A note on firm age and the margins of imports:

First evidence from Germany

by

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WORKING PAPER

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Abstract:

This note uses a new tailor-made data set to investigate the link between firm age and the extensive margins of imports empirically for the first time for Germany. Results turn out to be fully in line with the theoretical considerations. Older firms are more often importers, import more different goods, and import from more different countries of origin.

Keywords: Imports, firm age, import margins, Germany

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1. Motivation

In their comprehensive empirical study of firms in the US that trade goods Bernard et al. (2005: 5) noted that "there is virtually no research documenting and analyzing importing firms". Ten years later, this is no longer the case. For more and more countries data (usually based on transactions recorded by customs) on the imports of firms become available that are used to describe the patterns of imports and to investigate empirically the links between various dimensions of firm performance (e.g., survival, productivity, profitability) and the margins of imports (participation in imports, number of imported goods, number of countries of origin).[1]

To the best of my knowledge, the role of firm age for the margins of imports is not discussed in this literature. This comes as a surprise because we can expect that firm age and the margins of import tend to be closely related. Although some new firms are "born global" firms that start to source on international markets from the start, typically it takes years before firms eventually import from one foreign market, and then enter other markets progressively. Firms gain expertise in entering new foreign markets from experience and this lowers the fixed costs of entry to any further new market over the next years (see Sheard 2014: 536 with regards to exports). A similar argument can be made with regard to the number of products imported.

At any point in time, therefore, firm age and the margins of imports can be expected to be closely linked. This notes tests this hypothesis, using unique newly available data for Germany.[2]

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[1] See Wagner (2012) for a review of this literature.

[2] See Wagner (2014) for a study on the links between firm age and the margins of exports.

2. Data and measurement issues

The empirical investigation here uses a tailor-made data set that combines for the first time high quality firm-level data from three official sources. The first source of firm level information is the regular survey of establishments from manufacturing industries by the Statistical Offices of the German federal states. The survey covers all establishments from manufacturing industries that employ at least twenty persons in the local production unit or in the company that owns the unit. Participation of firms in the survey is mandated in official statistics (see Malchin and Voshage (2009) for details). For this study establishment data were aggregated to the enterprise level to match the unit of observation in the other data sources (described below). From this survey information is used on the age of a firm and its detailed industry affiliation.

The second source of data is the German Turnover Tax Statistics Panel (described in detail in Vogel and Dittrich 2008). This data set is based on the yearly turnover tax; all enterprises with a turnover that exceeds the rather low threshold of 17,500€ are covered in the data. This data set can be used to identify firms that were importers in a year. Details aside, this is due to two reasons. First, firms that imported from non-EU member countries had to pay an import turnover tax charged by the customs authorities that is deductible as input tax and therefore reported in the data set. Second, imports from EU-member countries are reported under the item of "intra Community acquisitions".

Information on the goods traded internationally is available from the statistic on foreign trade (*Außenhandelsstatistik*). This statistic is based on two sources. One source is the reports by German firms on transactions with firms from countries that are members of the European Union (EU); these reports are used to compile the so-called *Intrahandelsstatistik* on intra-EU trade. The other source is transaction-level

data collected by the customs on trade with countries outside the EU (the so-called *Extrahandelsstatistik*).[3] Data in the statistic of foreign trade are transaction-level data, i.e. they relate to one transaction of a German firm with a firm located outside Germany at a time.

For the reporting year 2010 these transaction-level data have been aggregated at the level of the importing firm. These data were matched with the enterprise register system (*Unternehmensregister-System*) and with the enterprise level data from the two other sources discussed above. For each importing firm that reported either to the statistic on intra-EU trade, or to the statistic on trade with countries outside the EU, we know from the data the number of goods imported and the number of countries imported from.

With these data it is possible to investigate the relationship between the age of a firm and the extensive margins of the firm's exports. Information on the age of a firm is not included in the data used here. However, it is possible to distinguish firms that existed already in 1995 (the first year covered by the regular survey of establishments from manufacturing industries described above) and firms that entered the data set in later years. Using this information three age cohorts of firms are identified. Cohort 1 is made of all firms that existed already in 1995. Cohort 2 includes all firms that entered the data set between 1996 and 2002. Cohort 3 covers all firms that entered the data set between 2003 and 2009. Note that this definition of age cohorts might be fuzzy because a firm that entered the data set in, say, 2003 has not necessarily been founded in 2003 – it might be the case that the firm existed for

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[3] Note that firms with a value of imports from EU-countries that does not exceed 400,000 Euro do not have to report to the statistic on intra-EU trade. For trade with firms from non-member countries all transactions that exceed 1,000 Euro are registered. For details see Statistisches Bundesamt, Qualitätsbericht Außenhandel, Januar 2011.

some years before but that the number of employees was below the threshold value of 20 and, therefore, the firm was not obliged to report to the survey.

The three extensive margins of imports by a firm in 2010 are measured by an importer dummy variable that takes on the value 1 if the firm was an importer (and the value 0 otherwise), by the number of goods[4] imported, and by the number of countries of origin of imports.

3. Results

The empirical investigation uses information on 29,459 enterprises from manufacturing industries in West Germany in 2010. About half of these firms existed already in 1995 and form cohort 1. Cohort 2 (made of firms that entered the sample between 1996 and 2002) and cohort 3 (including firms that entered between 2003 and 2009) are approximately of same size and cover a quarter of all firms each. Table 1 shows that the share of importers is larger in cohort 1 compared to the younger cohorts, while the share of importers is about the same in cohort 2 and cohort 3.

[Table 1 near here]

Results for empirical models that test for differences in the margins of imports between firms from the three age cohorts are reported in Table 2. Note that these models are not used to empirically explain a margin; they are just vehicles to estimate the margin premium of a cohort (controlling for industry affiliation).

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[4] A good is an eight-digit number from the official nomenclature for the statistics of foreign trade.

The results for model 1 clearly indicate that the probability of participation in imports is lower in both cohort 2 and cohort 3 compared to cohort 1 (the reference category in all empirical models). The estimated average marginal effect for firms from cohort 2 and cohort 3 is -7.9 percent and -9.1 percent, respectively.

Results for model 2 show that the number of imported goods tends to increase with firm age. Compared to firms from cohort 1, firms from cohort 3 import 13.7 percent less different goods (while the point estimate is much lower and not statistically different from zero for firms from cohort 2). Results for the number of countries of origin show a similar picture. Compared to firms from cohort 1, firms from cohort 2 import from 6 percent less destination countries, and the difference for firms from cohort 3 is 13.7 percent.[5]

[Table 2 near here]

4. Concluding remarks

The empirical investigation demonstrates that, controlling for industry affiliation, the import participation is larger in old firms from cohort 1. Furthermore, the number of goods imported and the number of countries of origin tend to increase with firm age. Future empirical research on the determinants of the margins of imports, therefore, should investigate these links further, ideally using longitudinal data that cover a large time span (and that are not yet available for Germany, unfortunately).

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[5] Results for pair-wise Kolmogorov-Smirnow tests for the three age cohorts of firms and for both the number of goods imported and the number of countries of origin of imports are fully in line with the results reported in Table 2.

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Table 1: Firm Age and Import Participation: Descriptive Statistics

Cohort	Description	Number of firms	Share of importers in 2010
1	Firm existed in 1995	15,232	56.64
2	Firm entered between 1996 and 2002	6,892	46.56
3	Firm entered between 2003 and 2009	7,335	45.40

Table 2: Firm Age and Margins of Import in 2010: Regression Results

Model		1	2	3
Endogenous variable		Exporter (Dummy; 1 = yes)	Log of number of goods imported	Log of number of countries of origin of imports
Method		Probit	OLS	OLS
Cohort 2	ß	-0.079	-0.041	-0.059
(Dummy; 1 = yes)	p	(0.000)	(0.178)	(0.011)
Cohort 3	ß	-0.091	-0.137	-0.137
(Dummy; 1 = yes)	p	(0.000)	(0.000)	(0.000)
Industry controls		yes	yes	yes
Number of firms		29,459	11,828	11,828

Note: For a definition of cohorts see table1.Firms from cohort 1 are the reference category. The reported results for model 1 are estimated average marginal effects; the prob-values reported are based on robust standard errors. For model 2 and 3 ß is the estimated regression coefficient and p is the prob-value based on heteroscedasticity-robust standard errors. Industry controls are dummy-variables for two-digit industries in model 1 and for four-digit industries in model 2 and 3. All models include a constant term.

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