	0.335***	-0.095
	(0.056)	(0.052)	(0.056)	(0.057)	(0.056)	(0.066)	(0.090)
$Collateral_{it}*(1-GE_{it})$	-0.788***	-0.846***	-0.787***	-0.788***	-0.787***	-0.512***	-0.690***
	(0.077)	(0.074)	(0.077)	(0.076)	(0.077)	(0.101)	(0.073)
$Collateral_{it}*GE_{it}$	-0.394***	-0.449***	-0.392***	-0.394***	-0.392***	-0.647***	-0.940***
	(0.119)	(0.112)	(0.112)	(0.121)	(0.112)	(0.163)	(0.196)
Observations	253151	253150	253151	253151	252860	132200	252829

Notes: $Size_{it}$ represents the logarithm of real assets for firm *i* at time *t.* Robust standard errors are reported in parentheses. In the pooled Logit specifications, the standard errors are corrected for clustering. Time-dummies and industry dummies were included in the specifications reported in columns (1) to (4) and (6) to (7). In the specification reported in column (5), time dummies are included together with time dummies interacted with industry dummies. Cohort dummies (not reported) were included in the Cox proportional hazard specification. Sample period: 1997-2002. * indicates significance at the 5% level. ** indicates significance at the 1% level. Also see Notes to Table 1.

Table 4. Financial variables, global engagement, and firms' survival: newly established firms

	Pooled Logit model	Cox proportional hazard model	Rare-events Logit model	Random-effects Logit model	Pooled Logit model with time dummies interacted with industry dummies	Pooled Logit model $GE_{it}=EXPDUM_{it}$	Pooled Logit model $GE_{it}=FOREIGN_{it}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age_{it}	0.534***		0.532***	0.749***	0.532***	0.517***	0.533***
	(0.040)		(0.040)	(0.112)	(0.040)	(0.052)	(0.040)
$Group_i$	-1.257***	-1.153***	-1.255***	-1.580***	-1.264***	-1.127***	-1.220***
	(0.126)	(0.115)	(0.126)	(0.207)	(0.126)	(0.152)	(0.133)
$Size_{it}$	-0.112***	-0.132***	-0.112***	-0.134***	-0.113***	-0.053	-0.108***
	(0.036)	(0.038)	(0.036)	(0.047)	(0.036)	(0.045)	(0.036)
$Profitability_{it}$	0.003	-0.085	-0.0004	0.060	0.007	-0.256**	0.001
	(0.126)	(0.114)	(0.126)	(0.138)	(0.126)	(0.126)	(0.128)
$Leverage_{it}*(1-GE_{it})$	0.330***	0.282***	0.342***	0.459***	0.332***	0.270**	0.330***
	(0.098)	(0.094)	(0.098)	(0.141)	(0.100)	(0.122)	(0.095)
$Leverage_{it}*GE_{it}$	0.0631	0.024	0.087	0.106	0.053	0.082	-0.052
	(0.165)	(0.133)	(0.165)	(0.163)	(0.165)	(0.182)	(0.232)
$Collateral_{it}*(1-GE_{it})$	-1.390***	-1.244***	-1.372***	-1.691***	-1.382***	-0.730**	-1.251***
	(0.266)	(0.260)	(0.265)	(0.355)	(0.265)	(0.310)	(0.253)
$Collateral_{it}*GE_{it}$	-0.149	0.0832	0.006	-0.018	0.001	-0.182	-0.109
	(0.341)	(0.341)	(0.341)	(0.422)	(0.342)	(0.564)	(0.409)
Observations	27900	26586	27900	27900	23476	15032	27817

Notes: $Size_{it}$ represents the logarithm of real assets for firm *i* at time *t.* Robust standard errors are reported in parentheses. In the pooled Logit specifications, the standard errors are corrected for clustering. Time-dummies and industry dummies were included in the specifications reported in columns (1) to (4) and (6) to (7). In the specification reported in column (5), time dummies are included together with time dummies interacted with industry dummies. Cohort dummies (not reported) were included in the Cox proportional hazard specification. Sample period: 1997-2002. * indicates significance at the 5% level. ** indicates significance at the 1% level. Also see Notes to Table 1.

Table A1: Variance-covariance matrix of main variables

Panel A: Full sample

	$FAIL_{it}$	Age_{it}	$Group_i$	$Size_{it}$	$Profitability_{it}$	$Leverage\ ratio_{it}$	$Collateral_{it}$	GE_{it}
$FAIL_{it}$	0.017							
Age_{it}	-0.065	416.62						
$Group_i$	-0.005	0.108	0.237					
$Size_{it}$	-0.010	6.891	0.268	2.400				
$Profitability_{it}$	-0.001	-0.063	-0.007	-0.018	0.041			
$Leverage_{it}$	0.001	-0.547	0.334	0.017	-0.019	0.101		
$Collateral_{it}$	-0.001	0.383	-0.014	0.045	-0.003	-0.006	0.079	
GE_{it}	-0.001	0.102	0.092	0.184	-0.007	0.020	-0.022	0.228

Panel B: Newly established firms

	$FAIL_{it}$	Age_{it}	$Group_i$	$Size_{it}$	$Profitability_{it}$	$Leverage\ ratio_{it}$	$Collateral_{it}$	GE_{it}
$FAIL_{it}$	0.015							
Age_{it}	0.014	2.213						
$Group_i$	-0.004	-0.029	0.219					
$Size_{it}$	-0.009	0.151	0.263	3.000				
$Profitability_{it}$	0.0001	0.053	-0.022	0.018	2.00			
$Leverage_{it}$	0.0003	-0.023	0.047	-0.076	-0.105	0.268		
$Collateral_{it}$	-0.001	-0.008	0.003	0.120	-0.003	-0.008	0.098	
GE_{it}	-0.001	-0.023	0.095	0.177	-0.022	0.028	-0.021	0.237

Notes: The subscript *i* indexes firms, and the subscript *t*, time, where *t*=1997-2002. Sample size in Panel A: 253151. Sample size in Panel B: 27900. Also see Notes to Tables 1 and 3.