

Damijan, Jože P.; Kostevc, Črt

**Working Paper**

## Firms' Pattern of Trade and Access to Finance

LICOS Discussion Paper, No. 278

**Provided in Cooperation with:**

LICOS Centre for Institutions and Economic Performance, KU Leuven

*Suggested Citation:* Damijan, Jože P.; Kostevc, Črt (2011) : Firms' Pattern of Trade and Access to Finance, LICOS Discussion Paper, No. 278, Katholieke Universiteit Leuven, LICOS Centre for Institutions and Economic Performance, Leuven

This Version is available at:

<https://hdl.handle.net/10419/74947>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



LICOS Centre for Institutions and Economic Performance

Centre of Excellence

## LICOS Discussion Paper Series

Discussion Paper 278/2011

### **Firms' Pattern of Trade and Access to Finance**

*Jože P. Damijan and Črt Kostevc*



**Katholieke Universiteit Leuven**

LICOS Centre for Institutions and Economic  
Performance  
Waaistraat 6 – mailbox 3511  
3000 Leuven

BELGIUM

TEL: +32-(0)16 32 65 98

FAX: +32-(0)16 32 65 99

<http://www.econ.kuleuven.be/licos>

# Firms' pattern of trade and access to finance<sup>1</sup>

Jože P. Damijan<sup>2</sup>, Črt Kostevc<sup>3</sup>

## Abstract

This paper summarizes recent advances in the empirical research on firms' learning from trade participation and the role of finance in both starting to trade, surviving in export markets as well as expanding along the intensive and extensive trade margins. It highlights the increased importance of imports, which impacts at firms' performance primarily through relaxed technological constraints by increasing firms' scope of inputs and by lowering their input price index. In addition, imports are shown to boost firms' innovation and introduction of new products, which facilitates firms' decisions to start exporting. Another important aspect that has been highlighted is the essential role of finance in furthering firms' survival and expansion in export markets.

**Keywords:** Exports, learning-by-exports, export expansion, financial constraints, credit crunch

**JEL Classification:** D24 , F12, F14

---

<sup>1</sup> A version of this paper will be published in autumn 2011 by Edward Elgar in "*Post-Crisis Growth and Integration in Europe - Catching-Up Strategies after the Crisis*" (edited by Nowotny, E., P. Mooslechner and D. Ritzberger-Grünwald)

<sup>2</sup> University of Ljubljana; Institute for Economic Research, Ljubljana; LICOS, KU Leuven, Belgium. address: Faculty of Economics, University of Ljubljana, Kardeljeva ploscad 17, 1000 Ljubljana, Slovenia, e-mail: [joze.damijan@ef.uni-lj.si](mailto:joze.damijan@ef.uni-lj.si)

<sup>3</sup> University of Ljubljana; address: Faculty of Economics, University of Ljubljana, Kardeljeva ploscad 17, 1000 Ljubljana, Slovenia, e-mail: [crt.kostevc@ef.uni-lj.si](mailto:crt.kostevc@ef.uni-lj.si),

## 1. Introduction

---

Vast empirical research conducted since the mid-1990s on the issue of international trade has documented significant differences between exporters and firms serving domestic markets only. At the same time, both empirical and theoretical work on trade has been quite ineffective in establishing a convincing mechanism for learning-by-trading. In other words, evidence is still limited on how firms' foreign trade participation feeds back into their performance. One of the primary reasons is that much of the literature has focused solely on exports. Here, the existing theoretical models with heterogeneous firms and randomly assigned productivities in the tradition of Melitz (2003) fall short of explaining why some firms are initially 'better', enabling them to start exporting. Studies dealing with the impact of imports on firm performance are rather scarce, but importers have been shown to have a larger productivity premium than exporters (Altomonte et al., 2008). The notion of imports has traditionally been a source of increased competition in the local markets, impacting firms' productivity through increased competitive pressures. Only recently have studies started to focus on other aspects of imports as a source of corporate productivity growth, such as lower input prices and larger input varieties. Amiti and Konings (2007) document the effects of import liberalization on the productivity of Indonesian firms, which imply that access to cheaper intermediates might have a much larger impact on firm productivity gains than that of increased import competition. Goldberg et al. (2010) demonstrate the impact of trade liberalization in India on manufacturing productivity growth through a broader variety of intermediate inputs. These findings suggest that input tariff liberalization may have relaxed the technological constraints for local firms, and thus enhanced their performance, by giving them access to new imported inputs and by lowering the input price index.

In addition, Goldberg et al. (2010) document that larger input varieties have also impacted firms' innovation in terms of new products they launched. This echoes findings of some previous studies documenting a sequencing of firm trade participation. Based on

Spanish micro data, Damijan and Kostevc (2009) demonstrate that sequencing goes from imports through innovation to export decision.

Another issue that has recently surfaced is the role of finance for exporting firms. Firms' own cash flow and their access to bank finance and to internal credit markets has been found to be a trigger factor in their decision to start exporting, and a crucial factor in enabling them to survive in export markets and expand along the intensive and extensive margins of trade. Access to external finance is in particular important for small firms and during financial crises. Exporters are likely to be affected more adversely by financial turmoil than firms serving only local markets, given higher working capital requirements and longer time lags in payments. Recent empirical evidence shows that small exporters are hit harder when bank finance dries up. The striking evidence of recent empirical literature highlights the stabilizing effects of foreign direct investments as inter-firm finance does not appear to dry up at times of crisis. Hence, exports of firms that are part of the networks of multi-national firms are more stable during financial crises.

This paper summarizes recent advances in the empirical research on firms learning from trade participation and the role of finance in both starting to trade, surviving in export markets as well as expanding along intensive and extensive trade margins. Section 2 below discusses new findings about how firms learn from trade. Section 3 discusses factors hampering expansion in export markets, while section 4 documents the role of financial constraints for participation in trade. Section 5 documents the role of finance during the financial turmoil and identifies factors that help firms withstand crises more successfully. Section 6 concludes.

## **2. How do firms learn from trade?**

---

Recent empirical research starting with Bernard and Jensen (1995, 1999) and Roberts and Tybout (1997) documented substantial differences between exporting and non-exporting firms. Exporting firms are shown to outperform non-exporters in terms of productivity, capital intensity, wages, and size. A wide body of cross-country evidence (see Greenaway and Kneller, 2006, and Wagner, 2007, for an overview of empirical studies)

documents a quite substantial productivity premium of exporting firms, ranging between 20 and 30 per cent when measured by OLS and between 7 and 10 per cent when taking into account firm fixed effects (see Table X.1).

**Table 1: Average productivity premia for exporters (value added/employee, in %)**

	<b>Pooled OLS</b>	<b>Fixed effects</b>
Average 14 countries (ISGEP, 2008)	22.4	7.0
US (BJRS, 2007)	29.7	10.5
France (Mayer & Ottaviano, 2007)	31.0	

Note: Pooled OLS – estimates obtained by using the ordinary least squares method and pooled over all years. Fixed effects – estimates obtained by accounting for firm fixed effects.

Source: ISGEP (2008), Bernard et al. (2007), Mayer and Ottaviano (2007).

Two competing hypotheses, that are not mutually exclusive, have been examined by economists all over the world in order to explain this productivity premium of exporting firms. The first hypothesis stresses *self-selection* of firms into exporting status, i.e. only more productive firms can afford to pay the extra export cost. The second hypothesis actually points towards reverse causality: the *learning-by-exporting* hypothesis claims that exporters become ‘better’ once they have started to export, as more intense competition and knowledge flows from foreign buyers have improved their post-entry performance. Broad empirical evidence, however, unanimously points towards self-selection of initially better performing firms into exporting and not vice versa. Table X.2 gives an overview of pre-entry and post-entry performance of new exporters for a set of European countries, China and the US. Pre-entry premia of future exporters over non-exporters three years before starting to export is found to be around 10 per cent on average (and slightly less in the US). Post-entry growth premia of new exporters three year after starting to export, however, has been found to be very meagre – on average only around 2.5 per cent and insignificant (zero per cent in the US).

*Table 2: Pre- and post-entry growth premia (value added/employee, in %)*

	<b>Pre-entry premia</b>	<b>Post-entry growth difference</b>
	<i>t-3</i>	<i>t+3</i>
Austria	0.1	0.1
Belgium	6.1	19.3
Chile	12.1	1.9
China	20.8	-4.5
Colombia	15.9	-0.1
France	7.5	-0.2
W. Germany	4.7	0.0
E. Germany	5.6	-2.2
Italy	17.4	4.3
Ireland	16.1	-1.4
Slovenia	-1.2	6.2
Spain	24.1	5.2
Sweden	-1.2	2.1
UK	10.9	3.9
<b>Average</b>	<b>9.9</b>	<b>2.5</b>
US	8.7	0.4

Source: ISGEP (2008) for 14 countries, Bernard and Jensen (1997) for US.

The observed large pre-entry productivity premia of new exporters compared to non-exporters imply that the decision to start exporting has to be determined by factors that affect the productivity of firms before they start exporting. While empirical studies document substantial heterogeneity in firm productivity within and between industries (Bartelsman and Doms, 2000) the theory on firm dynamics still does not provide a convincing explanation of what generates this firm heterogeneity and divergent growth dynamics of firms. Some explanation for this can be found in endogenous growth theory, which associates productivity to decisions such as to invest into R&D and innovation. Romer (1990) stresses that innovative activity is central to corporate technological progress and productivity growth. Ericson and Pakes (1995) analyse the behaviour of

firms exploring profit opportunities in the world of uncertainty arising from investment in R&D-type processes and derive firm optimal policies, including entry and exit. Constantini and Melitz (2008) present a model that shows that anticipation of trade liberalization may cause a firm to bring forward the decision to innovate in order to 'dress up' for future participation in the export market. Similarly, Atkeson and Burstein (2008) model the interdependence between the choices of exporting and investing in R&D on the one hand and firm productivity on the other hand.

Recent empirical studies find some support for the link between innovation, productivity premia and export decisions. Exploring micro data, Aw et al. (2008) and Lileeva and Trefler (2007) show that exporting is correlated with firm investment in R&D and innovation. Aw et al. (2009) find that both R&D and exporting have a positive direct effect on future productivity, which reinforces the selection effect. They find that the productivity effect of R&D is larger, but that fewer firms opt to innovate than to export, given higher costs. Cassiman and Golovko (2007) find that the productivity premia of exporting firms disappear when controlled for product innovation. In a related paper on a sample of Spanish firms, Cassiman and Martinez-Ros (2007), find that engaging in product innovation significantly increases the probability to start exporting. Similarly, Becker and Egger (2007) find after controlling for the endogeneity of innovation that product innovation at German firms plays an important role in increasing the propensity to export, while they find no such evidence for process innovation. Finally, Damijan et al. (2010) find for a sample of Slovenian firms that both product and process innovations increase the likelihood of becoming an exporter. At the same time they find evidence that exporting increases the probability of becoming a process but not a product innovator, and that exporting leads to productivity improvements. These findings suggest that participation in trade may positively affect firm efficiency by stimulating process innovations, which can also make a case in favour of learning-by-exporting hypothesis.

On the other hand, importing has attracted much less attention in empirical studies as a source of important knowledge spillovers. Recently, studies by Altomonte et al. (2008) and Damijan and Konings (2011) using micro data for Hungary and Slovenia demonstrate that the impact of imports on firm performance is several times more important than the impact of a firm's engagement in exporting. Amiti and Konings (2007)



study the channels through which imports can boost firm productivity. By using the Indonesian micro data, they find that benefits arising from lower tariffs on intermediate inputs might have an impact that is ten times larger than that of increased import competition on firm productivity gains. This finding has been strengthened recently by Goldberg et al. (2010) who study the impact of trade liberalization in India on productivity growth of manufacturing firms. They find that trade liberalization facilitates imports of new varieties of intermediate inputs, which lowers the import price index for intermediate goods on average by an additional 4.7 per cent per year. In addition, they show lower input tariffs to account on average for 31 percent of the new products introduced by domestic firms. These findings suggest that input tariff liberalization may have relaxed technological constraints for local firms through firms' access to new imported inputs and hence boosted their better performance after trade liberalization. Similarly, Halpern et al. (2009) show imported inputs in the period 1992-2003 to have increased Hungarian firm productivity on average by 11 per cent, with new varieties of imported intermediates accounting for 60 per cent of this effect.

This evidence suggests that firms' trade participation may be sequenced in a particular way. A firm starts out to venture abroad by importing capital goods or intermediates that are either not available at home or less expensive abroad. Exporting starts later, after a firm has 'dressed up' sufficiently in terms of productivity to bear the fixed entry cost of foreign markets. In the meantime, investment in R&D and innovation helps firms to start producing new varieties suitable for sale in foreign markets. A recent study by Damijan and Kostevc (2010) using Spanish micro data finds a clear sequencing pattern in how firms learn from trade, proceeding from (1) engagement in imports, through (2) the decision to start product or process innovation, to (3) the decision to start exporting. Therefore, there is a complexity of channels through which firms benefit from trade, whereby the export decision may well come very late in the sequence.

### 3. Why is expansion in foreign markets that sluggish?

---

Recent empirical research on export activity of individual firms broadly focuses on the causes and consequences of the gap between exporters and non-exporters. Much less attention has so far been paid to the heterogeneity of exporters themselves and the evolution of export activity. With access to more detailed information on all dimensions of exporting activity, part of the research focus has shifted towards explaining the patterns of exporting growth. There is a growing number of recent empirical studies using transaction-level data that focus either on the number of exporting markets or on the dynamics of the exported product mix (Eaton et al. 2004, 2006; Damijan et al. 2007, Eaton et al. 2008). A study by Eaton et al. (2008), employing transaction level data for Colombia, offers a rare glimpse into the evolution of exporting activity of first-time exporters. They tend to be small firms starting off tentatively with only one initial export market, with most first-time exporters ultimately managing only a short stint in this market. Their future expansion and survival depends crucially on the choice of that initial export destination.

Recent studies provide evidence on the existence of destination-specific sunk costs of market entry. Studying the dynamics of the export product mix on a sample of Mexican firms, Iacovone and Smarzynska Javorcik (2010) confirm the existence of within-firm product heterogeneity. They also find that new exporters test the foreign markets with a single variety and very small volumes relative to their total sales. While most exported varieties do not survive in a given foreign market any longer than a year, their survival rate is shown to increase with a variety's tenure in the export market. This suggests that exporters are facing great uncertainty in the foreign markets, making the strategy of experimenting with a small number of varieties, small sales volumes and/or different partners in the export markets a likely choice for first-time exporters. A recent paper by Albornoz, Calvo Pardo, Corcos and Ornelas (2010) provides theoretical rationale for the observed export patterns of new exporters incurring sunk costs of entry into the initial foreign market in spite of the high failure rates. Namely, by proposing that export profitability is positively correlated over time and across exporting destinations, they

show that upon realizing its true exporting productivity a firm has the option of entering new export destinations or, alternatively, upon realizing a less favourable 'profitability' of exiting the foreign markets after the initial period. It is the potential of profitable expansion in terms of both intensive and extensive margins which prompts surviving exporters to try out new destinations and new varieties.

Yet this mechanism still does not offer a satisfactory explanation for the generally sluggish expansion of new exporters. Having paid a fixed entry cost, firms do not adjust instantaneously in export markets in terms of volumes, varieties and destinations, as is implicit in Melitz's (2003) workhorse model of trade with heterogeneous firms. Among the questions remaining unanswered are therefore: Why do new exporters not start by exporting all available varieties to all prospective markets? Why do they not adjust instantaneously in the second year of exporting or in subsequent years once they have realized their exporting profitability?

A recent paper by Damijan et al. (2011) sheds new light on the evolution of exporters by proposing that the process of adjustment in foreign markets is delayed above all by demand uncertainty and financial constraints. Studying the export dynamics of Slovenian new exporting firms, they find extremely slow expansion along both extensive dimensions of exporting. While average first-time exporters typically start by exporting a single variety to one foreign market, the most productive new exporters can only serve up to two foreign markets with up to four varieties. Following initial entry, export expansion – controlled for survival – is very protracted. The surviving exporters add new varieties to existing export markets very gradually while expansions to new destinations happens at an even slower rate. This suggests that adding a new variety to an existing exporting destination is less costly than entering a completely new foreign market. They show that the slow pace of expansion, on the one hand, reflects the cost of serving foreign markets, which increases with the dimensionality of the pattern of export products and markets. The more complex a firm's product-market space becomes, the higher the *'aggregate cost of exporting'*. On the other hand, exporting is associated with demand uncertainties a firm faces for each variety in every single foreign market. Although markets and products may smooth overall risks, more complex exporting patterns generally increase the *'aggregate uncertainty'* faced by the firm. The aggregate cost of exporting a firm can bear and the

magnitude of uncertainty it can cope with, however, are related not only to its size and productivity, but also to its access to either internal or external sources of finance.

The issues of export expansion fit into a more general question on the fundamentals of firm dynamics. Foster et al. (2008) explore the reasons for the slow growth of small firms. Exporting markets can be viewed as only another layer of added complexity in a firm's choice set. This view is consistent with a recent unified model of firm growth by Arkolakis (2009), who assumes that firm growth is balanced across all markets in which a firm has to pay a market penetration cost. In general, recent firm growth literature shows that growth dynamics depend decisively upon market uncertainties (Luttmer, 2007) and firm heterogeneity in terms of access to finance (Cooley and Quadrini, 2001, Cabral and Mata, 2003). Therefore, sluggish export expansion can be attributed to inherent financial constraints. As financing a complex product-market export pattern is costly, each firm's export expansion is limited by its internal finance, i.e. its equity, as well as by its access to external finance.

***Table 3: Expansion dynamics and survival in foreign markets – evidence from Slovenia***

	Pr[Survival]	Markets <sub>t</sub>	Products <sub>t</sub>
Equity <sub>t-1</sub>	0.111***	0.058***	0.074***
Employment <sub>t-1</sub>	-0.039	0.021***	-0.001
Return on assets <sub>t-1</sub>	0.554***	0.154***	0.277***
TFP <sub>t-1</sub>	0.042	0.012	0.022
High school <sub>t-1</sub>	-0.015	0.104***	0.053
Capital per employee <sub>t-1</sub>	-0.027	-0.011**	-0.026***
Debt-to-Assets Ratio <sub>t-1</sub>	0.407***	0.255***	0.415***
Foreign Ownership <sub>t-1</sub>	0.376***	-0.013	0.092***
Time Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Observations	19,084	19,084	19,084

Note: Standard errors omitted from the table; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Source: Damijan, Kostevc and Polanec (2011).

Such financial constraints along with aggregate fixed cost of exporting and the associated aggregate uncertainty in foreign markets in a multi-product/multi-destination setting, imply that firm size is the single most important determinant of the speed of export expansion. The amount of equity raised directly and indirectly through profit accumulation and external debt may hence explain the variation of export margins across firms. *Ceteris paribus*, smaller firms will find export growth, both in terms of geographical expansion as well as in terms of number of exported varieties, a much slower process.

Damijan et al. (2011) provide empirical evidence for Slovenian exporting firms that adding new varieties to existing export markets and expanding to new foreign destinations is positively associated with firm size, productivity and access to finance for both new and incumbent exporters. Interestingly, though, as demonstrated in Table X.3, they find that - when controlled for firm size and skill intensity - firm equity, return on assets, access to bank finance and to internal credit markets (within multi-national firms' networks) play a more important role for export expansion than firm productivity (as measured by total factor productivity, TFP). New exporters who face positive demand shocks in foreign markets that also translate into positive cash flows will not only more likely decide to expand at a faster rate, but will primarily have the means to finance expansion themselves or be able to get external finance. This suggests that, other things equal, a firm's ability to finance a costly and risky export expansion might be essential for understanding why some firms expand faster than others.

#### **4. Exports, firm size and financial constraints**

---

A large body of literature suggests that access to financing is an important determinant of firm investment (Stiglitz and Weiss, 1981; Fazzari and Hubbard, 1988; Evans and Jovanovic, 1989; Bond, 1994; Dixit and Pindyck, 1994; Hubbard, 1998). Cabral and Mata (2003) argue that the expansion of small firms is hampered by financial constraints resulting in observed right-skewed firm size distribution. Financial factors are also shown

to be important in explaining the patterns of international trade. Chaney (2005) has theoretically shown that given large fixed costs of exporting, access to financing may explain part of the variation in the foreign market participation. Greenaway et al. (2007) confirm this prediction for a set of UK manufacturing firms. Further, Zia (2008) reports that the removal of subsidized credit causes a significant decline in the exports of privately owned Pakistani firms, while the exports of large, publicly listed, and group network firms remain unaffected. In a similar vein, Bellone et al. (2009) demonstrate that less financially constrained Italian firms are more likely to start exporting earlier, but that exporting per se does not improve the financial health of exporters. Taking export intensity as a proxy for serving a large number of destinations, they also find a negative relationship between access to financing and export intensity. The reasoning for the latter is straightforward. The further expansion of exporters to new foreign markets as well as the introduction of new products to the existing markets is associated with significant sunk costs. Financial constraints will therefore provide an important barrier both to export market entry and to the dynamics of expanding in foreign markets. Damijan et al. (2011) show that Slovenian firms with higher debt-to-asset ratios tend to export a greater number of products to a greater number of markets. In both cases, firm size is shown to be positively correlated with the new exporters' expansion dynamics.

These findings suggest that the patterns of export expansion may vary for exporters of different size. While large firms are likely to experience monotonic expansion due to their larger internal funds and better access to external finance, this pattern might be non-monotonic for small exporters for a number of reasons. First, small exporters may have weaker access to external finance or have to pay higher finance premia. The speed of foreign market expansion is therefore constrained by the internal funds available to them. Second, as famously argued by Knight (1921), bearing risk is one of the essential characteristics of entrepreneurship. As noted by Bond et al. (2008), households with a lower relative risk tolerance shy away from business ventures in times of excessive macro volatility. Small firms are in general more risk averse and will shy away both from taking excessive risks in foreign markets and from taking on excessive external debt to finance export ventures. Studying financial constraints affecting new French firms, Bonnet, Cieply and Dejardin (2005) find that there is a non-negligible share of firms

which do not ask for a bank loan even when facing financial constraints. This self-imposed constraint produces a vicious circle, squeezing their intensive and extensive export margins even more than their smaller size would imply.

Lower intensive and extensive export margins of small firms in combination with their necessary larger exposure to external debt, however, affects also their survival in export markets. where small firms are poorly insured against the risk of failure. While large firms can use the extensive geographic dispersion of export markets and a variety of products exported as insurance against the risk of failure in a single foreign market or in a single product exported, any failure in export projects can be terminal for small firms. They may have to exit the export market, or excessive debt might even drive them out of business altogether.

This means that, for the same levels of external financing, small firms will export a smaller share of their total sales. Furthermore, small firms may expand to a lesser extent than large firms even if they are not liquidity constrained. A smaller size of internal funds and the risk of failure will cause smaller exporters to be more cautious in terms of taking additional risks associated with increased export intensity. At the same time, small firms willing to risk tapping into external finance may well use the additional funds more efficiently. Bond et al. (2008) show that households with promising business opportunities and modest wealth would be the main beneficiaries of better-functioning credit markets.

Drawing a correlation between the level of external debt and export intensity, large firms are more likely to display a monotonic relationship, while an inverted *U*-shape will be more common among small firms. The right tail will consist of firms that have failed in their exporting endeavour because they have taken on excessive debt. As a consequence, their export share diminishes and their debt-to-asset ratio rises significantly.

**Table 4: Impact of financial constraints on firms' intensive margin: evidence from Slovenia (dependent variable: export share)**

	small firms	medium firms	large firms	small firms	medium firms	large firms
EBITDA/sales_t-1	0.046**	-0.128**	-0.115			
Debt_assets_t-1				0.054***	-0.003	0.142***
Va_emp_t-1	0.000	8.731e-06***	0.000	-6.794e-07*	9.785e-06***	6.557e-06**
Sales_t-1	9.6e-08***	3.286e-08***	5.403e-09***	9.122e-08***	3.139e-08***	4.212e-09***
Int_rate_t-1	0.014	0.503***	0.552***	0.014	0.511***	0.273**
Collateral_t-1	-0.028*	0.007	-0.092	-0.027	-0.006	-0.078
Sh_assoc_t-1	0.070**	-0.023	-0.007	0.066**	-0.021	-0.033
Variance_sales_t-1	4.370e-16**	-1.305e-16***	-2.267e-18***	4.960e-16***	-1.278e-16***	-1.792e-18***
Constant	0.997***	-0.599	0.765	-0.191	-0.033	0.335
Observations	8170	2096	1051	8399	2113	1060
R-squared	0.164	0.386	0.66	0.162	0.383	0.662

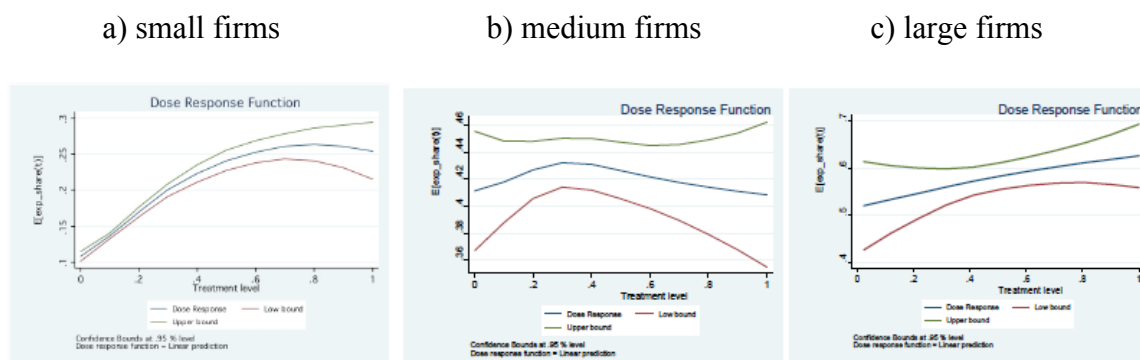
Note: Standard errors omitted from the table; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Size classes are defined as: small firms (at most 50 employees), medium-sized firms (from 51 to 200 employees) and large firms (more than 200 employees).

Source: Damijan, Kostevc and Polanec (2010b).

In a recent paper Damijan et al. (2010b) analyse this relationship between the extent of liquidity constraints and the intensive margin of exports for firms of different sizes for a set of Slovenian firms for the period 2001–2008. They take corporate cash flows as firms' main internal source of liquidity and use outstanding short- and long-term bank loans as well as intra-group borrowing as external sources of finance. Table X.4 reveals a positive correlation between the lagged debt-to-asset ratio and export intensity for both small and large firms, implying that access to external financing improves the scope of firm exposure in foreign markets. The impact on mid-sized firms is ambiguous as it is not significantly different from zero. On the other side, own cash-flow relative to sales (*EBITDA/sales*) is shown to increase export intensity at small firms only. For small firms, the share of loans from associated firms also increases their export shares. For mid-sized and large firms this relationship to borrowing from associated firms in the group is not significant, while firm size (*Sales*), productivity (*VA/emp*) and lagged interest rates (*Int\_rate*) and lower variation in sales (*Variance\_sales*) positively impact the export share.



**Figure 1: The impact of relative debt-to-asset ratio on export intensity of Slovenian firms in 2000-2007**



*Note:* Size classes are defined as: small firms (at most 50 employees), medium-sized firms (from 51 to 200 employees) and large firms (more than 200 employees).

Source: Damijan, Kostevc and Polanec (2010b).

The above estimates show only average responses of export intensity to different measures of firms' access to finance. Damijan et al. (2010b), however, also provide an econometric test whether, for the same expected debt-to-assets ratio, small exporting firms experience a different pattern of export expansion than their medium and large-sized counterparts. They use a continuous matching technique based on the generalized propensity score and the relevant dose response functions in order to test how additional bank debt impacts a firm's export share.<sup>1</sup> As shown by the Figure, the response of export intensity to relative indebtedness is not linear. This is particularly evident for small and medium-sized firms, while for large firms a linear response of export intensity to relative financial constraints seems to be in place. Secondly, firm size crucially impacts the dose response function, which gradually becomes flatter as firm size increases. This is particularly evident for large firms where the dose response function appears linear, but less so for medium-sized firms that still exhibit a more concave response. In any case, this evidence suggests that improving access to finance does not necessarily monotonically translate into higher export intensity. It is only generally valid for large

firms, while for small and mid-sized firms export shares only increase with better access to finance up to a certain range of debt-to-asset ratio.

## 5. Credit crunch and exports

---

Given the results on the importance of access to finance for firms participating in exports and expanding either along the intensive or extensive margin of exports, one may expect that the global financial crisis has had a negative impact on exporting firms, in particular for small firms. Dried-up finance may affect exporters more severely. The reasoning is straightforward. Exporting is costly and more risky too, hence exporters are exposed to higher default risk and higher working capital requirements, which requires additional trade credit. As pointed out by Amiti and Weinstein (2010), the need to insure against credit default risk arises because exporters usually do not have the capacity to evaluate default risk and usually turn to banks to provide payment insurance and guarantees. In addition, exporters need more working-capital financing than firms engaged in domestic transactions because of the time lags inherent in international trade. Hence, if banks limit trade finance, exports are likely to be affected more adversely than domestic sales.

Several empirical studies conducted to either analyse past crises or the global financial crisis that emerged in 2008 demonstrate that the drying-up of credit finance adversely affects exporters. Iacovone and Zavacka (2009) study banking crises and exports in 23 banking crises episodes between 1980-2000 and find negative and significant effects of banking crises on export growth. They find that credit crunch-induced impact of ‘supply-side’ shocks is additional and independent from that of ‘demand-side’ shocks (especially in sectors producing durable goods). These effects are found to be stronger for deeper crises and in countries with a less developed financial system. Interestingly, unlike bank finance, inter-firm finance does not appear to dry up at times of crisis and sectors characterized by a higher share of tangible assets are affected significantly less by the crisis (due to collateral). Amiti & Weinstein (2010) study Japanese financial crises of the 1990s and find a causal link from shocks in the financial sector to exporters. They find

that limiting trade credits (fewer letters of credit) results in exports declining much faster than output. The size of these bank-induced export declines accounts for about one-third of the drop in Japanese exports. These effects are found to be smaller for large firms, multi-nationals and, interestingly, for firms that export mostly by air (due to shorter time lags in payments).

Bricongne et al. (2009) study the impact of current crises on French exporters by exploiting monthly firm-level export data. They find that drops in French exports are mainly due to the declining intensive margin of large exporters, which reduced the size of their shipments. However, small and large firms are evenly affected when sectoral and geographical specialisations are controlled for. At the same time, firms in sectors structurally more dependent on external finance are found to be most affected by the crisis. Similarly, Chor and Manova (2010) study the collapse of international trade flows during the recent global financial crisis using detailed data on monthly US imports. They show that adverse credit conditions were an important channel through which the crisis affected trade volumes. Countries with higher interbank rates and thus tighter credit markets exported less to the US during the peak of the crisis. These effects were especially pronounced in sectors that require extensive external financing, have few collateralizable assets, or have limited access to trade credit. Similarly to the Bricongne et al. (2009) study for France, they find that exports of financially dependent industries were more sensitive to the cost of external capital and that this sensitivity rose during the financial crisis.

Empirical studies related to credit crunches and exports unanimously point out that a sound financial system is essential for promoting exports as exporters are more prone to dried-up finance. Hence, fixing financial sectors will facilitate the catching-up of exports. At the same time, firms with better access to internal credit markets (i.e. firms within multi-national affiliates network) are less affected by financial crises. FDI seems to have a remarkable positive ‘stabilization effect’ on exporting.

## 6. Conclusions

---

This chapter gives an overview of recent empirical studies on exporters by focusing on factors that affect the decision of firms to start to export, how firms learn from trade and expand along the intensive and extensive margins, and what helps them survive in export markets. Evidence on firms' learning-by-exporting has been shown to be very scarce by the vast majority of cross-country studies. Instead, imports are shown to precede the decision to start exporting and to have a strong effect on efforts to dress up in terms of pre-export-entry productivity growth. Moreover, evidence suggests that the process of trade participation is sequenced in a particular manner. Usually, a firm will start out to venture abroad by importing capital goods or intermediates. This step affects its productivity by either increasing the variety of goods it can offer on the home market or/and by lowering price index of inputs. Exporting starts only later, after a firm has dressed up sufficiently in terms of productivity to bear the fixed entry cost of foreign markets. In the meantime, investments in R&D and innovation may help a firm start producing new varieties suitable for sale in foreign markets.

Sound finance and access to external finance are crucial both for firms' export decisions as well as for their export dynamics. Firms with larger internal cash flows and better access to bank credits and to internal credit markets are shown to export broader varieties and to expand to new export markets at a higher rate. The same is found for firm expansion along the intensive margin. Access to external finance is particularly important for small firms and during financial crises. Evidence shows that exporters are likely to be affected more adversely than firms serving only local markets. In particular, exports of financially dependent industries are shown to be more sensitive to the cost of external capital, while sectors characterized by a higher share of tangible assets are affected significantly less by the crises. One of the most striking findings in the empirical literature is that inter-firm finance does not appear to dry up in times of crisis and that exports of firms that are part of the networks of multi-national firms are more stable during financial turmoil.

1. Given that the continuous matching technique requires that the treatment variable is continuous on the relevant interval, we constructed a measure of a relative debt-to-asset ratio on an interval between 0 and 1. For that purpose relative values of the debt-to-asset ratio are calculated by relating absolute values to the year-industry-size class specific maximum debt-to-asset ratios. The resulting relative debt-to-asset ratios therefore span in the interval between 0, which implies no debt, and 1, which is the highest debt-to-asset ratio achieved by a firm of that size class in the relevant year and industry.

## References

---

- Albornoz, F., Calvo Pardo, H., Corcos, G. and Ornelas, E. (2010). ‘Sequential exporting’, *CEPR Discussion Paper No. 8103*.
- Altomonte, Carlo, Gabor Bekes and H. Murakozy (2008), ‘Trading activities and productivity: evidence from Hungary’, Bocconi University, Mimeo.
- Amiti, Mary and Josef Konings (2007), ‘Trade liberalization, intermediate inputs, and productivity: evidence from Indonesia’, *American Economic Review*, **97** (5), 1611–38.
- Amiti, Mary and David Weinstein (2010), ‘Exports and financial shocks’, *NBER Working Paper No. 15556*.
- Atkeson, A., and A. Burstein (2008), ‘Innovation, firm dynamics, and international trade’, Department of Economics, University of California, Los Angeles, Working paper.
- Aw, Bee Yan, Mark J. Roberts and Tor Winston (2005), ‘The complementary role of exports and R&D investments as sources of productivity growth’, *NBER Working Paper No. 11774*.
- Aw, Bee Yan, Mark J. Roberts and D. Y. Xu (2008), ‘R&D investments, exporting, and the evolution of firm productivity’, *American Economic Review*, Papers and Proceedings, **98** (2), 451–56.
- Aw, Bee Yan, Mark J. Roberts and D. Y. Xu (2009), ‘R&D investment, exporting, and productivity dynamics’, *NBER Working Paper No. 14670*.
- Bartelsman, Eric J. and Marc Doms (2000), ‘Understanding productivity: lessons from longitudinal microdata’, *Journal of Economic Literature*, **38** (2), 569–94.

- Becker, S. and Peter Egger (2007), 'Endogenous product versus process innovation and a firm's propensity to export', *CESIFO Working Paper* No. 1906.
- Bellone, F. P. Musso, L. Nesta and S. Schiavo (2009), 'Financial constraints and firm export behavior', *GREDEG Documents de travail*, 2009-01.
- Bernard, Andrew B. and J. Bradford Jensen (1995), 'Exporters, jobs, and wages in U.S. manufacturing: 1976–1987', *Brookings Papers on Economic Activity: Microeconomics*, 67–119.
- Bernard, Andrew B. and J. Bradford Jensen (1999), 'Exceptional exporter performance: cause, effect, or both?', *Journal of International Economics*, **47** (1), 1–25.
- Bernard, Andrew B., J. Bradford Jensen and Peter K. Schott (2006), 'Trade costs, firms and productivity', *Journal of Monetary Economics*, **53**, 917–37.
- Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding and Peter K. Schott (2007), 'Firms in international trade', *Journal of Economic Perspectives*, **21** (3), 105–30.
- Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott (2009), 'The margins of US trade', *American Economic Review*, **99** (2), 487–93.
- Bond, S. (1994), 'Financial constraints and company investment', *Fiscal Studies*, **15** (2), 1–18.
- Bond, E., J.R. Tybout and H. Utar (2008), 'Credit rationing, risk aversion and industrial evolution in developing countries', *NBER Working Paper* No. 14116.
- Bricongne, Jean-Charles, Lionel Fontagné, Guillaume Gaulier, Daria Taglioni and Vincent Vicard (2009), 'Firms and the global crisis: french exports in the turmoil', Bank of France.
- Cabral, Luis M.B. and Jose Mata (2003), 'On the evolution of the firm size distribution: facts and theory', *American Economic Review*, September, **93** (4), 1075–90.
- Cassiman, Bruno and Elena Golovko (2007), Innovation and the Export-Productivity Link, IESE Business School, Mimeo.
- Cassiman, Bruno and Ester Martinez-Ros (2007), 'Product Innovation and Exports. Evidence from Spanish Manufacturing', IESE Business School, Mimeo.
- Chaney, T. (2005), 'Liquidity constrained exporters', Mimeo, University of Chicago.
- Chor, Davin and Kalina Manova (2009), 'Off the Cliff and Back? Credit Conditions and International Trade during the Global Financial Crisis', Stanford University, Mimeo.
- Cooley, Thomas F. and Vincenzo Quadrini (2001), 'Financial markets and firm dynamics', *American Economic Review*, **91** (5), 1286–310.
- Damijan, Joze, Črt Kostevc and Saso Polanec (2010a), 'From innovation to exporting or vice versa?', *The World Economy*, **32** (2), 374–98.
- Damijan, Joze, Črt Kostevc and Saso Polanec (2010b), 'Firm Size, Financial Constraints and Non-Monotonic Export Intensity', University of Ljubljana, Mimeo.

- Damijan, Joze, Črt Kostevc and Saso Polanec (2011), 'Export Strategies of New Exporters: Why is Export Expansion Along the Extensive Margins so Sluggish?,' *Licos Discussion paper No. 276/2011*.
- De Loecker, Jan (2007), 'Do exports generate higher productivity? Evidence from Slovenia', *Journal of International Economics*, **73** (1), 69–8.
- Eaton, Jonathan, Samuel Kortum and Francis Kramarz (2004), 'Dissecting trade: firms, industries, and export destinations', *American Economic Review*, **94** (2), 150–54.
- Eaton, Jonathan, Samuel Kortum and Francis Kramarz (2006), 'An anatomy of international trade: evidence from rich firms', *Meeting Papers 197*, Society for Economic Dynamics.
- Eaton, J., M. Eslava, M. Kugler and J. Tybout (2008), 'Export dynamics in Colombia: transaction-level evidence,' in E. Helpman, D. Marin and T. Verdier (eds), *The Organization of Firms in a Global Economy*, Cambridge, MA: Harvard University Press, 231–72.
- Greenaway, D., A. Guariglia and R. Kneller (2007), 'Financial factors and exporting decisions', *Journal of International Economics*, **73** (2), 377–95.
- Greenaway, D. and R. Kneller (2007), 'Firm heterogeneity, exporting and foreign direct investment', *The Economic Journal*, **117** (February), 134–61.
- Hubbard, R. Glenn (1998), 'Capital-market imperfections and investment', *Journal of Economic Literature*, **36** (1), 193–225.
- Iacovone, Leonardo and Beata Smarzynska Javorcik (2010), 'Multi-product exporters: product churning, uncertainty and export discoveries', *The Economic Journal*, **120** (May), 481–99.
- Iacovone, Leonardo and Veronika Zavacka (2009), 'Banking crises and exports: lessons from the past', *World Bank Policy Research Working Paper 5016*, Washington, D.C.: World Bank.
- ISGEP – International Study Group for Economic Performance (2008), 'Understanding cross-country differences in exporter premia: Comparable evidence for 14 countries', *Review of World Economics*, **144** (4), 596–635.
- Jovanovic, Boyan (1982), 'Selection and the evolution of industry', *Econometrica*, **50** (3), 649–70.
- Lileeva, A. and D. Trefler (2007), 'Improved access to foreign markets raises plant-level productivity for some plants', *NBER Working Paper No. 13297*.
- Luttmer, E. G. J. (2007), 'Selection, growth, and the size distribution of firms', *Quarterly Journal of Economics*, **122** (3), 1103–44.
- Manova, K. and Z. Zhang (2009), *Export Prices and Heterogeneous Firm Models*. Stanford University, Mimeo.

- Mayer, Thierry, Marc J. Melitz and Gianmarco I.P. Ottaviano (2009), Market Size, Competition and Product Mix of Exporters, Harvard University, Mimeo.
- Melitz, Marc J. (2003), 'The impact of trade on intra-industry reallocation and aggregate industry productivity', *Econometrica*, **64** (6), 1695–725.
- Melitz, Marc J. and Gianmarco I.P. Ottaviano (2008): 'Market size, trade and productivity', *Review of Economic Studies*, **75**, 295–316.
- Parisi, Maria Laura, Fabio Schiantarelli and Alessandro Sembenelli (2006), 'Productivity, innovation and R&D: micro evidence for Italy', *European Economic Review*, **50** (8), 2037–61.
- Roberts, Mark J. and James R. Tybout (1997), 'The decision to export in Colombia: an empirical model of entry with sunk costs', *American Economic Review*, **87** (4), 545–64.
- Romer, Paul Michael (1990), 'Endogenous technological change', *Journal of Political Economy*, **98** (5), 71–102.
- Salomon, Robert M. and J. Myles Shaver (2005), 'Learning by exporting: new insights from examining firm innovation', *Journal of Economics and Management Strategy*, **14** (2), 431–60.
- Stiglitz, J. and A. Weiss (1981), 'Credit rationing in markets with imperfect information', *American Economic Review*, **71**, 393–410.
- Tybout, James R. (2003), 'Plant and firm level evidence on new trade theories', in E. Kwan Choi and James Harrigan (eds), *Handbook of International Trade*, Oxford (UK): Basil Blackwell.
- Wagner, J. (2007), 'Exports and productivity: a survey of the evidence from firm level data', *The World Economy*, **30** (1), 60–82.
- Zia, B.H. (2008), 'Export incentives, financial constraints, and the (mis)allocation of credit: micro-level evidence from subsidized export loans', *Journal of Financial Economics*, **87** (2), 498–527.