

Does the partial year effect invalidate the evidence on new exporters?

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Abstract

The literature shows that new exporters have small levels of exports relative to regular exporters upon entry, and, if they survive, they have very high export growth rates between the entry year and the next year. However, a recent paper by Bernard et al. (2014), using Peruvian data, has shown that these empirical facts might be biased by the partial year effect: firms that start to export late during the year have a lower level of exports upon entry and a higher growth rate between the entry year and the next year. In this paper, we test the partial year effect for Spain, a country with a much larger number of exporters and a more diversified export structure than Peru. We confirm that the partial year undervalues entry levels and overvalues growth rates. However, despite these adjustments, new exporters still have much lower export values and much higher growth rates than regular exporters.

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1. Introduction

The empirical literature on the dynamics of firm-level exports points out that new exporters have a small level of exports relative to incumbent exporters. In addition, the surviving new exporters have much larger growth rates between the initial year and the second year than regular exporters (Buono and Fandinger, 2012; Eaton et al. 2008; Fernandes et al., 2013; Lawless, 2009). Motivated by these empirical findings, scholars have developed theoretical models that introduce uncertainty and learning to explain these empirical regularities (Albornoz et al., 2012; Eaton et al., 2011).

However, as recently argued by Bernard et al. (2014), the stylized facts on the dynamics of new exporters might be biased by a statistical artifact: the partial year effect. This effect arises because most researchers, due to limitations in the data, use the calendar year to determine the amount of annual exports.¹ If firms began to export in January, total exports in the first twelve months and total exports in the first calendar year would be the same. However, it is likely that firms start exporting in a month different to January. In this case, the total annual exports in the first calendar year might undervalue the amount of exports in the first twelve months, and overestimate the growth in exports between the first export year and the second export year. Using Peruvian data, Bernard et al. (2014) conclude that the partial year effect leads to an underestimate of more than 60% the average level of first-year exports and an overestimate of 121 percentage points of the exports growth rate between the first and the second year.

In this paper we replicate the Bernard et al. (2014) exercise using Spanish data. The replication is interesting for three reasons. First, Bernard et al. (2014) is the only paper that has estimated the partial year effect and, at this point, there is a high marginal value confirming whether the partial year effect bias is prevalent in other countries.² Second, the number of new exporters in Spain is much larger than in Peru. A larger sample ensures the robustness of results and allows the calculation of both market-specific and overall partial year effects. Third, Spanish trade specialization is very different to the Peruvian trade

¹ Two exceptions are Berthou and Vicard (2013) and Blum et al. (2013).

² Berthou and Vicard (2013) also compute the partial-year effect using data for French firms. Their partial effect estimates are much lower than those calculated by Bernard et al. (2014). However, the results are not fully comparable due to differences in the definition of new exporters.

specialization, which allows us to identify whether the bias is related to industry characteristics, such as the average number of export operations.

As in Bernard et al. (2014), we also find that the partial year effect leads to an increase in entry value of new exporters and attenuates the growth rate of new exporters between the initial and the second year. However, despite these adjustments, new exporters have still a much lower entry value than regular exporters and their growth rate between the initial and the second year is much larger than for regular exporters.

2. Estimating the bias

The empirical analyses are carried out using monthly data drawn from the Customs and Excise Department of the Spanish Revenue Agency. This database includes all Spanish firms that carried out foreign trade transactions between 2002 and 2012.³ For each firm we create two measures of annual exports. The first measure adds up monthly transactions during the calendar year (calendar value). The second measure sets the start of the year in the month where the first export operation took place; the annual value is the sum of the transactions in that month and the following eleven months (initial month adjusted value).⁴

As in Bernard et al. (2014), the first empirical analysis focuses on the evolution of the export value for new exporters and for firms that cease to export. To be included in the sample a firm has to export consecutively during four years and has to enter or exit the foreign market, but not both. As our database starts in 2002 and finishes in 2012, the first new exporters are born in 2003, and the last new exporters are born in 2009; the first firms exiting the market are identified in 2006, and the last in 2011. It should be stressed that we

³ A detailed explanation of the data set can be found in de Lucio et al. (2011).

⁴ Note that fixing the start of the period in the month in which the firm performs the first export operation might lead to an overestimation of the export value during the first twelve months. For example, if a firm only exports once per calendar year, and the month in which the firm exports is random, fixing the start of the period in the month where the first export operation takes place raises the probability that the export operation belonging to the second calendar falls as well within the first twelve months period.

do not know whether the firms identified as new exporters exported before 2002.⁵ Our sample includes 11,844 new regular exporters and 11,984 firms that exit foreign markets.

In the first empirical analysis we compare the value of exports in the initial three years after export entry to export levels in subsequent years; and the value of exports in the three years previous to exit the export market compared with earlier years. For entry and exit, our aim is to determine the differences between the values calculated with the calendar year and the values adjusted for initial month.

Following Bernard et al. (2014), we estimate the following regression:

$$\ln X_{it} = \sum_{n=0}^2 \delta_{i,t-n}^{entry} + \sum_{m=1}^3 \delta_{i,t+m}^{exit} + \delta_i + \delta_t + \varepsilon_{it} \quad (1)$$

where X_{it} are exports of firm i at year t , $\sum_{n=0}^2 \delta_{i,t-n}^{entry}$ takes the value of 1 if firm i begins to export at year $t-n$ and zero otherwise, and $\sum_{m=1}^3 \delta_{i,t+m}^{exit}$ takes the value of 1 if firm i exits foreign markets at year $t+m$. Hence, there is a dummy variable for the entry year, for the first year after entry and for the second year after entry; and a dummy variable for the year before exiting the export market, two years before exiting and three years before exiting. In the case of new exporters, the omitted category are all the years after the third year of exporting; for exiting exporters, the omitted categories are all the years before the last three years of exporting. The regression includes year and firm fixed effects. Hence, the dummy variable $\delta_{i,t}^{entry}$ is the log value of exports in the entry year relative to the average value of exports after three years of exporting; the dummy variable $\delta_{i,t+1}^{exit}$ is the log export value of firm i relative to the average value of exports before the last three years of exporting.

We estimate two different versions of regression (1). The first regression uses calendar annual exports as the dependent variable and the second regression uses the initial-month adjusted annual exports as dependent variable. We run two sets of regressions. The first set considers the whole foreign market. In this set, new exporters are firms that start to export to any export market, and exiting exporters that cease to export to all foreign markets. In the second set we only consider a specific market, France, which constitutes the

⁵ We carried out additional empirical analysis demanding more stringent conditions to consider a firm as a new exporter. In particular we demanded that, at least, the firm did not export before 2004 (2 years) and before 2005 (3 years): The results of the empirical analyses were not altered.

most important foreign market for Spanish firms. In this second set, new exporters are firms that start to export to France and exiting firms are firms that leave the French market.

Columns 1 and 2 of Table 1 report the estimates of the regression analyses when all markets are considered. Results for calendar annual exports show that at the entry year the value of exports is only 24% of the average value of exports after three years of exporting ($\exp(-1.41)$). During the second year of exporting the average value rises to 56% ($\exp(-0.58)$) and during the third year it further rises to 75% ($\exp(-0.29)$). For firms that cease to export, results show that the value of exports, relative to the value of exports before the last three years of exporting, declines as firms approach their final year of exporting. In particular, three years before exiting the export value represents 72% of the average value, two years before 51% of the average value and one year before only 17% of the average value.

When the regression is estimated with the initial-month adjusted annual exports we also observe that the initial value of exports is lower than the average; however, the differences are much lower than those calculated with calendar annual exports. The initial value of exports is now 52% of the average value after three years of exporting (vs. 24% in calendar), the second year 65% of the average value (vs. 56% in calendar) and the third year 81% of the average value (vs. 75% in calendar). Hence, there is a large increase in the initial value of exports when initial-month adjusted annual exports are used. Results also indicate large differences for firms that cease to export when using initial-month adjusted annual exports. According to the new coefficients, the last year the value of exports is 37% of the average value before the last three years of exporting (vs. 17% in calendar), two years before exit 57% of the average value (vs. 51% in calendar) and three years before exit 76% of the average value (vs. 72% in calendar).

Focusing on the export growth rate, according to the calendar values, exports grow 83 log points ($-0.58 - (-1.41)$) or 129% between the initial year and the second year, 34% between the second year and the third year, and 32% between the third year and the fourth year. These growth rates are severely reduced when the initial-month adjusted data is used: between the initial year and the second year exports grow 26%, between the second year and the third year 25%, and between the fourth year and the third year 23%. Regarding

firms that cease to export, based on initial-month adjusted values, the reduction in exports between four years before exit and the three years before exit is 24% (vs. 28% in calendar), between three and two 24% (vs. 29% in calendar) and between two and the last year 36% (vs. 66% in calendar).

Our results are very similar to those obtained Bernard et al. (2014). They find that the average value of Peruvian exporters in the initial year increases from 25% of the average value to 54% of the average value when adjusted annual exports are used instead of calendar annual exports. Our results, which report an increase from 24% to 52%, are almost identical. Bernard et al (2014) also find that the exports growth rate between the initial and the second year reduces from 146% to 25% when adjusting for initial-month values; we report a similar drop: from 129% to 26%. Results are also similar for firms exiting the export market.

To sum up, we find that using initial-month adjusted annual exports raises the initial value of exports and reduces the exports growth rate between the initial year and the second year. However, despite these adjustments, it is important to stress that the export value in the initial year of new exporters, even when it is adjusted for the partial year effect, still represents a small share of the average value of regular exporters: 31%.⁶ In addition to that, the average growth rate of new exporters between the entry and the second year (29%) is 27 percentage points higher than the average growth for regular exporters (2%). Hence, although the partial year effect attenuates the more extreme figures estimated with calendar values, it still yields results supporting models predicting that new exporters will start with low values, and if they obtain profits in the foreign market, will grow fast between the entry year and the following year.

Columns 3 and 4 of Table 1 present the results when we do the analysis for a specific market: France. As before, controlling for the partial year effect leads to a large increase in the initial value. However, now the value of exports at the entry year is larger both when it is measured with calendar values (37% vs. 24%) or initial-month adjusted values (65% vs. 52%). The estimations for France confirm that the growth rate between the initial and the second year of exporting are severely reduced when controlling for the

⁶ Regular exporters are defined as firms that export during the whole 2002-2012 period.

partial year effect: from 79% with calendar values to 11% with adjusted values. Nevertheless, these growth rates are also lower than those estimated for new exporters in all markets. Conclusions are similar for firms that exit the French export market: the export value in the last year of exporting is much higher when controlling for the partial year effect (46% vs. 24%) and these values are higher than those estimated for all markets. When compared with regular exporters, and after adjusting for the partial year effect, the value of entry of new exporters is still 40% of the average value of regular exporters; new exporters also yield a growth rate which is 9 percentage points higher than the average growth for regular exporters to France (11% vs. 2%).

In order to test the robustness of our results, we estimate the partial-year effect establishing less stringent conditions to consider a firm as a new exporter. In particular, we define as a new exporter a firm that did not export in $t-1$, and exports in t and in $t+1$.⁷ Our estimations conclude that the entry value of exports rises by 74% when adjusted by initial-month, and there is a 75 log points difference between the calendar value growth rate and the adjusted value growth rate. We also compare the value of exports for new exporters with the value of exports of regular exporters, defined as firms that export in $t-1$, t and $t+1$. Based on the calendar value, the average export value of new exporters during the period 2002-2012 only represents 13% of the average value of regular exporters; when the average value of exports of new exports is adjusted for initial month the share rises to 23%.

We also perform the robustness check for firms that enter the French market. We find that the entry value of exports rises by 47% when adjusted by initial-month, and there is a 65 log points difference between the calendar value growth rate and the adjusted value growth rate. Comparing to regular exporters, using calendar values, the average export value of new exporters during the period 2002-2012 only represents 29% of the average value of regular exporters; when the average value of exports of new exports is adjusted for initial month the share rises to 42%.

⁷ Intermittent exporters are excluded from the analysis.

4. Conclusions

New exporters might start exporting during any month in the year. Not controlling for the initial month might lead to an underestimation of the value of exports in the entry year and to an overestimation of the growth rate between the initial year and the next year. Using Spanish Customs firm-level monthly data, we show that the calendar year underestimates the exports value by 54% at entry and overestimates by 103 percentage points the growth rate between the initial year and the next year. However, despite these adjustments, new exporters have still much lower entry values than regular exporters and their growth rate between the initial and the next year is much larger than the average growth for regular exporters. Hence, the partial year effect does not invalidate the empirical regularities that motivate the new models on export dynamics.

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Table 1. Export levels for new regular exporters and regular exporters that cease to export

	All markets		France	
	Calendar (1)	Adjusted (2)	Calendar (3)	Adjusted (4)
First year	-1.41*** (0.03)	-0.66*** (0.03)	-0.99*** (0.04)	-0.43*** (0.04)
Second year	-0.58*** (0.02)	-0.43*** (0.02)	-0.41*** (0.04)	-0.33*** (0.03)
Third year	-0.29*** (0.02)	-0.21*** (0.02)	-0.21*** (0.03)	-0.18*** (0.03)
1 year before exit	-1.76*** (0.03)	-1.00*** (0.03)	-1.42*** (0.04)	-0.78*** (0.03)
2 years before exit	-0.67*** (0.02)	-0.56*** (0.02)	-0.54*** (0.03)	-0.45*** (0.02)
3 years before exit	-0.33*** (0.02)	-0.28*** (0.02)	-0.26*** (0.02)	-0.21*** (0.02)
Observations	160,421	160,421	50,056	50,056
Number of firms	23,828	23,828	7,423	7,423
Adjusted- R ²	0.80	0.80	0.79	0.80

Note: The estimation includes firm and year fixed effects. Standard errors clustered by firm in parentheses. *** statistically significant at 1%.