Credit Access and Market Access*

Cláudia Custódio† Christopher Hansman‡

Imperial College London, CEPR, ECGI Emory University

Bernardo Mendes §

London Business School

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Abstract

We show that credit allows firms to enter export markets. We employ a regression discontinuity design around eligibility for a government program that provided credit guarantees to Portuguese SMEs. Eligible firms access credit and become exporters, expanding both the scale and scope of their international presence. The effects are persistent. Firms that are temporarily eligible for the guarantee continue to export after losing access. This evidence is consistent with trade models in which financial frictions distort participation at the extensive margin. Our findings underscore the role of credit-focused policies in promoting international trade.

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†Department of Finance, Imperial College Business School; Email: c.custodio@imperial.ac.uk

‡Department of Economics, Emory University; Email: c.hansman@emory.edu

§Department of Finance (PhD), London Business School; Email: bdematosmendes@london.edu

1 Introduction

Most firms do not participate in international trade.[1] Yet, there is growing evidence that exporting increases firm-level productivity and profitability (De Loecker, 2007; Atkin et al., 2017). As a result, governments worldwide invest heavily in easing barriers to market access (Lederman et al., 2010; Ali et al., 2025; Juhász et al., 2025). Frictions in credit markets provide a classic rationale for intervention—indeed, standard trade models with imperfect capital markets emphasize the possibility that credit constraints can keep otherwise productive firms out of export markets (e.g., Chaney, 2016).

Despite these theoretical predictions, causal evidence that credit impacts entry into export markets is scarce. A major challenge has been identification—estimating the impact of finance on export market entry requires a credible source of variation in credit conditions for potential entrants, along with rich data on firms' financing choices and export activities. While there is a growing high-quality quasi-experimental literature that studies the impact of finance on exporting, this work typically studies existing exporters, often relying on shocks to trade finance for identification (see, e.g., Amiti and Weinstein, 2011; Paravisini et al., 2015; Monteiro and Moreira, 2025; Kabir et al., 2024). As a consequence, it necessarily focuses on the impacts on incumbents—how much they export, product mix, and which foreign markets they serve—rather than on entry.[2]

In this paper we show that a shock to credit conditions allows firms to enter, and subsequently remain in, export markets. To do so, we implement a regression discontinuity based on the eligibility thresholds of a loan guarantee program introduced in Portugal after the great recession. The program—designed to support lending to small and medium sized enterprises—offered government-backed guarantees covering up to 70% of credit lines to qualifying firms, resulting in a sizable expansion of firm borrowing. While there was no explicit or implicit link to international trade, we find that access to the guarantee sharply increases firms' likelihood of exporting. These effects are highly persistent—qualifying firms continue to be more likely to export even years after losing eligibility.

[1] A large literature shows that only a small minority of firms export, with the vast majority selling exclusively in domestic markets (e.g., Tybout, 2003; Bernard et al., 2003, 2012; Eaton et al., 2004). In the United States, for example, only about 2.8% of firms exported in 2021 (U.S. Census Bureau, 2022).

[2] Given the trade literature's emphasis on sunk costs and hysteresis, the effect of a credit shock on exit for existing exporters is unlikely to symmetrically capture the impact on entry by new exporters.

The Portuguese setting offers three features that together make it possible to study the role of credit in export entry. First, the institutional design of the credit guarantee scheme generates sharp cross-sectional variation in financing conditions across otherwise similar firms. Second, this variation applies to both incumbent exporters and non-exporters, allowing us to study export entry directly rather than inferring it from responses among incumbents. Third, rich Portuguese administrative data allow us to link detailed firm financials to high-quality transaction-level international trade data, including prices, destinations, and fine-grained product categories.

Our analysis focuses on Portugal's *SME-Leader Program*, a guarantee scheme first implemented in 2008. Program eligibility was determined by fixed thresholds applied to firms' lagged financial and operating performance. While the specific variables and thresholds varied across years, they typically included measures of sales, profitability, and balance sheet strength. These rules create a discrete increase in access to guaranteed credit for firms that marginally exceed the qualifying thresholds. Consistent with the requirements of our regression discontinuity design, firms are smoothly distributed around the thresholds we examine, and we find no evidence of discontinuities in key outcomes prior to the program. In contrast, eligibility leads to a pronounced increase in the use of finance: firms that narrowly qualify experience higher program take-up and greater total borrowing.

Our paper is organized into three parts. In the first, we show that the shift in credit conditions generated by the guarantee impacts the decision to export. Firms that marginally qualify are 3 percentage points (12%) more likely to export, compared to similar, non-qualifying firms. We also show that qualifying firms exported a more diverse set of products (measured at the 8-digit product category), reached a larger number of product markets, and had higher total export values. The results are not sensitive to particular bandwidth, kernel, or other specification choices, hold when measuring export activity in an alternative data source, and are concentrated among firms that were not exporters prior to qualifying.

In the second, we show that the impact on exporting is persistent. A standard rationale for export-promotion policies is that a one-off shock might help firms clear an initial barrier to exporting, with effects that endure beyond the period of support. This mechanism features prominently in models of trade with sunk costs and hysteresis (e.g., Baldwin and Krugman, 1989). Indeed our regression discontinuity shows that firms that qualify in a given year continue to export at higher

rates in the future. A potential concern, however, is that this persistence could reflect repeated access to the guarantee, rather than the longer run impact of a one-off relaxation in financing conditions.

To address this concern, we implement a complementary RD strategy that isolates firms receiving only a temporary credit shock. We exploit an unexpected tightening of eligibility thresholds between 2012-2013. For example, the required equity-to-assets ratio was increased from 20% to 25%. We confirm in the data that, as a result of this increase, firms that were marginally eligible in 2012 where highly unlikely to requalify in 2013 or subsequent years. Comparing firms just above and just below the pre-tightening thresholds therefore captures a temporary difference in access to the guarantee. Despite the transitory nature of this shock, we continue to find persistent effects on exporting: firms that only temporarily qualified for the scheme export at higher rates for several years.

The increase in export participation that we document could arise for two distinct reasons. The guarantee may relax a financing friction that prevents productive firms from exporting. However, it may also operate as a pure subsidy, lowering the cost of capital and leading firms to take on projects they would not otherwise. In the third and final part of the paper, we provide evidence that the guarantee operates by relaxing a financing friction. We show that access to the guarantee leads firms to expand capital and labor while increasing revenue productivity, particularly in export-intensive industries. This pattern—input expansion accompanied by higher average productivity—is difficult to reconcile with a pure subsidy, which would predict expansion into lower-return activities, but is natural if credit constraints prevent firms from financing high-return opportunities abroad. We reinforce this evidence by examining heterogeneity across firms in our main regression discontinuity design. Consistent with this interpretation, we find that the effects of the guarantee on export participation are largest among firms that are more likely to face financial constraints. Taken together, our results show that a shock to credit conditions can increase export participation, and that this effect appears to operate by relaxing financial constraints.

Related Literature. Our work is most directly related to the literature on the role of financial frictions in international trade. A large body of theoretical work emphasizes the importance of credit access for export participation at the extensive margin, using Melitz (2003)-style models

with fixed or sunk export costs (e.g., Alessandria and Choi, 2007; Manova, 2013; Chaney, 2016; Leibovici, 2021). Consistent with these predictions, a broad empirical literature documents a positive relationship between financial development, credit conditions, and export participation and activity across countries, industries, and firms (e.g., Beck, 2002; Berman and Héricourt, 2010; Amiti and Weinstein, 2011; Bricongne et al., 2012; Chor and Manova, 2012; Becker et al., 2013; Antras and Foley, 2015; Xu, 2022).[3] More broadly, research on financial frictions and trade is part of a long-standing literature linking financial development to economic growth (Schumpeter, 1911; Kletzer and Bardhan, 1987; Rajan and Zingales, 1998).

While the theoretical literature emphasizes export entry as a key margin through which credit frictions operate, existing causal evidence has largely examined how changes in credit conditions affect firms that are already active in export markets. In particular, most causally identified studies exploit negative credit shocks to incumbent exporters — such as tightening in bank credit or disruptions to trade finance — and therefore document effects concentrated along the intensive margin, including export volumes, product scope, and destination composition (Zia, 2008; Amiti and Weinstein, 2011; Paravisini et al., 2015; Kabir et al., 2024; Monteiro and Moreira, 2025). We instead exploit firm-level exogenous variation in credit conditions to provide direct causal evidence that a positive shock to credit increases firms' participation in export markets. Moreover, we show that even a one-off shock to credit access generates persistent effects on export activity, highlighting the importance of credit frictions for export entry and longer-run export dynamics.[4]

Our work also contributes to the literature on the effectiveness of Export Promotion Agencies (EPAs) (e.g., Bernard and Jensen, 2004; Görg et al., 2008; Martincus and Carballo, 2008, 2010; Lederman et al., 2010; Volpe Martincus and Carballo, 2010; Volpe Martincus et al., 2010; Cadot et al., 2015; Kabir et al., 2024; Buus et al., 2025; Ali et al., 2025).[5] A first broad finding in this literature is that export promotion appears to be more effective at improving the performance of established exporters than at inducing non-exporters to enter foreign markets (Bernard and Jensen, 2004; Görg

[3] Kohn et al. (2022) provides an overview of both the theoretical and empirical literature.

[4] A broad empirical literature documents a positive relationship between financial development and export activity across countries (e.g. Beck, 2002) and industries (e.g. Svaleryd and Vlachos, 2005; Manova, 2013). Firm-level studies similarly document correlations between extensive-margin export activity and financial constraints, proxied via balance sheets (Bellone et al., 2010; Berman and Héricourt, 2010), surveys (Minetti and Zhu, 2011), or credit scores (Muûls, 2015). Our results provide causal evidence that is consistent with these patterns.

[5] EPAs provide a range of services, including grants and subsidies, information provision, and match-making, aimed at directly lowering the fixed or variable costs of accessing foreign markets or supporting incumbent exporters.

et al., 2008; Cadot et al., 2015). Moreover, evidence on persistence is mixed.[6]. We contribute to this literature by showing that a temporary, non-export-targeted credit shock leads potential exporters to enter foreign markets and remain exporters even after the credit shock dissipates. Given the growing evidence that access to foreign markets improves firm performance and productivity (Atkin et al., 2017; Alfaro-Urena et al., 2022), our results suggest that an important mechanism through which financial development promotes growth is by allowing individual firms to access foreign markets.

Finally, we add to the expanding literature on the real effects of government-backed loan guarantee programs. This includes work on the SME-Leader Program in Portugal itself (Bonfim et al., 2023), analyses of similar programs in the UK after the great recession and during the COVID crisis (Gonzalez-Uribe and Wang, 2020) and of related schemes across international contexts (Lelarge et al., 2010; Bach, 2014; Bachas et al., 2021; Columba et al., 2010). Despite the vast literature on the impact of government credit guarantee schemes, our understanding of their effect on firms' export dynamics remains very limited. Our work show that these guarantee schemes have impacts beyond the domestic market, and provide an effective means of promoting export activity. Our evidence suggests that these effects operate by relaxing firms' binding financial constraints, leading to persistent increases in firm productivity, particularly in export-intensive industries.

2 Background and Data

2.1 The Portuguese Credit Guarantee Scheme: The SME-Leader Program

The *SME-Leader Program* is a credit guarantee scheme in Portugal run by a government agency (IAPMEI). The scheme began in the aftermath of the financial crisis with the stated goal of ensuring that the best-performing small and medium-sized enterprises (SMEs) had access to financing during the downturn. Since 2008, this program has provided qualifying firms with an official certification and access to credit lines backed by a partial government guarantee. The guarantee helps expand access to financing and contributes to a more streamlined and standardized approval process.

[6]While some studies find that export promotion effects fade after support ends (Cadot et al., 2015), others document persistent impacts (Atkin et al., 2017)

The allowable terms on credit guaranteed by the scheme have varied somewhat over the course of the program. For example, the maximum spread that banks could place on credit lines granted to *SME-Leader firms* in 2015 ranged between 2.7 and 3 p.p. above the 6-month Euribor,[7] and the maximum loan maturity allowed was 10 years. The maximum guarantee was between 50% and 70%.

To be eligible for the *SME-Leader* guarantee in a given year, a firm has to satisfy a set of criteria based on financial and operational measures. These requirements form the basis of our regression discontinuity strategy. The specific eligibility criteria have changed every year since the creation of the program, but have involved different combinations of the following financial variables and ratios: total assets, number of employees, total sales, net income, EBITDA, net income/assets, equity/assets, sales growth and EBITDA growth. For example, in 2008, firms were required to have a ratio of equity-to-net assets above 20% and a positive growth rate of business turnover. The qualifying thresholds for these variables have also changed over time. Appendix Table C1 shows the exact set of criteria for each year from 2008 to 2014, our sample period.

To access the scheme, firms must submit an application through a participating Portuguese commercial bank (the set of participating institutions includes all major Portuguese lenders). There is no application fee. The bank evaluates whether the firm meets the eligibility criteria, completes its own credit screening, and submits the final application to IAPMEI. The bank also negotiates the interest rate and other commercial fees with the firm and maintains its monitoring function. The official certification is valid for one year and must be renewed every year under the new set of eligibility criteria, although both loans and guarantees can have longer maturity.

Unlike credit rating agencies, IAPMEI does not screen firms, it simply defines a set of criteria for eligibility. If conditions are met, firms qualify automatically. Figure 1 shows the number of certified firms and the inflow of firms certified for the first time between 2008 and 2014. The number of certified firms was increasing in our sample period, from around 2600 in 2008 to approximately 7100 in 2014. In contrast, the number of newly certified firms was decreasing over time.

The typical timeline of the program is summarized in Appendix Figure C1. Firms submit their annual financial reports in April to the tax authorities and other relevant bodies; eligibility criteria based on the filed financial statements are announced, and firms apply to the program during the

[7] For reference, the average spread for new loans under €1 million was 3.8 p.p. in the same period.

summer; the list of certified firms is publicly announced by IAPMEI early in the fall; firms benefit from their certified status for one year. Over the years, the announcement of the list of certified firms has shifted slightly later in the fall, but the application period has never preceded the filing date for financial reports. This reduces firms' ability to manipulate financial data to access the scheme.

2.2 The Portuguese Export Market

The export market has become an increasingly important component of the Portuguese economy over the past few decades (Figure 2). In the 1970s and early 1980s, exports accounted for approximately 15–20% of GDP. This share rose to around 25–30% in the following decades, remaining relatively stable until 2009. Since then, it has increased sharply, surpassing 40% of GDP by 2014.

SMEs account for a substantial share of total exports. During our sample period (2008-2014), the SMEs in our sample were responsible for approximately 35-40% of the total Portuguese exported value (Appendix Figure A1). Moreover, their export behavior closely mirrors the export patterns of the nation as a whole. Appendix Figure A2 shows the main export products, aggregated at the two-digit level, and destination countries for Portuguese SMEs and the overall economy, highlighting the strong overlap in both products and destination markets. The main export partners include several EU member states, such as Spain, France, and Germany, as well as non-EU destinations, including the United Kingdom, the United States, and former Portuguese colonies such as Brazil and Angola. Leading export products comprise machinery and plastic molds, clothing and footwear, and beverages (mostly wine).

2.3 Data

We use data from three administrative sources:

Data on Eligibility Criteria and Enroll for the Guarantee Scheme (IAPMEI). We use data on the eligibility criteria and the identity of enrolled firms from IAPMEI, the government agency responsible for the *SME-Leader* program.

Balance Sheet Data (SCIE). We use unique fiscal identification numbers to merge these data to detailed firm-level accounting records collected by *Sistema de Contas Integradas das Empresas* (SCIE), a joint project of the Ministry of Finance, Ministry of Justice, Statistics Portugal and *Banco de Portugal* (the Bank of Portugal). SCIE attempts to integrate the information that Portuguese firms are required to report for legal, fiscal, and statistical purposes. This accounting data is used by banks to confirm that firms meet the eligibility criteria for the guarantee scheme. We use this data for three purposes. First, we compute the value of each eligibility criterion for each firm–year and identify the firms that are eligible for the program. Second, balance sheet data allows us to consider key dimensions of heterogeneity, and measure firm output, factor utilization and productivity. Third, the SCIE database includes the total export volume of goods and services by firm in each year (starting in 2010) for both EU and non-EU markets, as well as the value of domestic sales. This gives us a complementary measure of export activity to use in our analysis beyond the trade flows discussed below.

Trade Flows (FTS). We combine these data with granular transaction-level data on export flows. The Foreign Trade Statistics (FTS) database records virtually all flows of goods between Portuguese firms and international trade partners. This database includes detailed information on the product, the market, and the value and quantity for both exports and imports, reported at a monthly frequency. These data are collected by the Statistics Portugal and serve as the official Portuguese source of information on trade with EU and non-EU trade partners. Data on trade transactions with non-EU countries (*Estatísticas Correntes do Comércio Extracomunitário*) are obtained from the customs clearance system, covering the universe of external trade transactions. Data on transactions with EU members (*Estatísticas Correntes do Comércio Intracomunitário*) are recorded through *Instrastat*. This system requires firms whose annual value of total exports exceeds a predetermined threshold to provide information on all their exports and imports. The threshold is determined to ensure that at least 97% of the total value of intra-EU trade transactions is reported.

Products are classified at an eight-digit level according to the *Nomenclatura Combinada* (Combined Nomenclature). This system of classification is standardized for all EU members. For each recorded export or import, the database contains the destination (or origin) country and the corresponding total value (in €). Export and import values in these data are *free-on-board* and therefore

exclude any duties or shipping charges. The comprehensiveness and granularity of these data allows us to map firms' exported products and destination markets in detail over time. For an illustrative example, Appendix Figure A3 shows the top ten exported products by our sample of firms at the most granular level (eight digits) between 2008 and 2014, broken down by destination country. The figure also provides detailed product descriptions.

2.4 Sample Definition

Given the set of firms targeted by the guarantee, we focus on the full set of SMEs with at least 10 employees. We define SMEs following EU recommendation 2003/361. Our analysis considers program enrollment from 2008 to 2014. We focus on this period for two primary reasons. First, this is a period of major export expansion in Portugal. A drop in domestic demand during the 2008-2014 period led firms to shift to external markets. Between 2009 and 2014, exports as a fraction of GDP grew by roughly 13 percentage points (Figure 2). This allows us to focus on a period during which exports significantly contributed to the health and sustainability of Portuguese firms. Second, Bonfim et al. (2023) show that the guarantee scheme had a strong impact on the availability of finance in the post-crisis period, but had little impact on financing conditions after the market recovered in 2015. Focusing on the pre-2015 portion of the sample allows us to target the period in which the scheme meaningfully shifted financing conditions.

Because firms do not apply to the program until the summer, and certification is not typically granted until early fall, the timing of program benefits does not perfectly align with the calendar year. For the FTS data, which provide our primary outcomes and are reported at a monthly frequency, we define the initial treatment year (T) as the 12-month period beginning in July of the certification year. For data available only at the annual frequency, such as the balance sheet information, we define the initial treatment year T as the calendar year immediately following the certification year. While our analysis focuses on program enrollment between 2008 and 2014, the dataset extends through 2017, allowing us to track firms over time and assess the dynamic effects of enrollment. We present the details on the estimation of the dynamic response in Section 5.

Summary Statistics. Table 1 presents summary statistics. Panel A displays the cross-section of firm financial and operational characteristics in 2010, the first year in which all variables are

available in our sample period.[8] The median firm in our sample has 18 employees, sales of €1.13 million and around €1.13 million in total assets. Median net income is €11,300. Panel B shows statistics on export variables from the FTS data. In our sample period, the average firm exported a total of €243,000 in goods per year. 25% of firms are exporters in a given year, although, as Appendix Figure A4a shows, this percentage was increasing over our sample period. Appendix Figure A4b shows the time series patterns of exports for program recipients and non-recipients. On average, recipients of the program are almost twice as likely to export as non-recipients. The average value of exports is also roughly twice as large (Appendix Figure A4c).

The average firm in our sample exports just under 4.5 unique products to roughly 1.2 countries each year. Appendix Figure A5 shows the distribution of the number of export destinations, products and product-destination pairs for both program recipients and non-recipients. The distribution of each of these variables among program recipients is slightly shifted to the right, when compared to non-recipients, indicating that certified firms tend to export a greater variety of products to a broader range of destination markets. The average relationship duration in our sample of firms is approximately 0.6 years.[9] Appendix Table A1 reports summary statistics from our alternative source of export data from SCIE, which considers both goods and services.

3 Empirical Strategy

Our baseline approach is a regression discontinuity design that compares export-related outcomes for firms that qualified for the guarantee provided through the SME-Leader program versus firms that did not. We focus specifically on comparing firms that met the criteria for eligibility by a small margin against those that failed to meet the criteria by a small margin. Because these criteria were multidimensional (and varied from year to year), implementing a regression discontinuity requires a clear definition of what it means to meet the criteria "by a small margin."

[8] Variables related to trade credit, namely Payable and Receivable Accounts, are only available from 2010 onward.
[9] Here, we define an export relationship as exporting a 4-digit product code to a given destination country.

3.1 Defining the Running Variable r_{it}

We follow the strategy implemented in Ferreira et al. (2018) and Bonfim et al. (2023) and transform the multidimensional criteria into a univariate running variable for firm i in year t: r_{it}. The approach is as follows. Suppose there is a set of K criteria, where firm i qualifies for the program in year t if financial or operating variable c_{it}^k exceeds threshold T^k ($c_{it}^k > T_k$) for all k in K.

Our first step is to create a standardized version of each criterion c_{it}^k.

$$\tilde{c}_{it}^k = \frac{c_{it}^k - T_k}{\sigma_k}.$$

Where σ_k represents the standard deviation of c_{it}^k. We then define the running variable as the *most binding* across the relevant set of criteria. Formally, this is just the minimum:

$$r_{it} = \min_{k \in K} \tilde{c}_{it}^k.$$

The intuition is relatively straightforward. r_{it} represents the variable that most directly determines the eligibility status of firm i. In principle, if $r_{it} > 0$ the firm is eligible, and if $r_{it} < 0$ it is not. For r_{it} below 0, this represents the c_{it} that is furthest below the threshold. For r_{it} above 0, this represents the c_{it} closest to the threshold. In either case, if r_{it} is in a small neighborhood around 0, a small change in the relevant c_{it} could cause an eligible firm to become ineligible (or vice-versa). With this r_{it} defined, we can then implement a standard regression discontinuity design.

In practice, we consider all accounting criteria in each year t in our definition of r_{it} except for one: the 2009-2014 requirement that firms have positive *net income* in the past year. This is because of the well documented tendency of firms to report small positive earnings, which creates bunching in the distribution of net income just above zero across countries and contexts (see, e.g., Burgstahler and Dichev, 1997). Indeed, this sort of bunching is consistently present among Portuguese SMEs both before and after the SME-Leader program was introduced (Appendix Figure A6). By contrast, we do not observe meaningful bunching in any of the other program criteria between 2008 and 2014 (See Figure 3a for our running variable and Appendix Figure A7 for individual criteria). Excluding net income from r_{it} ensures that our running variable is not influenced by bunching, which could otherwise conflate the impact of the guarantee with systematic differ-

ences among firms just above the zero-profit threshold.

3.2 Implementing the Regression Discontinuity

Our primary focus is on the local impact of program eligibility, the intention-to-treat (ITT) effect, at the eligibility threshold $r_{it} = 0$. Formally, for outcome y_{it}, we define $y_{it}(1)$ and $y_{it}(0)$ as the potential outcomes observed if firm i were eligible or ineligible, respectively, for the credit guarantee scheme at time t. Our parameter of interest is

$$\tau = E[y_{it}(1) - y_{it}(0)|r_{it} = 0].$$

We take a non-parametric local linear (or, in robustness tests, local polynomial) approach to estimate this parameter following Cattaneo et al. (2019). Given a bandwidth h, we estimate separate weighted least squares regressions of y_{it} for observations with $r_{it} > 0$ and $r_{it} < 0$, weighting each observation according to some kernel function $K(\frac{r_{it}}{h})$. We then recover the intercepts α_+ (using observations with positive values of r_{it}) such that $\hat{y}_{it} = \hat{\alpha}_+ + \hat{\beta}_+ r_{it}$, and α_- (using observations with negative values of r_{it}) such that $\hat{y}_{it} = \hat{\alpha}_- + \hat{\beta}_- r_{it}$. Our estimate is then

$$\hat{\tau} = \hat{\alpha}_+ - \hat{\alpha}_-.$$

Our baseline approach uses a triangular kernel, although we consider alternative kernels for robustness. When considering a rectangular kernel, the above simplifies to estimating the following linear regression (for observations with $r_{it} \in [-h, h]$):

$$y_{it} = \alpha_- + \beta_- r_{it} + \tau \mathbb{1}\{r_{it} > 0\} + (\beta_+ - \beta_-)\mathbb{1}\{r_{it} > 0\} \times r_{it} + \varepsilon_{it}.$$

Our key identifying assumption is continuity in average potential outcomes functions across the threshold. In other words, that both $E[y_{it}(1)|r_{it}]$ and $E[y_{it}(0)|r_{it}]$ are continuous at the point $r_{it} = 0$. We select symmetric MSE-optimal bandwidths following Calonico et al. (2014) and Calonico et al. (2019) and compute standard errors clustered at the firm level using the plug-in residual approach outlined in Calonico et al. (2019). We report both conventional standard errors and robust bias-corrected confidence intervals.

3.3 Manipulation Tests

To evaluate the main identifying assumption in our RD methodology, that average potential outcomes are continuous at the threshold $r_{it} = 0$, we conduct tests in the spirit of McCrary (2008). Specifically, we ask whether the density of the running variable r_{it} is continuous at the threshold by implementing the tests outlined in Cattaneo et al. (2018) based on local polynomial density estimators. The null hypothesis for these tests is a lack of bunching, implying continuity of the density function at $r_{it} = 0$. Figure 3a shows the density of our running variable, displaying a smooth distribution through the threshold. Our estimated manipulation test for this running variable is insignificant, with a t-statistic of 0.85. Because we exclude net income, this version of r_{it} does not fully determine eligibility. Still, we should expect a sharp increase in program eligibility and uptake for firms above the threshold. We test and confirm this formally in Section 4.

Placebo Tests. We conduct a placebo exercise to support the validity of our regression discontinuity approach. In this exercise, we simulate the introduction of the SME-Leader Program in 2007, one year prior to its actual implementation. We define our running variable for 2007, assuming the same criteria as in 2008. We then apply our regression discontinuity specification using the main outcome variables described in Section 4. As shown in Appendix Figure A8, the estimated coefficients are small and not statistically different from zero, indicating no discontinuity around the threshold. These findings reinforce the validity of our RD approach, suggesting that our running variable does not capture any other discontinuity apart from enrollment into the SME-Leader Program.

3.4 Panel Regressions

We complement our regression discontinuity with a set of panel regressions that exploit the timing of enrollment in the scheme within firms. These regressions reinforce our RD approach, allow us to control for any fixed differences between enrolling and non-enrolling firms, and provide insight into the impacts of the credit guarantee in a sample that includes firms outside of a local neighborhood around the eligibility threshold. We consider both a two-way fixed effects estimator and a staggered difference-in-difference specification following Callaway and Sant'Anna (2021a).

4 Main Results: Credit Leads to Entry

In this section we present our main empirical finding: credit leads firms to enter export markets. We proceed in two steps. First, we validate that our regression discontinuity captures a shock to credit. Firms just above the threshold are substantially more likely to enroll in the credit guarantee program, triggering an observable expansion of credit. Second, we show that these firms have a distinctly higher probability of exporting, that they expand export activities more generally, and that this specifically reflects the entry margin.

4.1 The Regression Discontinuity Captures a Credit Shock

We begin by confirming that our regression discontinuity captures a meaningful change in enrollment in the credit guarantee scheme. To do so, we run the empirical approach outlined in Section 3, considering a binary outcome y_{it} equal to 1 if firm i is officially certified as an SME-Leader in year t. We present our results in Figure 3b, with details in Appendix Table A2.

The threshold $r_{it} > 0$ corresponds to a sharp jump in the probability of enrollment in the SME-Leader program. The point estimates suggest that firms with a value of r_{it} just above the threshold were roughly 15 percentage points more likely to access the guarantee program.[10] In Appendix Figure A9, we perform the same tests using a second-order local polynomial approximation on either side of the threshold instead of a local linear approximation. The point estimates are virtually unchanged. These results indicate that our regression discontinuity approach captures a sharp change in eligibility for, and take-up of, the guarantee.

We next show that access to the guarantee leads to sharp increases in the use of credit among qualifying firms. In other words, the guarantee appears to have a meaningful impact on credit conditions, and leads firms to take on more debt. To do so, we repeat our regression discontinuity approach, but consider outcomes that capture the quantity of firm borrowing. We consider total debt (in thousands of €) and its log transformation, a binary variable for whether the firm has a loan, and the log of each firm's total loans. We show the results in Table 2.

We find sizable effects on borrowing across all measures we consider. Qualifying firms take

[10] The mass of enrolled firms with $r_{it} < 0$ reflects the exclusion of net income from r_{it}. In years requiring either positive net income or positive sales growth, firms with net income > 0 but negative sales growth appear below the threshold yet still qualify.

on approximately €95,000 more debt, representing an 11% increase. This appears to be largely the consequence of an increase in loans—the type of debt that is subject to the guarantee. Eligible firms are 3 percentage points more likely to have a loan, and their total loan amounts are roughly 18% higher relative to non-eligible firms. These effects may reflect a change in the cost of capital (price mechanism), a shift in access to credit (quantity mechanism) or both. Regardless of the underlying mechanism, Table 2 provides direct evidence that the guarantee improves credit conditions for qualifying firms.[11] In Appendix Section D, we develop a stylized one-period model in which firms borrow to finance production both in the domestic and foreign markets to show how this improvement might impact export participation.

4.2 The Credit Shock Impacts Export Participation

Export Participation

We next show our main result: the change in credit conditions generated by the guarantee leads to a sharp increase in the probability that a firm exports. The first column of Table 3 shows the intention to treat estimates from our RD approach. The dependent variable is an indicator equal to one if firm i exports to any destination in year t. We measure this variable in the FTS data.

We see a positive, economically meaningful, and statistically significant estimate of 0.029. This means that firms that marginally exceed the eligibility criteria are roughly 3 percentage points more likely to export, compared to those just below the threshold. This is a 12% increase relative to the mean. Figure 4a presents this same result graphically, displaying a distinct and economically meaningful jump at the threshold. A shock to credit increases export participation.

The Number of Destinations and Exported Products

Our results suggest that credit also allows firms to enter new product and destination markets. We count the number of export destinations of a firm and the number of products it exports (unique 8-digit code level products) in a given year. Note that at this granular level, very similar products are given distinct codes, so a firm exporting an additional product might simply reflect a slight

[11] While we are not able to observe the interest rate on loans in our data, Bonfim et al. (2023) uses granular credit-registry and loan data to show that the guarantee program reduces the costs of borrowing.

expansion of variety within a broader product class (an example of this granularity is illustrated in the product descriptions in Appendix Figure A3). We measure both variables in the FTS data.

Columns 2 and 3 of Table 3 show statistically and economically significant positive estimates for both measures. Firms that marginally exceed the eligibility criteria export to 0.2 more countries each year, and export just under 1.3 more products, on average. These represent a 18% and 29% increase, respectively, compared to the means of these variables. Robust, bias-corrected 95% confidence intervals do not contain 0. Figures 4b and 4c, present these results graphically, again showing distinct jumps at the eligibility threshold. This evidence, which captures expansions by both new exporters and established participants, suggests that easier credit conditions allow firms to reach new destinations and broaden the diversity of the products they offer.

The Value of Exports

The last column of Table 3 shows an increase in the total value of exports. Our estimates suggest a sharp jump in the total value of exports at the threshold, equivalent to just over €50,000. This is more than 20% of the mean value of exports across firms in our sample. Figure 4d shows the corresponding graphical evidence. Once again, robust, bias-corrected 95% confidence intervals do not contain 0. The increase in the value of exports may represent a combination of pure-extensive margin shifts, of an expansion to new destinations or products among existing exporters, and of pure shifts along the intensive margin (i.e. increasing the value of exports within a given product and destination).

4.3 Robustness

We conduct a series of tests to show that our main results are robust to our specification choices, data source, and estimation approach.

Alternative RD Specifications

First, we show that our results are robust to alternative specification choices for the regression discontinuity design. Appendix Table A3 repeats our main results while allowing for higher-order local polynomial regressions (Panel A), different kernel choices (Panel B), and different bandwidth

choices (Panel C). The point estimates and their corresponding statistical significance closely resemble the benchmark estimates in Table 3. This suggests that the results are not sensitive to the particular choices used in our implementation.

An Alternative Data Source

Second, we measure export activity using the SCIE data, which allows us to examine the robustness of our findings using an alternative data source. Export-related variables are reported starting in 2010. Appendix Table A4 reports the results. Across total exports, goods, and services, we find statistically and economically significant effects on both the extensive and intensive margins, reinforcing our baseline findings. For goods exports, which closely mirror the FTS data, the estimated responses relative to the mean are comparable to our benchmark results: firms are roughly 12% more likely to export and have nearly 19% higher export values.

The response in export activity is present in both EU and non-EU destination markets (Appendix Table A5). Interestingly, the increase in export values is more pronounced for EU members, whereas the response on the extensive margin is stronger for destinations outside the EU. This pattern is consistent with higher sunk entry costs in non-EU markets (such as greater regulatory and customs barriers, longer shipping distances, and weaker pre-existing business networks) making the guarantee particularly important in facilitating entry into these destinations.

An Alternative Estimation Strategy: Panel Regressions

Our complementary panel regressions support the findings of the RD approach. Panel A of Appendix Table A6 presents the results from the two-way-fixed effects estimator described in Section 3.4. Given the alternative approach, the coefficients we recover represent a slightly different impact than the local ITT estimates in our regression discontinuity approach. Specifically, they capture the average impact of program enrollment (rather than eligibility) in a broader set of firms. Despite these differences, our panel estimates (shown in Appendix Table A6) are consistent with our regression discontinuity approach. Across all four measures, we see positive estimates that are statistically significant at any conventional level.

The staggered difference-in-difference approach following Callaway and Sant'Anna (2021a)

yields similar results. Panel B of Appendix Table A6 displays our estimates. The aggregate ATTs are close to, but slightly larger than, our baseline two-way fixed effects approach. We present dynamic versions of these estimates in Appendix Figure A10. There are two valuable takeaways that emerge from the dynamic effects. First, across all four outcome variables, there is evidence that the parallel trends assumption may be violated, at least to a modest degree. This indicates that our RD approach may provide more reliable estimates of the causal impacts of the credit guarantee scheme. Second, the estimated ATTs are consistently positive and appear to be growing over time. This pattern suggests that there may be some meaningful persistence in the impacts of the scheme. We consider this possibility in greater detail in Section 5.

4.4 Do the Impacts Reflect New Entry?

Our results show that access to the credit guarantee impacts the probability a firm exports. In principal, this could reflect a decrease in the exit rate among existing exports, rather than new entry. We next show that the results reflect new entry. To do so, we leverage the granularity of our data to explore heterogeneity in the results by prior export status, classifying firms according to whether they previously exported to a given destination or product market.

We begin with export destinations. We estimate the impact of program eligibility on the probability that a firm exports to country c in year t separately for firms that exported to c in $t-1$ and those that did not. The first two columns of Table 4 show that the impact of the guarantee on the probability of exporting to country c is concentrated among firms that were not prior exporters to c. The estimate in column 1 indicates that, among firms that did not export to c in year $t-1$, the probability of exporting in year t is close to 0.04 percentage points higher for firms above the threshold compared to those immediately below. Among firms that exported to c in $t-1$, the estimated effect is small and is not statistically significant. This indicates that the guarantee allows new entry into destination markets.

We next repeat the exercise focusing on within-product differences in exporter status. We focus on relatively broad (4 digit) product categories. The last two columns of Table 4 suggest a pattern similar to the one for destinations. Among firms not exporting product j in $t-1$, those that are eligible for the credit guarantee in t are nearly 0.05 percentage points more likely to export j versus

non-eligible firms. In other words, the guarantee allows firms to enter new product markets. Together, these findings suggest that credit impacts entry into export markets.

4.5 Are Exports Particularly Sensitive to Credit Shocks?

We next ask whether credit has a particularly pronounced impact on exporting. In principle, our results could simply reflect a general expansion of firm activity: following a positive credit shock, firms may scale up along their most profitable margins, irrespective of whether these opportunities are domestic or international. Alternatively, the impact on exports could reflect a reallocation of sales from domestic to foreign markets. We begin by testing these possibilities. Leveraging the richness of the SCIE data, the first column of Table 5 shows that firms above the eligibility threshold increase domestic sales by approximately 7%. This finding indicates that the effects of the program are not confined to exporting and are not driven by pure reallocation to foreign markets. At the same time, it raises a question: is there anything special about international trade?

Our results indicate that exports are particularly sensitive to the guarantee, echoing Amiti and Weinstein (2011) and related work. For example, the second column considers the ratio of exports to total sales as an outcome variable. We see a sharp increase in exports-to-sales for firms just above the threshold. The remaining columns of Table 5 further show this sensitivity by comparing the impacts of the guarantee in industries that are export oriented. To show this, we first define an industry's propensity to export, as the share of exporting firms within each 2-digit industry classification in 2008 (in the beginning of our sample period). Industries above the 75^{th} percentile of this distribution are classified as having a *high propensity to export*, while those below the 25^{th} percentile are considered to have a *low propensity to export*. We then show that the effects of the guarantee — on both the probability of exporting and total sales — are significantly stronger among firms in export-intensive industries. These results suggest that credit allows firms to overcome factors that are specific to exporting.

5 Credit Has Persistent Impacts on Exporting

A key motivation behind interventions that target export participation is a notion of persistence. The idea that a short-term shock or subsidy may allow firms to overcome an initial hurdle, en-

abling them to become exporters and remain so thereafter. Indeed, sunk cost driven hysteresis is at the core of many standard models of trade (e.g., Roberts and Tybout, 1997; Melitz, 2003; Caggese and Cuñat, 2013).[12]

A natural question, then, is whether a positive shock to credit has a persistent impact on participation in export markets. Estimating such persistent effects is challenging, as it requires a one-off, plausibly exogenous change in credit conditions that affects both incumbent exporters and potential entrants—variation that is often difficult to isolate in empirical settings. Our empirical design provides a clean setting to study this question. We implement a complementary RD approach that exploits a substantial tightening of eligibility thresholds between 2012 and 2013. This allows us to isolate firms that receive a temporary, one-off shock to credit and examine whether they remain more likely to export several years later.

5.1 Persistence in the Baseline RD

We begin by re-estimating our baseline RD specification, considering firms' export activity one, two, and three years in the future as outcomes. This allows us to assess whether the impact of program eligibility on exporting persists beyond the year of qualification.[13]

The results indicate substantial persistence in export participation following a shock to credit conditions. In the last four columns of Table 6, Panel A, we show that program enrollment has a persistent impact on export activity at the extensive margin, well beyond the treatment year. The effects of easing credit conditions on the probability of being an exporter last for at least three years, with the estimated coefficients slightly increasing over time. Three years after initially becoming eligible, firms just above the threshold are 4.3 percentage points more likely to be exporters, compared with those just below the threshold. Similarly, Appendix Table A7 shows persistent effects on the number of export destinations (Panel A), exported products and the value of exports (Panel B).

[12] The presence of hysteresis in export markets was proposed by Baldwin and Krugman Baldwin (1988) and Dixit (1989) to explain the unexpected persistence of the US trade deficit during the mid-1980s. A large temporary rise in the exchange rate induces foreign firms to enter the domestic market. However, since entry costs are sunk, not all entrants exit the domestic market when the exchange rate returns to its original level. This phenomenon results in persistent impacts on trade.

[13] The latest year of eligibility we consider is 2014, as in our main sample. We consider outcomes through 2017.

5.2 Isolating a Temporary Shock: The 2013 Tightening of Eligibility Thresholds

A key concern with using our baseline RD to examine persistence is that the results might reflect the same group of firms receiving the guarantee in multiple years, rather than the long run impact of a one-off shock to credit. To assess this possibility, we first examine the relationship between eligibility and subsequent program enrollment in the baseline. The first four columns of Table 6, Panel A and Appendix Figure A11a show that eligibility strongly predicts contemporaneous enrollment, but has a small and rapidly diminishing effect on future enrollment. Estimated coefficients become statistically insignificant two and three years later. This pattern suggests that firms at the margin experience a largely transitory shock to credit, and that the estimated persistence in export outcomes is unlikely to be mechanically driven by continued program participation.[14] Still, we cannot rule out some persistence in the use of the guarantee.

To more thoroughly address this concern, our complementary RD approach is aimed at isolating firms that received only a one-off shock. We do so by exploiting a unexpected tightening of two eligibility criteria between 2012 and 2013. Specifically, the equity-to-assets ratio rose from 20% to 25%, and the business turnover threshold increased from €500,000 to €750,000. These higher thresholds were not subsequently relaxed in later years.

Our design rests on the fact that firms that were marginally eligible in 2012 according to these two criteria—for example, firms with equity-to-assets ratios just above 20% or business turnover just above €500,000—were highly unlikely to qualify for the guarantee in later years when the criteria tightened. Comparing firms just above, versus just below, these thresholds therefore captures a sharp, but temporary, difference in access to the guarantee. To implement this approach, we focus exclusively on eligibility in 2012, redefining the running variable as described in Section 3, using only the equity-to-assets ratio and business turnover as eligibility criteria. We then repeat the RD, following firms over time to assess the dynamic effects of a one-off shock.

The first four columns of Table 6, Panel B and Appendix Figure A11b show that our approach captures a sharp, temporary shock to credit. Our modified measure of program eligibility strongly predicts contemporaneous enrollment. Firms just above the threshold are 20 percentage points more likely to enroll. However, it does not predict enrollment one, two, or three years after eligi-

[14] Consistent with this interpretation, columns 1–3 of Panel A of Appendix Table A7 show that current eligibility is not a strong predictor of future eligibility.

bility. The coefficients in years $t+1$, $t+2$, and $t+3$, shown in columns 2-4, are close to zero and statistically insignificant.[15]

While the shock to credit is temporary, we find highly persistent impacts on the probability of exporting, with estimated coefficients that are stable over time. The last four columns of Table 6, Panel B show that firms just above the equity-to-assets and business turnover-based eligibility threshold in 2012 are 8.7 percentage points more likely to be exporters three years later compared to those just below the threshold. We also find a persistent impact of the credit guarantee on the number of export destinations, exported products and export value (Appendix Table A8).

Taken together, our results indicate that a one-time shock to credit allows firms to enter export markets and continue to export for a sustained period, including after easier credit has disappeared. This suggests short run, targeted interventions in credit markets can allow firms to overcome the barriers that prevent them from reaching international markets. This evidence is consistent, for example, with the guarantee allowing firms to overcome the sunk costs that feature in standard theoretical models of international trade.

5.3 Relationship Length

Consistent with our earlier evidence of persistent effects on exporting, we find that the credit shock also enables firms to sustain longer export relationships. We define a relationship k as the export of a given product (defined at the 4- or 6-digit level) to a particular export destination.[16] For each export relationship k of firm i in year t, we build a *relationship length* variable equal to the total number of years the relationship lasts. We then compute both the export-value weighted and equal-weighted relationship duration across k at the firm-year level (*Weighted Relationship Duration* and *Mean Relationship Duration*, respectively), assigning zeros to non-exporters and including year fixed effects to address mechanical sample truncation.

Appendix Table A9 shows that program eligibility increases firms' average export relationship duration by about 0.10 years, corresponding to a 12% increase relative to the mean. This finding suggests that the persistent impact on treated firms operates through more stable prod-

[15] In columns 1 to 3 of Panel A of Appendix Table A8, we show eligibility in 2012 is also not a strong predictor of future eligibility.

[16] It is important to note that this definition does not guarantee that the trade partner firm remains the same throughout the entire duration of the relationship. Nevertheless, it captures the degree to which a firm can fulfill the demand for a particular product in a particular destination market.

uct–destination relationships over time, rather than frequent reallocation across markets. The effect is economically meaningful given the typically short duration of export relationships, especially among smaller firms (see, e.g., Albornoz et al., 2012).

6 Why The Guarantee Matters

Our evidence shows that access to the guarantee increases firm export activity—allowing them to enter and remain in foreign markets. This suggests that credit guarantees are an effective instrument for export promotion. One interpretation is that the guarantee relaxes financing frictions, allowing productive exporters to cover sunk entry costs or other barriers that prevent them from accessing foreign markets. An alternative interpretation, however, is that the guarantee operates as a pure subsidy. By shielding banks from downside risk, it may encourage lending—potentially at favorable rates—to projects or firms that wouldn't receive finance in a frictionless market. Our stylized model in Appendix Section D illustrates these alternatives more formally.

In this section, we present evidence that the impact reflects the relaxation of a financing friction. We do so in two parts. First, we show that eligible firms have higher revenue productivity, particularly in export intensive industries. This is consistent with the guarantee relaxing a financing constraint (in the presence of fixed or sunk costs), but difficult to rationalize with a simple subsidy. Second, we show the impacts on export activity are concentrated among firms that are more financially constrained ex-ante, at least according to standard proxies.

6.1 Suggestive Evidence from Persistence and Export Specificity

Before turning to these results, it is worth noting that two previously discussed patterns are already consistent with a financing-friction interpretation. The fact that the impacts are persistent—as discussed in Section 5—provides an initial piece of evidence that the guarantee operates by relaxing financial constraints. If the guarantee merely subsidized inefficient entry, one might expect its impact to be short-lived, fading once firms face the full costs of competing abroad. However, persistence alone is not conclusive. Even if export projects are not profitable once entry costs are taken into account, firms may continue exporting after entry if flow profits are positive. In this case, a subsidy that helps firms at the margin overcome sunk entry costs can generate persistent

export activity, even in the absence of binding financing frictions.

Similarly, the pronounced impact of the guarantee on exports—relative to domestic output, as discussed in Section 4.5—is consistent with the relaxation of financing constraints. If the guarantee acted as a simple subsidy to the cost of capital, one might expect firm activity to expand proportionally across markets. The fact that exports are particularly concentrated in export markets—where upfront and sunk costs are particularly salient—is indicative of financial frictions. Still, this is not conclusive. An alternative explanation is that the guarantee disproportionately induces firms to expand into riskier export markets where the insurance value of the guarantee is greatest.

6.2 Productivity and Factor Utilization

In the absence of financing frictions, a credit subsidy induces firms to undertake new, lower-return activities that were previously unattractive, lowering average revenue productivity. By contrast, when financing frictions prevent firms from covering large upfront or sunk costs—such as the costs of entering export markets—a relaxation of credit constraints can enable firms to undertake high-return activities that were previously infeasible. The effect of the guarantee on revenue productivity thus provides one test of whether the policy relaxes a financing friction or operates primarily as a subsidy.

In this section, we show that access to the guarantee increases revenue productivity. Marginally eligible firms exhibit higher revenue-based total factor productivity (TFPR) than non-eligible firms, with gains that are statistically significant, persistent, and particularly pronounced in export-intensive industries. We now describe these results in detail.

We begin by examining how eligibility for the guarantee affects firms' scale and factor utilization, using our RD specification. Panel A of Table 7 reports the results. Marginally eligible firms have higher output, measured by both total sales (column 1) and total gross value added (column 2), as well as higher operating profitability (column 3). These output gains are supported by increases in both capital and labor inputs: eligible firms utilize approximately 10 percent more capital and employ close to 1.3 additional workers, resulting in a 4 percent higher total wage bill relative to non-eligible firms. Capital increases more strongly than labor, leading to a statistically significant rise in capital intensity, with eligible firms exhibiting labor-to-capital ratios that are

approximately 8 percent lower (column 1 of Panel B of Table 7).

We then turn to the impact on (revenue based) output-input ratios, which provide a transparent view of how firms' input expansions translate into output, without relying on more complex productivity measures. Despite large increases in both capital and labor, our RD indicates that access to the guarantee generates a substantial rise in revenue labor productivity—output per worker increases by 5.5 percent—while revenue per unit of capital declines only modestly and is statistically indistinguishable from zero (see columns 2 and 3 of Table 7, Panel B). Taken together, these patterns indicate that eligible firms generate more revenue per worker while maintaining roughly similar revenue per unit of capital.

This combination is natural in our setting if access to the guarantee lowers the effective cost of capital and allows firms to enter new, high-return export markets.[17] As firms expand into these opportunities, the return to labor rises because each unit of labor deployed in the new activities generates more revenue than before, leading average labor productivity to increase. At the same time, firms invest until the marginal return to capital is driven down to its new, lower cost, implying that the average output to capital ratio may change little even as total investment rises.[18] It is more difficult to rationalize if the guarantee acts as a simple subsidy to the cost of borrowing.

The impacts we measure with respect to revenue productivity reinforce the patterns observed in output–input ratios. In the remaining columns of Panel B of Table 7, we estimate revenue-based total factor productivity (TFPR) using the method proposed by Levinsohn and Petrin (2003). Our RD estimates indicate that eligibility for the guarantee leads to a sharp increase in revenue productivity: Column 4 shows that qualifying firms exhibit 3.4 percent higher TFPR relative to non-eligible firms. These results are robust to alternative productivity estimation approaches. Appendix Table A10 shows similar effects using Ordinary Least Squares (OLS), Olley and Pakes (1996), and Wooldridge (2009) (see Appendix B for details). Moreover, the productivity gains are persistent: TFPR remains elevated even three years after initial eligibility.

Finally, the productivity effects are concentrated in export-intensive industries (Columns 5 and 6). This pattern suggests that the observed productivity gains reflect access to export markets

[17] This could be because the transition to exporting allows firms to access opportunities where their true technological productivity is higher, or because a Portuguese firm is simple able to charge higher markups in a foreign country where their good is horizontally differentiated.

[18] We expect the marginal output to capital ratio to decline as the cost of capital decreases.

rather than a general expansion of activity. Entry into export markets can raise measured revenue productivity through several channels, including higher markups abroad, learning from foreign demand, quality upgrading, or the adoption of more efficient production technologies. Consistent with this interpretation, the persistence of the productivity effects mirrors our earlier finding that one-off access to the guarantee allows firms to enter—and remain in—export markets.

In sum, the productivity response to the guarantee is robust, persistent, and concentrated in export-intensive industries. Combined with the observed patterns in input use and output–input ratios, these findings are hard to reconcile with a pure credit subsidy and instead point to the guarantee relaxing a financing friction.

6.3 Are the Effects Concentrated in Financially Constrained Firms?

As a final piece of evidence, we examine whether the effects of the guarantee are stronger among firms that are more financially constrained prior to eligibility. If the guarantee operates by relaxing financing frictions, its impact should be larger for firms facing tighter constraints ex ante. To assess this prediction, we study heterogeneity along several dimensions commonly used to proxy for financial constraints. For each measure, we re-estimate our RD specification separately for firms in the bottom and top quartiles of the distribution in the year prior to program eligibility.

While no single proxy is perfect, we find a consistent pattern: the impacts of the guarantee are substantially larger among firms that are more likely to face financing constraints. In particular, effects are stronger for smaller firms, firms with high dependence on external finance, firms with high dependence on trade finance, and firms with limited cash holdings. Taken together, this heterogeneity further supports the interpretation that the guarantee relaxes a financing constraint.

Firm Size. First, we consider our results with respect to firm size, under the hypothesis that larger firms are less likely to be subject to financial constraints (e.g. Beck et al., 2008). This echos the logic of Manova et al. (2015), which compares domestic to multinational firms in China. Larger firms may also be better able to overcome fixed entry costs compared to smaller firms, particularly if those costs do not vary by firm size or are concave in scale. We present our results in Panel A of Table 8.

The impact on export participation is concentrated in smaller firms. For firms in the bottom

quartile of the size distribution, access to the guarantee increases the probability of exporting by approximately 2.5 percentage points. We find no effect for firms in the top quartile. A similar pattern holds for export values. The impact is positive and economically and statistically significant for small firms, but minimal and insignificant for the largest firms in our sample. The results are more mixed for the number of export products and destinations. While we see a marginally significant positive effect on destinations for small firms, the point estimate is on par with the insignificant estimate we observe for large firms. We do not see a significant impact on the number of products exported for either small or large firms.

External Finance Dependence. Second, we examine heterogeneity by firms' dependence on external finance. We use the measure developed by Rajan and Zingales (1998), which captures the share of capital expenditures financed with external funds. Using Portuguese data, we construct this measure at both the firm and industry levels. Results based on the industry-level measure are presented in Panel B of Table 8, while those based on the firm-level measure are shown in Panel C.

Across both, we see stronger impacts on export participation for those with high dependence on external finance. The difference is more exaggerated at the firm level (point estimate of 8.5 percentage points versus 1.3 percentage points), but still present at the industry level. Similarly, the effects on the number of export destinations and the value of exports are larger for those with a high dependence on external finance. The impacts on the number of products exported are more mixed. Taken together, these results indicate that access to the guarantee has a greater impact on firms that rely more heavily on external finance.

Payables-to-Sales. Third, we consider heterogeneity by payables-to-sales ratio. Accounts payable reflect the amount a firm owes to suppliers for goods and services purchased on credit, and may indicate difficulty accessing traditional financing sources (Wilner, 2000; Nilsen, 2002; Cunat, 2007). A firm that cannot get loans through a bank (or who is charged relatively high interest rates) may turn to suppliers or distributors for credit. This interpretation is consistent with, e.g. Casey and O'Toole (2014). Across all measures, the effects of the guarantee on exports are stronger among firms who rely heavily on accounts payable. Of course, a high reliance on payables may also reflect

stronger bargaining power with suppliers rather than limited access to finance, so this evidence should be interpreted with caution.

Cash and Equivalents. Fourth, we examine heterogeneity by firms' cash and equivalents, which provide a measure of liquidity. We find large and consistent effects of access to the guarantee among firms in the bottom quartile of the liquidity distribution, but no significant effects for firms in the top quartile. This pattern indicates that the guarantee disproportionately benefits relatively illiquid firms, enabling them to access export markets.

Taken together, the stronger effects among smaller firms, firms with high reliance on external or trade finance, and firms with limited liquidity point to the presence of financial frictions. These heterogeneity patterns are difficult to reconcile with a pure credit subsidy interpretation and instead support the view that the guarantee operates by easing access to credit for firms that are otherwise constrained.

7 Conclusion

In this paper, we show that credit is driver of the decision to enter export markets. We focus on the implementation of a unique credit guarantee scheme, the SME-Leader program, for small and medium-sized enterprises in Portugal between 2008 and 2014. We implement a regression discontinuity design to compare firms that barely qualified for the program to similar firms that just failed to qualify. This setting allows us to examine the causal impact of a shock to credit on the decision to enter export markets for a range of firms—including not-yet-exporters.

Our results indicate that access to the credit guarantee increases export participation. These effects are persistent, concentrated in export-intensive industries, and driven primarily by new exporters. A one-off improvement in access to credit allows firms to enter foreign markets and remain exporters thereafter—in line with standard international trade models that incorporate financing frictions alongside sunk entry costs. More broadly, our findings imply that government credit guarantees—and interventions targeting credit markets more generally—can be effective tools for promoting export participation.

Taken together with the entry and persistence patterns above, the evidence suggests that the

guarantee operates through the relaxation of a financing constraint rather than as a pure subsidy. Eligible firms exhibit higher revenue productivity, and the impacts of the program are concentrated among firms that are more likely to face financial constraints ex ante. These patterns indicate that the guarantee relaxed a binding financial constraint that was particularly distortionary for export activity, rather than encouraging inefficient or unproductive entry. Overall, our results underscore the importance of policies that target credit markets as a means of addressing extensive-margin distortions in international trade.

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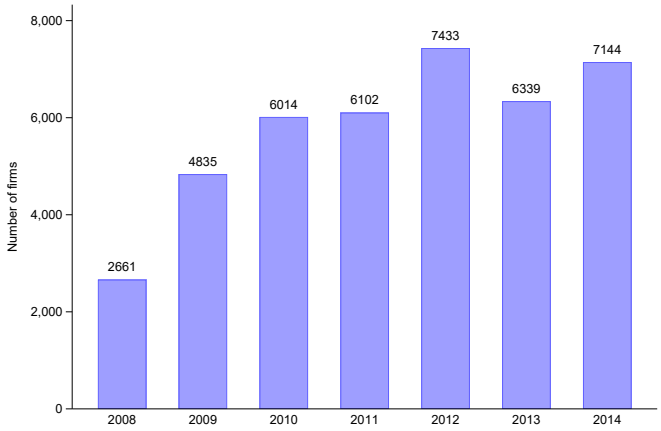
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8 Figures

FIGURE 1. Program Participation

(a) Number of Certified Firms



(b) Number of Firms Certified for the First Time

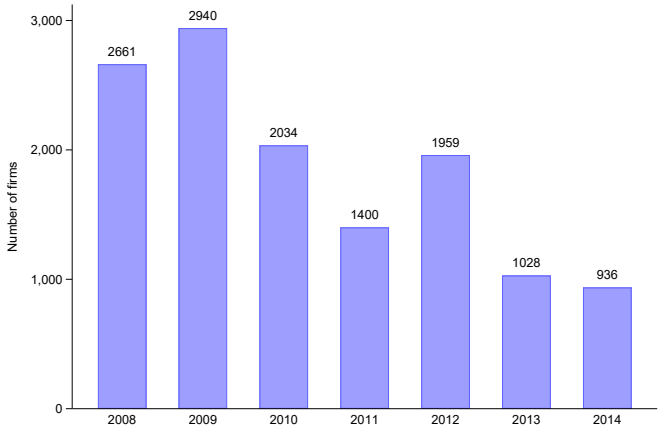
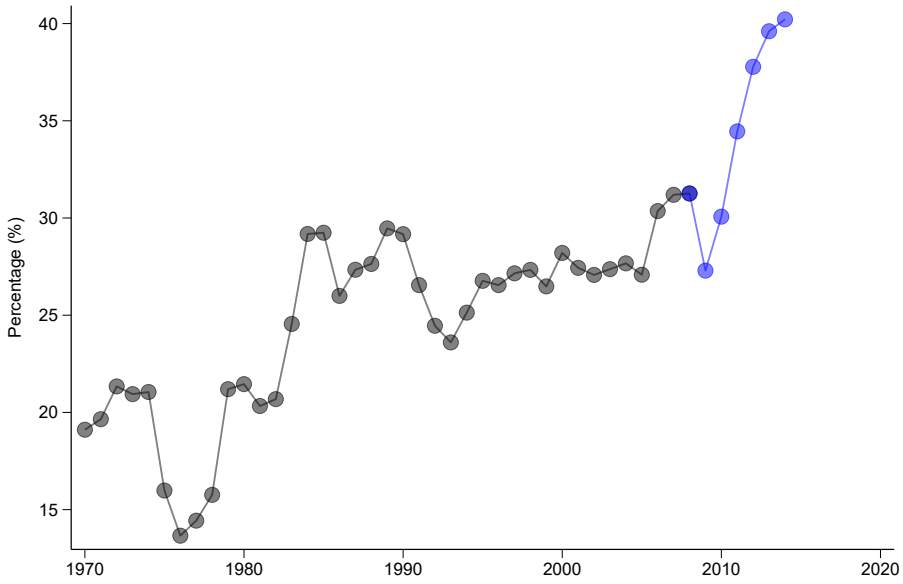


FIGURE 2. Portuguese Export Value-to-GDP

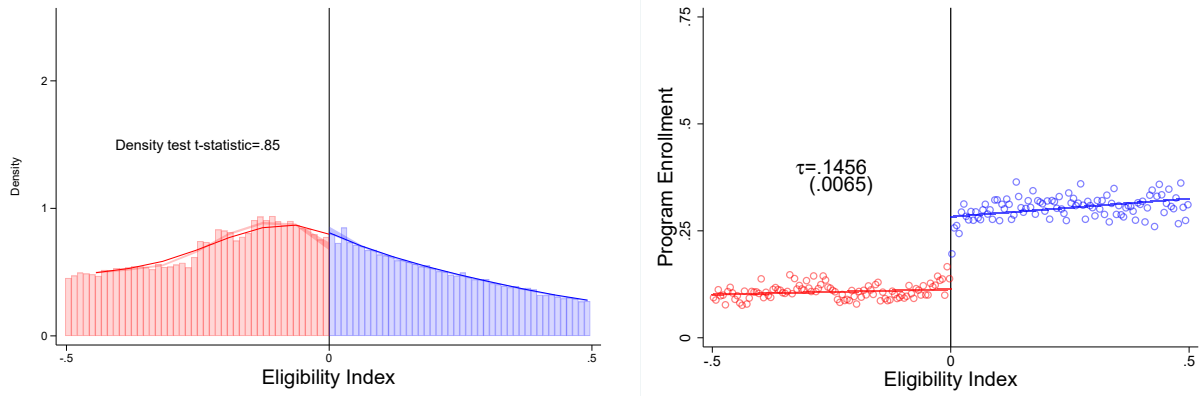


Source: World Bank, World Development Indicators (Portugal)

FIGURE 3. Density Test and the Impact of Eligibility on Program Enrollment

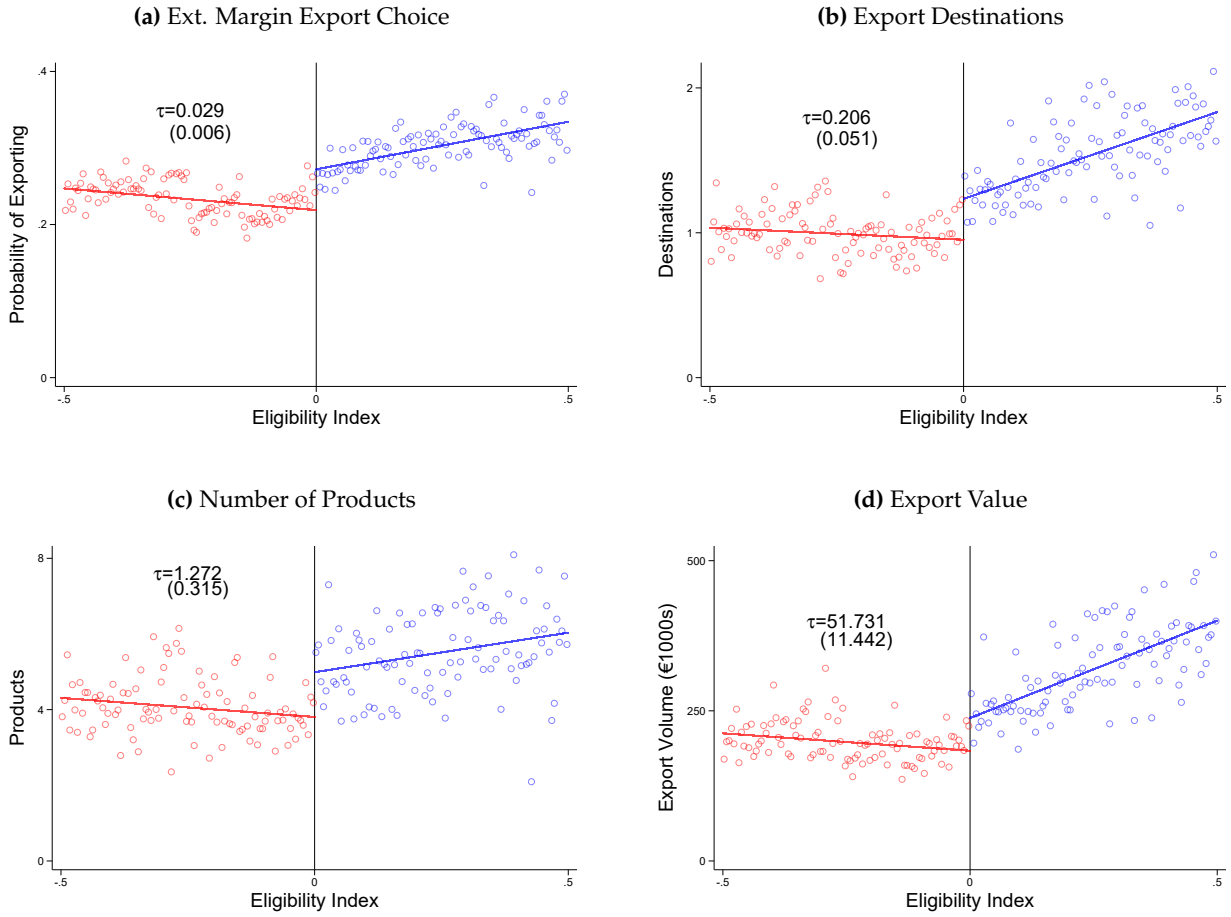
(a) Density Test

(b) Impact on Program Enrollment



Panel (a) of this figure shows Cattaneo et al. (2018) density tests around the threshold. Panel (b) shows the intention to treat estimates for the impact of firm certification on program enrollment, based on our regression discontinuity design detailed in Section 3. *Program Enrollment* is a binary variable equal to 1 if the firm enrolled in the program in a given year, and 0 otherwise. The time period considered is 2008-2014.

FIGURE 4. Impact of Eligibility on Export Activity



This figure shows the intention to treat estimates for the impact of firm certification on export activity based on our regression discontinuity design detailed in Section 3. *Extensive Margin Export Choice* is a binary variable that takes the value of 1 if a firm registered a positive value of exports in a given year, and 0 otherwise. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All outcome variables are retrieved from the FTS database. This figure shows estimates where the outcome variables are observed in the 12 months following the official certification announcement. The estimates are based on program eligibility in the 2008-2014 period. Standard errors clustered by firm are reported in parentheses.

9 Tables

TABLE 1. Summary Statistics

	Panel A: Unique Firm Characteristics (SCIE)						
	Mean	Std. Dev.	p25	p50	p75	p99	Obs.
Assets (€, in thousands)	2,078	2,423	505	1,135	2,633	11,429	33,126
Employees	24.06	16.62	13.00	18.00	29.00	84.00	34,539
Sales (€, in thousands)	2,079	2,352	531	1,136	2,638	10,904	33,043
Net Income (€, in thousands)	34.36	98.18	0.73	11.34	49.31	416.70	32,660
EBITDA (€, in thousands)	146	202	23	72	192	924	32,666
Net Income-to-Assets	0.01	0.06	0.00	0.01	0.04	0.16	33,541
Net Income-to-Equity	0.09	0.20	0.01	0.06	0.16	0.82	32,912
Equity-to-Assets	0.31	0.21	0.16	0.28	0.45	0.77	33,493
EBITDA-to-Assets	0.08	0.08	0.03	0.07	0.12	0.28	33,621
Debt-to-EBITDA	3.05	4.61	0.00	1.73	4.74	20.71	34,010
Sales growth	0.04	0.19	-0.08	0.02	0.14	0.56	32,163
EBITDA growth	-0.20	0.77	-0.55	-0.19	0.16	1.95	31,972
Payables-to-Sales	0.19	0.19	0.07	0.15	0.26	0.94	32,056
Receivables-to-Sales	0.30	0.26	0.11	0.26	0.42	1.21	32,082
	Panel B: Exports and Imports (FTS)						
Exports Volume (€, in thousands)	243	946	0	0	0	5,446	244,880
Exporting Firm	0.25	0.44	0.00	0.00	1.00	1.00	244,880
Number of Export Destinations	1.17	3.76	0.00	0.00	1.00	20.00	244,880
Number of Export Products	4.41	22.16	0.00	0.00	1.00	92.00	244,880
Value-Weighted Avg. Relationship Duration (Years)	0.80	1.89	0.00	0.00	0.00	8.00	246,952
Avg. Relationship Duration (Years)	0.61	1.49	0.00	0.00	0.00	7.00	246,952

This table displays summary statistics for the main variables used in the paper. Panel A displays unique firm financial and operational characteristics for 2010, the first in-sample year for which all variables are available. In Panel B, the time period considered is 2008-2014.

TABLE 2. Impact of Eligibility on Firm Financing

	Total Debt	Log(Total Debt)	Loans (Binary)	Log(Total Loans)
Program Eligibility	95.659***	0.113***	0.030***	0.184***
	(14.391)	(0.036)	(0.006)	(0.037)
Robust CI	[60.253 ; 123.511]	[.022 ; .171]	[.016 ; .041]	[.091 ; .246]
Bandwidth	0.350	0.191	0.338	0.261
Kernel Type	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	630.999	12.510	0.834	12.519

This table shows the intention to treat estimates for the impact of firm certification on firm financing, based on our regression discontinuity design detailed in Section 3. *Total Debt* is the firm's annual total debt, reported in thousands of euros. *Log(Total Debt)* corresponds to the natural logarithm of firm's total debt in each year. *Loans (Binary)* is a binary variable equal to one if the firm has any loan in a given year, and zero otherwise. *Log(Total Loans)* corresponds to the natural logarithm of firm's total loans, including, for instance, bank loans and credit lines. Financing-related variables are retrieved from the SCIE firm-year level data. This table shows estimates where the outcome variable is observed in the year after the official certification announcement, as explained in Section 2. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE 3. Impact of Eligibility on Export Activity

	Ext. Margin Export Choice	Export Destinations	Number of Exported Products	Export Value
Program Eligibility	0.029***	0.206***	1.272***	51.731***
	(0.006)	(0.051)	(0.315)	(11.442)
Robust CI	[.013 ; .04]	[.08 ; .301]	[.661 ; 2.042]	[24.986 ; 74.788]
Bandwidth	0.312	0.389	0.416	0.494
Kernel Type	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.254	1.168	4.409	242.925

This table shows the intention to treat estimates for the impact of firm certification on Extensive Margin Export Choice, Export Destinations, Number of Exported Products and Export Value, respectively, based on our regression discontinuity design detailed in Section 3. *Extensive Margin Export Choice* is a binary variable that takes the value of 1 if a firm registered a positive value of exports in a given year, and 0 otherwise. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All outcome variables are retrieved from the FTS database. This table shows estimates where the outcome variables are observed in the 12 months following the official certification announcement. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE 4. Impact of Eligibility on the Extensive Margin of Export Choice: Heterogeneity by Prior Export Status

	Ext. Margin Export Choice			
	Within-Country		Within-Product	
	Non-Exporters in $t-1$	Exporters in $t-1$	Non-Exporters in $t-1$	Exporters in $t-1$
Program Eligibility	0.00036***	-0.00452	0.00045***	-0.01046
	(0.00007)	(0.00813)	(0.00008)	(0.01401)
Robust CI	[0 ; .001]	[-.025 ; .011]	[0 ; .001]	[-.045 ; .018]
Bandwidth	0.47716	0.48301	0.31900	0.52715
Kernel Type	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.002	0.737	0.001	0.539

This table shows the intention to treat estimates for the impact of firm certification on the Extensive Margin Export Choice based on our regression discontinuity design detailed in Section 3. In the first two columns, we estimate the impact of credit access on the probability that a firm exports to country c in year t separately for firms that exported to c in $t-1$ and those that did not. In the last two columns, we estimate the impact of credit access on the probability that a firm exports product j in year t separately for firms that exported product j in $t-1$ and those that did not. The outcome variables are retrieved from the FTS database. This table shows estimates where the outcome variables are observed in the 12 months following the official certification announcement. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE 5. Impact of Eligibility on Domestic and Foreign Markets (SCIE data)

	Log(Domestic Sales)	Exports-to-Sales	Ext. Margin Export Choice		Log(Total Sales)	
Industry Propensity to Export:			Low	High	Low	High
Program Eligibility	0.070**	0.019***	0.004	0.061***	0.056	0.160***
	(0.033)	(0.004)	(0.017)	(0.013)	(0.043)	(0.032)
Robust CI	[-.013 ; .119]	[.01 ; .027]	[-.039 ; .031]	[.031 ; .088]	[-.053 ; .121]	[.08 ; .22]
Bandwidth	0.129	0.471	0.222	0.544	0.137	0.394
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	6.968	0.127	0.205	0.689	13.655	14.496

This table shows the intention to treat estimates for the impact of firm certification on domestic sales, the export-to-sales ratio, the extensive margin of exporting, and total sales, based on our regression discontinuity design detailed in Section 3. We present estimates for the extensive margin and total sales by industry-level propensity to export. Industries are classified as having low (below the 25th percentile) or high (above the 75th percentile) export propensity based on the share of exporting firms at the 2-digit level in 2008. Estimates are based on the SCIE firm-year level data. This table shows estimates where the outcome variable is observed in the calendar year after the official certification announcement, as explained in Section 2. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE 6. Impact of Eligibility on Future Enrollment and Ext. Margin Export Choice

Panel A: Baseline RD								
	Program Enrollment				Ext. Margin Export Choice			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility	0.146***	0.032***	0.012	0.007	0.029***	0.034***	0.038***	0.043***
	(0.006)	(0.009)	(0.009)	(0.009)	(0.006)	(0.007)	(0.007)	(0.007)
Robust CI	[.129 ; .156]	[.009 ; .046]	[-.011 ; .027]	[-.017 ; .021]	[.013 ; .04]	[.018 ; .046]	[.021 ; .05]	[.026 ; .056]
Bandwidth	0.220	0.125	0.119	0.135	0.312	0.334	0.366	0.382
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.162	0.198	0.217	0.227	0.254	0.276	0.291	0.300

Panel B: Criteria whose thresholds increased 2012-2013								
	Program Enrollment				Ext. Margin Export Choice			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility	0.204***	-0.007	0.000	-0.008	0.080***	0.080***	0.079***	0.087***
	(0.010)	(0.008)	(0.013)	(0.009)	(0.010)	(0.012)	(0.012)	(0.013)
Robust CI	[.179 ; .221]	[-.026 ; .008]	[-.032 ; .02]	[-.032 ; .008]	[.056 ; .1]	[.052 ; .104]	[.048 ; .104]	[.058 ; .115]
Bandwidth	0.261	0.184	0.144	0.241	0.461	0.422	0.419	0.443
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.221	0.216	0.258	0.235	0.278	0.312	0.325	0.320

This table shows the intention to treat estimates for the impact of firm certification on contemporaneous and future Program Enrollment and Extensive Margin Export Choice. In Panel A, we use our full sample following the RD strategy detailed in Section 3. In Panel B, we exploit large changes in eligibility thresholds that took place between 2012 and 2013. We focus exclusively on 2012 and define program eligibility using only the equity-to-assets ratio and business turnover as criteria. *Program Enrollment* is a binary variable equal to 1 if the firm enrolled in the program in a given year, and 0 otherwise. *Extensive Margin Export Choice* is a binary variable that takes the value of 1 if a firm registered a positive value of exports in a given year, and 0 otherwise. This table shows estimates where the outcome variables are observed in the 12 months following the official certification announcement (T), and one (T+1), two (T+2) and three (T+3) years afterwards. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE 7. Impact of Eligibility on Output, Capital, Labor and Productivity

Panel A: Output, Capital and labor						
	Log(Total Sales)	Log(Value Added)	Log(EBITDA)	Log(Capital)	Nr. Employees	Log(Wages)
Program Eligibility	0.085***	0.038*	0.068**	0.104***	1.265***	0.038**
	(0.025)	(0.022)	(0.031)	(0.040)	(0.274)	(0.017)
Robust CI	[.022 ; .123]	[-.018 ; .071]	[-.01 ; .115]	[.004 ; .166]	[.58 ; 1.735]	[-.005 ; .064]
Bandwidth	0.101	0.133	0.125	0.168	0.278	0.146
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

Panel B: Productivity						
	Log(Wages/Capital)	Log(Sales/Capital)	Log(Sales/Nr. of Employees)	TFPR (Levinsohn and Petrin (2003))	TFPR (Levinsohn and Petrin (2003))	
Industry Propensity to Export:					Low	High
Program Eligibility	-0.078***	-0.021	0.055***	0.034**	0.001	0.082***
	(0.029)	(0.023)	(0.021)	(0.014)	(0.028)	(0.019)
Robust CI	[-.126 ; -.006]	[-.067 ; .033]	[.002 ; .087]	[-.002 ; .056]	[-.07 ; .045]	[.04 ; .126]
Bandwidth	0.284	0.494	0.108	0.147	0.171	0.499
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

This table shows the intention to treat estimates for the impact of firm certification on firm output, labor, capital, and productivity, based on our regression discontinuity design detailed in Section 3. Panel A reports results for the natural logarithm of firm sales, gross value added, and capital; the number of employees; the logarithm of the total wage bill; and the labor-to-capital ratio. Panel B focuses on productivity-related outcomes, including the logarithm of the sales-to-capital and sales-to-labor ratios. The third and fourth columns present estimates of firm-level revenue-based total factor productivity (TFPR), calculated using OLS (column 3) and the method proposed by Levinsohn and Petrin (2003) (column 4). The final two columns show the impact of certification on TFP (estimated via Levinsohn and Petrin) by industry-level propensity to export. Industries are classified as having low (below the 25th percentile) or high (above the 75th percentile) export propensity based on the share of exporting firms at the 2-digit level in 2008. Estimates are based on the SCIE firm-year level data. This table shows estimates where the outcome variable is observed in the year after the official certification announcement, as explained in Section 2. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE 8. Heterogeneous Effects of Eligibility: Firm Size and Reliance on Trade Credit

	Panel A: Firm Size							
	Smaller Firms				Larger Firms			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.024***	0.068*	0.097	12.206***	-0.009	0.092	0.958	3.634
	(0.008)	(0.038)	(0.162)	(4.464)	(0.013)	(0.152)	(0.903)	(39.081)
Robust CI	[.006 ; .042]	[-.015 ; .156]	[-.268 ; .458]	[1.642 ; 21.451]	[-.037 ; .019]	[-.273 ; .399]	[-.859 ; 3.159]	[-82.808 ; 93.083]
Bandwidth	0.462	0.465	0.407	0.453	0.566	0.507	0.561	0.519
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.070	0.167	0.632	17.769	0.464	2.563	9.604	587.758

	Panel B: Industry-Level Dependence on External Finance (Rajan and Zingales, 1998)							
	High Dependence on External Finance				Low Dependence on External Finance			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.057***	0.320***	0.848**	80.367***	0.028***	0.117*	1.858**	20.031
	(0.012)	(0.101)	(0.364)	(27.251)	(0.011)	(0.061)	(0.815)	(14.918)
Robust CI	[.029 ; .082]	[.1 ; .532]	[.155 ; 1.719]	[27.043 ; 144.992]	[.002 ; .047]	[-.023 ; .249]	[.287 ; 3.901]	[-13.68 ; 51.585]
Bandwidth	0.576	0.531	0.439	0.534	0.366	0.483	0.375	0.611
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

	Panel C: Firm-Level Dependence on External Finance (Rajan and Zingales, 1998)							
	High Dependence on External Finance				Low Dependence on External Finance			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.085***	0.494***	2.382**	76.654**	0.013	0.239	2.360	-53.008
	(0.017)	(0.155)	(1.020)	(37.289)	(0.022)	(0.169)	(1.474)	(46.732)
Robust CI	[.045 ; .121]	[.128 ; .819]	[.434 ; 4.908]	[-9.423 ; 157.55]	[-.043 ; .051]	[-.167 ; .595]	[-.687 ; 6.031]	[-171.69 ; 30.348]
Bandwidth	0.549	0.426	0.342	0.402	0.262	0.455	0.384	0.294
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

	Panel D: Payables-to-Sales							
	High Payables-to-Sales				Low Payables-to-Sales			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.065***	0.385***	2.599***	92.573**	0.046***	0.146	0.102	39.451***
	(0.015)	(0.144)	(0.918)	(36.325)	(0.010)	(0.092)	(0.314)	(15.130)
Robust CI	[.036 ; .103]	[.081 ; .725]	[.9 ; 4.81]	[17.247 ; 179.206]	[.022 ; .067]	[-.059 ; .359]	[-.604 ; .783]	[10.348 ; 75.758]
Bandwidth	0.437	0.386	0.396	0.364	0.467	0.312	0.266	0.289
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.350	1.560	6.380	290.602	0.099	0.393	1.353	70.492

	Panel E: Cash & Equivalents							
	Low Cash				High Cash			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.089***	0.458***	1.946***	89.046***	0.014	-0.045	0.669	53.177
	(0.014)	(0.103)	(0.594)	(25.429)	(0.017)	(0.164)	(1.120)	(47.892)
Robust CI	[.055 ; .115]	[.219 ; .668]	[.612 ; 3.295]	[36.038 ; 151.511]	[-.021 ; .055]	[-.375 ; .356]	[-1.49 ; 3.403]	[-39.849 ; 172.281]
Bandwidth	0.428	0.415	0.344	0.333	0.376	0.508	0.471	0.403
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

This table shows heterogeneous intention to treat estimates for the impact of firm certification on the Extensive Margin Export Choice, Export Destinations, Number of Products and Export Value based on our regression discontinuity design detailed in Section 3. Panel A presents the heterogeneous results for firms of different size. Panel B and C present the heterogeneous effects by firm's external finance dependence (Rajan and Zingales, 1998), both at the firm (Panel B) and industry levels (Panel C). Panel D considers heterogeneity by payables-to-sales ratio. Finally, Panel E consider Cash and Equivalents. We run our RD analysis separately for firms in the bottom versus top quartile of the distribution in $t-1$. *Extensive Margin Export Choice* is a binary variable that takes the value of 1 if a firm registered a positive value of exports in a given year, and 0 otherwise. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All outcome variables are retrieved from the FTS database. This table shows estimates where the outcome variables are observed in the 12 months following the official certification announcement. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

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C Appendix: SME-Leader Program Details **72**

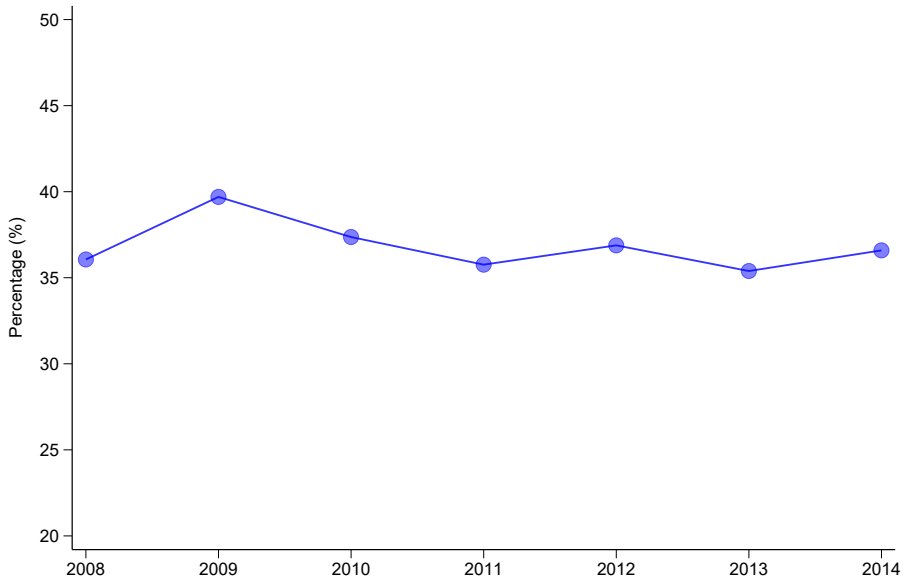
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A Appendix: Figures and Tables

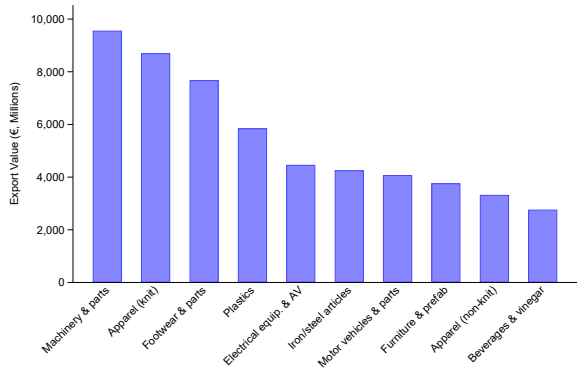
FIGURE A1. Exports from SMEs (% of Total Exports)



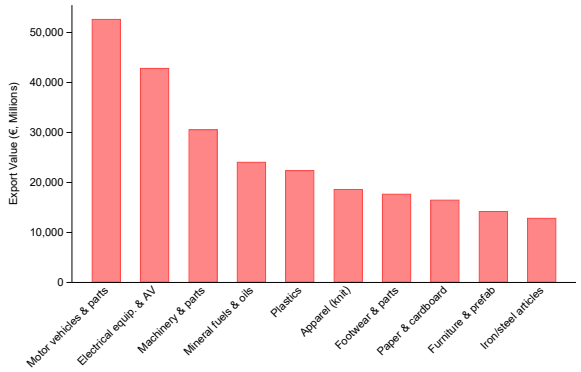
This figure shows the contribution of SMEs in our sample to the total export value of Portuguese firms, based on data from the FTS.

FIGURE A2. Main Exported Products and Export Destinations

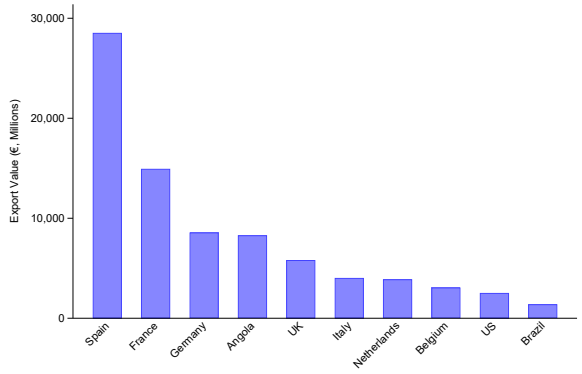
(a) Top Exported Products (Sample)



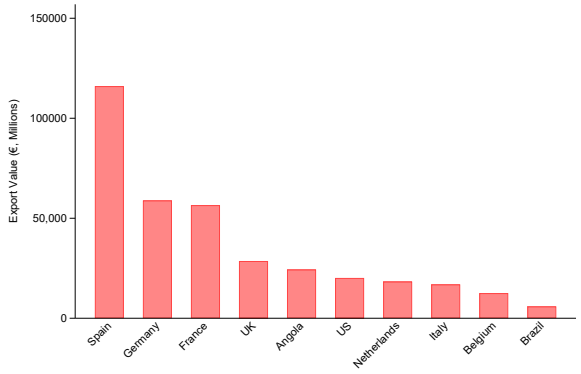
(b) Top Exported Products (All Firms)



(c) Top Export Destinations (Sample)

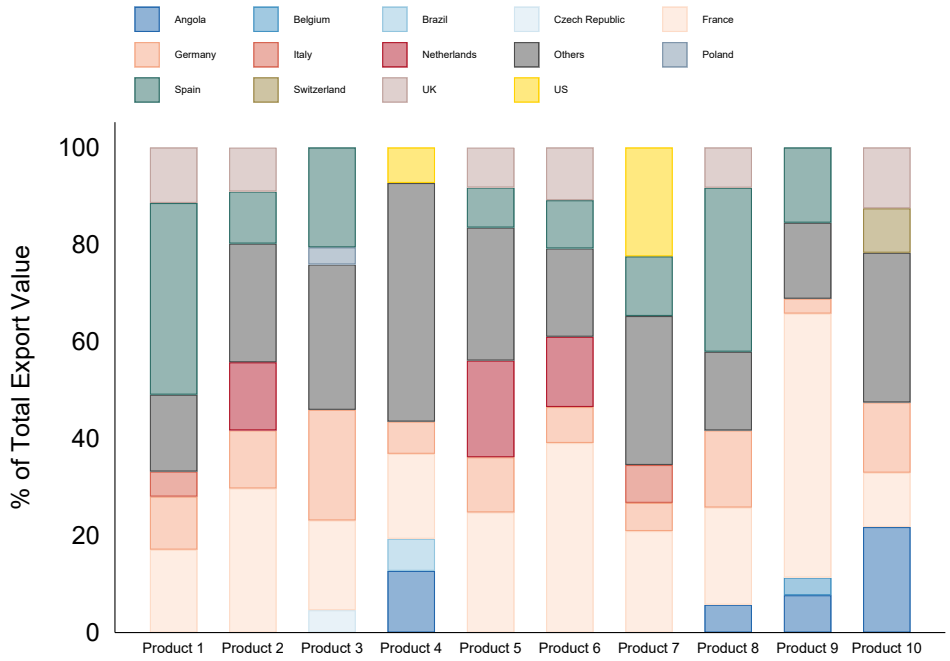


(d) Top Export Destinations (All Firms)



This figure illustrates the main export products and destination countries for both Portuguese SMEs (Panels (a) and (c)) and the overall Portuguese economy (Panels (b) and (d)), based on data from the FTS.

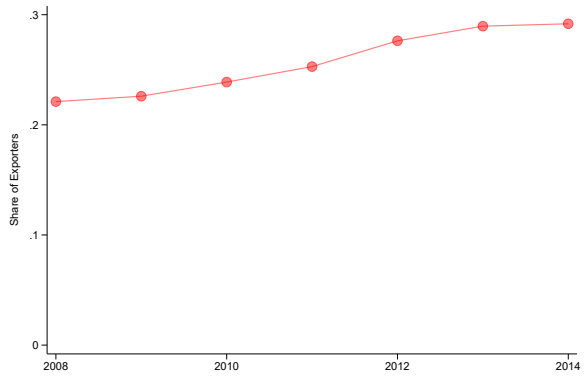
FIGURE A3. Top 10 exported products between 2008 and 2014, by destination country



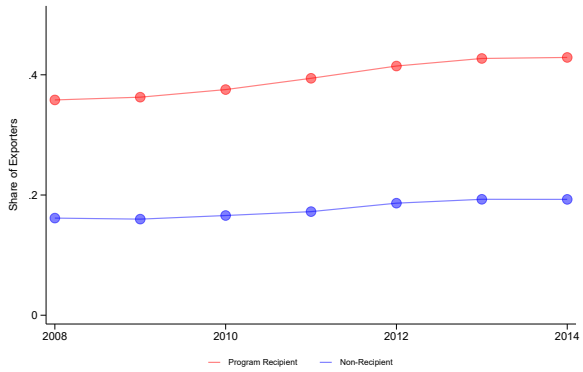
	Product Description
Product 1	T-shirts, undershirts, and similar knitted articles - *Made of cotton*
Product 2	Footwear with an outer sole of rubber, plastic, natural leather, or reconstituted leather and an upper part made of natural leather - *Other*
Product 3	Casting boxes; bottom plates for molds; mold patterns; molds for metals (excluding ingot molds), metallic carbides, glass, mineral materials, rubber, or plastics - *For injection molding or compression molding*
Product 4	Wines from fresh grapes, including wines enriched with alcohol - *in containers with a capacity not exceeding 2 litres*
Product 5	Footwear with an outer sole of rubber, plastic, natural leather, or reconstituted leather and an upper part made of natural leather - *covering the ankle*
Product 6	Footwear with an outer sole of rubber, plastic, natural leather, or reconstituted leather and an upper part made of natural leather - *Other*
Product 7	Natural Corks
Product 8	Parts and accessories of motor vehicles - *Others*
Product 9	Other furniture and their parts - *Other wooden furniture*
Product 10	Medicines (except products of positions 3002, 3005, or 3006) consisting of mixed or unmixed products, prepared for therapeutic or prophylactic purposes, presented in doses (including those intended to be administered percutaneously) or packaged for retail sale

FIGURE A4. Time Series of Exports

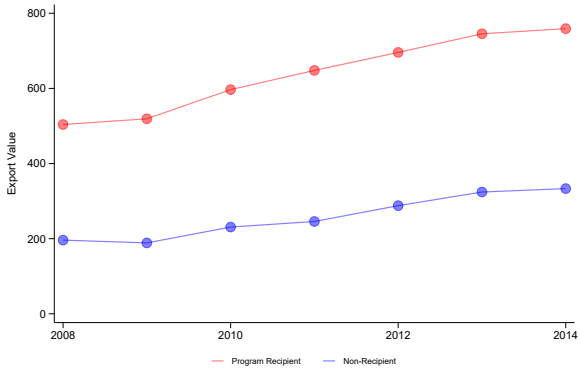
(a) Average Share of Exporters



(b) Average Share of Exporters



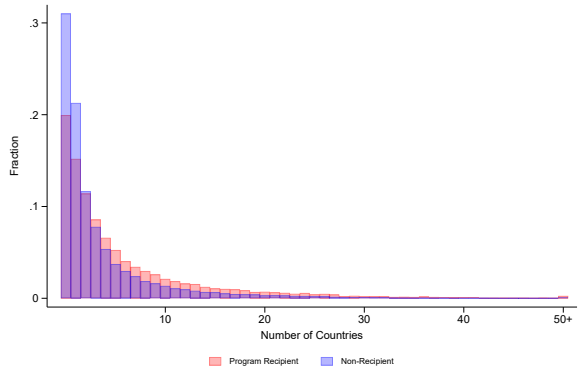
(c) Average Export Value



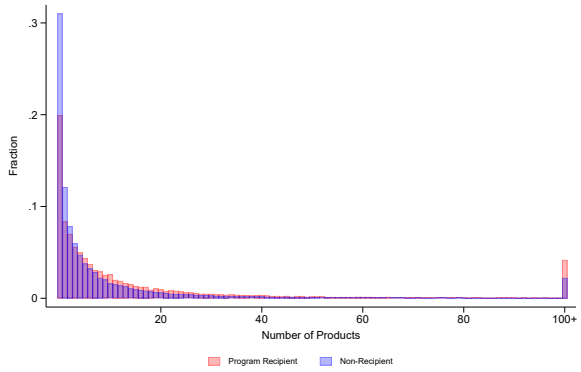
This figure shows the time series of the average share of exporters and export value by year, for certified and non-certified. Certified firms are defined as firms that were certified as *SME-Leader* at least once during our sample period.

FIGURE A5. Distribution of Export Destinations and Number of Products

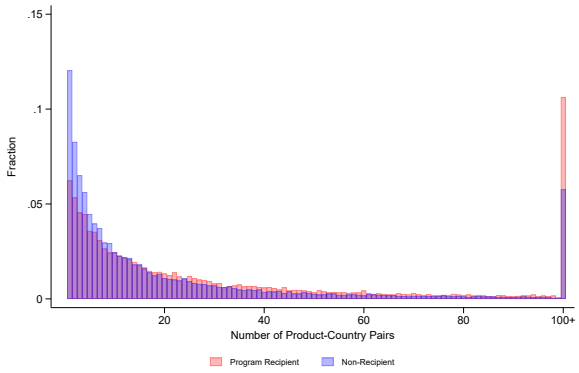
(a) Number of Export Destinations



(b) Number of Products



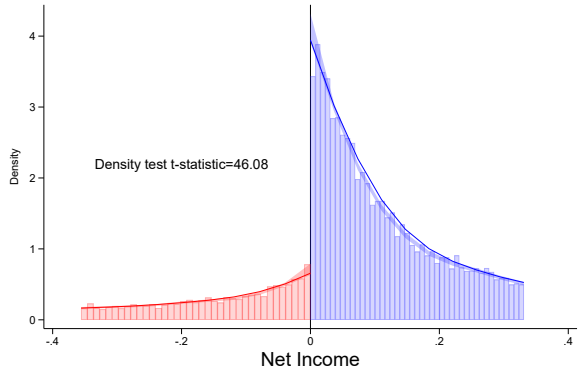
(c) Number of Product-Country Pairs



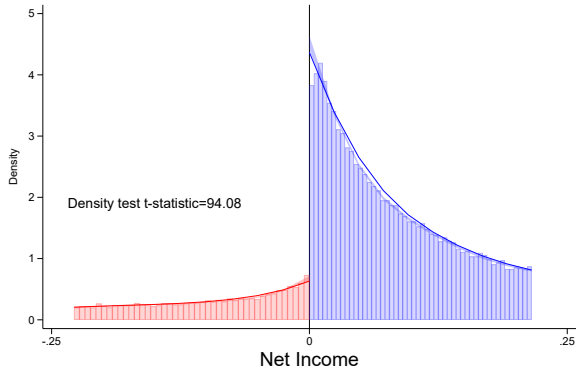
This figure shows the distribution of the number of Export Destinations, Number of Products and Number of Product-Country pairs for certified and non-certified. Certified firms are defined as firms that were certified as *SME-Leader* at least once during our sample period.

FIGURE A6. Density Tests: Net Income Before and During the Program

(a) Pre-Period (2006)

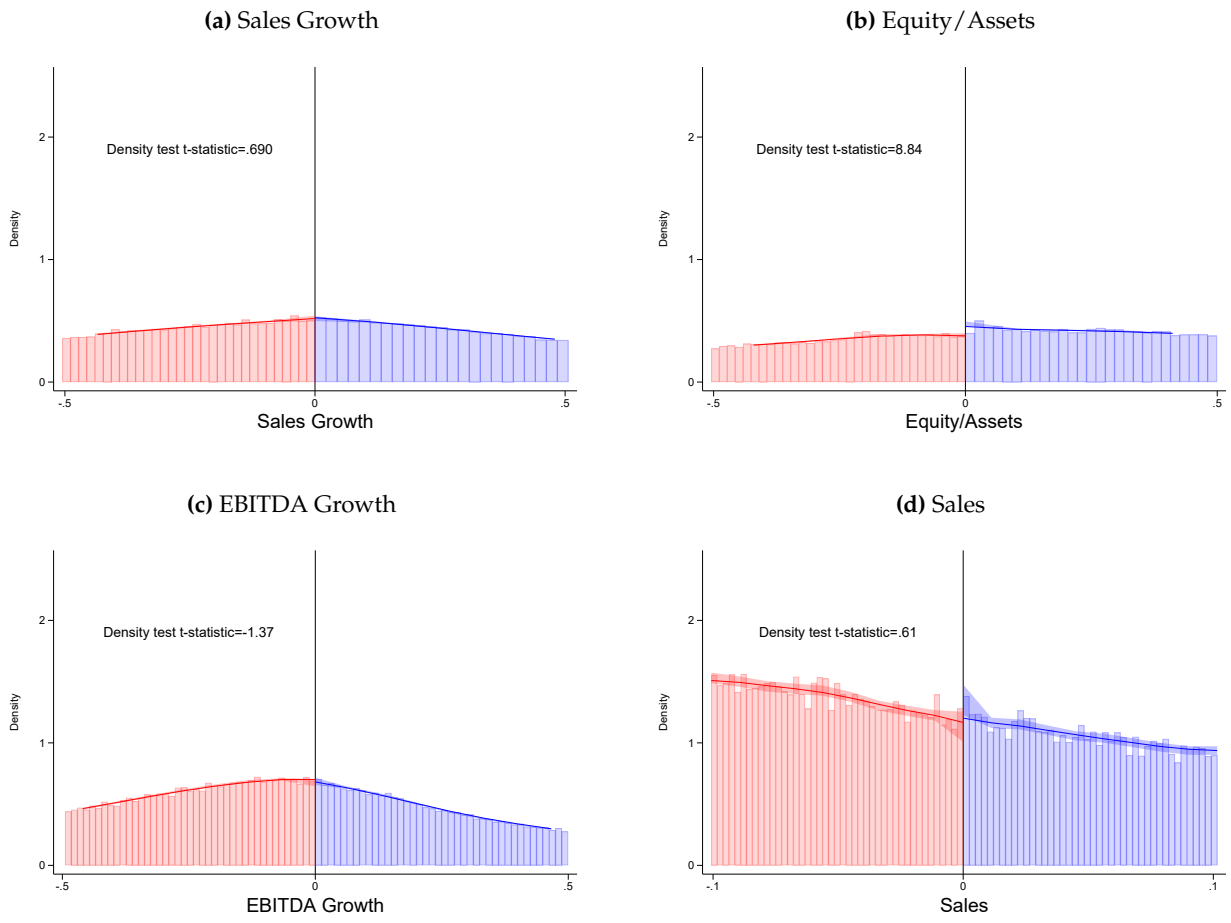


(b) During the Program (2008-2014)



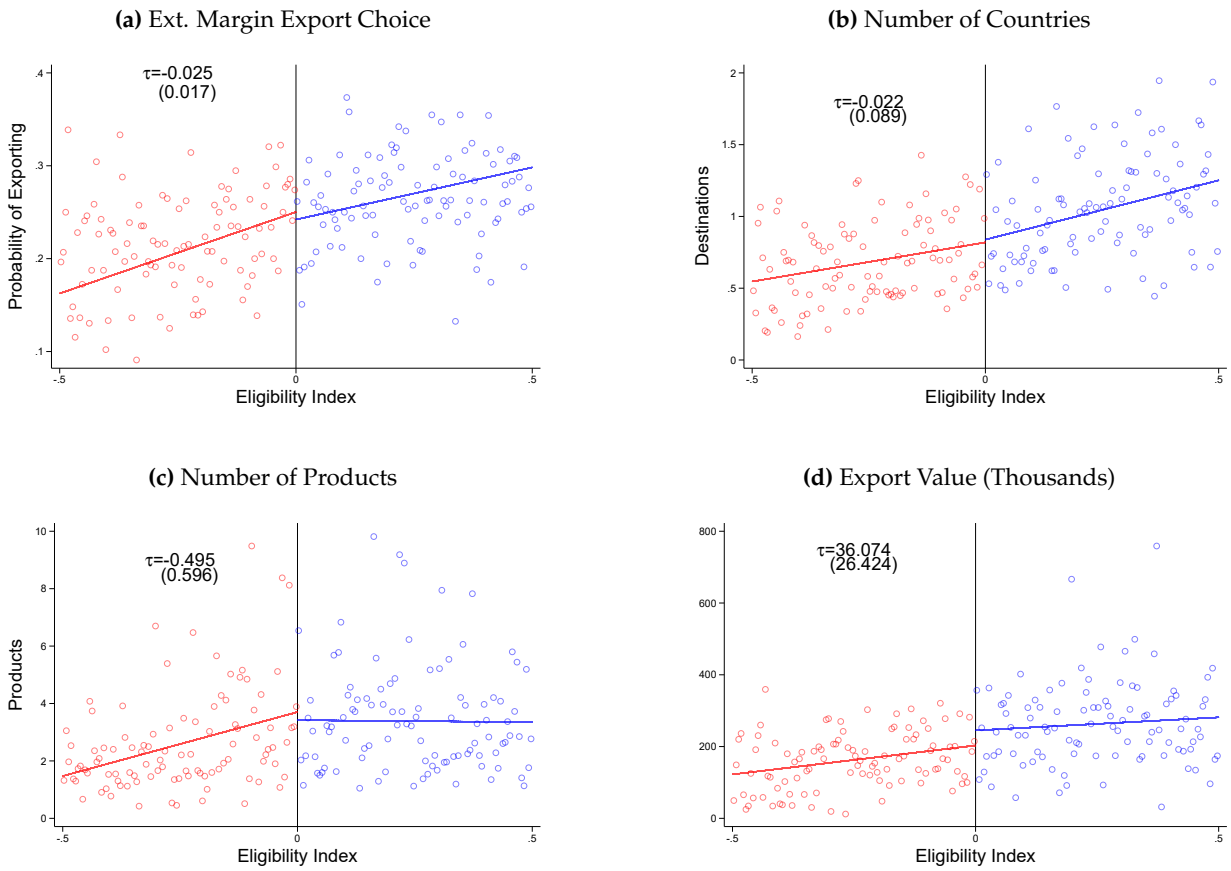
This figure shows Cattaneo et al. (2018) density tests around the zero cutoff for net income. Panel (a) focuses on the pre-program period (2006), while Panel (b) covers the full sample period from 2008 to 2014. Variables are standardized, as defined in Section 3.

FIGURE A7. Density Tests for Individual Criterion



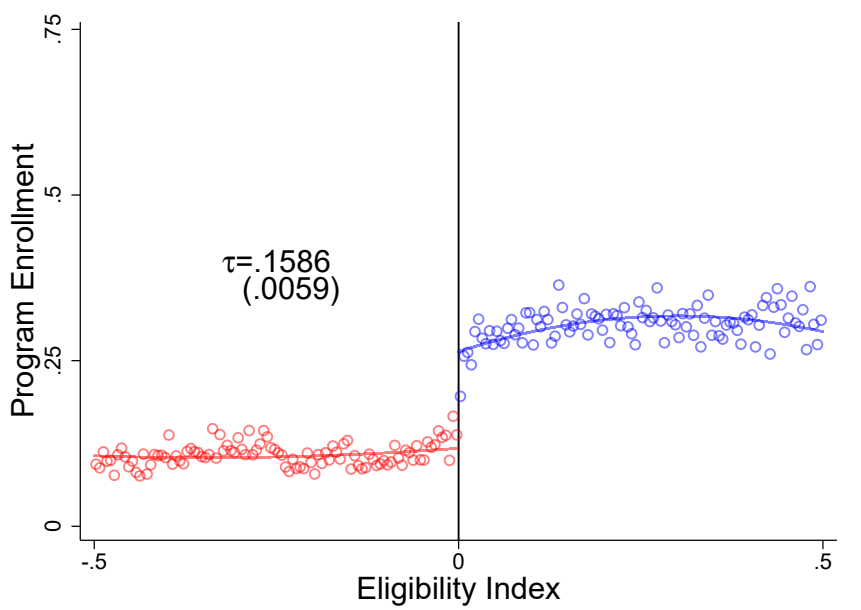
This figure shows Cattaneo et al. (2018) density tests around the threshold for all the individual criteria considered for eligibility. Variables are standardized, as defined in Section 3. The time period considered is 2008-2014.

FIGURE A8. Placebo Exercise



This figure shows the intention to treat estimates of the placebo exercise described in Section 4. In this exercise, we simulate the introduction of the SME-Leader Program in 2007, one year prior to its actual implementation. We construct the running variable for 2007, assuming the same criteria as for 2008. We then apply our main regression discontinuity specification (Section 3) to the four main outcome variables. *Extensive Margin Export Choice* is a binary variable that takes the value of 1 if a firm registered a positive value of exports in a given year, and 0 otherwise. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All outcome variables are retrieved from the FTS database. Standard errors clustered by firm are reported in parentheses.

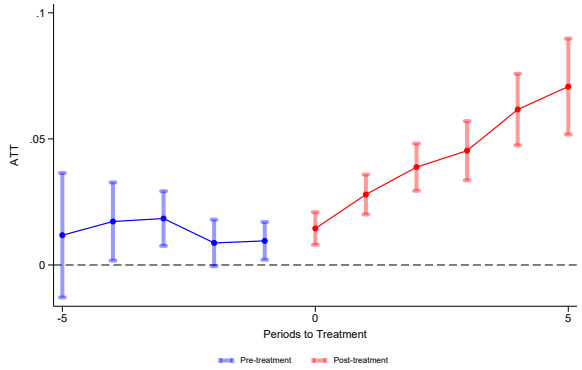
FIGURE A9. Impact on Program Enrollment (Second-Order Polynomial)



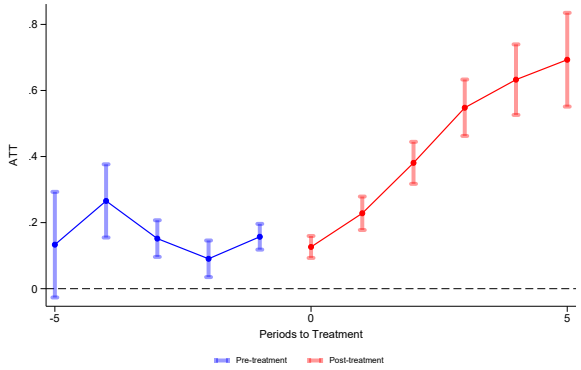
This figure shows the intention to treat estimates for the impact of firm certification on the program take-up, based on our regression discontinuity design detailed in Section 3. *Program Enrollment* is a binary variable equal to 1 if the firm enrolled in the program in a given year, and 0 otherwise. The figure presents second-order polynomial approximations around the threshold. The time period considered is 2008-2014.

FIGURE A10. Dynamic ATTs: Event-Study

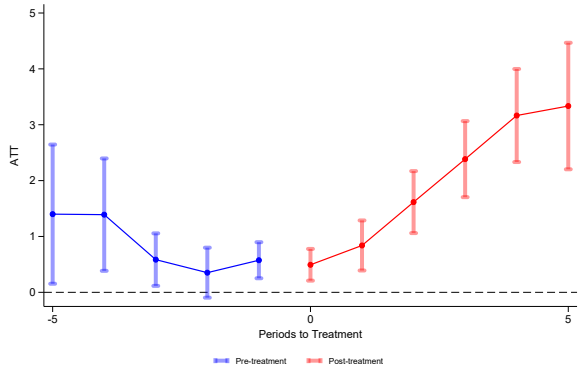
(a) Ext. Margin Export Choice



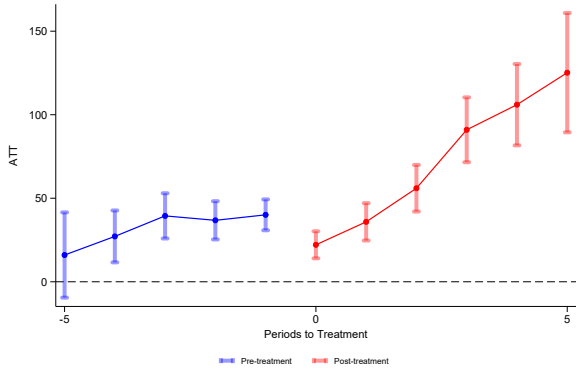
(b) Export Destinations



(c) Number of Exported Products



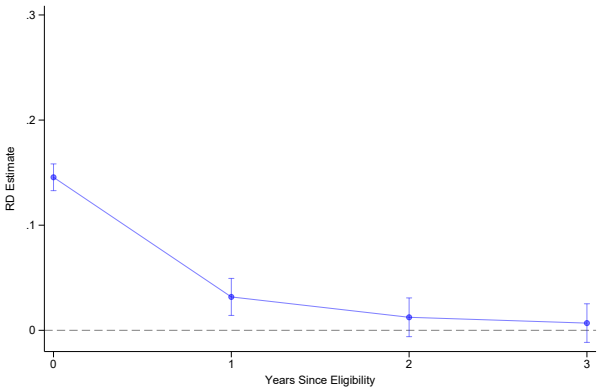
(d) Export Value



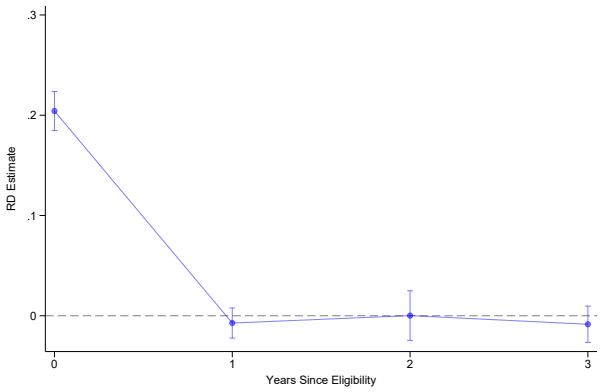
This figure shows the dynamic ATT of firm certification on the main outcome variables, detailed in Section 3. This figure depicts the difference in first-differences in the pre-period, and the difference relative to $t-1$ for all post-periods. The time period considered is 2008-2014.

FIGURE A11. Impact of Eligibility on Future Enrollment

(a) Baseline RD



(b) Criteria Whose Thresholds Increased 2012-2013



This figure shows the intention to treat estimates for the impact of firm certification on contemporaneous and future Program Enrollment. In Panel (a), we use our full sample following the RD strategy detailed in Section 3. These estimates correspond to columns (1)-(4) of Panel A of Table 6. In Panel (b), we exploit large changes in eligibility thresholds that took place between 2012 and 2013. We focus exclusively on 2012 and define program eligibility using only the equity-to-assets ratio and business turnover as criteria. These estimates correspond to columns (1)-(4) of Panel B of Table 6. The estimates are based on program eligibility in the 2008-2014 period.

TABLE A1. Summary Statistics: Alternative Export Variables

	Exports (SCIE)						
	Mean	Std. Dev.	p25	p50	p75	p99	Obs.
Exporting Firm	0.45	0.50	0.00	0.00	1.00	1.00	164,664
Total Exports Volume (€, in thousands)	399.92	1,233.55	0.00	0.00	117.17	6,935.56	164,664
Exporting Firm (only goods)	0.33	0.47	0.00	0.00	1.00	1.00	164,646
Exports of Goods (€, in thousands)	269.10	985.09	0.00	0.00	16.23	5,729.40	164,646
Exporting Firm (only services)	0.22	0.41	0.00	0.00	0.00	1.00	164,695
Exports of Services (€, in thousands)	68.99	301.13	0.00	0.00	0.00	1,741.89	164,695
Exporting Firm to EU	0.40	0.49	0.00	0.00	1.00	1.00	164,668
Export to EU (€, in thousands)	265.02	888.24	0.00	0.00	39.09	5,129.08	164,668
Exporting Firm to non-EU	0.25	0.43	0.00	0.00	1.00	1.00	164,584
Export to non-EU (€, in thousands)	86.01	350.10	0.00	0.00	0.02	2,012.76	164,584
Exports-to-Sales	0.13	0.26	0.00	0.00	0.08	1.00	147,351

This table displays summary statistics for the export variables recorded on SCIE. The time period considered is 2010-2014. The discrepancies between the FTS and SCIE datasets regarding goods exports arise mainly because transactions with EU members recorded in FTS are collected through Intrastat, which only requires firms exceeding a predetermined annual export threshold to report their figures.

TABLE A2. Impact of Eligibility on Program Enrollment

	Program Enrollment
Program Eligibility	0.146***
	(0.006)
Robust CI	[.129 ; .156]
Bandwidth	0.220
Kernel Type	Triangular
Mean Dep. Variable	0.162

This table shows the intention to treat estimates for the impact of firm certification on program enrollment, based on our regression discontinuity design detailed in Section 3. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE A3. Impact of Eligibility on Export Activity: Robustness to Regression Discontinuity Specification

	Panel A: Local Polynomial							
	Quadratic Polynomial				Cubic Polynomial			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.035***	0.217***	1.372***	47.091***	0.002	0.164**	1.506***	46.992***
	(0.006)	(0.054)	(0.382)	(14.224)	(0.009)	(0.065)	(0.414)	(15.751)
Robust CI	[.02 ; .046]	[.103 ; .332]	[.645 ; 2.255]	[16.853 ; 78.058]	[-.018 ; .018]	[.017 ; .29]	[.692 ; 2.417]	[12.755 ; 78.893]
Bandwidth	0.693	0.787	0.597	0.631	0.553	0.874	0.905	0.892
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.254	1.168	4.409	242.925	0.254	1.168	4.409	242.925
	Panel B: Kernel							
	Uniform Kernel				Epanechnikov Kernel			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.044***	0.250***	1.146***	52.238***	0.034***	0.215***	1.260***	52.523***
	(0.006)	(0.050)	(0.284)	(11.667)	(0.006)	(0.050)	(0.310)	(11.384)
Robust CI	[.03 ; .055]	[.133 ; .35]	[.553 ; 1.81]	[25.529 ; 76.349]	[.019 ; .045]	[.093 ; .311]	[.662 ; 2.017]	[26.181 ; 75.980]
Bandwidth	0.334	0.346	0.398	0.371	0.323	0.378	0.399	0.460
Kernel Type	Uniform	Uniform	Uniform	Uniform	Epanechnikov	Epanechnikov	Epanechnikov	Epanechnikov
Mean Dep. Variable	0.254	1.168	4.409	242.925	0.254	1.168	4.409	242.925
	Panel C: Bandwidth							
	Bandwidth = 0.25				Bandwidth = 0.50			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Program Eligibility	0.022***	0.154**	1.354***	45.370***	0.045***	0.246***	1.236***	51.854***
	(0.007)	(0.061)	(0.390)	(14.926)	(0.005)	(0.047)	(0.292)	(11.396)
Robust CI	[-.017 ; .021]	[-.049 ; .284]	[.375 ; 2.463]	[-.251 ; 79.45]	[.005 ; .034]	[.008 ; .26]	[.588 ; 2.212]	[9.976 ; 71.314]
Bandwidth	0.250	0.250	0.250	0.250	0.500	0.500	0.500	0.500
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.254	1.168	4.409	242.925	0.254	1.168	4.409	242.925

This table shows the intention to treat estimates for the impact of firm certification on the Extensive Margin Export Choice, Export Destinations, Number of Products and Export Value based on our regression discontinuity design. Panel A displays the estimates using second and third-order local polynomials. Panel B displays the estimates using a uniform and Epanechnikov kernel. Panel C displays the estimates using fixed estimation bandwidth equal to 0.25 and 0.5. *Extensive Margin Export Choice* is a binary variable that takes the value of 1 if a firm registered a positive value of exports in a given year, and 0 otherwise. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All outcome variables are retrieved from the FTS database. This table shows estimates where the outcome variables are observed in the 12 months following the official certification announcement. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE A4. Impact of Eligibility on Export Activity: SCIE Data

	Total Exports		Exports of Goods		Exports of Services	
	Ext. Margin Export Choice	Export Value	Ext. Margin Export Choice	Export Value	Ext. Margin Export Choice	Export Value
Program Eligibility	0.040***	84.604***	0.039***	54.857***	0.038***	14.566***
	(0.009)	(17.525)	(0.008)	(13.744)	(0.006)	(4.471)
Robust CI	[.019 ; .054]	[48.101 ; 125.331]	[.02 ; .053]	[26.716 ; 87.099]	[.024 ; .05]	[3.614 ; 22.89]
Bandwidth	0.291	0.466	0.343	0.493	0.475	0.365
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.462	430.989	0.344	292.644	0.227	70.806

This table shows the intention to treat estimates for the impact of firm certification on the Ext. Margin Export Choice and Export Value, based on our regression discontinuity design detailed in Section 3. Estimates are based on the SCIE firm-year level data. We present the estimates for total exports (including goods and services), exports of goods and exports of services. This table shows estimates where the outcome variable is observed in the calendar year after the official certification announcement, as explained in Section 2. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE A5. Impact of Eligibility on Export Activity Within and Outside EU

	Within EU		Outside EU	
	Ext. Margin Export Choice	Export Value	Ext. Margin Export Choice	Export Value
Program Eligibility	0.029***	51.629***	0.046***	15.693***
	(0.009)	(12.595)	(0.007)	(4.790)
Robust CI	[.008 ; .043]	[23.657 ; 79.358]	[.029 ; .059]	[4.699 ; 25.946]
Bandwidth	0.277	0.464	0.376	0.492
Kernel Type	Triangular	Triangular	Triangular	Triangular

This table shows the intention to treat estimates for the impact of firm certification on the Ext. Margin Export Choice and Export Value for EU and non-EU members, based on our regression discontinuity design detailed in Section 3. Estimates are based on the SCIE firm-year level data. This table shows estimates where the outcome variable is observed in the calendar year after the official certification announcement, as explained in Section 2. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE A6. Impact of Certification on Export Activity: Panel Regressions

	Panel A: Two-way Fixed Effects			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
Certified Firm	0.018***	0.184***	0.842***	46.658***
	(0.002)	(0.019)	(0.164)	(4.616)
Constant	0.240***	1.076***	4.126***	221.401***
	(0.000)	(0.003)	(0.024)	(0.685)
Observations	267745	267745	267745	267745
Adjusted R-Squared	0.715	0.848	0.691	0.855
Mean Dep. Variable	0.243	1.103	4.251	228.326
Fixed Effects	Firm & Year	Firm & Year	Firm & Year	Firm & Year

	Panel B: Staggered Diff-in-Diff			
	Ext. Margin Export Choice	Export Destinations	Number of Products	Export Value
ATT	0.035***	0.349***	1.526***	57.156***
	(0.004)	(0.025)	(0.199)	(5.795)

This table shows panel regression estimates for the effect of being certified as SME-Leader on Extensive Margin Export Choice, Export Destinations, Number of Products and Export Value. Panel A displays the estimates from the two-way fixed effects regression. We estimate linear regressions of export-related outcomes on an indicator ($Certified\ Firm_{it}$) that is equal to one if firm i is certified—enrolled in the government guarantee scheme—in year t:

$$y_{it} = \theta Certified_{it} + \gamma_i + \delta_t + \varepsilon_{it}.$$

Where γ_i and δ_t represent firm and year fixed effects, respectively. In Panel B, we implement the procedure suggested by Callaway and Sant'Anna (2021b) defining treatment as the first year a firm is certified. Under a parallel trends assumption, this allows us to estimate the group and year-specific ATTs using never treated firms as controls, given by:

$$ATT(g,t) = \mathbb{E}[y_t(g) - y_t(0)|G_g = 1]$$

Where $G_g = 1$ represents firms treated at time period g. This corresponds to the average treatment effect for the group of firms treated at time period g, in year t. We then aggregate the $ATT(g,t)$'s by taking weighted averages across g following Callaway and Sant'Anna (2021a). *Extensive Margin Export Choice* is a binary variable that takes the value of 1 if a firm registered a positive value of exports in a given year, and 0 otherwise. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All outcome variables are retrieved from the FTS database. This table shows estimates where the outcome variables are observed in the 12 months following the official certification announcement. The estimates refer to the 2008-2014 period. Standard errors clustered by firm are reported in parentheses. Significance levels: * p $<$ 0.10, ** p $<$ 0.05, *** p $<$ 0.01.

TABLE A7. Impact of Eligibility on Future Eligibility and Export Activity: Baseline RD

	Panel A							
	Eligibility Index				Export Destinations			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility		0.012	-0.000	-0.005	0.206***	0.186***	0.196***	0.259***
	–	(0.008)	(0.010)	(0.012)	(0.051)	(0.059)	(0.065)	(0.068)
Robust CI	–	[-.008 ; .026]	[-.026 ; .016]	[-.034 ; .014]	[.08 ; .301]	[.042 ; .293]	[.035 ; .314]	[.091 ; .386]
Bandwidth	–	0.289	0.225	0.199	0.389	0.388	0.372	0.404
Kernel Type	–	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	–	-0.191	-0.235	-0.246	1.300	1.332	1.466	1.555

	Panel B							
	Number of Exported Products				Export Value			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility	1.272***	1.152***	1.066***	1.513***	51.731***	54.047***	60.783***	44.504***
	(0.315)	(0.363)	(0.369)	(0.367)	(11.442)	(12.559)	(13.380)	(14.310)
Robust CI	[.661 ; 2.042]	[.448 ; 2.046]	[.275 ; 1.951]	[.726 ; 2.381]	[24.986 ; 74.788]	[25.803 ; 80.856]	[29.861 ; 87.692]	[10.73 ; 72.358]
Bandwidth	0.416	0.412	0.431	0.462	0.494	0.526	0.556	0.507
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	4.934	4.951	5.316	5.359	267.667	274.252	302.091	310.373

This table shows the intention to treat estimates for the impact of firm certification on future Eligibility Index, Number of Export Destinations, Number of Exported Products and Export Value, based on our regression discontinuity design detailed in Section 3. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All exported-related outcome variables are retrieved from the FTS database. This table shows estimates where the outcome variables are are observed in the 12 months following the official certification announcement (T), and one (T+1), two (T+2) and three (T+3) years afterwards. The estimates are based on *Program Eligibility* in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE A8. Impact of Eligibility on Future Eligibility and Export Activity: Criteria whose thresholds increased 2012- 2013

Panel A

	Eligibility Index				Export Destinations			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility	–	0.007	-0.013	-0.008	0.251***	0.325***	0.329***	0.335***
	–	(0.016)	(0.016)	(0.017)	(0.085)	(0.091)	(0.100)	(0.108)
Robust CI	–	[-.029 ; .042]	[-.054 ; .016]	[-.051 ; .025]	[.046 ; .426]	[.111 ; .524]	[.084 ; .536]	[.07 ; .556]
Bandwidth	–	0.319	0.280	0.228	0.255	0.257	0.271	0.262
Kernel Type	–	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	–	-0.342	-0.202	-0.036	1.527	1.527	1.609	1.662

Panel B

	Number of Exported Products				Export Value			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility	2.023***	2.061***	2.238***	2.389***	63.816***	67.767***	76.975***	79.053***
	(0.559)	(0.639)	(0.660)	(0.649)	(19.469)	(25.271)	(28.365)	(27.987)
Robust CI	[.815 ; 3.342]	[.774 ; 3.633]	[.933 ; 3.885]	[1.181 ; 4.066]	[23.15 ; 109.531]	[15.71 ; 128.366]	[19.449 ; 146.181]	[18.101 ; 144.557]
Bandwidth	0.248	0.277	0.298	0.340	0.263	0.253	0.256	0.259
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	6.163	6.163	6.030	5.441	308.621	308.621	330.944	337.003

This table shows the intention to treat estimates for the impact of firm certification on future Eligibility Index, Number of Export Destinations, Number of Exported Products and Export Value, based on our regression discontinuity design exploiting large changes in eligibility thresholds that took place between 2012 and 2013. In this table, we focus exclusively on 2012 and define program eligibility using only the equity-to-assets ratio and business turnover as criteria, similarly to Panel B of Table 6. *Export Destinations* corresponds to the number of countries to which a firm exports, per year. *Number of Exported Products* equals the number of products (eight-digit code) that each firm exports, per year. *Export Value* corresponds to the total value of exports of each firm by year. All exported-related outcome variables are retrieved from the FTS database. This table shows estimates where the outcome variables are are observed in the 12 months following the official certification announcement (T), and one (T+1), two (T+2) and three (T+3) years afterwards. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE A9. Impact of Eligibility on Export Relationships Length

	4-Digit Product Code		6-Digit Product Code	
	Weighted Rel. Length	Mean Rel. Length	Weighted Rel. Length	Mean Rel. Length
Program Eligibility	0.104***	0.089***	0.100***	0.085***
	(0.025)	(0.019)	(0.023)	(0.017)
Robust CI	[.044 ; .15]	[.043 ; .125]	[.045 ; .143]	[.045 ; .117]
Bandwidth	0.356	0.388	0.367	0.401
Kernel Type	Triangular	Triangular	Triangular	Triangular
Mean Dep. Variable	0.803	0.607	0.714	0.527

This table shows the intention to treat estimates for the impact of firm certification on export relationship duration. *Weighted Relationships Duration* corresponds to the weighted average of the duration (in years) of all the export relationships of each firm in a given year, where the weights are given by the total value exported under each relationship (in year t). *Mean Relationships Duration* corresponds to the unconditional average of the export relationships of each firm, in each year. In the first 2 columns, we define an export relationship as exports of a given 4-digit product code to a destination country. In the last 2 columns, we use the 6-digit product classification. Because relationship duration is mechanically truncated by our sample period, we include indicator variables for each year. The estimates refer to the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

TABLE A10. Persistent Impact of Eligibility on Productivity

	Panel A:							
	TFPR (OLS)				TFPR (Levinsohn and Petrin, 2003)			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility	0.020	0.026**	0.023**	0.019*	0.034**	0.031**	0.029**	0.028**
	(0.012)	(0.011)	(0.010)	(0.011)	(0.014)	(0.014)	(0.013)	(0.013)
Robust CI	[-.011 ; .039]	[-.002 ; .045]	[-.003 ; .04]	[-.008 ; .036]	[-.002 ; .056]	[-.005 ; .053]	[-.003 ; .049]	[-.005 ; .049]
Bandwidth	0.183	0.201	0.236	0.236	0.147	0.146	0.165	0.167
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

	Panel B:							
	TFPR (Olley and Pakes, 1996)				TFPR (Wooldridge, 2009)			
	T	T+1	T+2	T+3	T	T+1	T+2	T+3
Program Eligibility	0.039**	0.037**	0.025	0.028*	0.034**	0.031**	0.029**	0.027**
	(0.017)	(0.016)	(0.016)	(0.015)	(0.014)	(0.014)	(0.013)	(0.013)
Robust CI	[-.003 ; .064]	[-.005 ; .062]	[-.014 ; .049]	[-.011 ; .051]	[-.002 ; .056]	[-.005 ; .053]	[-.004 ; .049]	[-.006 ; .048]
Bandwidth	0.133	0.131	0.139	0.148	0.145	0.144	0.162	0.164
Kernel Type	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

This table shows the intention to treat estimates for the impact of firm certification on future firm productivity, based on our regression discontinuity design detailed in Section 3. In Panel A, we estimate revenue-based total factor productivity (TFPR) using both OLS and the method proposed by Levinsohn and Petrin (2003). In Panel B, we use the methods proposed by Olley and Pakes (1996) and Wooldridge (2009). This table shows estimates where the outcome variables are observed in the calendar year after the official certification announcement, and one, two and three years afterwards. The estimates are based on program eligibility in the 2008-2014 period. Conventional standard errors clustered by firm are reported in parentheses. Significance Levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust confidence intervals are reported in the table notes.

B Appendix: Measuring Firm-Level Revenue-Based TFP

To estimate firm-level revenue-based TFP, we consider a Cobb-Douglas production function. The standard estimation equation is shown as follows:

$$y_{i,t} = \alpha + \beta_l l_{i,t} + \beta_k k_{i,t} + \gamma_{i,t} \tag{1}$$

Where i and t indicate firm and year, respectively; $y_{i,t}$, $l_{i,t}$, and $k_{i,t}$ represent the logarithms of value added, number of employees, and one-year lagged capital stock, respectively. The term $\gamma_{i,t}$ captures the unobserved firm-level productivity we want to estimate.

The data used for our estimations come from SCIE, which directly reports firm-level measures of value added, capital stock, and the number of employees. For capital stock, we rely on the balance sheet category labeled "tangible fixed assets, intangible assets, biological assets, and investment properties". To estimate β_l and β_k, we consider all firms in our sample and our estimation window is 2010 to 2018, as we only have information on all variables starting in 2010.

There are two concerns when estimating this equation using OLS. The first concern is simultaneity: firms may observe their productivity shocks and adjust input use accordingly, affecting output. The second is selection bias, as productivity shocks can influence firms' exit decisions. As a result, OLS estimates are likely biased. To address these concerns, several seminal papers have proposed alternative estimation methods. We employ, besides the OLS-based estimation, the methods proposed by Olley and Pakes (1996), Levinsohn and Petrin (2003) and Wooldridge (2009).

In line with Olley and Pakes (1996), we use the logarithm of investment as a proxy for unobserved productivity. Levinsohn and Petrin (2003) propose a semi parametric method by using intermediate inputs as a proxy for unobserved productivity shocks. Following their approach, we use the logarithm of intermediate consumption as a proxy, a variable that we directly observe in our data. Building on this framework, Wooldridge (2009) introduce an alternative estimation strategy that improves identification and allows for more efficient and robust inference.

C Appendix: SME-Leader Program Details

FIGURE C1. SME-Leader Program Timeline

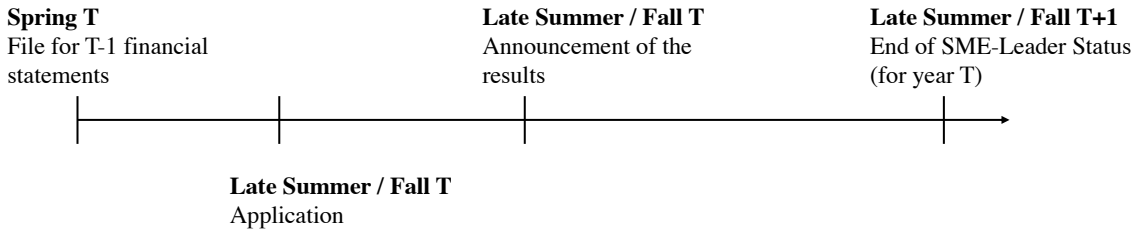


TABLE C1. Program Criteria

	Formal	Accounting
2008	- SME Certification - Credit Rating: AAA, AA and A	- Positive growth in business turnover - Equity/Net Assets >=20%
2009	- SME Certification - Credit Rating: AAA, AA and A - Regularized Status with the fiscal authority, social security and IAPMEI	- Net income >= 0 or positive growth in business turnover - Equity/Net Assets >=15%
2010	- SME Certification - Financial reports available for 1 fiscal year - Credit Rating: AAA, AA and A - Regularized Status with the fiscal authority, social security and IAPMEI	- Net income >= 0 or positive growth in business turnover - Equity/Net Assets >=15%
2011	- SME Certification - Financial reports available for 3 fiscal years - Credit Rating: AAA, AA and A - Regularized Status with the fiscal authority, social security and IAPMEI	- Net income >= 0 - Positive growth in business turnover or EBITDA - Equity/Net Assets >=20% - Business turnover>=500,000€ - No. of Employees (AWU)>=5
2012	- SME Certification - Financial reports available for 3 fiscal years - Credit Rating: AAA, AA and A - Regularized Status with the fiscal authority, social security and IAPMEI	- Net income >= 0 - Positive growth in business turnover or EBITDA - Equity/Net Assets >=20% - Business turnover>=500,000€ - No. of Employees (AWU)>=5
2013	- SME Certification - Financial reports available for 3 fiscal years - Credit Rating: AAA, AA and A - Regularized Status with the fiscal authority, social security and IAPMEI	- Net income >= 0 or positive growth in business turnover or EBITDA (with positive EBITDA in 2011 and 2012) - Positive growth in business turnover or EBITDA - Equity/Net Assets >=25% - Business turnover>=750,000€ - No. of Employees (AWU)>=10
2014	- SME Certification - Financial reports available for 3 fiscal years - Credit Rating: AAA, AA and A - Regularized Status with the fiscal authority, social security and IAPMEI	- Net income >= 0 or positive growth in business turnover or EBITDA (with positive EBITDA in 2012 and 2013) - Positive growth in business turnover or EBITDA - Equity/Net Assets >=25% - Business turnover>=750,000€ - No. of Employees (AWU)>=10

This table summarizes the eligibility for *SME-Leader* between 2008 and 2014. *Regularized status with fiscal authority, social security and IAPMEI* means that the firm does not have an irregular situation (for instance overdue debt) with any of these institutions. *Credit rating* is the credit rating attributed by the sponsor bank to the company that is not publicly available. *SME certification* is based on the European Union size for SMEs and it is obtained electronically through the IAPMEI website.

D Stylized Theoretical Framework

We develop a simple theoretical framework to illustrate how financial constraints shape firms' exporting decisions. Within this framework, we show how relaxing these constraints induces entry into export markets.

D.1 Setup

We consider a one-period model in which firms face both domestic and foreign demand. Firms maximize profits by choosing how much capital to allocate to domestic and foreign production (k_d and k_f, respectively). For simplicity, capital is the only input in production. Firms are endowed exogenously with a productivity level x_i and pledgeable assets A_i. Domestic operating profits are given by $F_d(x_i, k_d)$, and foreign operating profits are given by $F_f(x_i, k_f)$. Capital investment must be financed through external debt. The firm raises external debt D at the beginning of the period and repays $(1 + r)D$ at the end of the period, where r denotes the interest rate. Formally, firms solve the following maximization problem:

$$\max_{k_d, k_f} F_d(x_i, k_d) + F_f(x_i, k_f) - (1 + r)D \tag{2}$$

subject to the constraints:

$$k_d + k_f + \theta_f = D, \quad \text{if } k_f > 0, \tag{3}$$

$$k_d = D, \quad \text{if } k_f = 0, \tag{4}$$

$$D < \bar{D}(A_i). \tag{5}$$

Firms face two production regimes. A firm may choose to serve only the domestic market, in which case it allocates all borrowed funds to domestic capital, so that $k_d = D$. There are no fixed costs of domestic production. Instead, a firm may choose to serve both domestic and foreign markets. Exporting entails a fixed cost θ_f, which must be financed upfront. If the firm exports, total borrowing must therefore cover domestic and foreign capital investments as well as the fixed export cost, implying $k_d + k_f + \theta_f = D$. In both regimes, the firm faces an external financing

constraint: the total amount of debt it can raise is bounded above by $\bar{D}(A_i)$, which is increasing in the firm's pledgeable assets A_i. The firm chooses between the domestic-only and exporting regimes by comparing the associated profit levels. Following Kabir et al. (2024), we distinguish between two types of firms: unconstrained and financially constrained firms.

D.1.1 Unconstrained Firms

A firm is unconstrained if its optimal level of external financing, D^*, lies below the borrowing limit, $\bar{D}(A_i)$, so that the financing constraint does not bind in equilibrium.

Domestic Production Only. The profit function when operating only in the domestic market is given by:

$$\pi_d(k_d) = F_d(x_i, k_d) - (1+r)k_d. \tag{6}$$

The first-order condition for optimal k_d is given by $F_d'(x_i, k_d^*) = 1 + r$, which defines the unconstrained optimal domestic capital k_d^*. Substituting back yields unconstrained domestic-only profits $\pi_d^{*U} = F_d(x_i, k_d^*) - (1+r)k_d^*$.

Domestic and Foreign Production. When the firm serves both domestic and foreign markets, its profit function is

$$\pi_{d+f}(k_d, k_f) = F_d(x_i, k_d) + F_f(x_i, k_f) - (1+r)(k_d + k_f + \theta_f). \tag{7}$$

The first-order conditions for optimal k_d and k_f are given by $F_d'(x_i, k_d^*) = 1 + r$ and $F_f'(x_i, k_f^*) = 1 + r$, respectively. Unconstrained profits when exporting are therefore $\pi_{d+f}^{*U} = F_d(x_i, k_d^*) + F_f(x_i, k_f^*) - (1+r)(k_d^* + k_f^* + \theta_f)$. An unconstrained firm chooses to export if $\pi_{d+f}^{*U} \geq \pi_d^{*U}$.

D.1.2 Constrained Firms

A firm is financially constrained if its desired level of external financing exceeds the borrowing limit, so that the financing constraint binds in equilibrium, i.e., $D = \bar{D}(A_i)$. In this case, the firm's capital choices and export decision are distorted by limited access to external finance.

Domestic Production Only. If the constrained firm serves only the domestic market, the financing constraint implies that domestic capital is limited by $k_d = D = \bar{D}(A_i)$. Profits are given by $\pi_d^C = F_d(x_i, \bar{D}(A_i)) - (1+r)\bar{D}(A_i)$.

Domestic and Foreign Production. If the constrained firm chooses to export, total borrowing must cover domestic and foreign capital investments as well as the fixed export cost. The binding financing constraint implies $k_d + k_f + \theta_f = \bar{D}(A_i) \Leftrightarrow k_d = \bar{D}(A_i) - \theta_f - k_f$, which restricts the scale of production in both markets. Substituting back into the objective function, we get

$$F_d(x_i, \bar{D}(A_i) - \theta_f - k_f) + F_f(x_i, k_f) - (1+r)\bar{D}(A_i).$$

The first-order condition with respect to k_f is

$$-F_d'\big(x_i, \bar{D}(A_i) - \theta_f - k_f\big) + F_f'(x_i, k_f) = 0,$$

which implicitly defines the optimal foreign capital choice k_f^*. The corresponding optimal domestic capital allocation is $k_d^* = \bar{D}(A_i) - \theta_f - k_f^*$.

D.2 Model Predictions

To illustrate the implications of the model and to provide graphical intuition for the different regimes characterized above, we impose specific functional forms for domestic and foreign operating profits. These assumptions are made purely for expositional convenience and are not essential for the qualitative implications of the model. We assume that operating profits are increasing and concave in capital:

$$F_d(x_i, k_d) = x_i k_d^\alpha \quad F_f(x_i, k_f) = x_i k_f^\alpha,$$

where $\alpha \in (0,1)$. In addition, we assume that the borrowing constraint is proportional to pledgeable assets and is given by $\bar{D}(A_i) = \lambda A_i$, with $\lambda \in (0,1)$.

Figure D1a summarizes the model's implications in (A_i, x_i) space. Firms with productivity below the horizontal cutoff $\bar{x}$ do not export, as exporting is unprofitable regardless of financial conditions. Absent financing constraints, all firms with productivity higher than $\bar{x}$ would export.

This is no longer the case in the presence of financing frictions.

Among sufficiently productive firms, those with pledgeable assets below the vertical cutoff $\bar{A}$ face borrowing constraints that are sufficiently tight to prevent exporting. For these firms, exporting is either infeasible because they cannot finance the fixed export cost, or unprofitable because limited external finance prevents them from operating at a profitable scale in the foreign market. Firms located above the productivity cutoff and to the right of $\bar{A}$ export, but differ in the extent to which financial constraints distort their production decisions. Firms in the light red region are constrained exporters: they optimally choose to export despite a binding borrowing constraint, but operate at an inefficiently low scale relative to the unconstrained benchmark. Firms in the dark red region are unconstrained exporters. For these firms, pledgeable assets are sufficiently high that the borrowing constraint does not bind, allowing them to finance both domestic and foreign production at the unconstrained optimal scale.

Relaxation of Financing Constraints. We consider two channels through which such a relaxation of financing constraints may operate. In the first case, we model a relaxation of financing constraints as an increase in pledgeable assets, A_i, which expands firms' borrowing capacity and captures a quantity-based mechanism. In the second case, we allow the relaxation to also affect the cost of external finance, capturing a price-based mechanism.

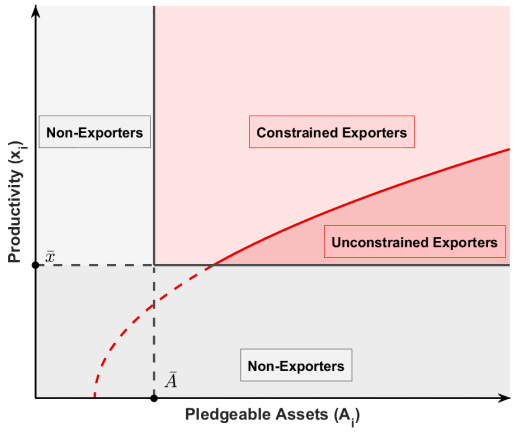
Figure D1b considers an increase in pledgeable assets. Graphically, it relaxes the borrowing constraint and shifts the asset threshold for exporting leftward to $\tilde{A}$. As a result, some firms that were previously financially constrained non-exporters are able to enter export markets (vertical striped red region). Export entry arises exclusively from firms that were previously productive enough to export but financially constrained. In addition, the boundary separating constrained from unconstrained exporters shifts outward, allowing a larger set of exporting firms to operate closer to the unconstrained optimal scale.

Figure D1c considers a relaxation of financing constraints that operates through both a quantity channel and a price channel. Export entry is now driven by two different mechanisms. First, as in Figure D1b, the expansion in borrowing capacity allows previously constrained but sufficiently productive firms to enter export markets. Second, the reduction in the cost of capital lowers the profitability threshold for exporting, shifting the export productivity cutoff downward

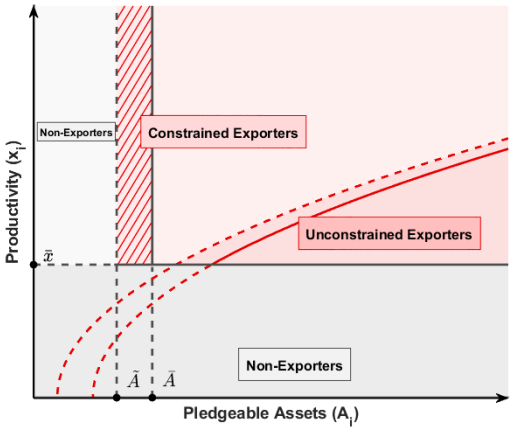
to $\tilde{x}$. This price-based mechanism induces entry by firms that were insufficiently productive to export (horizontal striped red region). By reducing the cost of capital, the relaxation raises export profitability for these marginal firms, operating analogously to an implicit subsidy to production and exporting.

FIGURE D1. Model Predictions

(a) Baseline



(b) Quantity Mechanism



(c) Quantity and Price Mechanisms

