Export quality upgrading and credit constraints

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Abstract

This paper studies the impact of credit constraints on exported-output quality upgrading by small and medium firms (SME's). Italian SMEs strongly rely on the local banking sector to finance their trade costs as well as their production costs. When credit available in the market is reduced, less productive firms face more difficulties to finance investments in order to upgrade exported-output quality. Our empirical investigation, based on a survey of Italian firms, ran in 2011, confirms that credit constrained firms are less likely to increase output quality for the export market. The impact of credit constraints is stronger for firms exporting outside Europe and on medium-sized firms. Reducing the probability of upgrading exported output quality credit constraints impact on the extensive margin of trade.

JEL codes: F10, F14, F36, G20, G28, G32.

Keywords: Credit constraints, heterogeneous firms, international trade.

- VERY PRELIMINARY -

October, 2013

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1 Introduction

Following the literature on heterogenous firms in international trade, starting from Melitz (2003), only the most productive firms become exporters. In fact, exporting entails higher entry costs than selling in the domestic market: firms need to acquire information on foreign markets, customize products to fit local tastes/regulations and set up distribution networks. Moreover, a firm's export performance is influenced by a number of observable and non-observable characteristics peculiar to the firm itself and the environment in which it operates. Among these, financial development[1] of firms' homeland has been traditionally considered as crucial. The recent availability of firm level data-sets has then given rise to a new stream of research focused on the relationship between credit availability and firm's export performance, either in terms of probability of exporting[2] or in terms of export quality[3]. Results generally confirm that credit constrained firms are less likely to become exporters and to increase output quality.

So far, models studying the impact of credit constraints on firm's optimal output quality choice considered it as homogeneous across markets[4]. However, firms often vary output quality according to market characteristics[5]. To the best of our knowledge, the literature lacks studies on this aspect. Namely, the impact of credit constraints on the choice to upgrade exported output quality with respect to the one produced for the domestic market. A second issue that has not yet been investigated is the impact of credit constraints on firms exporting to more distant markets. Researches on export destination and output quality[6] confirm that firms producing high-quality output are more likely to serve distant markets. However, it is not clear how credit availability might impact on the quality upgrading and export destination decisions.

This paper aims at filling these gaps deriving implications from a stylized partial equilib-

[1] Beck (2002).

[2] Manova (2010), Minetti and Zhu (2011) and Chaney (2013).

[3] Fan et al. (2012) and Secchi et al. (2012).

[4] Manova (2010) and Fan et al. (2012) consider output quality as equal in the domestic and the export market.

[5] See Verhoogen (2008) and Flach (2013) on this.

[6] On the debate regarding quality and distance see Alchian and Allen (1964), Hummels and Skiba (2004) and Martin (2012).

rium model[7] that combines export quality upgrading and capital cost. We study the optimal output quality choice for firms that are heterogeneous in terms of productivity and produce for both the domestic and the foreign market. In this framework, an increase in the cost of capital induces firms to decrease the quality differential between exported and domestic output. A second implication of our framework is that firms producing higher quality goods are able to reach more distant markets[8].

We test theoretical findings on a novel firm-level dataset based on the VIIIth UniCredit Survey on small and medium firms (SME's), ran by the Italian banking group UniCredit in 2011. We focus on manufacturing SME's, and combine survey data with balance-sheets information for the period 2002-2010. We test the validity of several quantitative measures of credit constraints and find that firms' rating as defined by an external agency[9] on the basis of balance-sheet information, positively and significantly predicts the probability that a firm declares to be strongly credit constrained in 2010. We then use this measure to study the impact of credit constraints on the probability that firms upgrade exported output quality. Since the impact of credit constraints might depend on firm size, we check the robustness of our model by considering, as an alternative explanatory variable, the interaction between our proxy for credit constraint and firm size.

Our main empirical results confirm theoretical findings: credit constraints impact negatively and significantly on a firm's decision on whether to upgrade the quality of exported output. We also find that credit constraints impact significantly on exported-output quality upgrading only when firms export outside Europe. The impact of credit rationing is moreover stronger on medium-sized firms under analysis. Since our main explicative variable might be endogenous we consider a proper instrumental variable approach that confirms our main result.

This paper lies at the intersection between two strands of the recent international trade literature. The first strand investigates on characteristics of firms that are capable to upgrade the quality of their exported output. The second strand studies the impact of credit constraints on the probability that a firm becomes an exporter and on its output quality.

[7] See Verhoogen (2008).

[8] Confirming the Alchian-Allen effect (1964).

[9] CEBI, Centrale Bilanci, is an independent agency founded by Italian banking institutions to provide trustable and comprehensive information on Italian firms.

Supposing that consumers in developed countries have a higher willingness to pay for quality than domestic ones, Verhoogen (2008) models the quality upgrading decision of firms, in an emerging market like Mexico, and studies its impact on wage inequality. In his paper quality upgrading depends on workers' skills and on the cost of capital. More productive plants raise the export share in sales and increase the number of external quality certificates obtained[10]. We take the model proposed by Verhoogen (2008) as our main reference to derive theoretical implications to be tested on our dataset. Flach (2013) investigates on the relationship between quality upgrading and pricing of Brazilian firms in export destinations. Using a data-set that combines quality information and prices at the firm level Flach finds that producers raise quality and prices when exporting to high-income destinations. Moreover, variation in prices across different markets is mainly driven by demand for quality in high-income destinations and not by other factors such as market shares and markups.

A good number of papers studied the impact of credit constraints on the extensive margin of trade. Campa and Shaver (2001) is, to our knowledge, the first article focusing on the relation between a firm's exporting status and liquidity constraints. Using a data-set on Spanish firms, the two authors find that liquidity constraints are more binding for non-exporters. This results is reversed by Chaney (2013) who proposes a theoretical framework based on the heterogenous firms trade model to conclude that more productive firms generating large revenues from their domestic sales and wealthier firms with a large amount of liquidity are the ones more likely to be exporters. Manova (2007), introduces credit market frictions in a heterogeneous firms trade model. Being firms different in their credit needs because of the different technologies employed and industries in which they operate, the impact of a reduction in credit available reinforces the selection mechanism already at work in the heterogenous firm trade model. Small exporting firms are the ones suffering more for a reduction of credit available in the economy since they tend to rely more on external funds from the banking sector. Amiti and Weinstein (2009) examine whether deteriorations of the banking sector can explain large drops in exports relative to output in the recent economic downturn. Their paper is the first to establish a causal link between the health of banks providing trade finance and growth in firm's exports relative to domestic sales. Results suggest that the status of financial institutions is an important determinant of firm-level exports

[10]ISO 9001 is an international qualitative standard used to proxy output quality.

during economic downturns.

Minetti and Zhu (2011) work on data from a survey on Italian manufacturing firms[11] to investigate the impact of credit rationing on firms' export. They employ a qualitative firm level measure of credit rationing, obtained from the survey, and account for the possible endogeneity of this measure. Our work strongly builds on this article for what concerns the construction of control variables considered in the empirical investigation and uses their measures of credit rationing, "Strong Rationing", to test the validity of our preferred explicative variable. Minetti and Zhu (2011) find that credit constraints impact negatively on firms' export participation and foreign sales. Muuls (2008) proposes a theoretical model confirming that firms are more likely to export if they are more productive and when they face lower credit constraints. The main explicative variable employed in our analysis, the external score assigned to the firm, is similar to the one proposed by Muuls (2008) to study Belgian firms.

Turning to papers investigating the relationship between credit constraints and firm's output quality choice. Bernini et al. (2013) investigate on the relationship between firm's leverage and exported output quality[12] focusing a sample of French firms. Considering firms operating in specific sectors, they report that more leveraged firms export goods of lower quality.

Fan et al. (2012), extend the quality-heterogenous firms model proposed by Baldwin and Harrigan (2011) considering liquidity constraints. Heterogenous firms produce goods of a certain quality level, determined by their productivity draw, for both the foreign and the domestic markets. Once credit constraints start to be binding, optimal prices, and therefore the quality of supplied products, decrease because firms start buying inputs of lower quality. The authors employ a firm level data-set on Chinese firms (NBSC) to find that a more difficult access to credit forces firms to reduce the quality of exported output. Fan et al. (2012) use industry finance dependence[13] as a proxy for credit constraints. In the empirical section of this paper we question the validity of this measure for our investigation.

This paper is divided in seven sections. Section 2 proposes a simple theoretical framework.

[11] They use the "Capitalia-Mediocredito Centrale" 2001 Survey on Italian Manufacturing Firms. This banking insitution was part of UniCredit from 2007 to 2011.

[12] They rely on Khandelwal (2008) to derive their proxy for output quality.

[13] See Rajan and Zingales (1998) and Manova (2010).

In section 3 we describe the data-set at our disposal. In section 4 we discuss results on how credit rationing impacts on the quality of exported output, while in section 5 we study how credit constraints and export destination impact on export quality upgrading. Section 6 concludes the paper.

2 Model

In this section, we discuss the model proposed by Verhoogen (2008) and use it to derive interesting implications for our study. We consider two countries, D, home, and X, foreign. In each country, j=d,x, a representative individual consumes one unit of a good from a continuum of goods indexed by ω. The indirect utility derived from consuming is:

$$V(\omega) = \theta_j q(\omega) - \widetilde{p_j}(\omega) + \varepsilon \tag{1}$$

where $q(\omega)$ represents the quality of variety ω and $\widetilde{p_j}$ is the price of ω relative to the price level in country d. θ_j represents the consumer's willingness to pay for quality in country j. This term can be thought as a function of income: richer consumers have a lower marginal utility of income and therefore pay more for a certain level of quality. Verhoogen (2008) assumes that θ_j is a country specific characteristic and that, $\theta_x > \theta_d$. This assumption is clearly valid for a developing country like Mexico, the case studied by Verhoogen (2008), but it fails to describe the case of firms producing in a developed country like Italy. However, we might think of the parameter θ_j as being sector specific: in certain sectors domestic consumers are willing to pay more than foreing ones for quality while this does not happen in other sectors. For the time being, we do not introduce this variation to the model and use its original version. Assume that δ_j is the ratio of the price level in country j to the price level in d, $\delta_d = 1$ and δ_x is the real exchange rate. The consumer-product match term ε is i.i.d across consumer with a type 1 extreme-value distribution. It is possible to obtain the expected demand for each good:

$$x_j(\omega) = \frac{N_j \exp\left[\frac{1}{\mu}\left(\theta_j q(\omega) - \frac{p_j(\omega)}{\delta_j}\right)\right]}{\int_{\Omega_j} \exp\left[\frac{1}{\mu}\left(\theta_j q(\omega) - \frac{p_j(\omega)}{\delta_j}\right)\right] d\omega} \tag{2}$$

Here μ is a parameter for the distribution of the consumer-product match term capturing

the degree of differentiation between goods while Ω_j represents the set of goods available in market j.

2.1 Production

In both countries a group of heterogenous firms in terms of an exogenously determined productivity parameter λ, produce product varieties. We solve our model considering only the decision of firms operating in the home country, d. To understand the model is crucial to think of a plant that enters both the domestic and export markets as producing on different production lines goods to be sold in the two markets. Each unit of output is produced employing production factors in fixed amounts: one white-collar worker, one blue-collar worker and one machine. Product quality is a function of workers' quality, technical sophistication of the machine and firm productivity, using a convenient Cobb-Douglas formulation:

$$q_j\left(k_j; e_j^h; e_j^l; \lambda\right) = \lambda (k_j)^{\alpha^k} (e_j^h)^{\alpha^h} (e_j^l)^{\alpha^l} \tag{3}$$

Here k represents the amount of capital embodied in the machine while e_j^l and e_j^h represent the quality of the blue-collar and the white-collar worker, respectively. Verhoogen (2008) assumes that $\alpha = \alpha^k + \alpha^h + \alpha^l$ so that improvements to product quality from a given increase in the skill and sophistication of inputs are diminishing when $\alpha < 1$.Firms face worker quality-wage schedules that are upward-sloping and linear[14]. Worker quality improves product quality but it comes with a cost: the wage of the worker, w_j, and the cost of capital, represented by ρ. Finally, as in standard trade models, exporters need to pay a sunk cost, f_x, in order to start exporting.

Each firm chooses white collar wage, blue collar wage, capital intensity and prices to maximize profits, separately for each production line. As in every monopolistic competition

[14]

$$e_j^h(w_j^h) = z^h(w_j^h - \underline{w}_j^h)$$
$$e_j^l(w_j^l) = z^l(w_j^l - \underline{w}_j^l)$$

w_j^h and w_j^l are wages of white-collar and blue-collar workers on a particular production line while z^h and z^l are positive constans, $\underline{w}_j^h$ and $\underline{w}_j^l$ are average wages of white-collar and blue collar workers in the outside labor market and are considered exogenous.

model each plant is small relative to the market, therefore the denominator in (1) is not affected by a single-plant choice. Optimization yields the following solution for $q_j^*(\lambda)$,

$$q_j^*(\lambda) = \left[\lambda(\frac{\alpha^k}{\rho})^{\alpha^k}(z^h\alpha^h)^{\alpha^h}(z^l\alpha^l)^{\alpha^l}\delta_j^\alpha\theta_j^\alpha\right]^{\frac{1}{1-\alpha}} \tag{4}$$

This equation gives us some important implications. High productivity and larger firms, the ones with high λ, produce goods of higher quality. If a firm enters both the export and the domestic market it produces the high quality variety for the market in which θ_j is higher. If θ_j is higher in the foreing market than the firm produces goods of higher quality for this market. This result is in line with the Alchian-Allen effect[15] stating that firms export goods of higher quality further abroad. It is also important to notice that this result is obtained without assuming per-unit transport cost.

A firm producing for both the foreing and the domestic market produces goods of different quality in the foreign, x and in the domestic, d market:

$$q_x^*(\lambda) = \left[\lambda(\frac{\alpha^k}{\rho})^{\alpha^k}(z^h\alpha^h)^{\alpha^h}(z^l\alpha^l)^{\alpha^l}\delta_x^\alpha\theta_x^\alpha\right]^{\frac{1}{1-\alpha}}$$

$$q_d^*(\lambda) = \left[\lambda(\frac{\alpha^k}{\rho})^{\alpha^k}(z^h\alpha^h)^{\alpha^h}(z^l\alpha^l)^{\alpha^l}\delta_d^\alpha\theta_d^\alpha\right]^{\frac{1}{1-\alpha}}$$

The difference between optimal quality in the two markets is:

$$\Delta_q = q_x^*(\lambda) - q_d^*(\lambda) = \left[\lambda(\frac{\alpha^k}{\rho})^{\alpha^k}(z^h\alpha^h)^{\alpha^h}(z^l\alpha^l)^{\alpha^l}\right]^{\frac{1}{1-\alpha}}(\delta_x^\alpha\theta_x^\alpha - \delta_d^\alpha\theta_d^\alpha)^{\frac{1}{1-\alpha}} \tag{5}$$

This term, the difference in quality for the export market with respect to the one produced for the domestic one is decreasing in the cost of capital:

$$\frac{\partial\Delta_q}{\partial\rho} = -\left[\frac{\alpha^k}{1-\alpha}\right]\rho^{\left(\frac{-\alpha^k}{1-\alpha}-1\right)}\left[\lambda(\alpha^k)^{\alpha^k}(z^h\alpha^h)^{\alpha^h}(z^l\alpha^l)^{\alpha^l}\right]^{\frac{1}{1-\alpha}}(\delta_x^\alpha\theta_x^\alpha - \delta_d^\alpha\theta_d^\alpha)^{\frac{1}{1-\alpha}}$$

[15] See Alchian and Allen (1964).

$$\frac{\partial \Delta_q}{\partial \rho} < 0$$

The cost of capital, ρ, impacts negatively on the possibility of a firm to increase the quality of exported output, $q_x^*(\lambda)$ with respect to the quality of output produced for the domestic market, $q_d^*(\lambda)$. A lower availability of credit in the market, increases the cost of capital for a firm that is therefore less likely to upgrade the quality of exported output with respect to the one produced for the domestic market.

3 Data-set

The empirical part of this paper is based on the VIIIth UniCredit Survey on italian SMEs, ran in the period June-September 2011. The sample was designed according to a stratified selection procedure, so that findings are representative at company size level, individual sactor level as well as at the territorial level. The sample size consists of 7436 non-financial firms, of which 1057 are manufacturing. The main strenght of this database is the very detailed information it collects on individual firms. In particular, the 2011 wave features information regarding firms's: *a.* characteristics; *b.* innovation; *c.* financial structure and relationship with banks; *d.* credit availability; *e.* production characteristics; *f.* collaboration and cooperation agreements; *g.* internationalization. Data on balance sheets are taken from CEBI[16] for the period 2002-2010. Along with information on firms' balance sheets, firms' rating scores from UniCredit and by CEBI are also at our disposal. To this database we merge information on economic activity at the provincial level. In particular we use data on provincial value added from 1998 to 2008 obtained from ISTAT, and on the average number of bank branches per 1000 inhabitants during the period 1991-1998.

3.1 Main Variables

In our specifications we use variables obtained from the survey as well as variables derived from firm's balance sheets. We start by describing variables in the first group. Our main

[16] CEBI stands for "Centrale dei Bilanci", which is the main independent source of information on firms' creditwhortiness for Italian Banks.

dependent variable[17] is a dummy equal to one if the firm answers "higher" to the following question: "How would you define the quality of your exported output compared to the one you sell in the domestic market ?" Firms are asked to compare the quality of exported output with the one sold in the domestic market, without clearly stating a definition of output quality. We are however confident that who answers this question during the interview is capable to disentangle quality differences between exported and domestic output mainly referring to the cost of inputs employed in the two different production lines. Moreover, this question is placed in the internationalization section of the survey, where firms are asked to describe their stance in the international markets: it is unlikely that who answers other questions regarding a firm's export activity is not aware of differences in characteristics that make exported output quality different from the one sold in the domestic market. Since firms can answer that they export products of lower or equal quality with respect to the ones produced for the domestic market we also use this information in different specifications.

Turning to our set of possible explicative variables, interviewed firms are asked to describe their relationship with creditors, specifically they are asked to answer to following questions: a) "In 2010 would the firm have liked to obtain more credit at the market interest rate?" and b) "In 2010 did the firm demand more credit than it actually obtained?". In case of positive answer to both questions, we define a firm as strongly rationed[18].

From balance sheets it is also possible to extract other information on a firm's stance in the credit market. First of all, for the group of firms in the sample that, at the time of the survey, were customers of UniCredit we compute the ratio of total credit used over total credit available from the whole banking system[19] in the years from 2008 to 2010. Moreover, from the same source, we use the external CEBI score[20] spanning from one, for firms in good financial health, to nine, for firms likely to default. In our specifications we take the average of this external score in the period 2008 to 2010 as our explicative variable in order to reduce endogeneity deriving from contemporaneous observations. In the following paragraph we

[17] "High Quality Out".

[18] See Minetti & Zhu (2011).

[19] The total credit used over the total credit available and the credit used in the short term over the credit available in the short term.

[20] Muuls (2011) uses external ratings as a proxy for firm's credit rationing. When a firm reports a worse rating it is more difficult for it to obtain credit at the market's interest rate.

demonstrate why this is the variable that best can tell us if a firm is credit constrained[21].

In our specifications we use a number of controls that are correlated with a firm's decision to upgrade the quality of exported output. In the survey, firms are asked to state the percentage of University graduates in their labor force[22], when the firm was founded[23] whether it is part of a business group, a corporation or a company and if it is located in the center, the south or the north of Italy[24]. Moreover, given that output quality is often the result of firm's innovative practices, we build a dummy variable equal to one if the firm has introduced new products or significantly ameliorated existing ones during the three years preceding the survey[25].

Turning to balance sheets data we then compute a variable representing firm's size, as usually done in the literature[26], proxied by the number of employees. Moreover, we compute variables that can proxy for the amount of financial resources generated internally and for the use of external finance. In particular we have information on i) firm's leverage ratio, defined by firm's total liabilities over equity, ii) firm's liquidity ratio, computed dividing current assets less current liabilities by total assets, iii) firm's cash flow, equal to net revenues over total equity, iv) firm's capital intensity, the ratio between total fixed assets and the number of employees v) firm's labor productivity, defined by total value added over the number of employees. It is important to recall here that variables from i) to iii) have often been used in the literature as proxies for credit constraints[27], in this paper they are used as controls since we expect our main explicative variable to be more representative of a firm's credit whortiness. In particular, firm's leverage gives an information on the relative amount of credit is used by the firm. The amount of external funds obtained by a firm is the result of production tecnologies, investments and economic cycles, not giving us any information on

[21] The idea of using firm's rating as a measure for credit constraint is widely known and accepted in the Finance literature (cit.). However, we include the following sub-section that empirically shows why, in our case, the firm's rate can be used as a proxy for credit constraint. The reader who is convinced on this channel can skip to section 4.

[22] Variable "Labor Skill".

[23] The variable, "Firm Age" is constructed based on this information.

[24] In our specificiations we will use a dummy for "South" and one for "Center".

[25] "Innovation" is a dummy equal to one in case the firms answers positively to one the two questions.

[26] See Bernard et al. (2004), Minetti and Zhu (2011).

[27] See Greenaway et al. (2007) and Bernini et al. (2013).

how difficult and costly is the access to external funding for a firm. The external firm rate is instead an information on the firm that is known by all banking institution across Italy, it is probably the first information on a firm that a bank branch director checks when asked for credit by a firm manager.

3.2 Different Measures of Credit Constraint

To support our choice to use the average external rate in the period 2008-2010 as our main explicative variable and correct proxy for a firm's credit whortiness, we first study the relationship between the dummy indicating whether a firm is strongly credit rationed in 2010, as obtained from the survey, and four variables that we could use as proxies for a firm's credit availability. The four candidate explicative variables are: the average of the external score for the period 2008-2010, a dummy equal to one if the firm has a bad score from Unicredit in 2010, the average of the total credit use in the period 2008-2010 and the average of credit use in the short term during the same period. It is important to underline that the last three variables are available only for those firms in our data-set that are customers of Unicredit, therefore, using these variables would restrict our sample size. Moreover, we think it is important to have a quantitative proxy for credit constraint that confirms what declared in the survey but also measures how intense is the reduction of credit available to the firm. In fact, two firms both declaring to be credit constrained in our survey might be differently credit rationed. We think we can measure this difference using the average external score in the three years preceding the survey. We confirm the validity of our choice reporting the following specifications where a dummy equal to 1 if the firm declares to be strongly rationed is regressed, using a probit model, on our four candidate explicative variables as well as on firm level[28] and province-level controls.

[Table 1 here]

[28] In this specification we also consider other variables, obtained from the survey, that might positively impact on the probability that a firm declares to be strongly credit rationed in 2010. We control for the number of creditors to the firm, the percentage of credit obtained from the principal bank over total credit, the percentage of credit over total assets and a proxy equal to one if the firm has changed principal bank in the last year.

Results show that average external score is the only candidate that is positively and significantly correlated with our dummy variable for a firm declaring to be strongly credit rationed in 2010. The average marginal effect of an increase in the external score (i.e. a worsening of a firm's credit stance) is equal to 0.074 and is significant at the 5%. The coefficient for this variable remains significant also when we run a specification jointly including the other candidates, reporting an average marginal effect equal to 0.072, significant at the 1%. Firms with a high level of credit over assets are also more likely to be strongly credit rationed. More leveraged firms and those with a low cash flow are also more likely to be strongly credit rationed in 2010. Interestingly, firms operating in a province that has experienced a positive growth of provincial valued added are less likely to be strongly credit rationed. This last result confirms the economic resoning for which firms have less problems accessing to the credit market when they operate in a province that has experienced economic growth in recent years.

In order to further assess if our quantitative measure of credit constraint is reliable, we propose a table reporting correlations between indicators of firm's economic performance and our main explicative variable. Table 2 reports OLS estimates obtained using average external score as a dependent variable. Controlling for firm size, higher the liquidity ratio and higher the cash flow, lower hence better, the external score obtained by the firm. In specification (1) to (4) we exploit time variation using data for the period 2002-2010 with firm and time fixed effects, while in specification (5) we use data from the 468 firms observable in 2010 and use industry dummy variables to account for other sources of comparative advantage and for the pattern of world demand for goods. Notice that when we use labor productivity, a variable highly representative of a firm's status in trade theory, we observe that, higher is labor productivity of the firm lower, hence better, its external score. More productive firms are better rated.

[Table 2 here]

Among variables representing firm's economic performance, the liquidity ratio is the one impacting the most on our main explicative variable, reporting a coefficient significant at the 1%.

3.3 Non-Constrained and Constrained Exporters

As written above, in the survey, several questions on their international activities are asked. One of these questions asks to state firm's main activity in the foreign markets as an importer, exporter or if it has productive establishments abroad. Among manufacturing firms in our sample almost the 65% declare to be exporters in 2010. This percentage is consistent with what reported by Minetti and Zhu (2011) on a similar data-set of Italian firms in 2001; ISTAT[29] data also confirm this number, stating that for the period 1998-2005 between the 63% and 70% of manufacturing firms with more 10 employees declared to be exporters.

In the following table we divide our sample of manufacturing exporting firms in two groups, non-constrained (N. C.) exporting firms are those having an average external score lower or equal to four[30] while constrained exporting firms are the ones reporting an external score from five to nine[31].

[Table 3 here]

This table reports group means, standard deviations and Ttests for difference in means for a group of variables. Even from this summary statistics' we can observe interesting differences between constrained and non-constrained firms. Constrained firms are significantly less productive, have less cash flow, are more leveraged and less liquid. On the contrary, non-constrained firms are significantly older, less capital intense and, most importantly, are more likely to upgrade the quality of exported output with respect to the one supplied to the domestic market. If, following Bernard et al. (2007), exporting firms are more productive and bigger than non-exporters, at a first glance, we also notice that constrained exporters are different from non-constrained exporters in terms of economic performance and, interestingly for our analysis, in the possibility to tailor the quality of output for the foreign market.

4 Results: Upgrading Quality for the Foreing Market

In this section, we investigate on implications derived from the theoretical section presented above. We expect credit constrained firms to be the ones less likely to upgrade the quality

[29] See "Annuario ISTAT-ICE".

[30] 1= High Safety, 2= Safety, 3= High Solvency, 4= Solvency.

[31] 5= Vulnerability, 6= High Vulnerability, 7=Risk, 8=High Risk, 9=Very High Risk.

of exported output with respect to the quality of output produced for the domestic market. Lower credit availability forces firms to cut on costs impacting on their possibility to tailor product characteristics, with quality among those. To investigate on our research question we use the following specification:

$$\Pr(Q_i = 1) = prob(\alpha + \varsigma_{ind} + \beta C_i + \gamma X_i + \chi T_j + \varepsilon_i > 0). \tag{6}$$

The probability that firm i upgrades the quality of exported output, $Q_i = 1$, depends on our main explicative variable, C_i, credit available to the firm, proxied by the average external score in the period 2008-2010. We control for firm level variables correlated with firm's credit availability and with the capability of a firm to upgrade the quality of exported output, X_i. We also control for variables representing the level of economic development in the province where the firm operates, such as average provincial value added and provincial value added growth, and for a variable correlated with credit availability at the province level, the number of bank branches per 1000 inhabitants, all these variables are present in vector T_j. In this specification we also insert an intercept and use industry dummies[32], ς_{ind}, in order to account for other sources of comparative advantage and for the pattern of world demand for goods. If we assume that ϵ_i is i.i.d, normally distributed with mean 0 and variance 1, we have:

$$\Pr(Q_i = 1) = \Phi(\alpha + \varsigma_{ind} + \beta_1 C_i + \gamma_1 X_i + \chi_1 T_j). \tag{7}$$

Table 4 reports our first set of results. In this table we do not use all variables described above but only the variables on firm's economic performance in order to observe how these variables are related to the probability that a firm upgrades the quality of exported output.

[Table 4 here]

It is interesting to notice that bigger and more productive firms are the ones more likely to upgrade quality for the foreign market, the average marginal effect for these two variables is in fact positive and significant at the 5% in all specifications. In specification (2) to (4) we insert other variables representing firm's economic activity, such as the percentage of skilled individuals, cash flow, liquidity ratio, leverage ratio, firm age and capital intensity. All these

[32] We have 25 industries, using the ateco two-digit classification.

controls report non significant and very small average marginal effects. In specification (5) we insert our main explicative variable and clearly observe that it enters with a negative and significant average marginal effect. Higher is the average external score of the firm in 2008-2010, i.e. more difficult is its access to credit, lower is the probability that it produces an output of higher quality for the foreing market. Moreover, once we introduce this variable, we notice that it is highly correlated with firm's productivity and firm's size, since the average marginal effects of these variables are significantly smaller and lose explicative power in this last specification.

We then propose our most important set of results in tables 5 and 6. Table 5 reports average marginal effects of our variables of interest.

[Table 5 here]

We start in specification (1) using our main explicative variable, average external score in 2008-2010, and insert by groups our control variables in the following fashion. We first introduce firm's level controls obtained from balance sheet data, in specification (2), then consider the percentage of skilled labor force, in specification (3). Specification (5) introduces the full set of controls including firm innovation and the average level of provincial value added that are not considered in specification (4). Results show that the average marginal effect of our proxy for credit constraint always enters with a negative and significant[33] value. It is important to notice that the magnitude of the marginal effect for this variable remains quite stable across specifications[34]. Confirming another implication from the model outlined above, we notice that more productive and bigger firms are more likely to upgrade the quality of exported output. Productivity and firm size are found to be good predictors not only of exporting but also of exported output quality upgrading. Our results are therefore homothetic to the ones usually obtained in the literature on heterogenous firms in international trade. Firms belonging to a business group and producing in a province that experienced a positive growth in value added during the period 1998-2008 are instead less likely to upgrade quality. The second result is in line with the intuition that firms in more dynamic provinces have lower incentives to vary the quality of exported output since their

[33] At the 5%.

[34] It varies from -0.023 to -0.029.

domestic demand, and the supposedly consequent high level of market competition, select those firms producing an output quality closer to the one demanded by foreing markets.

In Table 6 the reader can compare results obtained in specification (5) of table 5 with those obtained from a linear probability model, specification (1) and (2) respectively. Results are very similar. Credit constrained firms are less likely to upgrade the quality of exported output, while more productive and bigger firms are more likely to do that.

[Table 6 here]

In specification (3) we change our dependent variable to "Quality". This variable is equal to 0 if a firm declares to export output of lower quality, equal to 1 if the firm states that the output quality does not vary between the two markets and equal to 2 if the firm declares to produce a good of higher quality for the export market. We run an ordered probit model using our main explicative variable and our full set of controls. Results for this last specification are in line with the ones previously described.

As previously stated, Fan et al. (2013) use financial dependence at the industry level[35], measured on US data, as another proxy for credit constraint. The rationale to use this variable being that a firm operating in a particular industry needs more external funds because of the inherent characteristics of the production technologies employed in that industry. The ranking of industrial finance dependence tends to be quite similar across countries and, being built on US data, it guarantees that financial market imperfections are not influencing this variable. It is possible to consider this measure also in our analysis.

[Table 7 here]

Results in table 7 show that industrial finance dependence enters with a positive average marginal effect when we cluster standard errors at the industry level while it reports non significant average marginal effects when we cluster standard errors at the province level. This positive sign, in our view, might just be a consequence of the fact that firms operating in industries requiring large financial resources are those more likely to upgrade the quality of

[35] This industry level indicator of finance dependence has been first proposed by Rajan and Zingales (1998).

their products, because of the peculiar characteristics of those industries[36], without any link to the credit access status of the firm. Notice that our variable of interest, average external score, does not change sign and significance in specifications jointly using the two measures. Moreover the magnitude of the average marginal effect is equal to the one obtained in specifications not using the index of industrial financial dependence as a regressor. These results confirm then that our preferred explicativa variable is a valid proxy for credit constraints. In our view, when it is possible to rely on firm level measures of credit constraints those should be preferred to measures obtained at the industry level.

Turning back to our main specification, we now study how our measure of credit contraints impacts on exported output quality upgrading when interacted with firm-size. Our theoretical framework predicts that more productive and bigger firms are more likely to increase the quality of exported output with respect to the one produced for the domestic market. However, firm size is clearly an issue when firms ask for credit from the banking sector, bigger firms might have stronger connections with banking institutions simply because they require financial services more often and in large amounts and therefore might have easier access to credit. In the following table we report results obtained interacting our proxy for credit constraints with four firm-size dummies. We divide firms in four groups: a) firms having less than 50 employess, b) firms having 50 to 99 employess, c) firms having 100 to 249 employees, and d) firms having 250 to 499 employess[37]. Results show that our interaction term reports a negative significant coefficient for firms having less than 50, 50-99 and 100-249 employees. This result is robust to controlling for all regressors previously used.

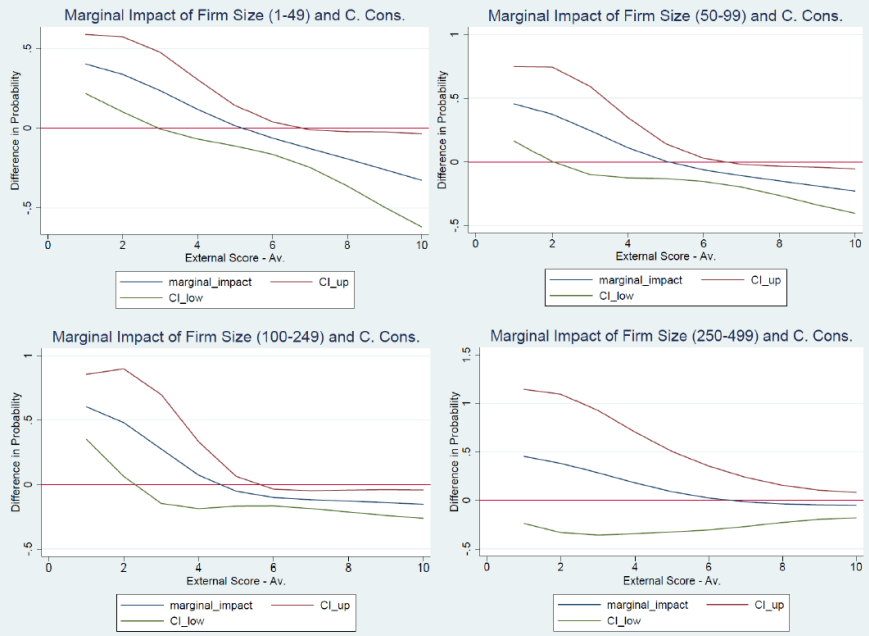
[Table 8 here]

To easily grasp the sense of our results we propose the following graphs reporting the change in the probability of quality upgrading for firms in the different group size. On the X axis we report the external rating of firms and on the Y axis the difference in probability. These marginal impacts have been computed using results from specification 5 in Table 8. It is possible to observe that as the external rate worsens (i.e. increases), firms having less than

[36] For example, firms producing in the Electrical machinery industry, an industry highly dependent on external financing, might need and be able to quality differentiate across markets more often than producers of Tobacco.

[37] The residual category is the group of firms having 500 to 1387 employees.

50, 50 to 99 and 100 to 249 employees are less likely to upgrade exported output quality. The graph for firms having 250 to 499 employees shows that we cannot draw conclusions on the relation between quality upgrading and our interaction term for this group of firms since the confidence interval is above and below the zero bound.



Graph 1.

4.1 Tackling Endogeneity

Results showed above have been discussed supposing that our main explicative variable is exogenous. However, we have to underline that information on how CEBI defines firms' ratings is not at our disposal: it is proprietary information. If this external-rating company gives better (i.e. lower) scores to those firms that are capable to differentiate the quality of exported output with respect to the one of the output sold domestically we face a classical reverse causality problem. Given that we expect quality upgrading firms to obtain better external scores, we suppose that our estimates might be downward biased. Based on this reasoning, if we would be capable to find a proper instrument for our explicative variable

we should find a less negative coefficient when instrumenting. Moreover, even if we are controlling for a good number of factors correlated with our main explicative variable, there might be unobservables, such as entrepreneur's connections with the baking sector that might be negatively correlated with firm's external score[38] and negatively correlated with exported-output quality upgrading[39] thus producing upward biased estimates. We do not have any priors on which of the two biases should dominate. We suppose that our main specification,

$$\Pr(Q_i = 1) = prob(\alpha + \varsigma_{ind} + \beta C_i + \gamma X_i + \chi T_j + \varepsilon_i > 0) \tag{8}$$

is still valid, while the variable proxing for a firm's credit rationing, C_i can be instrumented by controls used in the main specification and by a vector of instrumental variables, Z_j :

$$C_i = \mu + \varsigma_{ind} + \eta Z_j + \gamma X_i + \chi T_j + \iota_i. \tag{9}$$

Luckily we can base our analysis on other researches that have been dealing with endogeneity while working on data-sets and research questions strictly related to ours. Minetti and Zhu (2011) use province level variables[40] proxing for local credit supply as instruments for a firm declaring to be strongly rationed in 2001. We used these variables as instruments for our main explicative variable obtaining not satisfactory results. Secchi et al. (2012) use the lagged value of the firm external score as their main explicative variable in order to explain the impact of credit constraints on firms exporting performance and the price of traded products. The authors control for selection and endogeneity using the framework developed in Semykina and Wooldridge (2010).

In the following analysis we use the average external score obtained by the firm in the period 2002-2006 as our instrument for the average score obtained by the same firm in the period 2008-2010. We use this variable since we think that the external scores, obtained by the firm, four to eight years before the survey are not influenced by the fact that it can

[38] Entrepreneurs that are more connected with the banking sector might be able to obtain lower ratings.

[39] Entrepreneurs well connected with banking institutions might have less incentives to be innovative in order to succed in foreign markets and increase revenues.

[40] See Guiso et al. (2004).

produce an upgraded version of its output for the foreign market in 2010. Moreover we expect our instrument to be related to our dependent variable only through the instrumented one. In table 9, results obtained using our instrumental variable approach are reported.

[Table 9 here]

We show in this table the first stage[41] and the second stage coefficients of our specifications. We notice that, as expected, our instrument is not weak since the correlation with the endogenous variable is always high and significant at the 1%. Results confirm that more constrained firms are less likely to upgrade the quality of exported output, while bigger firms have an advantage in pursuing this strategy. Firms with a high level of cash flow are more likely to upgrade exported output quality. Table 9 does not report average marginal effects, we then have to rely on Table 10 to observe how the magnitude of marginal effects varies when we instrument.

[Table 10 here]

Results in specification (1) show that the omitted variable bias is dominating. In fact, the average marginal effect for the instrumented variable is now greater in magnitude and equal to -0.049, a value that almost doubles the one obtained without instrumenting. In the second specification we report coefficients obtained when running a two stage least squares procedure on the same model proposed in specification (1). We need this specification to obtain a series of interesting tests on our results. First of all, our F test of excluded instruments reports a high F statistic, telling us that excluded instruments are irrelevant. The Cragg-Donald Wald test F-statistic is well above the Stock-Yogo weak-ID critical value and the endogeneity test tells us that results obtained when instrumenting are statistically different than the ones obtained without instrumenting. We are aware that ours might not be the perfect instrument to tackle our endogeneity problem, however it gives results that are quite reassuring in terms of economic reasoning and passing the required statistical tests.

[41] RHS column.

5 Export destination and credit constraints

Starting from the seminal work of Alchian and Allen (1964) many authors[42] have studied the relationship between export destinations and the quality of exported output. These studies proxy quality with the unit value of traded products and confirm that firms sell high quality goods further abroad. Without entering in the debate on why firms sell products of higher quality further abroad, we investigate in this section if there is any link between export destination, credit availability to the firm and exported-output quality upgrading. In fact, firms selling their products further abroad might need to upgrade the quality of their products with a higher probability than the ones selling their goods to closer markets[43].

Firms interviewed in this survey are asked to declare to which markets they are exporting. These markets are identified in terms of macro geographic areas: North-America, Latin-America, Africa, Mediterranean Countries[44], Asia[45], China-India, Oceania, European main markets for Italian exporters[46], European secondary markets[47] and Est-European countries[48]. Given this information, we differentiate our exporters using a dummy equal to 1 for those that are exporting outside the European Area[49] (EU). We study the impact of credit constraints on these firms, interacting this dummy with our main explicative variable: the average external score obtained by the firm during the period 2008-2010. Equation (10) reports the model estimated in table 11.

[42] See Hummels and Skiba (2004) and Martin (2012) among others.

[43] These markets are closer in terms of distance and therefore transportation costs have a higher impact on the price charged to the final consumers. Moreover, these markets are often closer in terms of consumer preferences and therefore require less tailoring to match foreing consumers' tastes.

[44] North Africa and the Middle East.

[45] Including countries in the Arabic peninsula.

[46] Germany, France, UK and Spain.

[47] Switzerland, Sweden, Belgium, the Netherlands.

[48] New EU members, Balcanic Countries and Russia.

[49] We identify as exporters to the EU those firms declaring exports to European main markets, European secondary market and Est-European countries. We refer to EU as a geographical area and not as a political-economic entity in this analysis.

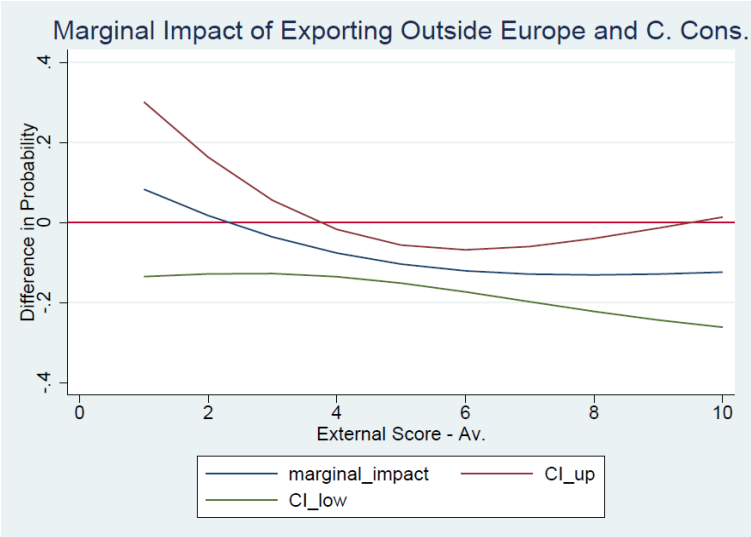
$$\Pr(Q_i = 1) = prob(\alpha + \varsigma_{ind} + \beta C_i + \lambda OutEu_i + \delta OutEu_i * C_i + \gamma X_i + + \chi T_j + \varepsilon_i > 0) \quad (10)$$

[Table 11 here]

This table, reporting estimation coefficients and not average marginal effect, shows an interesting result. Firms hit by credit constraints when deciding on whether to upgrade quality are the ones selling their products outside Europe. This finding, which has not been documented so far in the literature, might be explained in two ways. First, firms exporting inside Europe are less likely to upgrade quality since these markets are more similar in terms of preferences to the domestic one, therefore they are less likely to be credit constrained since they do not need extra funds for this purpose. A second explanation might be related to the Alchian-Allen effect: in order to export their products to non-European markets firms need to upgrade the quality of their output so to increase the monetary unit value of exports[50]. Credit constraints impact on this decision as would impact on a firm's exporting decision[51]: selecting the most productive firms. Specifications reported in Table 11 confirm that more productive and larger firms are the ones more capable to upgrade the quality of exported output in order to be profitable in the foreing markets. Firms producing in provinces that experienced a positive rate of economic growth in terms of value added are less likely to differentiate the quality of exported output. More productive firms, the ones that probably do not need to upgrade the quality of their exported output are, in fact, the ones producing in the most dynamic areas of Italy. In column (7) of this table we can observe that the effect of credit constraints on firms exporting outside Europe does not vary when we run an ordered probit model considering also firms downgrading the quality of their exported output. Since the interpretation of coefficients in probit models including interaction terms is not straightforward[52], we report, in graph 2, the marginal impact of an increase in the average external score, on the X axis, on the probability of product quality upgrading by exporters outside Europe, on the Y axis. The impact of an increase in the external score

[50] To decrease the ratio of transport cost over product price.
[51] See Manova (2008), Minetti and Zhu (2011) and Chaney (2013).
[52] See Norton et al. (2004).

and therefore of a worsening in credit availability has a negative impact on the probability of quality upgrading. This impact is significantly negative for exporters outside EU with an average external score higher than 4 but tends to remain negative and of similar magnitude for higher average external scores.



Graph 2.

In Table 12 and 13 we report results obtained when considering one-by-one various extra-EU destinations. Results are not as uniform as when we use our extra-EU dummy, however the sign for the coefficient of our interaction term is always negative when significant.

[Table 12 here]
[Table 13 here]

We notice that Italian manufacturing firms exporting to Southern and Central Africa are more likely to upgrade the quality of their exported output and negatively impacted by a worsening of their access to credit. Exporters to these new and fast-growing markets are the ones more in need to vary product characteristics such as quality.

6 Conclusion

We investigated on the relationship between the choice to upgrade exported output quality and credit rationing using survey data on a sample of Italian manufacturing SMEs. Ameliorating the quality of exported output is often an activity that requires significant external resources and that is crucial in order to guarantee to a firm constant revenues from foreign markets. Our findings confirm that the more binding credit constraints are the less likely a firm is to increase the quality of its exported output. Results are confirmed by specifications controlling for endogeneity of our explicative varibale and robust to the introduction of a different proxy for credit need used in the literature. Medium-sized firms are the ones more affected by credit constraints when taking the decision to upgrade quality. Moreover, we find that firms exporting outside Europe are the ones whose quality upgrading process is the most affected by a worsening in credit rationing. We believe that our results have important policy implications: better access to credit might help exporting firms in making higher revenues from exporting markets thanks to output quality upgrading.

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7 Tables

Table 1: Strongly Rationed firms in 2010 - Exporters, Probit

	(1) Strong Rationing	(2) Strong Rationing	(3) Strong Rationing	(4) Strong Rationing	(5) Strong Rationing
External Score - Av.	0.074**				0.072***
	(0.035)				(0.026)
Negative Bank Rate		0.071			0.032
		(0.086)			(0.102)
Total Credit Use - Av.			0.181		-0.114
			(0.230)		(0.337)
Short Term Credit Use				0.175	0.085
				(0.198)	(0.331)
Number of Creditors	0.014	0.017	0.017	0.016	0.014
	(0.013)	(0.014)	(0.014)	(0.014)	(0.013)
Perc. Principal Bank credits over total	-0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Perc. Credit Over Assets	0.004***	0.004***	0.004***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Bank Switchers	0.077	0.097	0.088	0.091	0.079
	(0.119)	(0.122)	(0.118)	(0.117)	(0.118)
Firm Size - Av.	-0.029	-0.077	-0.068	-0.064	-0.027
	(0.059)	(0.050)	(0.060)	(0.062)	(0.065)
Labour Productivity - Av.	-0.024	-0.014	-0.017	-0.016	-0.023
	(0.051)	(0.054)	(0.052)	(0.051)	(0.051)
Cash Flow - Av.	-0.327**	-0.414***	-0.390**	-0.386**	-0.320*
	(0.155)	(0.141)	(0.162)	(0.159)	(0.175)
Leverage Ratio - Av.	0.008**	0.008**	0.007*	0.006	0.008**
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Liquidity Ratio - Av.	0.388	-0.075	-0.057	-0.029	0.412
	(0.345)	(0.202)	(0.232)	(0.244)	(0.309)
Capital Intensity - Av.	-0.033	-0.102	-0.094	-0.091	-0.031
	(0.080)	(0.065)	(0.071)	(0.069)	(0.081)
Labour Skill	0.000	0.001	0.001	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Corporation	0.094	0.107	0.109	0.108	0.094
	(0.076)	(0.072)	(0.074)	(0.075)	(0.076)
Business Group	-0.023	-0.000	0.005	-0.002	-0.031
	(0.073)	(0.078)	(0.077)	(0.079)	(0.081)
Center	0.025	0.034	0.045	0.040	0.018
	(0.075)	(0.071)	(0.078)	(0.076)	(0.075)
South	-0.027	0.026	0.052	0.044	-0.041
	(0.125)	(0.140)	(0.140)	(0.134)	(0.132)
Provincial Value Added - Av.	0.371*	0.388	0.468**	0.463**	0.329
	(0.221)	(0.247)	(0.208)	(0.208)	(0.231)
Provincial Value Added Growth, 98-08	-0.842*	-0.718	-0.673	-0.687	-0.887*
	(0.469)	(0.477)	(0.453)	(0.460)	(0.484)
Firm Age	-0.015	-0.016	-0.009	-0.012	-0.020
	(0.041)	(0.043)	(0.042)	(0.042)	(0.042)
N. Branches per 1000 inhab.	-0.370	-0.304	-0.276	-0.281	-0.370
	(0.293)	(0.294)	(0.310)	(0.306)	(0.315)
Observations	148	148	148	148	148
Percent correctly predicted	84.46	84.46	83.78	83.11	83.78
Log pseudolikelihood	-48.94	-50.78	-50.57	-50.38	-48.76
Pseudo R^2	0.395	0.3727	0.3753	0.3776	0.3977

Notes: This table studies the impact of our candidates for credit constraint, regressors (1) to (4), on the probability that a firm declares to be "Strongly Credit Rationed" in 2010. Average Marginal Effects reported. All specifications include industry dummies. Variables indicated with - Av. are averages for the period 2008-2010.
All probit regressions include a constant term and cluster standard errors at the province level. *, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 2: External Score and Firm Characteristics, OLS

	(1) External Score	(2) External Score	(3) External Score	(4) External Score	(5) External Score, 2010
Firm Size	-0.020	-0.372***	-0.061	-0.245***	-0.306***
	(0.079)	(0.096)	(0.077)	(0.085)	(0.084)
Cash Flow	-0.901***			-0.428***	-0.237*
	(0.085)			(0.062)	(0.134)
Labour Productivity		-0.932***		-0.716***	-0.862***
		(0.116)		(0.083)	(0.123)
Liquidity Ratio			-4.578***	-4.174***	-5.317***
			(0.172)	(0.177)	(0.288)
Observations	4138	4138	4138	4138	468
R^2	0.822	0.829	0.855	0.875	0.599

Notes: This table studies the relation between various firm level characteristics and External Score.
Specifications (1) to (4) include firm and year fixed effects while specification (5) considers industry fixed effects.
All regressions include a constant term and robust standard errors, reported in parentheses.
*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 3: Summary statistics for Constrained and Non-Constrained Exporters 2010

Variable	**Mean N.C.**	**Std. Dev. N.C.**	**Mean C.**	**Std. Dev. C.**	**TTest**
Quality Upgrader	0.156	0.364	0.06	0.239	0.0961**
Firm Size	3.925	0.751	3.869	0.810	0.0552
Lab. Productivity	4.236	0.487	3.963	0.54	0.273***
Cash Flow	1.149	0.552	0.968	0.408	0.182***
Leverage Ratio	0.609	0.726	3.903	11.22	-3.294***
Liquidity Ratio	0.28	0.19	0.05	0.161	0.230***
Capital Intensity	4.099	1.131	4.371	1.04	-0.272***
Labor Skill	10.972	16.027	9.667	12.708	1.306
Age	3.38	0.661	3.134	0.851	0.246***
Center	0.138	0.345	0.195	0.397	-0.0573
South	0.093	0.291	0.114	0.319	-0.0212
Firms	500				

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Exported Vs Domestic Quality, Firm Charact. and External Rating, Probit

	(1)	(2)	(3)	(4)	(5)
	High Quality Out	High Quality Out	High Quality Out	High Quality Out	High Quality Out
Firm Size - Av.	0.058***	0.057**	0.056**	0.054**	0.041*
	(0.022)	(0.023)	(0.023)	(0.023)	(0.024)
Labour Productivity - Av.	0.064**	0.064**	0.062**	0.070**	0.064*
	(0.029)	(0.029)	(0.030)	(0.035)	(0.036)
Labour Skill		0.000	0.000	0.000	0.000
		(0.001)	(0.001)	(0.001)	(0.001)
Firm Age			0.009	0.007	0.008
			(0.023)	(0.024)	(0.024)
Cash Flow - Av.				-0.016	-0.033
				(0.028)	(0.030)
Leverage Ratio - Av.				-0.001	-0.000
				(0.001)	(0.000)
Liquidity Ratio - Av.				0.050	-0.152
				(0.096)	(0.144)
Capital Intensity - Av.				-0.009	-0.021
				(0.021)	(0.022)
External Score - Av.					-0.029**
					(0.015)
Observations	429	429	429	429	429
Percent correctly predicted	84.85	84.85	84.95	84.38	84.62
Log pseudolikelihood	-174.50	-174.49	-174.42	-173.91	-172.22
Pseudo R^2	0.0525	0.0526	0.0530	0.0557	0.0648

Notes: This table studies the impact of various firm level characteristics on the probability that a firm declares to produce higher quality for the foreign market. Average Marginal Effects reported. All specifications include industry dummies. Variables indicated with - Av. are averages taken for the period 2008-2010. All probit regressions include a constant term and robust standard errors, reported in parentheses.

*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 5: Exported Vs Domestic Quality, Determinants, Probit

	(1)	(2)	(3)	(4)	(5)
	High Quality Out	High Quality Out	High Quality Out	High Quality Out	High Quality Out
External Score - Av.	-0.023***	-0.029**	-0.029**	-0.028**	-0.028**
	(0.008)	(0.015)	(0.015)	(0.014)	(0.014)
Firm Size - Av.		0.043*	0.042*	0.053**	0.054**
		(0.022)	(0.022)	(0.024)	(0.024)
Labour Productivity - Av.		0.064**	0.064**	0.059*	0.062*
		(0.031)	(0.031)	(0.034)	(0.034)
Cash Flow - Av.		-0.033	-0.032	-0.034	-0.038
		(0.022)	(0.022)	(0.024)	(0.025)
Leverage Ratio - Av.		-0.000	-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.001)	(0.001)
Liquidity Ratio - Av.		-0.147	-0.147	-0.125	-0.131
		(0.140)	(0.139)	(0.135)	(0.139)
Capital Intensity - Av.		-0.020	-0.019	-0.013	-0.015
		(0.020)	(0.020)	(0.022)	(0.022)
Labour Skill			0.000	0.000	0.000
			(0.001)	(0.001)	(0.001)
Innovation					-0.028
					(0.033)
Firm Age				0.001	0.002
				(0.022)	(0.022)
Corporation				-0.015	-0.015
				(0.034)	(0.034)
Business Group				-0.099**	-0.098**
				(0.042)	(0.043)
Consortium				-0.114	-0.105
				(0.101)	(0.103)
Center				-0.026	-0.025
				(0.038)	(0.038)
South				0.008	0.001
				(0.054)	(0.082)
Provincial Value Added Growth, 98-08				-0.651***	-0.661***
				(0.176)	(0.187)
N. Branches per 1000 inhab.				-0.151	-0.131
				(0.129)	(0.131)
Provincial Value Added - Av.					-0.018
					(0.127)
Observations	429	429	429	429	429
Percent correctly predicted	84.15	84.62	84.62	84.85	84.85
Log pseudolikelihood	-175.111	-172.27	-172.27	-164.52	-164.18
Pseudo R^2	0.0492	0.0646	0.0646	0.1067	0.1086

Notes: This table studies the impact of our proxy for credit constraint, "External Score - Av." on the probability that a firm declares to produce higher quality for the foreign market. Average Marginal Effects are reported. All specifications include industry dummies. Variables indicated with - Av. are averages taken for the period 2008-2010.
All probit regressions include a constant term and cluster standard errors at the province level.
*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 6: Exported Vs Domestic Quality, Determinants, Probit, OLS and Ordered Probit

	(1)	(2)	(3)
	High Quality Out - Probit	High Quality Out - OLS	Quality - Ordered Probit
External Score - Av.	-0.028**	-0.024*	-0.026*
	(0.014)	(0.014)	(0.014)
Firm Size - Av.	0.054**	0.053**	0.052***
	(0.024)	(0.025)	(0.020)
Labour Productivity - Av.	0.062*	0.053*	0.068**
	(0.034)	(0.032)	(0.032)
Cash Flow - Av.	-0.038	-0.031	-0.031
	(0.025)	(0.022)	(0.019)
Leverage Ratio - Av.	-0.000	-0.000	-0.000
	(0.001)	(0.000)	(0.001)
Liquidity Ratio - Av.	-0.131	-0.076	-0.178
	(0.139)	(0.131)	(0.128)
Capital Intensity - Av.	-0.015	-0.006	-0.025
	(0.022)	(0.022)	(0.019)
Labour Skill	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)
Innovation	-0.028	-0.028	-0.036
	(0.033)	(0.037)	(0.031)
Firm Age	0.002	-0.003	-0.002
	(0.022)	(0.024)	(0.021)
Corporation	-0.015	-0.011	-0.025
	(0.034)	(0.039)	(0.031)
Business Group	-0.098**	-0.085**	-0.085**
	(0.043)	(0.037)	(0.039)
Consortium	-0.105	-0.078	0.019
	(0.103)	(0.083)	(0.081)
Center	-0.025	-0.027	-0.047
	(0.038)	(0.035)	(0.040)
South	0.001	-0.022	0.037
	(0.082)	(0.088)	(0.083)
Provincial Value Added - Av.	-0.018	-0.035	-0.051
	(0.127)	(0.141)	(0.126)
Provincial Value Added Growth, 98-08	-0.661***	-0.603***	-0.529***
	(0.187)	(0.197)	(0.189)
N. Branches per 1000 inhab.	-0.131	-0.173	0.034
	(0.131)	(0.121)	(0.101)
Observations	429	429	445
Percent correctly predicted	84.85		
Log pseudolikelihood	-164.18		-232.71
Pseudo R^2 or R^2	0.1086	0.085	0.085

Notes: This table studies the impact of our proxy for credit constraint, "External Score - Av.",
On the probability that a firm declares to produce higher quality for the foreign market (1) with Probit and OLS, (2),
and considers also firms for which Qd>Qx using an Ordered Probit model (3). Average marginal effects are reported in (1) and (3)
All specifications include industry dummies. Variables indicated with - Av. are averages taken for the period 2008-2010.
All specifications include a constant term and cluster standard errors at the province level.
*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 7: Exported Vs Domestic Quality, Role of Industrial Financial Dependence

	(1)	(2)	(3)	(4)
	High Quality Out	High Quality Out	High Quality Out	High Quality Out
External Score - Av.		-0.029**		-0.029**
		(0.014)		(0.011)
Industrial Financial Dependence	0.099	0.101	0.099***	0.101***
	(0.074)	(0.073)	(0.037)	(0.036)
Firm Size - Av.	0.066***	0.056***	0.066***	0.056**
	(0.021)	(0.021)	(0.022)	(0.025)
Labour Productivity - Av.	0.052	0.051	0.052	0.051
	(0.032)	(0.034)	(0.035)	(0.037)
Cash Flow - Av.	-0.014	-0.040	-0.014	-0.040
	(0.029)	(0.032)	(0.035)	(0.046)
Leverage Ratio - Av.	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.000)	(0.003)	(0.000)
Liquidity Ratio - Av.	0.069	-0.140	0.069	-0.140
	(0.079)	(0.120)	(0.110)	(0.155)
Capital Intensity - Av.	0.010	-0.004	0.010	-0.004
	(0.023)	(0.022)	(0.019)	(0.025)
Labour Skill	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Firm Age	-0.005	-0.006	-0.005	-0.006
	(0.023)	(0.023)	(0.018)	(0.018)
Corporation	-0.049	-0.045	-0.049	-0.045
	(0.032)	(0.032)	(0.033)	(0.036)
Business Group	-0.099**	-0.093*	-0.099***	-0.093**
	(0.048)	(0.048)	(0.038)	(0.039)
Consortium	-0.143	-0.129	-0.143	-0.129
	(0.109)	(0.108)	(0.090)	(0.090)
Center	-0.008	-0.006	-0.008	-0.006
	(0.041)	(0.040)	(0.048)	(0.048)
South	0.026	0.036	0.026	0.036
	(0.085)	(0.087)	(0.101)	(0.099)
Provincial Value Added - Av.	-0.065	-0.043	-0.065	-0.043
	(0.139)	(0.145)	(0.135)	(0.136)
Provincial Value Added Growth, 98-08	-0.654***	-0.678***	-0.654	-0.678*
	(0.212)	(0.211)	(0.400)	(0.398)
N. Branches per 1000 inhab.	-0.046	-0.066	-0.046	-0.066
	(0.145)	(0.149)	(0.170)	(0.175)
Observations	416	416	416	416
Percent correctly predicted	84.62	85.34	84.62	85.34
Log pseudolikelihood	-161.75	-160.12	-161.75	–160.12
Pseudo R^2	0.114	0.09	0.08	0.09

Notes: This table studies the impact of our proxy for credit constraint, "External Score - Av." on our main dependent variable, "High Quality Out". Average Marginal Effects are reported. All specifications include industry dummies ("ateco classi") in this case.

Variables indicated with - Av. are averages for the period 2008-2010.

All probit regressions include a constant term and cluster standard errors at the province level (1)-(2) or at the industry level (3) - (4).

*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 8: Exported Vs Domestic Quality and Firm Size, Probit, Coefficients

	(1)	(2)	(3)	(4)	(5)
	High Quality Out	High Quality Out	High Quality Out	High Quality Out	High Quality Out
External Rate - Av.	0.307*	0.273*	0.276*	0.337*	0.324**
	(0.161)	(0.148)	(0.146)	(0.176)	(0.164)
Dum-1-49	2.078**	2.051**	2.062**	2.564**	2.505**
	(0.986)	(0.989)	(0.982)	(1.170)	(1.129)
Dum-1-49 X External Rate - Av.	-0.436***	-0.416**	-0.419**	-0.496**	-0.483**
	(0.168)	(0.165)	(0.170)	(0.198)	(0.191)
Dum-50	2.147**	1.877*	1.881*	2.361*	2.316**
	(1.028)	(1.029)	(1.019)	(1.231)	(1.177)
Dum-50 X External Rate - Av.	-0.422**	-0.394**	-0.394**	-0.468**	-0.457**
	(0.179)	(0.172)	(0.170)	(0.207)	(0.197)
Dum-100	2.748**	2.348***	2.363**	2.940**	2.886**
	(1.107)	(1.119)	(1.112)	(1.252)	(1.211)
Dum-100 X External Rate - Av.	-0.577**	-0.550***	-0.552**	-0.652***	-0.645***
	(0.202)	(0.197)	(0.196)	(0.212)	(0.209)
Dum-250	0.943	1.112	1.110	1.755	1.664
	(1.462)	(1.726)	(1.733)	(1.615)	(1.572)
Dum-250 X External Rate - Av.	-0.131	-0.256	-0.255	-0.274	-0.250
	(0.286)	(0.331)	(0.332)	(0.303)	(0.301)
Firm Size - Av.		0.235	0.229	0.261	0.272*
		(0.151)	(0.152)	(0.161)	(0.159)
Labour Productivity - Av.		0.318**	0.312**	0.312*	0.332*
		(0.148)	(0.152)	(0.177)	(0.178)
Cash Flow - Av.		-0.130	-0.127	-0.153	-0.179*
		(0.092)	(0.092)	(0.102)	(0.100)
Leverage Ratio - Av.		-0.000	-0.000	0.001	0.001
		(0.002)	(0.002)	(0.003)	(0.003)
Liquidity Ratio - Av.		-0.515	-0.509	-0.532	-0.564
		(0.632)	(0.628)	(0.670)	(0.665)
Capital Intensity - Av.		-0.065	-0.063	-0.052	-0.064
		(0.086)	(0.087)	(0.097)	(0.098)
Labor Skill			0.001	0.003	0.003
			(0.004)	(0.004)	(0.004)
Innovation					-0.181
					(0.175)
Firm Age				0.037	0.045
				(0.108)	(0.108)
Corporation				-0.049	-0.055
				(0.150)	(0.151)
Business Group				-0.516**	-0.518**
				(0.207)	(0.210)
Consortium				-0.490	-0.436
				(0.497)	(0.514)
Center				-0.065	-0.048
				(0.204)	(0.196)
South				0.029	0.086
				(0.430)	(0.301)
Provincial Value Added - Av.				-0.103	
				(0.654)	
Provincial Value Added Growth				-3.439***	-3.339***
				(1.122)	(1.003)
N. Bank Branches per 1000 inhab.				-0.773	-0.724
				(0.712)	(0.693)
Provincial Value Added - Av.				-0.103	
				(0.654)	
Observations	429	429	429	429	429
Percent Correctly Predicted	84.09	84.56	84.56	84.56	84.56
Log pseudolikelihood	-166.38	-164.52	-164.49	-156.07	-155.53
Pseudo R^2	0.073	0.083	0.083	0.130	0.133

Notes: This table studies the impact of Firm Size interacted with our proxy for credit constraint, "External Rate - Av." on the probability that a firm declares to produce higher quality for the foreign market. All specifications include industry dummies. Variables indicated with - Av. are averages for the period 2008-2010. All probit regressions include a constant term and cluster standard errors at the province level. All probit regressions include a constant term and cluster standard errors at the province level. Variables indicated with - Av. are averages for the period 2008-2010.

*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 9: Exported Vs Domestic Quality, Determinants, IV, Coefficients

	(1)		(2)		(3)	
	High Quality Out		High Quality Out		High Quality Out	
	High Quality Out	External Score - Av. F.S.	High Quality Out	External Score - Av. F.S.	High Quality Out	External Score - Av. F.S.
External Score - Av.	-0.223**		-0.235**		-0.237**	
	(0.090)		(0.096)		(0.098)	
Firm Size - Av.	0.151	-0.219***	0.208*	-0.235***	0.212*	-0.236***
	(0.107)	(0.051)	(0.120)	(0.052)	(0.120)	(0.052)
Labour Productivity - Av.	0.269*	-0.324***	0.266	-0.316***	0.280	-0.322***
	(0.149)	(0.070)	(0.168)	(0.074)	(0.171)	(0.074)
Cash Flow - Av.	-0.205**	-0.237**	-0.226*	-0.248**	-0.247**	-0.238**
	(0.100)	(0.093)	(0.119)	(0.098)	(0.125)	(0.100)
Leverage Ratio - Av.	-0.001	0.002***	0.000	0.002***	-0.000	0.002**
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Liquidity Ratio - Av.	-1.340*	-2.022***	-1.335*	-2.107***	-1.368	-2.107***
	(0.764)	(0.262)	(0.807)	(0.278)	(0.834)	(0.284)
Capital Intensity - Av.	-0.132	-0.021	-0.113	-0.040	-0.124	-0.035
	(0.094)	(0.048)	(0.106)	(0.049)	(0.107)	(0.049)
Labour Skill	0.000	0.001	0.001	0.001	0.002	0.001
	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)
Firm Age			-0.003	0.050	0.003	0.047
			(0.111)	(0.046)	(0.108)	(0.045)
Corporation			-0.040	0.010	-0.042	0.011
			(0.158)	(0.078)	(0.158)	(0.077)
Business Group			-0.446**	0.135*	-0.446**	0.133
			(0.198)	(0.080)	(0.202)	(0.082)
Consortium			-0.484	0.023	-0.445	0.003
			(0.492)	(0.204)	(0.497)	(0.204)
Center			-0.108	0.076	-0.104	0.077
			(0.177)	(0.108)	(0.179)	(0.111)
South			0.057	0.044	0.026	0.077
			(0.250)	(0.138)	(0.384)	(0.206)
Provincial Value Added Growth, 98-08			-3.177***	-0.360	-3.229***	-0.302
			(0.818)	(0.479)	(0.860)	(0.516)
N. Branches per 1000 inhab.			-0.728	-0.313	-0.640	-0.360
			(0.599)	(0.302)	(0.613)	(0.327)
Innovation					-0.110	0.078
					(0.155)	(0.074)
Provincial Value Added - Av.					-0.083	0.075
					(0.599)	(0.346)
External Rate - Av. 02-06		0.757***		0.751***		0.751***
		(0.031)		(0.033)		(0.033)
Observations	429		429		429	
Percent correctly predicted	84.27		84.51		84.74	
Log pseudolikelihood	-620.09		-609.74		-608.80	
Prob > Chi2	0.064		0.064		0.060	

Notes: This table studies the impact of our proxy for credit constraint, "External Score - Av." on the probability that a firm declares to produce higher quality for the foreign market using an IV strategy.
Our IV for "External Score - Av." is the Average External Score in 2002-2006. All specifications include industry dummies.
Variables indicated with - Av. are averages taken for the period 2008-2010. All probit regressions include a constant term and cluster standard errors at the province level.
*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 10: Exported Vs Domestic Quality, Determinants, IV

	(1)	(2)
	High Quality Out, 2nd Stage	High Quality Out, 2SLS, 2nd Stage
External Score - Av.	-0.049**	-0.042**
	(0.021)	(0.019)
Firm Size - Av.	0.044*	0.036
	(0.024)	(0.022)
Labour Productivity - Av.	0.058	0.042
	(0.035)	(0.028)
Cash Flow - Av.	-0.051*	-0.044**
	(0.027)	(0.020)
Leverage Ratio - Av.	-0.000	0.000
	(0.000)	(0.000)
Liquidity Ratio - Av.	-0.284	-0.223
	(0.175)	(0.152)
Capital Intensity - Av.	-0.026	-0.017
	(0.022)	(0.019)
Labour Skill	0.000	0.000
	(0.001)	(0.001)
Innovatio (d)	-0.023	-0.024
	(0.032)	(0.032)
Firm Age	0.001	-0.002
	(0.023)	(0.021)
Corporation (d)	-0.009	-0.002
	(0.033)	(0.033)
Business Group (d)	-0.081**	-0.065**
	(0.032)	(0.031)
Consortium (d)	-0.071	-0.066
	(0.058)	(0.068)
Center (d)	-0.021	-0.019
	(0.034)	(0.031)
South (d)	0.005	-0.029
	(0.082)	(0.071)
Provincial Value Added - Av.	-0.017	-0.048
	(0.124)	(0.115)
Provincial Value Added Growth, 98-08	-0.670***	-0.560***
	(0.179)	(0.165)
N. Branches per 1000 inhab.	-0.133	-0.143
	(0.126)	(0.099)
Observations	429	429
Percent correctly predicted	84.74	
Log pseudolikelihood	-608.80	
Prob > Chi2	0.06	
F Test of excluded instruments		466.13
Cragg-Donald Wald, F statistic		600.74
Stock-Yogo weak ID test critical value, 10 percent		16.38
Anderson-Rubin Wald, F statistic		600.74
Endogeneity Test, Prob > Chi2		0.08

Notes: This table studies the impact of our proxy for credit constraint, "External Score - Av."
On the probability that a firm declares to produce higher quality for the foreign market using an IV strategy.
Our IV for "External Score - Av." is the Average External Score in 2002-2006.
Both specifications include industry dummies. Average Marginal Effects are reported
Variables indicated with - Av. are averages taken for the period 2008-2010.
Both regressions include a constant term and cluster standard errors at the province level.
*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 11: Exported Vs Domestic Quality and Exporting Outside Europe, Determinants, Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	High Quality Out	High Quality Out	High Quality Out	High Quality Out	High Quality Out	High Quality Out - OLS	Quality - Ordered Probit
External Score - Av.	-0.032	-0.035	-0.033	-0.031	-0.043	-0.009	-0.036
	(0.046)	(0.067)	(0.066)	(0.065)	(0.069)	(0.015)	(0.068)
Out Europe	0.496	0.521	0.529	0.412	0.503	0.055	0.593
	(0.414)	(0.409)	(0.409)	(0.445)	(0.457)	(0.108)	(0.4 22)
Out Europe X External Score - Av.	-0.226**	-0.231**	-0.234***	-0.201**	-0.219**	-0.028	-0.222**
	(0.094)	(0.090)	(0.090)	(0.096)	(0.098)	(0.0199)	(0.090)
Firm Size - Av.		0.205*	0.200*	0.255**	0.252**	0.055**	0.235**
		(0.107)	(0.107)	(0.116)	(0.118)	(0.025)	(0.098)
Labour Productivity - Av.		0.303**	0.298**	0.325**	0.297*	0.056*	0.328**
		(0.146)	(0.148)	(0.164)	(0.170)	(0.033)	(0.160)
Cash Flow - Av.		-0.150	-0.147	-0.123	-0.177	-0.032	-0.168*
		(0.099)	(0.099)	(0.111)	(0.111)	(0.021)	(0.088)
Leverage Ratio - Av.		-0.003	-0.003	-0.002	-0.002	-0.000	-0.004
		(0.004)	(0.004)	(0.004)	(0.004)	(0.000)	(0.014)
Liquidity Ratio - Av.		-0.444	-0.429	-0.292	-0.422	-0.047	-0.727
		(0.643)	(0.637)	(0.663)	(0.678)	(0.134)	(0.619)
Capital Intensity - Av.		-0.089	-0.087	-0.081	-0.069	-0.006	-0.131
		(0.095)	(0.096)	(0.105)	(0.108)	(0.023)	(0.097)
Labour Skill			0.002	0.002	0.003	0.001	0.004
			(0.004)	(0.004)	(0.004)	(0.001)	(0.004)
Innovation				-0.109	-0.100	-0.024	-0.167
				(0.152)	(0.155)	(0.037)	(0.147)
Firm Age				0.021	0.022	0.000	-0.000
				(0.109)	(0.109)	(0.023)	(0.108)
Corporation				-0.049	-0.028	-0.005	-0.081
				(0.143)	(0.150)	(0.037)	(0.142)
Business Group				-0.414**	-0.414**	-0.077**	-0.352*
				(0.210)	(0.203)	(0.037)	(0.187)
Consortium				-0.580	-0.497	-0.081	0.119
				(0.520)	(0.501)	(0.084)	(0.391)
Center				-0.159	-0.032	-0.016	-0.136
				(0.206)	(0.202)	(0.037)	(0.210)
South				0.129	0.115	-0.007	0.252
				(0.203)	(0.400)	(0.089)	(0.399)
Provincial Value Added - Av.					0.153	-0.011	-0.076
					(0.599)	(0.138)	(0.576)
Provincial Value Added Growth, 98-08					-2.966***	-0.559***	-2.415***
					(0.880)	(0.192)	(0.866)
N. Branches per 1000 inhab.					-0.669	-0.170	0.121
					(0.625)	(0.121)	(0.485)
Observations	429	429	429	429	429	429	445
Percent correctly predicted	83.92	84.38	84.62	84.62	84.15		
Log pseudolikelihood	-169.48	-166.73	-166.64	-163.46	-159.81		-228.04
Pseudo R^2 or R^2	0.079	0.094	0.095	0.112	0.132	0.097	0.099

Notes: This table studies the impact of the proxy for credit constraint, "External Score - Av." interacted with "Out Europe" on the probability that a firm declares to produce higher quality for the foreign market.
All specifications include industry dummies. Variables indicated with - Av. are averages for the period 2008-2010.
(6) reports coefficients obtained from the linear probability model and (7) reports results obtained running an ordered probit model, also considering firms for which Qd>Qx.
All regressions include a constant term and cluster standard errors at the province level. *, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 12: Exported Vs Domestic Quality, Destinations, Coefficients

	(1) High Quality Out	(2) High Quality Out	(3) High Quality Out
External Score - Av.	-0.094	-0.095	-0.122**
	(0.060)	(0.065)	(0.060)
North America	0.554		
	(0.454)		
North America X External Score - Av.	-0.139		
	(0.100)		
Latin America		0.450	
		(0.403)	
Latin America X External Score - Av.		-0.189**	
		(0.0877)	
Asia			0.223
			(0.451)
Asia X External Score - Av.			-0.397
			(0.0974)
Firm Size - Av.	0.254**	0.264**	0.254**
	(0.118)	(0.119)	(0.118)
Labour Productivity - Av.	0.294*	0.295*	0.298*
	(0.161)	(0.166)	(0.163)
Cash Flow - Av.	-0.190*	-0.169	-0.187*
	(0.107)	(0.113)	(0.112)
Leverage Ratio - Av.	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.002)
Liquidity Ratio - Av.	-0.572	-0.556	-0.626
	(0.633)	(0.672)	(0.650)
Capital Intensity - Av.	-0.068	-0.070	-0.076
	(0.101)	(0.102)	(0.104)
Innovation	-0.130	-0.113	-0.141
	(0.153)	(0.149)	(0.161)
Labour Skill	0.002	0.003	0.002
	(0.004)	(0.004)	(0.004)
Firm Age	0.013	0.001	0.013
	(0.102)	(0.105)	(0.103)
Corporation	-0.074	-0.049	-0.089
	(0.162)	(0.156)	(0.170)
Business Group	-0.453**	-0.476**	-0.458**
	(0.197)	(0.198)	(0.197)
Consortium	-0.490	-0.541	-0.506
	(0.488)	(0.487)	(0.481)
Center	-0.081	-0.087	-0.109
	(0.186)	(0.199)	(0.183)
South	0.027	-0.018	0.023
	(0.395)	(0.395)	(0.395)
Provincial Value Added - Av.	-0.015	-0.088	-0.077
	(0.609)	(0.625)	(0.609)
Provincial Value Added Growth, 98-08	-3.137***	-3.124***	-3.192***
	(0.873)	(0.898)	(0.857)
N. Branches per 1000 inhab.	-0.626	-0.640	-0.616
	(0.625)	(0.636)	(0.627)
Observations	429	429	429
Percent correctly predicted	84.15	84.38	84.62
Log pseudolikelihood	-163.32	-162.13	-164.04
Pseudo R^2	0.113	0.119	0.109

Notes: This table studies the impact of the proxy for credit constraint, "External Score - Av." interacted with our destination dummies on the probability that a firm declares to produce higher quality for the foreign market.

All specifications include industry dummies. Variables indicated with - Av. are averages for the period 2008-2010.

All regressions include a constant term and cluster standard errors at the province level.

*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.

Table 13: Exported Vs Domestic Quality, Destinations, Coefficients

	(1)	(2)	(3)
	High Quality Out	High Quality Out	High Quality Out
External Score - Av.	-0.110	-0.139**	-0.099
	(0.067)	(0.062)	(0.063)
China-India	0.202		
	(0.538)		
China-India X External Score - Av.	-0.098		
	(0.116)		
Oceania		-0.105	
		(0.669)	
Oceania X External Score - Av.		0.027	
		(0.163)	
Africa			0.778*
			(0.468)
Africa X External Score - Av.			-0.248**
			(0.108)
Firm Size - Av.	0.250**	0.257**	0.258**
	(0.118)	(0.119)	(0.120)
Labour Productivity - Av.	0.307*	0.294*	0.309*
	(0.163)	(0.166)	(0.168)
Cash Flow - Av.	-0.186	-0.178	-0.192*
	(0.116)	(0.115)	(0.109)
Leverage Ratio - Av.	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.003)
Liquidity Ratio - Av.	-0.601	-0.616	-0.575
	(0.677)	(0.667)	(0.658)
Capital Intensity - Av.	-0.080	-0.069	-0.082
	(0.108)	(0.105)	(0.105)
Innovation	-0.118	-0.136	-0.131
	(0.159)	(0.154)	(0.159)
Labour Skill	0.002	0.002	0.003
	(0.004)	(0.004)	(0.004)
Firm Age	0.013	0.008	0.013
	(0.105)	(0.103)	(0.104)
Corporation	-0.057	-0.072	-0.086
	(0.156)	(0.162)	(0.158)
Business Group	-0.433**	-0.469**	-0.456**
	(0.191)	(0.193)	(0.201)
Consortium	-0.493	-0.498	-0.509
	(0.496)	(0.487)	(0.491)
Center	-0.101	-0.123	-0.105
	(0.185)	(0.185)	(0.178)
South	0.025	0.001	0.031
	(0.398)	(0.395)	(0.382)
Provincial Value Added - Av.	-0.009	-0.088	-0.072
	(0.617)	(0.605)	(0.588)
Provincial Value Added Growth, 98-08	-3.118***	-3.139***	-3.200***
	(0.897)	(0.898)	(0.863)
N. Branches per 1000 inhab.	-0.631	-0.633	-0.575
	(0.621)	(0.634)	(0.607)
Observations	429	429	429
Percent correctly predicted	84.62	84.85	84.62
Log pseudolikelihood	-163.39	-164.16	-162.74
Pseudo R^2	0.112	0.108	0.116

Notes: This table studies the impact of the proxy for credit constraint, "External Score - Av." interacted with our destination dummies on the probability that a firm declares to produce higher quality for the foreign market.

All specifications include industry dummies. Variables indicated with - Av. are averages for the period 2008-2010.

All regressions include a constant term and cluster standard errors at the province level.

*, ** and *** indicate significance at the 1%, 5% and 10% level respectively.