

EXPORTS AND PRODUCTIVITY: DOES
DESTINATION MATTER?

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Abstract

In this work we analyse the effect of export destinations on Total Factor Productivity (TFP) of manufacturing Uruguayan firms for the period 1997-2006. We study two effects: self-selection and learning by exporting. To this end, we work with a panel of firms –provided by the Instituto Nacional de Estadísticas- and the destiny of exports - provided by the Dirección Nacional de Aduanas-. We estimate TFP using the Levinsohn & Petrin (2003) methodology. Results for Pooled Ordinary Least Squares estimations show the association between firms with higher share of their total exports to developed countries and higher TFP than firms exporting to less developed countries. Nevertheless, applying the transition group methodology (Alvarez & López 2005) in order to mitigate endogeneity issues, there is no evidence that exporting to developed countries enhances productivity through learning by exporting. However, evidence of learning by exporting is found for those firms starting to export to less developed countries. These findings suggest an international strategy through which firms reach gains in productivity exporting to markets with lower entry cost, and once they have learnt and improved their productivity, are in a better position to enter into more developed countries.

Key words: Total factor productivity, exports, destiny of exports, auto-selection, learning by exporting.

JEL: D21, D24, F14, O54.

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1. Introduction

The objective of this work is to study the relationship between total factor productivity of Uruguayan exporting firms and the destiny of exports. To this aim we focus on analyzing the effect of the development level of the country of destination of exports on TFP of manufacturing firms.

A number of empirical works conducted in the last decades find that exporting firms are more productive than non exporting ones (Clerides et al. 1998; Bernard & Jensen 1999; Girma et al. 2004; Alvarez & López 2005; Isgut & Fernandes 2007 ; De Loecker 2007; da Costa Ferré 2008). Thus, exporting firms could play an important role in the economic growth of countries, particularly for small developing economies like Uruguay.

A key aspect to analyse is whether the greater productivity of exporters is achieved before entering into foreign markets, or after breaking into exporting. In the literature both hypothesis are known as “self-selection” and “learning by exporting” respectively. Both hypotheses are not mutually opposite, since firms can increase their productivity before breaking into foreign markets, experiencing further increases in productivity, after entering into foreign markets due to gains in economies of scale, greater competition with foreign firms, learning of better practices and new technologies.

Even though several works analyse self-selection and learning by exporting, less studied has been the impact of the destiny of exports on productivity. Girma et al. (2004), Álvarez and López (2004), da Costa Ferré (2008), Pisú (2008) and Boermans (2010) are some examples of studies that analyze learning by exporting. Nevertheless, studies for developing countries that analyze learning by exporting and destination are less. Among the latter we find the works by Isgut & Fernandes (2007), Trofimenko (2008), De Loecker 2007, Granér & Isaksson (2009) and Boermans (2010).

Usually, it is assumed that the cost of entering foreign markets are higher the greater the level of economic development due to a higher level of exigency of foreign costumers – i.e. a higher valuation for quality- and a more competitive environment. One hypothesis is that those firms that export to more developed countries, with more sophisticated

markets have to overcome higher entry costs than firms that export to less developed countries, so that self-selection should be higher for these firms. This would imply that firms that export to high income countries are far more productive even before starting to export to high income destinations (Trofimenko 2008; Pisú 2008). In this regard Eaton et al. (2008) suggest that the relationship between firm performance and exporting depends on the destination of exports.

Regarding to learning by exporting, it can be argued that increases in productivity would be higher for those firms that export to developed countries. This would be so due to a greater competition and a higher exposure to more technology advanced firms than in less developed countries.

In this work we analyse if the above mentioned hypothesis are met for the Uruguayan case, for the period 1997-2006. To this end we first analyse if there is an association between productivity and exporting to developed countries. Then, we examine the causal relations using the methodology of transition groups to study self-selection and learning by exporting and the impact of the destiny of exports on them.

This work contributes to the existing literature by being one of the first studies to use actual data on the destiny of exports at the firm level to analyse the relationship between the destiny of exports and firm's performance. Thus, the results of this research could provide new insights for the discussion and design of the international strategy of the country.

This work structures as follows: after this introduction, in Section 2 we present briefly some previous literature, in Section 3 we describe the empirical strategy; in the fourth we present the results, and finally some concluding remarks.

2. Literature review

The conceptual framework is based on the theories of endogenous growth in open economies (Romer 1986; Grossman and Helpman 1991; Aghion and Howitt 1992), which recognise that in a world with international trade in goods and services, foreign

direct investment (FDI) and the international exchange of information, a country's productivity will also depend on technological knowledge produced by foreign countries, generating dynamic gains from globalisation. Further, in the last fifteen years, several works find evidence of substantial heterogeneity between firms, even in narrowly defined industries. These findings prompt up the development of new theoretical models (Melitz 2003; Bernard et al. 2004; Melitz and Ottaviano 2008) showing the mechanisms through which firms' heterogeneity can provide an additional source of productivity gains due to trade openness, namely through the reallocation of resources from less to more productive firms.¹

In the last years there was a burgeoning of studies showing the relationship between the level of productivity and the exporting status at the firm level (see for instance Aw and Hwang (1995) for Taiwan; Bernard and Wagner (1997) for Germany; Aw, B. et al. (1998) for South Korea; Bernard and Jensen (1999) for United States; Kraay (1999) for China; Delgado et al. (2002) for Spain; Girma et al. (2004) for the United Kingdom; Álvarez and López (2005) for Chile). Most of these works find that exporting firms are more productive than those that serve the domestic market.² Further, the evidence shows that while most studies find support for the self-selection hypothesis, this is not so for the learning by exporting hypothesis (Clerides et al. 1998; Bernard and Jensen 1999; Álvarez and López 2004 and Pisú 2008). Moreover, among the studies that do find learning by exporting, only few take into account the destiny of exports.

The first, most well known study was the one by Bernard and Jensen (1999) for the United States, finding that exporting firms are larger, more productive and more capital intensive. These authors find evidence in favour of self-selection but not for learning by exporting. Álvarez and López (2005) find similar results for Chilean firms using transition group methodologies. Nevertheless, Girma et al. (2004) for UK, using matching techniques find evidence of learning by exporting.

¹ In models based on a representative firm, changes in aggregate productivity are the result of changes in the technology of the representative firm.

² Bernard and Jensen (1999); Girma et al. (2002); Álvarez and López (2005); Isgut and Fernandes (2005); De Loecker (2007) are some examples of this literature. For a survey see Wagner (2007).

On the other hand, Isgut and Fernandes (2005) take into account the destination of exports in their analysis of productivity differences between exporters and non-exporters for Colombian firms. These authors find higher productivity for firms exporting to developed countries compared to those that export to less developed countries. Moreover, Trofimenko (2008) working also for Colombian firms, introduce four groups of countries of destination, obtaining similar results to the findings by Isgut and Fernandes (2005): exporting to countries with higher incomes enhances productivity gains. Nevertheless, there is also opposite evidence. Graner and Isaksson (2009), working for Kenyan firms find that exporters learn more from regional export participation and not by exporting to developed countries. The explanation they pose for this result is that the high technological distance from developed countries can act as an impediment to use external knowledge. Also they show that firms have to be more productive to enter into developed country markets, but this is not so for exporting inside the continent. Pisú (2008) analyses the destiny of Belgian exports, finding that self-selection explains the higher productivity of exporting firms, particularly for those firms that export to developed countries. This author confirms the hypothesis that sunk entry costs are country specific, but he finds no evidence of learning by exporting.

Boermans (2010) studies five African countries, and finds self-selection and learning by exporting using matching and difference-in-difference techniques. Taking into account the destiny of exports, this author finds that firms that export outside Africa are more capital and skilled labour intensive, which explain their higher productivity, compared to firms that exports to the region.

Mukim (2011) using matching techniques for Indian firms, finds that learning by exporting takes place only in the first years after breaking into foreign markets. This author makes a distinction between the countries of origin of exporting firms. In this regards, he argues, that since exporters from developing countries are far away the world technological frontier, there is greater scope for productivity improvements after breaking into foreign markets –i.e. higher scope for “catching-up”-.

For the Uruguayan case there are some works. Bittencourt & Vaillant (2001) analyse the characteristics of exporting firms for the 80s and 90s. These authors find an association

between average firm size and its permanence in exporting markets. They also analyse entry and exit in international markets and find that exiting firms have a short duration in export markets.

da Costa Ferré (2008) using a panel of Uruguayan manufacturing firms for the period 1997-2001, analyse whether the self-selection and learning by exporting hypothesis hold. This researcher, using transition group methodologies³ find evidence of self-selection and learning by exporting.

Finally, Peluffo (2010) analyse several channels of international technology transfer to explain the productivity of Uruguayan manufacturing firms for the period 1997-2001. This author analyses the effects of imported intermediate, exports and foreign ownership of capital in an augmented production function and in a two-step approach. The main findings are that these variables have a positive and significant impact on productivity, and that the effect is higher for those firms that undertake R&D and training of workers, and have so higher absorptive capacity.

To sum up, the empirical evidence points out a better performance of exporting firms, and robust evidence for the self-selection hypothesis. Nevertheless, results for learning by exporting are not clear cut. Regarding to the effect of the destination on self-selection and learning by exporting, most works support the hypothesis that sunk entry costs to foreign markets are country specific, and higher the greater the level of development of the country of destination. Therefore, self-selection would explain the greater productivity of firms exporting to more developed countries. Moreover, some works point out that exporting to more developed countries could bring greater productivity gains (Isgut and Fernandes 2005; Trofimenko 2008, Boermans 2010). Nevertheless, there is also opposite evidence (Granér and Isaksson 2009). In this regard there is an on-going debate on the literature. On one side there is the idea that to be able to learn from foreign technologies, the technology gap should be small (e.g. Aghion et al. 2009), and on the other side, there is the idea that the greater the technological distance, the greater the probability to catch up (Griffith et al. 2004).

³ This methodology has been used by Aw, Chung and Roberts (2000) and Álvarez and López (2005).

3. Empirical Strategy

3.1. Methodology

3.1.1. Exporting Premium

Firstly we analyse associations, namely the exporting premium without controlling for destination, and then we control for destination with a dummy variable that takes the value of one if the firm exports to developed countries and zero otherwise. Further we also try a dummy variable that takes the value of one if the firm has as destiny half or more of its exports to a developed country. Further, we also control for firm size, foreign ownership of capital, sector and time shocks. Our dependent variable is Total Factor Productivity (TFP) in natural logarithms and we use Ordinary Least Squares estimation. Total Factor Productivity is estimated using the Levinshon and Petrin methodology which allows correcting for endogeneity in inputs, while attrition is tackled using an unbalanced panel of firms.⁴

Thus, our estimating equations are the following:

$$\ln tfp_{it} = \alpha_0 + \alpha_1 exp_{it} + \alpha_2 foreign_{it} + \alpha_3 medium_{it} + \alpha_4 big_{it} + d_t + d_j + \varepsilon_{it} \quad (1)$$

$$\ln tfp_{it} = \alpha_0 + \alpha_1 exp_{it} + \alpha_2 exp rich_{it} + \alpha_3 foreign_{it} + d_t + d_j + \varepsilon_{it} \quad (2)$$

$$\ln ptf_{it} = \alpha_0 + \alpha_1 exp_{it} + \alpha_2 exp outreg_{it} + \alpha_3 foreign_{it} + d_t + d_j + \varepsilon_{it} \quad (3)$$

Where *exp* stands for a dummy variable that takes the value of one if the firms exports and zero otherwise; *foreign*: is a dummy that takes the value of one if the firms is foreign owned; *medium*: is a dummy variable that takes the value of one if the firms has between 49-99 workers and zero otherwise; *big*: is a dummy variable that takes the value of one if the firms has more than 100 workers and zero otherwise; *dj*: are sectoral dummies; *dt*: are time dummies, *exp rich*: is a dummy that takes the value of one if the firms exports to developed countries and zero

⁴ Results on coefficients and explanations of the methodology are available upon request.

otherwise; *expoutreg*: is a dummy variable that takes the value of one if the firm exports outside the region and zero otherwise.

We further analyse the effect of the exporting more than 50 % of total exports to more developed countries (*exrich*>50 %) and the effect of exporting more than 50 % of total exports outside the region (*exp outreg*>50 %). We estimate the following equations:

$$\ln tfp_{it} = \alpha_0 + \alpha_1 \exp_{it} + \alpha_2 \exp \text{ rich} > 50\%_{it} + \alpha_3 \text{foreign}_{it} + d_t + d_j + \varepsilon_{it} \quad (4)$$

$$\ln tfp_{it} = \alpha_0 + \alpha_1 \exp_{it} + \alpha_2 \exp \text{ outreg} > 50\%_{it} + \alpha_3 \text{foreign}_{it} + d_t + d_j + \varepsilon_{it} \quad (5)$$

3.1.2. Transition group methodology

To test the hypothesis of self-selection and learning by exporting we use transition groups methodology, used by Aw et al. (1998), Álvarez and López (2004), da Costa Ferré (2008) and more recently by Verardi and Wagner (2012). Firstly we test the hypothesis without taking into account the destination of exports, and then we distinguish by destination, according to whether firm exports are targeted to high income (richer) countries.

We define four groups of firms according to their export activities during different time intervals. We take two years, t-s and t (t-s stands for the initial year of exporting activity and t the final year, s is the time interval), the exporting status of the firm is defined by: a) Non-exporting: does not export in t-s, neither in t; b) Entrant (*ent*): does not export in t-s, but starts exporting in t; c) Quitter (*quit*): exports in t-s, and stops exporting in t; d) Permanent exporter (*perm*): exports in t-s and in t.

To test the hypothesis of self-selection we analyse the differentials in productivity with respect to non-exporting firms at the beginning of the period (t-s). Thus, we evaluate whether the differentials in productivity of entrants are verified before of breaking into export markets.

To analyse the hypothesis of learning by exporting we use both years (t-s and t), in order to compare productivity at the beginning and at the end of the period. In this way we can analyse if firms that start exporting become more productive after breaking into export markets.

The transition groups consider intervals of 1 to 4 years, so the export status is defined according to the following transition periods/groups: a) Transition 1 year: all the possible combinations between t-1 and t (i.e.: 97-98, 98-99, 99-00, 00-01, 01-02, 02-03, 03-04, 04-05); b) Transition 2 years: all the possible combinations between t-2 and t (i.e.: 97-99, 98-00, 99-01, 00-02, 01-03, 02-04, 03-05); c) Transition 3 years: all the possible combinations between t-3 and t (i.e.: 97-00, 98-01, 99-02, 00-03, 01-04, 02-05); d) Transition 4 years: all the possible combinations between entre t-4 and t (i.e.: 97-01, 98-02, 99-03, 00-04, 01-05).

The econometric model for the initial year of exporting is:

$$\ln tfp_{i,t-s} = \phi_0 + \phi_1 ent_{it}^s + \phi_2 sale_{it}^s + \phi_3 perm_{it}^s + \phi_4 foreign_{it} + \phi_5 medium_{i,t} + \phi_6 big_{i,t} + \varepsilon_{i,t-s} \quad (6)$$

Where s=1,2, 3 and 4.

The model for the final year is:

$$\ln tfp_{i,t} = \gamma_0 + \gamma_1 ent_{it}^s + \gamma_2 sale_{it}^s + \gamma_3 perm_{it}^s + \gamma_4 foreign_{it} + \gamma_5 medium_{i,t} + \gamma_6 big_{i,t} + \varepsilon_{i,t} \quad (7)$$

Where s=1,2, 3 and 4.

Further, $\ln tfp$; ent ; $sale$, $perm$, $foreign$, $medium$ and big are the variables defined previously.

The coefficients that measure the percentage difference in productivity with respect to non-exporting firms are the following:

ϕ_1 and γ_1 is the percentage difference between entrants and non-exporting firms in t-s and t respectively.

ϕ_2 and γ_2 is the percentage difference is between quitters and non-exporting firms in t-s and t respectively.

ϕ_3 and γ_3 is the percentage difference between permanent exporters and non-exporting firms in t-s and t respectively.

If there is self-selection the following two relations should be met:

$\phi_1 > 0$, hence the productivity of entrants should be higher than of non-exporting before starting to export.

$\phi_3 > \phi_2 > 0$, so that productivity of permanent exporters should be higher than for quitters, and productivity of permanent exporters and quitters should be higher than for non exporting firms.

If the there is learning by exporting in the period (t-s, t) then we should find the following:

$\gamma_1 - \phi_1 > 0$, so the difference in productivity between entrants and non-exporting firms increases.

$\gamma_3 - \phi_3 > 0$, so the differential in productivity between permanent exporters and non-exporting firms increases.

$\gamma_3 - \gamma_2 > \phi_3 - \phi_2$, so the difference in productivity between firms that stay in the export market and quitters should increase.

3.2. Data sources and descriptive statistics

The empirical analysis is based on the Annual Industrial Survey carried out by the National Institute of Statistics of Uruguay (INE) for the years 1997 to 2006.⁵ The surveys cover manufacturing plants with more than 5 workers at the firm level. Each firm has a unique

⁵ In 1997 a Census was carried out.

identification number which allows following the firms over time. For each firm the INE collects data on production, value added, sales, employment,⁶ wages, exports, investments, capital, depreciation, energy usage, foreign ownership of capital among other variables. Further, each firm is classified by its main activity at the 4 digit ISIC level. Nevertheless they do not register exports by destination, so we use data from the National Direction of Customs and Uruguay XXI that has exports in value and country of destination, and merge these data to the INE database. All variables were deflated by specific price indexes.⁷

The countries of destination of exports were classified according to the level of development and the geo-economic region according the World Bank classification⁸ for each year.

To test the hypothesis of self-selection and learning by exporting we construct two broad categories: countries with a higher level of development than Uruguay –i.e. high income countries- and countries with similar or lower level of development than Uruguay –i.e. medium and low income countries. Furthermore, we classify countries according to the geo-economic region in the following groups: MERCOSUR, NAFTA, Other Latin American countries, European Union and Rest of the World.

3.3. General Features of the data

We have an unbalanced panel for the period 1997-2006 with 8,260 total observations and 1,330 manufacturing firms,⁹ of which 726 had export activity in the period according to data from the Customs Direction.¹⁰

From Table 1 it can be observed a high presence of exporting firms in the panel, with the highest presence in 2006 due to the fact that only the compulsory stratum was surveyed that year.

⁶ Further workers are classified as those in non-production activities and those in production activities, which is used to define the skill level.

⁷ The specific Price indexes were estimated and provided by Susana Picardo.

⁸ Countries are classified according to their income per capita as: OECD high income countries; non-OECD high income countries; medium-high income countries; medium-low income countries; and low income countries. Uruguay belongs to the medium-high income countries.

⁹ The number is lower in 2006 since only those firms with more than 50 workers and/or sales greater than 120 millions of pesos per year were surveyed (compulsory stratum).

¹⁰ There is a difference of 7.3 % lower if we take data from the INE.

Regarding to the destiny, it can be observed from Chart 1, a high participation of firms that have as main destination MERCOSUR's partners (62 % of exporting firms). After 2002 there is a reduction in the share of firms that export mainly to MERCOSUR's partners (52 %), and there is an increase in exports to the Nafta and the Rest of the World.

The amounts in value by destiny (Chart 2) to the MERCOSUR were in average 38 % of total exports per year, with a figure of 44 % for the period 1997-2001 and 30 % for the period 2003-2006. Thus since the beginning of the recession in 1999 there is a diversification in the destiny of exports that is further deepened after the 2002 crisis that hit the Uruguayan economy.

From Table 2 it can be observed that up to 1999 most exporting firms concentrate their exports to MERCOSUR's partners. After the 2002 crisis, there is a reduction in exports to MERCOSUR's countries, from 53 % for the period 1997-1999, to 36 % in 2002.

We find a similar behaviour when we analyse the share of exporting firms according to destination by level of economic development.

As can be observed in Table 3, most exporting firms target their sales towards the region, with this feature being more pronounced for the period 1997-2001. As was to be expected, most of the exports to richer countries are concentrated outside the region.

In Table 4 we report the association between exporting more of the 50 % of total exports to richer countries and outside the region. It can be observed that for the 98 % of the observations firms export to both richer countries and outside the region (834 observations).¹¹ On the other hand, when firms export outside the region, in 70 % of the cases the destination is to non-richer countries, while for 30 % of the observations firms export outside the region and to richer countries (348 observations).

¹¹ The coefficient of correlation is 0.91.

In Table 5 we present the main features according to whether the firms export or not, and if they export to richer or non-richer countries.¹² We can observe that exporting firms are bigger in terms of employment, value added and foreign ownership of capital, corroborating the findings of the empirical works for other countries. Further, there are significant differences if exports are mainly targeted to non richer countries or if they export to more developed (richer) countries.¹³

Those firms that have as destiny developed countries (more than 50 %) have a higher export propensity (55 %) than those that target their sales to less developed countries (20 %), while those firms that target less than 50 % of their exports to developed countries have an export propensity of 42 %.

To analyse entrants into exporting by destiny we define a dummy variable *entrich1* that takes the value of one if the firm did not export to rich countries in t-1 and export to richer countries in t. Further, we define the dummy variable *expnoricht-1* that takes the value of one if the firm exported only to less developed countries in t-1 and zero otherwise. The variable *entnorich1* is a dummy that takes the value of one if the firm did not export only to less developed countries in t-1 and export only to less developed countries in t; and the variable *expriicht-1* that takes the value of one if the firm exported to developed countries in t-1 and zero otherwise. In Table 6 and 7 we present the entrants to exporting to developed countries and the entrants to less developed countries.

In Table 6 we can observe that those firms that start exporting to developed countries in t, in 76 % of the cases exported in the previous period to less developed countries (241 observations), while only 24 % did not export in the previous year.

On the other hand from Table 7 we can observe that firms that start to export to less developed countries, in 53 % of the cases did not export in the previous year (235 observations).

¹² A similar analysis was conducted for export to the region or outside the region and throw out similar results. Results are available upon request.

¹³ Along the text we will refer to richer or developed countries as synonymous.

These features could point out that the firms that were previously domestically oriented –i.e. did not export- first acquire experience in less developed and close export markets (i.e. countries with lower entry costs), and after they gain experience they oriented their sales to developed destinations. Further, we can assume that entry costs are higher to developed countries compared to less developed and close export markets, thus past export experience could help to ease the entry to developed countries.¹⁴

4. Results

4.1. Premia

In Table 8 we present the estimation by Ordinary Least Squares. The first column shows the results without controlling for foreign ownership of capital and firms size, while in the second column we control for these variables, aside sectoral and time dummies. It can be observed that controlling for foreign ownership and size translates into a reduction in the exporting premium. In the second column the exporting premium is of 24.9 %. Furthermore, bigger and foreign owned firms are more productive than smaller and domestically owned firms.

To analyse the effect of destination on TFP, we first analyse if the premium is higher for those firms that export to developed countries –i.e. countries richer than Uruguay-. To this end we define the variable *exprich*, that is a dummy variable that takes the value of one if the firm exports to developed countries and zero otherwise. The premium of exporting to developed countries is equal to $\alpha_1 + \alpha_2$, while the premium of exporting to a country of similar or lower income per capita is equal to α_1 where α_1 is the coefficient of exporting status and α_2 is the coefficient of *exprich* (see equation 4).

Results are presented in Table 9.

We find that the coefficient of *exp* and *exprich* (α_1 and α_2 respectively) are positive and significant with values of 43.2% y de 7.3% respectively. Nevertheless, when we control for foreign ownership of capital and size, while α_1 is positive and significant, while α

¹⁴ Additionally we estimate a probit model to analyse the determinants of the probability of exporting to developed countries in period t , finding that the fact of exporting to less developed countries in $t-1$ has a positive and significant impact, and even higher than the size and lagged productivity. Results are available upon request.

loses significance. This would indicate that there is no premium for exporting to developed countries.

We also try a dummy variable named *exp rich > 50%*, that takes the value of 1 if the 50 % of exports are to countries richer than Uruguay and zero otherwise. In other words we try to see if there is a premium for concentrating most exports to developed countries. In this case we find that α_1 is positive and significant with a value of 23.1 %, while the coefficient for *exp rich > 50%* is positive and significant with a value of 8.86 %. This would be pointing out that those firms that concentrate their exports (more than 50 % of their exports) in developed countries have a higher productivity than other exporting firms. In Table 9 we present the results.

In order to analyse if productivity differentials between exporting firms are associated with geographical proximity of the destination country –and not with the level of development-, we estimate a regression including a dummy variable named *expoutreg*, that takes the value of one if the firm exports outside the region and zero otherwise. Results are presented in the first column of Table 10 and we find that the coefficient for the export status and exporting outside the region are positive and significant.¹⁵ Nevertheless when we control for foreign ownership of capital and size the coefficient for *expoutreg* is not significant. This result would point out that there is not a differential in productivity for exporting outside the region.

Results do not change if instead of including the variable *expoutreg*, we include the variable *expoutreg > 50%*, that takes the value of one if the firms sell more that 50 % of their exports to countries outside the region and zero otherwise. In the third column we include no controls for foreign ownership of capital and size while in the fourth we control for these variables. The results of both specifications seem to indicate that there is no evidence of higher productivity for those firms exporting outside the region.

¹⁵ The coefficients for *exp rich* and *expoutreg* are similar due to the high correlation between these variables.

Thus, the results would indicate that there is a premium for exporting, and that this premium is higher for those firms that concentrates more than the half of their exports in developed countries.

Therefore, when we distinguish destination by geographical proximity, we do not find evidence that targeting most of the exports outside the region translate into higher productivity. Thus, in what follows we will analyse the effect of destination of exports on self-selection and learning by exporting, according to the level of income of the countries of destination.

4.2. Transition groups

To analyse the hypothesis of self-selection and learning by exporting we use the methodology of transition groups, used by Aw et al (1998), Alvarez and Lopez (2005), da Costa Ferré (2008), and most recently by Verardi and Wagner (2012). Firstly, we test the hypothesis without taking into account the destination of exports. Then, we apply the same methodology but distinguishing the destiny of exports, according to their level of development. We consider the period 1997-2005, due to the fact that in 2006 only the compulsory stratum was surveyed by the INE.

Analysing the final year (t) we observe that all the estimated coefficient for the entrants (*ent*) and permanent (*perm*) firms are positive and significant. Thus, firms that enter into exporting markets and permanent exporters are more productive than those firms oriented towards the domestic market. Quitters (*quit*) are the firms that show lower levels of productivity. This suggests that exiting foreign markets is associated with a lower productivity of these firms. We present the results in Table 11.

When we analyse the initial year (t-s), we observe that the estimated coefficients for entrants are positive and significant, so the productivity of entrants is higher than for non-exporting firms even before breaking into foreign markets. Moreover, productivity of permanent firms is higher than for quitters and both have higher productivity than non-exporting firms. These results are consistent with the hypothesis of self-selection.

To analyse the hypothesis of learning by exporting we consider the initial year ($t-s$) and the final year (t) presented in Table 12 and 13 respectively. The results show that the productivity differential of entrants with respect to non-exporting firms increases in t with respect to $t-s$. Nevertheless, we do not observe an increase in productivity in permanent exporters, neither for quitters, as was to be expected. These results would indicate the existence of a learning process at the beginning of exporting, but not a learning process long after breaking into foreign markets. This result is consistent with the findings of Girma et al. (2004) using matching techniques for a panel of British firms.

We define the same four groups of firms as previously in non-exporting, entrants, quitters and permanent firms, but now we classify these groups according the main destination of exports into two groups: richer countries or countries that are similar or less rich than Uruguay.

The results for the initial year (Table 12) show that the coefficient for entrants is positive and significant in all the cases, regardless of the destination of exports. At its time, the coefficient for entrants to richer countries is positively significant and higher than for entrants to non richer countries for all the transitions groups. These results would indicate a process of self-selection, which is greater for entrants to richer countries, corroborating the hypothesis that to break into a more developed country higher levels of productivity are required in order to overcome the entry costs in these markets.

On the other hand, from the descriptive analysis we observe that exporters to richer countries are in average bigger (in terms of employment) than other exporting firms. This could suggest that to break into developed countries, aside reaching higher productivity, a higher production scale is required (being these variables determined simultaneously).

Regarding to the learning by exporting hypothesis we find that entrant and permanent firms that exported to richer countries do not seem to show increases in their

productivity levels. Thus, there is no evidence that firms after breaking into high income countries achieve significant increases in productivity.

On the other hand, analysing the evolution of the differentials in productivity of those firms that export exclusively to non richer countries, we find a similar behaviour to permanent exporters and firms that exported to richer countries (Table 13 and 14). Nevertheless, when we analyse entrants to non richer countries we find increases in productivity between the initial and the final year, for the intervals from one up to three years. This result is similar to the one found when we do not distinguish exports by destination. Summing up, gains in productivity in the first years of starting to export are associated with exports to non richer countries.

The explanation for these results could be associated with the strategy of internationalization of the firms. In this regard, firms could consider regional markets as the first market to break in due to geographic and cultural proximity, lower entry costs and trade agreements that make easier to enter and compete in these markets compared to other destinations (Vaillant and Cassoni, 1992). Thus, firms have a strategy of “learning to export” targeting their sales to closer markets with lower entry costs first.

Thus, firms gain experience and increase their productivity levels in regional markets. Once firms have acquired experience and become more productive in regional markets they can start a strategy of market diversification and enter into more exigent developed markets.

5. Concluding remarks

The main findings are that for the period 1997-2006, exporting firms exhibit higher productivity levels than non exporting ones, consistently with the national and international evidence. Moreover, there is evidence that the differentials in productivity are higher for those firms that have as main destination developed countries. These firms are characterised by higher export propensity and size with respect to those firms exporting to markets of similar or lower level of development than Uruguay.

Analysing causal relationships by means of transition groups show that self-selection helps to explain the higher productivity of exporting firms. To break into developed countries higher productivity seems to be a prerequisite. This, would indicate that entry barriers into foreign countries are higher, the higher the level of development of the country of destination.

On the other hand, there is no evidence of permanent gains in productivity through learning by exporting, but there are gains in productivity in the first years after entering into foreign markets. This result is also consistent with the empirical literature.¹⁶

Furthermore, there is no evidence that exporting to developed countries enhances firms' productivity. By the contrary, the evidence shows that learning by exporting is achieved by exporting to similar or less developed countries. Thus, learning by exporting is verified in the first years after starting exporting activities and towards countries with low trade costs.

Finally, there is also some evidence that size is an important factor to overcome sunk entry costs into foreign markets, in particular to developed countries. In this regard, industrial policies aimed at facilitating entry to foreign markets, and in particular for small and medium enterprises, would be important in helping firms to face the challenges of entering export markets, and could help to enhance their productivity.¹⁷

These finding also raise other related questions that are in our agenda, such as which type of goods do we sell by destination, and how do exports impacts on employment and skills. In this regard there is evidence that firms that enter into developed countries employ not only more workers, but also more skilled labour force. On the other hand, there are some studies that show that exporting firms offer better job conditions. To go deep into these issues, analysing causal relations is important if the objective is to improve the standard of living of the citizens of the country.

¹⁶ For instance, Girma et al. (2004) using matching techniques find gains up to three years after breaking into foreign markets.

¹⁷ In Uruguay there are some examples of these policies, such as "Exporta Facil", which is aimed at reduce the management costs to small and medium enterprises.

References

- Aghion, P., Blundell, R., Griffith, R., Howitt, P. and Prantl, S., 2009. The effects of entry on incumbent innovation and productivity. *The Review of Economics and Statistics*, 91(1), pp.20–32.
- Aghion, P. & Howitt, P., 1992. A Model of Growth through Creative Destruction. *Econometrica*, 60(2), pp.323–351.
- Alvarez, R. & López, R.A., 2005. Exporting and performance: evidence from Chilean plants. *Canadian Journal of Economics/Revue canadienne d'économique*, 38(4), pp.1384–1400.
- Aw, B.Y., Chung, S. & Roberts, M.J., 2000. Productivity and turnover in the export market: micro-level evidence from the Republic of Korea and Taiwan (China). *The World Bank Economic Review*, 14(1), p.65.
- Aw, B-Y & Hwang, A. R., 1995. Productivity and the export market: A firm-level analysis. *Journal of Development Economics*, 47(2):313-332.
- Bernard, A.B. & Jensen, J. B., 1999. Exceptional exporter performance: cause, effect, or both? *Journal of international economics*, 47(1), pp.1–25.
- Bernard, A.B. & Wagner, J., 1997. Export entry and exit by German firms. *Weltwirtschaftliches Archiv*, 133(1):134-157
- Bernard, A.B. & Jensen, J.B., 2004. Exporting and Productivity in the USA. *Oxford Review of Economic Policy*, 20(3), pp.343–357.
- Bittencourt, G. & Vaillant, M., 2001. Oferta exportable en Uruguay. Empresas: ¿ Quiénes venden. *Documento de trabajo, mimeo, Departamento de Economía, FCS, UDELAR, Montevideo.*
- Boermans, M.A., 2010. Learning-by-Exporting and Destination Effects: Evidence from African SMEs. HU Business School; Hogeschool Utrecht University of Applied Science, The Netherlands. Munich Personal RePEc Archive. [Online] Available at: <http://mpira.ub.uni-muenchen.de/22658>.
- Clerides, S.K., Lach, S. & Tybout, J.R., 1998. Is Learning by Exporting Important? Micro-Dynamic Evidence from Colombia, Mexico, and Morocco. *Quarterly Journal of Economics*, 113(3):903-947.
- da Costa Ferré, L., 2008. Diferenciales de productividad según orientación exportadora de las empresas: ¿se cumple la autoselección y el aprendizaje? Documento de Trabajo No. 07/08, Departamento de Economía, Facultad de Ciencias Sociales, UDELAR, Uruguay.
- Delgado, M.A., Farinas, J.C., Ruano, S., 2002. Firm productivity and export markets: a non-parametric approach. *Journal of International Economics*, 57(2):397-422.
- De Loecker, J. 2007. Do Exports generate higher productivity? Evidence from Slovenia. *Journal of International Economics*, 73(1): 69-98.
- Eaton, J., Kortum, S. & Kramarz, F., 2008. *An anatomy of international trade: Evidence from French firms*, National Bureau of Economic Research. Available at: <http://www.nber.org/papers/w14610> [Accedido febrero 11, 2013].
- Girma, S., Greenaway, D. & Kneller, R., 2004. Entry to export markets and productivity: A microeconomic analysis of matched firms. *Review of International Economics*, 12(5), pp.855–866.
- Granér, M. & Isaksson, A., 2009. Firm efficiency and the destination of exports: evidence from Kenyan plant-level data. *The Developing Economies*, 47(3), pp.279–306.

- Griffith, R., Redding, S. & Reenen, J., 2004. Mapping the two faces of R&D: Productivity growth in a panel of OECD industries. *Review of Economics and Statistics*, 86(4), pp.883–895.
- Grossman, G.M.H. & Helpman, E., 1991. *E.(1991), «Innovation and Growth in the Global Economy»*, Cambridge (Massachusetts), MIT Press.
- Isgut, A. & Fernandes, A., 2007. Learning-by-Exporting Effects: Are They for Real? Available at: <http://mpira.ub.uni-muenchen.de/3121/> [Accedido abril 28, 2010].
- Isgut, A. & Fernandes, A., 2005. Learning by doing, Learning by Exporting and Productivity: Evidence from Colombia. Development Research Group, The World Bank, Washington DC.
- Kraay, A. 1999. Exportations et Performances Economiques: Etude d'un Panel d'Entreprises Chinoises. *Revue d'Economie du Developpement* 0 (1-2), 183-207.
- Levinsohn, J.A. & Petrin, A., 2003. Estimating Production Functions Using Inputs to Control for Unobservables. *Journal of Development Economics*, 70, pp.317-341.
- Melitz, M., 2003. The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica*, 71(6), pp.1695–1725.
- Melitz, M.J. & Ottaviano, G.I., 2008. Market size, trade, and productivity. *Review of Economic studies*, 75(1), pp.295–316.
- Mukim, M., 2011. *Does exporting increase productivity? Evidence from India*, LSE working papers. Available at: http://personal.lse.ac.uk/mukim/mukim_jmp.pdf [Accedido septiembre 29, 2012].
- Peluffo, A. 2010. Trade liberalization and manufacturing performance: the Uruguayan case. Antwerpen: Universiteit Antwerpen. Faculteit Toegepaste Economische Wetenschappen, 2010-211 p. Thesis. ISBN 978-90-8994-028-5.
- Pisú, M., 2008. *Export destinations and learning-by-exporting: Evidence from Belgium*, National Bank of Belgium. Available at: <http://papers.ssrn.com/sol3/Delivery.cfm?abstractid=1685184> [Accedido septiembre 1, 2012].
- Romer, P.M., 1986. Increasing returns and long-run growth. *The Journal of Political Economy*, pp.1002–1037.
- Trofimenko, N., 2008. Learning by Exporting: Does It Matter Where One Learns? Evidence from Colombian Manufacturing Firms. *Economic Development and Cultural Change*, 56(4), pp.871-894.
- Vaillant, M. & Cassoni, A. 1992. Estrategias Empresariales y desempeño exportador. Documento de Trabajo No. 01/92. Departamento de Economía, Facultad de Ciencias Sociales, UDELAR, Uruguay.
- Verardi, V. & Wagner, J., 2012. Productivity Premia for German Manufacturing Firms Exporting to the Euro-Area and Beyond: First Evidence from Robust Fixed Effects Estimations. *The World Economy*. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9701.2011.01414.x/full> [Accedido febrero 17, 2013].
- Wagner, J., 2007. Exports and productivity: a survey of the evidence from firm-level data. *The World Economy*, 30(1), pp.60–82.

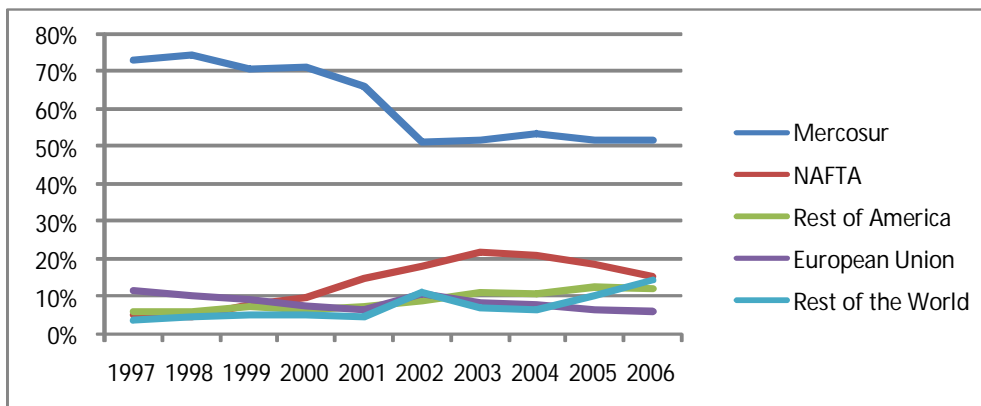
Exports and productivity: Does destination matter?

Table 1: Number of firms per year

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Non-exporting firms	525	420	436	403	479	452	482	485	491	135
Exporting firms	428	440	406	388	381	353	399	402	438	317
Exporting firms (%)	45%	51%	48%	49%	44%	44%	45%	45%	47%	70%
Total number	953	860	842	791	860	805	881	887	929	452

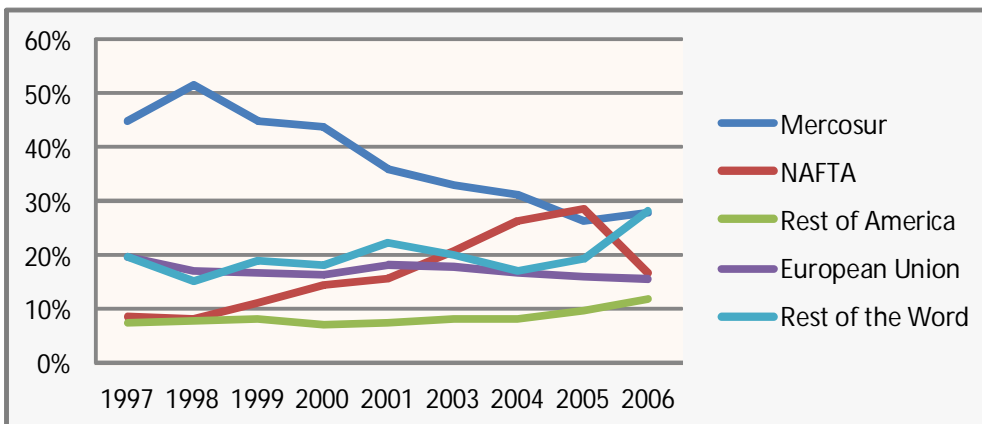
Source: own elaboration based on data of the INE and Dirección Nacional de Aduanas.

Chart 1: Firms by destination (% of exporting firms)



Source: Own elaboration based on data of the INE and Dirección Nacional de Aduanas.

Chart 2: Exports by destination (% of total exports in value)



Source: Own elaboration based on data of the INE and Dirección Nacional de Aduanas.

Table 2: Firms according to main destiny (to the region or outside the region)

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Non-exporting outside the region	229	234	211	191	181	128	151	157	171	100
Non-exporting outside the region (% of exporting firms)	54%	53%	52%	49%	48%	36%	38%	39%	39%	31%
Exports <50% outside the region	104	115	99	108	96	86	100	100	107	101
Exports <50% outside the region (% of exporting firms)	24%	26%	24%	28%	25%	24%	25%	25%	24%	32%
Exports >50 % outside the region	95	91	96	89	104	139	148	145	160	116
Exports >50 % outside the region (% of exporting firms)	22%	21%	24%	23%	27%	39%	37%	36%	37%	37%
Total exporting firms	428	440	406	388	381	353	399	402	438	317

Source: Own elaboration based on data of the INE and Dirección Nacional de Aduanas.

Table 3: Exporting firms according to the destination of exports (richer and non-rich countries)

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Export only to non-rich countries	247	253	230	217	210	157	185	189	212	125
Export only to non-rich (% exporting firms)	58%	58%	57%	56%	55%	44%	46%	47%	48%	39%
Export to rich countries<50%	98	104	96	104	92	106	110	116	129	127
Export to rich countries<50% (% exporting firms)	23%	24%	24%	27%	24%	30%	28%	29%	29%	40%
Export to rich countries>50%	83	83	80	67	79	90	104	97	97	65
Export to rich countries>50% (% exporting firms)	19%	19%	20%	17%	21%	25%	26%	24%	22%	21%
Total exporting firms	428	440	406	388	381	353	399	402	438	317

Source: Own elaboration based on data of the INE and Dirección Nacional de Aduanas.

Table 4: Number of observations according to destination

	Export<50% to rich countries	Export>50% to rich countries	Total
Export < 50% outside the region	2760	10	2770
Export>50% outside the region	348	834	1182
Total	3108	844	3952

Source: Own elaboration based on data of the INE and Dirección Nacional de Aduanas

Table 5: Characteristics of firms according to the destiny of exports

	Non-exporting	Exporting firms	Export only to non-rich countries	Export < 50 % to rich countries	Export>50% to rich countries
Number of workers	42	132	89	188	174
Value Added (thousands of constant pesos)	8,030	44,538	29,514	76,713	42,345
Exports/Sales		0.33	0.2	0.42	0.55
Multinational firms	6%	19%	16%	23%	17%

Source: Own elaboration based on data of the INE and Dirección Nacional de Aduanas

Table 6: Entrants to developed countries

	Entrant to rich country in t	Non-entrant to rich country in t	Total No. Obs.
Export only to non-rich countries in t-1	241	1524	1765
Non-exporting in t-1	76	6419	6495
Total number of observation	317	7943	8260

Source: Own elaboration based on data of the INE and Dirección Nacional de Aduanas

Table 7: Entrant to less developed countries

	Entrant to non-rich country in t	Non-entrant to non-rich country in t	no es entrante a mercado rico en t	No. of Observations
Exporting to rich countries in t-1	211		1434	1645
Non-exporting in t-1	235		6380	6615
Total number of observations	446		7814	8260

Source: Own elaboration based on data of the INE and Dirección Nacional de Aduana

Table 8: Exporting premium

VARIABLES	lnTFP	lnTFP
Exp	0.464*** (0.0228)	0.249*** (0.0254)
Medium		0.288*** (0.0278)
Big		0.398*** (0.0308)
Foreign		0.395*** (0.0360)
Sectoral dummies	Yes	Yes
Time dummies	Yes	Yes
Observations	6,306	6,113
R squared	0.273	0.308

Standard errors in brackets; *** p<0.01, ** p<0.05, *p<0.1

Table 9: Premium for exporting to high income countries

VARIABLES	lnTFP	lnTFP	lnTFP	lnTFP
Exp	0.432*** (0.0269)	0.243*** (0.0284)	0.448*** (0.0240)	0.231*** (0.0264)
Exprich	0.0730** (0.0324)	0.0161 (0.0322)		
Exprich>50%			0.0886** (0.0409)	0.0943** (0.0401)
Medium		0.288*** (0.0278)		0.289*** (0.0278)
Big		0.396*** (0.0311)		0.400*** (0.0308)
Foreign		0.395*** (0.0360)		0.394*** (0.0360)
Sectoral dummies	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Observations	6,306	6,113	6,306	6,113
R-squared	0.274	0.308	0.274	0.309

Standard errors in brackets; *** p<0.01, ** p<0.05, *p<0.1

Table 10: Premium for exporting outside the region

VARIABLES	lnTFP	lnTFP	lnTFP	lnTFP
Exp	0.426*** (0.0280)	0.239*** (0.0289)	0.453*** (0.0245)	0.235*** (0.0265)
Expoutreg	0.0758** (0.0323)	0.0215 (0.0318)		
Expoutreg>50%			0.044 (0.0378)	0.0538 (0.0368)
Medium		0.287*** (0.0276)		0.288*** (0.0276)
Big		0.395*** (0.0308)		0.398*** (0.0305)
Foreign		0.395*** (0.0359)		0.395*** (0.0359)
Sectoral dummies	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Observations	6,306	6,113	6,306	6,113
R squared	0.274	0.308	0.273	0.308

Standard errors between brackets ; *** p<0.01, ** p<0.05, *p<0.1

Table 11: Productivity differentials according to the permanence in the exporting market

Type of transition	Last year			
	1 year	2 years	3 years	4 years
VARIABLES	lnTFP	lnTFP	lnTFP	lnTFP
ent	0.344*** (0.0611)	0.377*** (0.0730)	0.365*** (0.0825)	0.402*** (0.0898)
quit	0.182*** (0.0669)	0.208*** (0.0705)	0.122 (0.0789)	0.131 (0.0922)
perm	0.300*** (0.0572)	0.293*** (0.0626)	0.291*** (0.0698)	0.280*** (0.0795)
medium	0.262*** (0.0539)	0.250*** (0.0593)	0.242*** (0.0656)	0.228*** (0.0732)
big	0.283*** (0.0667)	0.304*** (0.0720)	0.309*** (0.0789)	0.289*** (0.0882)
foreign	0.653*** (0.0859)	0.683*** (0.0893)	0.678*** (0.0963)	0.679*** (0.105)
constant	10.19*** (0.0375)	10.17*** (0.0397)	10.16*** (0.0439)	10.13*** (0.0493)
Observations	4,905	4,150	3,415	2,733
R-squared	0.117	0.114	0.105	0.092

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors between brackets.

Exports and productivity: Does destination matter?

Table 12: Productivity differentials according to the permanence in the exporting market

Type of transition VARIABLES	Initial year			
	1 year lnTFP	2 years lnTFP	3 years lnTFP	4 years lnTFP
ent	0.267*** (0.0618)	0.297*** (0.0664)	0.282*** (0.0669)	0.371*** (0.0560)
quit	0.232*** (0.0616)	0.210*** (0.0669)	0.174*** (0.0660)	0.173*** (0.0654)
perm	0.356*** (0.0551)	0.361*** (0.0548)	0.364*** (0.0559)	0.347*** (0.0547)
medium	0.227*** (0.0515)	0.237*** (0.0494)	0.174*** (0.0506)	0.206*** (0.0506)
big	0.267*** (0.0625)	0.265*** (0.0631)	0.234*** (0.0636)	0.258*** (0.0638)
foreign	0.589*** (0.0835)	0.591*** (0.0805)	0.591*** (0.0780)	0.556*** (0.0795)
constant	10.22*** (0.0376)	10.25*** (0.0386)	10.34*** (0.0390)	10.39*** (0.0383)
observations	4,743	4,032	3,369	2,833
R squared	0.125	0.135	0.145	0.166

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors between brackets.

Table 13: Differentials in productivity by destination

Type of transition VARIABLES ¹⁸	Final year			
	1 year lnTFP	2 year lnTFP	3 year lnTFP	4 year lnTFP
entrich	0.347*** (0.0800)	0.269*** (0.0990)	0.354*** (0.101)	0.308*** (0.104)
quitrich	0.224*** (0.0712)	0.239*** (0.0815)	0.195** (0.0876)	0.0888 (0.124)
permrich	0.196** (0.0868)	0.193** (0.0949)	0.152 (0.110)	0.144 (0.126)
entnorich	0.272*** (0.0577)	0.264*** (0.0718)	0.298*** (0.0779)	0.326*** (0.0984)
quitnorich	0.0994 (0.0649)	0.0744 (0.0670)	0.0536 (0.0775)	0.0574 (0.0827)
permmorich	0.326*** (0.0576)	0.328*** (0.0649)	0.332*** (0.0730)	0.346*** (0.0842)
medium	0.261*** (0.0538)	0.251*** (0.0594)	0.239*** (0.0656)	0.227*** (0.0732)
big	0.300*** (0.0680)	0.318*** (0.0732)	0.333*** (0.0801)	0.310*** (0.0892)
foreign	0.647*** (0.0846)	0.671*** (0.0881)	0.664*** (0.0941)	0.670*** (0.102)
constant	10.19*** (0.0373)	10.18*** (0.0395)	10.16*** (0.0433)	10.14*** (0.0486)
Observations	4,905	4,150	3,415	2,733
R squared	0.120	0.116	0.109	0.094

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors between brackets.

Table 14: Differentials in productivity according to destination and permanence in export markets

Type of transition Variables	Initial year			
	1 year lnTFP	2 years lnTFP	3 years lnTFP	4 years lnTFP
entrich	0.306*** (0.0705)	0.312*** (0.0685)	0.344*** (0.0746)	0.302*** (0.0695)
quitrich	0.215*** (0.0797)	0.171* (0.0887)	0.208** (0.0928)	0.0324 (0.103)
permrich	0.268*** (0.0805)	0.267*** (0.0811)	0.239*** (0.0813)	0.259*** (0.0781)
entnorich	0.226*** (0.0611)	0.243*** (0.0705)	0.173** (0.0847)	0.345*** (0.0607)
quitnorich	0.212*** (0.0586)	0.181*** (0.0577)	0.155** (0.0629)	0.161*** (0.0590)
permnorich	0.389*** (0.0560)	0.402*** (0.0568)	0.413*** (0.0566)	0.378*** (0.0566)
medium	0.229*** (0.0515)	0.241*** (0.0496)	0.179*** (0.0510)	0.206*** (0.0507)
big	0.289*** (0.0638)	0.291*** (0.0648)	0.273*** (0.0659)	0.278*** (0.0650)
foreign	0.584*** (0.0826)	0.583*** (0.0802)	0.587*** (0.0770)	0.552*** (0.0795)
constant	10.21*** (0.0378)	10.25*** (0.0389)	10.34*** (0.0386)	10.40*** (0.0377)
Observations	4,743	4,032	3,369	2,833
R squared	0.127	0.136	0.145	0.169

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors between brackets.