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by
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Profitability in German multi-market exporters and importers from manufacturing industries

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Abstract:

This paper provides the first empirical evidence on the link between the number of foreign markets (where a market is defined as the combination of one traded good and one country traded with) a firm is active on and its profitability. We find that in German manufacturing industries the profitability of a firm increases when the number of markets a firm exports to or imports from increases. The extra costs associated with being active on more foreign markets tend to be smaller than the extra benefits. It pays to be active on many foreign markets.

JEL Classification: F14

Keywords: Exports, Imports, Number of foreign markets, Profitability, Germany

* All computations were done at the research data center of the Statistical Office Berlin-Brandenburg in Berlin. The transaction level data and firm level data used are strictly confidential but not exclusive, see www.forschungsdatenzentrum.de for access. To facilitate replication the Stata do-files used are available from the author on request.

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1. Motivation

Germany is number three among the exporters and importers in world merchandise trade (World Trade Organization 2016, p. 94). International trade is important for the dynamics of the German economy as a whole, and in its regions and industries, in the short and in the long run. Reliable information on the causes and consequences of exports and imports, therefore, are important for analyses of the German economy.

For more than two decades now empirical studies on these issues are based more and more on data from the actors on the world market for goods – the internationally trading firms. While in former times a typical paper in this literature used data collected in surveys by official statistics or others more recent papers use data that are based on transaction level data collected by the customs (for trade with partners outside the European Union) or reported by the firms when trading with partners inside the EU (for the statistics on intra-EU trade). These data cover detailed information on the goods traded, its value, its weight, and the country of destination (for exports) or origin (for imports). In short, the data do not only show “who trades and how much”, but also “who trades how much of which goods of which value and which weight with firms from which countries”.

Transaction level data that include information on the German firm involved in the transaction have been prepared by the Federal Statistical Office for the reporting years 2009 onwards. These data, however, do not contain any information on characteristics of these firms (e.g., its size, age, productivity, or profitability) that can be expected to be related to the margins of exports and imports.

A way out is to use the firm identifier that is included in the transaction level data to link these data with information from other sources, including surveys conducted by official statistics that use the same firm identifier. Merged data of this

type have been used in a number of studies that shed light on various aspects of Germany's trade in goods for the first time.[1]

However, these studies only looked at either the number of countries traded with or at the number of goods traded, one at a time. But exporting to, say, five countries the same good or exporting to five countries several different goods obviously makes a difference – in both cases, however, the extensive margin "number of countries exported to" is the same. The same reasoning applies to the extensive margin "number of goods exported" – it makes a difference whether five different goods are exported to one country only or whether some of them are exported to several countries.

In a recent paper Wagner (2017) extended this literature by not looking at the number of countries traded with and the number of goods traded separately but by looking at the number of markets a trading firm is active on, where a market is defined as the combination of one traded good (defined according to the detailed HS6-classification) and one country traded with. Wagner (2017) finds that, controlling for detailed industry affiliation, the number of foreign markets a firm from manufacturing industries is active on as an exporter or importer is higher in firms that are larger, older and foreign owned and that have higher labor productivity, human capital intensity and R&D intensity. All these empirical results are in line with hypotheses that are derived from the literature on the links between firm characteristics and the extensive margins of foreign trade.

One important dimension of firm performance not investigated in Wagner (2017) is firm profitability. In general, the links between profitability and the margins of international trade qualify as an under-researched area. This comes as a surprise

[1] See Wagner (2016) for a survey of the literature (including studies with data for Germany) that uses transaction level data on exports and imports of goods.

because profit maximization can be regarded as a central aim of a firm. The number of studies on trade and profits, however, is still small and the number of countries covered (all of which are member states of the EU) is even smaller. Wagner (2012a) surveys the evidence for five countries from six studies. Results differ widely across the studies – from positive to no to negative profitability differences between exporters and non-exporters; from evidence for self-selection of more or less profitable firms into exporting to no evidence for self-selection at all; from no positive effects of exports on profits to positive effects.

As regards the links between the extensive margins of trade (number of countries traded with, number of goods traded) and firm profitability empirical evidence is even scarcer. From a theoretical point of view the sign of this link is ambitious. On the one hand, there are extra costs (that are often fixed costs) that come with every extra country served in exports or sourced in imports, and with every extra good traded internationally. On the other hand, every international extra deal a firm engages in voluntarily is (at least, potentially) profitable. And it might well be the case that only more productive firms self-select on more foreign markets because only these better firms are able to cover the extra costs caused by these extra extensive margins of trade. It is an open question whether the extra costs that come with extra international markets eat up any extra profits and any productivity advantages.

We have some empirical evidence on the links between the extensive margins of foreign trade and profitability in German firms from studies that look at either the number of countries traded with or at the number of goods traded, one at a time. Wagner (2014a) reports that the rate of profit tend to be higher in firms that export to a larger number of countries while there is no statistically significant link between

profitability and the number of exported products. Wagner (2014b) finds that profits are not higher in firms that import more goods and from more countries.

This paper contributes to the literature by providing the first empirical evidence on the link between the number of foreign markets (where a market is defined as the combination of one traded good and one country traded with) a firm is active on and its profitability. To anticipate the most important result the paper finds that the profitability of a firm increases when the number of markets a firm exports to or imports from increases. The extra costs associated with being active on more foreign markets tend to be smaller than the extra benefits. It pays to be active on many foreign markets.

The rest of the paper is organized as follows. Section 2 introduces the data and discusses the definition of variables. Section 3 presents the results for empirical models on the link between profitability of a firm and the number of markets the firm exports to or imports from. Section 4 summarizes results from a robustness check that uses an IV approach. Section 5 concludes.

2. Data and measurement issues

The transaction level data on exports and imports does not include any information on the characteristics of the trading firms. However, the firm identifier that comes with this data can be used to merge the information on foreign trade activities at the firm level with information collected on these firms in other surveys. The empirical investigation here uses a tailor-made data set that combines information on the number of markets a firm exported to or imported from with information from high quality firm-level data from three other 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 (known as the *Monatsbericht,* or monthly report) 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 the monthly establishment data were aggregated to annual data and at the enterprise level to match the unit of observation in the other data sources (described below).[2] The use of the enterprise (the legal unit) instead of the establishment (the local production unit) as the unit of analysis is mandated by the use of the enterprise as the unit of observation in the other data sources used in this study. It seems appropriate here because decisions about export activities are taken at the enterprise level, taking the characteristics of all establishments in a multi-establishment enterprise into account.

The second source of data is the cost structure survey for enterprises in the manufacturing sector. This survey is carried out annually as a representative random sample survey in about 15,000 firms. The sample is stratified according to the number of employees and the industries; all firms with 500 and more employees are covered by the cost structure survey (see Fritsch et al. 2004).[3]

The third source of data is the enterprise register system (*Unternehmensregister-System*) that is used to link information from the transaction level data on foreign trade with firm level data collected in the surveys by the statistical offices. With these linked data sets it is possible to investigate the role of

[2] Note that beginning with reporting year 2007 firms with more than 20 but less than 50 persons no longer have to report to the *Monatsbericht*. However, these firms have to report information on total sales, exports, number of employees and the sum of wages and salaries paid in the so-called *Jahresbericht* (the annual report), and this information is added to the data set used here.

[3] Data from the *monthly report*, the *annual report* and the *cost structure survey* are part of a combined data set known as the *AFiD Panel*; see Malchin and Voshage (2009) for details.

firm characteristics for the number of foreign markets a firm is active on for firms from manufacturing industries (that are covered in the surveys).

At the center of the empirical investigation here is the link between the rate of profit of a firm and the number of foreign markets a firm is active on in exporting or importing.

Rate of profit: The rate of profit is calculated as

(total turnover - total costs) / total turnover

Here *total turnover* is defined as the sum of turnover due to sales of own products, turnover due to sales of traded products bought from other firms, and turnover from any other activities of the firm. *Total costs* include gross wages and salaries paid (including contributions to social security), other social costs, costs for any work done by other firms, costs for rents and leasing, other costs (including costs for insurance), taxes and other public contributions, depreciations, and interests paid.

Number of markets in exports or imports: A market is defined as the combination of one traded good (defined according to the detailed HS6-clessification) and one country traded with. Information for the number of markets a firm is active on in a given year is taken from the transaction level data on exports and imports.

The empirical models estimated to reveal the link between profitability and the number of foreign markets a firm is active on as an exporter or as an importer include the following control variables that can be expected to be correlated with profitability and / or with the number of foreign markets:[4]

Firm size is measured by the number of employees in a firm (also included in squares to take care of non-linearity). The source of information on the number of employees is the cost structure survey.

[4] Given that these variables serve as control variables only the links between these variables and the rate of profit or the number of foreign markets are not discussed in detail here.

Labor productivity is measured by value added per employee; the information on sales and costs used in the computation of this productivity variable are taken from the cost structure survey.[5]

Human capital intensity is measured by the average wage per employee. Direct information on the qualification of the employees in a firm is not available in the data used in this study, but Wagner (2012b) demonstrates that the average wage is indeed a good proxy variable for the qualification of the workforce in German manufacturing firms. The source for information on the amount of wages paid and the number of employees is the cost structure survey.

Innovation is measured by a firm's activities in research and development (*R&D)* that are closely related to product and process innovations. R&D activity is measured as the share of employees in R&D in all employees. Information on R&D activity is taken from the cost structure survey.

Firm age: Information on firm age is not available from the data used in this study. However, we know whether a firm was already active in 1995 (the first year data from the monthly report are available for) or not. Firms that reported to the monthly report in 1995, and that were founded before 1996 accordingly, are classified as old firms. Firms that started to report in the years between1996 and 2002 are classified as medium-aged firms, and firms that started to report from 2003 onwards are classified as young firms.

Foreign owned firm: A firm is considered to be foreign owned if more than 50 percent of the voting rights of the owners or more than 50 percent of the shares are controlled (directly or indirectly) by a firm or a person/institution located outside

[5] Note that the data used has no information on the capital stock of the firms, so more elaborate measures of productivity like total factor productivity cannot be computed.

Germany. Information on foreign ownership status of an enterprise is taken from the enterprise register system.

Industry: Dummy variables for 4-digit industries are included in all empirical models to control for industry specific effects like competitive pressure, policy measures, demand shocks etc. Information on industry affiliation is taken from the cost structure survey.

3. Econometric investigation

In the empirical investigation data for the years 2009 to 2012 for samples of enterprises from manufacturing industries are used. Firm characteristics are either constant (firm age) or they do not vary much over the four year period. Furthermore, in 2012 a new sample has been drawn for the cost structure survey that is the source of most of the variables. Therefore, the data are not used as a panel data set here.[6] Instead, all empirical models are estimated with cross-section data for each year separately.

Descriptive statistics for the samples of exporting and importing firms are listed in the Tables A.1 – 2009 to A.1 – 2012 in the appendix. On average, the firms in the samples have about 150 employees, which is quite large compared to all manufacturing firms in Germany. However, by construction the data set used is limited to firms that are active in foreign trade, and these firms tend to be considerably larger on average than non-trading firms. About seven percent of all firms in the samples trade on a single foreign market only, while most trading firms are active on several foreign markets. Here, the number of markets tends to be considerably larger in imports than in exports.

[6] See Wagner (2011, section 5) for a discussion of this issue.

To uncover the link between profits and the number of markets in exports and imports empirical models are estimated with the rate of profit as the dependent variable and the number of markets (measured in logs) as the independent variable, controlling for the firm characteristics listed above (i.e., firm size; labor productivity; human capital intensity; R&D intensity; firm age; and foreign ownership status) plus detailed 4-digit industry controls. The models are estimated by OLS for data for each year from 2009 to 2012 and for exports and imports separately.

Results are reported in Table 1 (for exports) and Table 2 (for imports). Results uniformly point to a positive link between the number of markets served in foreign trade and firms' profitability. All estimated regression coefficients for the number of markets are positive and statistically different from zero at any conventional level of significance. The estimated effect of an increase in the number of markets on the rate of profit (controlling for all other firm characteristics included in the empirical model) is large from an economic point of view. For example, results for 2009 show that, compared to a firm that exports to one foreign market only, profits are some 12 percentage points larger in a firm that exports to 36.5 markets (i.e., to the mean number of markets). Similarly, compared to a firm that imports from one foreign market only, profits are 9 percentage points larger in a firm that imports from 111.8 markets (i.e., from the mean number of markets).[7]

[Table 1 and Table 2 near here]

[7] Given that the other variables included in the empirical models serve as control variables only the links between these variables and the rate of profit are not discussed here.

4. Robustness check: IV estimation

The empirical models for the ceteris paribus effect of the number of markets in exports or imports on firm profitability looked at in section 3 were estimated by OLS. This might be problematic. The number of markets a firm is active on in foreign trade might be endogenous in these empirical models because more profitable firms might find it easier to bear the extra costs of serving more markets in exports or sourcing from more markets in imports. If this is the case it is well known that the OLS estimator is inconsistent and that it can no longer be given a causal interpretation. The estimated regression coefficient of the number of markets can no longer be interpreted as an estimate of the marginal effect of an exogenous change in the number of markets in foreign trade on the rate of profit of a firm.

If endogeneity of the number of markets is a problem, instead of OLS instrumental variables (IV) regression should be used to estimate the causal effect of the number of markets in foreign trade on firms' profits.[8] Here, the number of foreign markets a firm is active on is instrumented by the 4-digit industry the firm is (mainly) active in. The rationale behind this instrument is as follows:

To start with exports, the number of different goods that is listed in the HS6 classification that is used here to distinguish goods varies from industry to industry. Therefore, the number of different goods a firm can potentially export varies from industry to industry. Furthermore, the number of potential countries a firm can export to differs from industry to industry. For firms from some industries, the number of trade partner countries tends to be more limited than for others – think of a firm that produces goods with a low value-to-weight ratio where transport costs matter a lot and, therefore, goods are traded with a small number of neighbor countries only.

[8] For a textbook treatment of linear instrumental-variables regression see Cameron and Trivedi (2010), chapter 6.

Firms from other industries produce goods that are of high value and that are attractive for (at least some) customers on rather distant markets, too – think of a high-quality car like a Porsche. The 4-digit industry of a firm, therefore, can be expected to be correlated with the number of markets a firm is active on in exports, while the same industry can be expected to be uncorrelated with the profitability of a firm because the rate of profit tends to differ widely between heterogeneous exporting firms from any single industry.

Turning to imports, in some industries the goods produced are made of a large number of parts, many of which come from suppliers that are located in different parts of the world. Electronic devices or aircrafts are cases in point. In other industries the manufactured goods include only a small number of parts supplied by other firms that might come from other countries – for example, maybe, only wood from Sweden is imported to produce furniture. The 4-digit industry of a firm, therefore, can be expected to be correlated with the number of markets a firm is active on in imports, too, while the same industry can be expected to be uncorrelated with the profitability of a firm because the rate of profit tends to differ widely between heterogeneous importing firms from any single industry.

This makes the 4-digit industry of a firm a candidate for a valid instrument for the number of foreign markets the firm is active on. If the number of markets is instrumented accordingly and if the empirical models are estimated by 2SLS or optimal GMM[9] (instead of OLS) the null hypothesis of weak instruments can firmly be rejected for all eight empirical models. For example, when optimal GMM is used to estimate the instrumented version of the model reported in the first column of Table 1

[9] IV-estimation uses the Stata-command `ivregress` (see Cameron and Trivedi 2010, ch. 6). Given that IV-estimation here serves as a robustness check only, detailed results are not reported but are available on request.

(for number of markets in exports in 2009) the F statistic for joint significance of the instruments in the first-stage regression is 65,964.3 – much larger than the widely used rule of thumb that views an F statistic of less than 10 as indicating weak instruments. The Durbin-Wu-Hausman test of endogeneity, however, does not reject the null-hypothesis that the number of markets is exogenous in these models at any conventional level of significance. In the example just mentioned the p-value of the test is 0.9452.

That said, there is no need to use IV estimators. Instead, we stay with the OLS results reported in Table 1 and Table 2.

5. Concluding remarks

This paper uses information on export and import transactions by German manufacturing firms from 2009 to 2012 to investigate the link between firm profits and the number of foreign markets a firm is active on as an exporter or an importer, where a market is defined as a combination of a good traded and a country traded with. Using merged information from trade transactions and from surveys conducted by the statistical offices it is shown that, controlling for firm characteristics (size, age, productivity, human capital intensity, R&D-intensity, foreign ownership status) and detailed industry affiliation, the number of foreign markets a firm is active on as an exporter or importer is positively linked with profitability of the firm.

These results are in stark contrast to findings from earlier studies with German firm level data (see Wagner 2014a and 2014b) that look at the links between firm profits and either the number of countries traded with, or the number of goods traded, and not at the number of foreign markets traded with. According to the findings presented here the extra costs associated with being active on more foreign markets

tend to be smaller than the extra benefits. It pays for firms to be active on many foreign markets.

References

Cameron, A. Colin, and Pravin K. Trivedi (2010): Microeconometrics Using Stata. Revised Edition. College Station, TX: Stata Press.

Fritsch, Michael, Bernd Görzig, Ottmar Hennchen, and Andreas Stephan (2004): Cost Structure Surveys for Germany. *Schmollers Jahrbuch / Journal of Applied Social Science Studies* 124 (4), 557-566.

Malchin, Anja and Ramona Voshage (2009): Official Firm Data for Germany. *Schmollers Jahrbuch / Journal of Applied Social Science Studies* 129 (3), 501-513.

Wagner, Joachim (2011): Exports and Firm Characteristics in German Manufacturing Industries: New Evidence from Representative Panel Data. *Applied Economics Quarterly* 57 (2), 107-143.

Wagner, Joachim (2012a): Exports, Imports and Profitability: First Evidence for Manufacturing Enterprises. *Open Economies Review* 23 (5), 747-765.

Wagner, Joachim (2012b): Average wage, qualification of the workforce and export performance in German enterprises: evidence from *KombiFiD* data. *Journal of Labour Market Research* 45 (2), 161-170.

Wagner, Joachim (2014a): Is export diversification good for profitability? First evidence for manufacturing enterprises in Germany. *Applied Economics* 46 (33), 4083-4090.

Wagner, Joachim (2014b): Extensive margins of imports, productivity and profitability: First evidence for manufacturing enterprises in Germany. *Economics Bulletin* 34 (3), 1669-1678.

Wagner, Joachim (2016): A survey of empirical studies using transaction level data on exports and imports. *Review of World Economics* 152 (1), 215-225.

Wagner, Joachim (2017): Active on many foreign markets. A portrait of German multi-market exporters and importers from manufacturing industries. University of Lüneburg Working Paper Series in Economics No. 368.

World Trade Organization (2016): World Trade Statistical Review 2016. Download: https://www.wto.org/english/res_e/statis_e/wts2016_e/wts16_toc_e.htm.

Table 1: Profits and number of markets in exports

Model		2009	2010	2011	2012
Log (number of markets)	ß	3.292	3.210	3.430	2.291
	p	0.000	0.000	0.000	0.033
No. of employees	ß	-0.008	-0.009	-0.012	-0.013
	p	0.000	0.000	0.000	0.008
No. of employees (squared)	ß	8.14e-7	1.98e-6	2.50e-6	2.94e-6
	p	0.165	0.016	0.010	0.036
Human capital intensity	ß	5.66e-6	-0.000028	-0.000037	0.000024
	p	0.828	0.306	0.242	0.676
R&D intensity	ß	-0.362	-0.198	-0.253	-0.224
	p	0.000	0.000	0.011	0.086
Firm age: medium aged firm (Dummy)	ß	1.841	1.564	0.988	1.229
	p	0.002	0.004	0.094	0.285
Firm age: young firm (Dummy)	ß	1.398	0.107	0.431	-5.840
	p	0.037	0.885	0.631	0.275
Foreign owned firm (Dummy)	ß	-0.111	-0.251	-0.585	1.578
	p	0.888	0.738	0.652	0.535
Constant	ß	39.643	43.204	44.809	44.920
	p	0.000	0.000	0.000	0.000
4-digit industry controls		yes	yes	yes	yes
R^2		0.294	0.272	0.210	0.056
No. of observations		6,120	6,225	6,330	6,447

Note: All models were estimated by OLS with profits as the dependent variable. A market is defined as a combination of a HS6-good and a country. For an exact definition of the variables see text. ß is the estimated regression coefficient and p is the prob-value (based on heteroscedasticity-consistent standard errors).

Table 2: Profits and number of markets in imports

Model		2009	2010	2011	2012
Log (number of markets)	ß	1.910	1.706	1.658	2.213
	p	0.000	0.000	0.000	0.000
No. of employees	ß	-0.002	-0.001	-0.003	-0.008
	p	0.245	0.427	0.239	0.126
No. of employees (squared)	ß	-3.74e-8	4.98e-7	8.31e-7	1.64e-6
	p	0.933	0.366	0.223	0.166
Human capital intensity	ß	0.000034	-0.000019	-0.000024	0.000018
	p	0.192	0.505	0.411	0.619
R&D intensity	ß	-0.346	-0.150	-0.224	-0.256
	p	0.000	0.002	0.024	0.005
Firm age: medium aged firm (Dummy)	ß	2.365	1.959	1.416	1.946
	p	0.000	0.000	0.021	0.004
Firm age: young firm (Dummy)	ß	0.937	-0.349	0.075	0.058
	p	0.167	0.708	0.934	0.963
Foreign owned firm (Dummy)	ß	2.167	1.848	1.650	1.120
	p	0.005	0.019	0.221	0.478
Constant	ß	39.776	44.108	46.474	42.852
	p	0.000	0.000	0.000	0.000
4-digit industry controls		yes	yes	yes	yes
R^2		0.274	0.221	0.197	0.137
No. of observations		6,196	6,265	6,303	6,490

Note: All models were estimated by OLS with profits as the dependent variable. A market is defined as a combination of a HS6-good and a country. For an exact definition of the variables see text. ß is the estimated regression coefficient and p is the prob-value (based on heteroscedasticity-consistent standard errors).

Table A.1 - 2009: Descriptive statistics for samples of firms

Exports, 2009	Mean	Std.dev.	p1	p50	p99
Profits	47.3	20.1	-6.7	48.3	87.2
Number of markets	36.5	61.5	1	18	283
Number of employees	152.6	241.4	22	85	1,029
Human capital intensity	33,259	10,682	13,334	32,435	62,453
R&D intensity	2.76	6.09	0.0	0.0	30.43
Medium aged firm (Dummy)	0.1884				
Young firm (Dummy)	0.1894				
Foreign owned firm (Dummy)	0.1279				

No. of observations	6,120				

Imports, 2009	Mean	Std.dev.	p1	p50	p99
Profits	46.8	20.1	-5.0	47.7	87.1
Number of markets	111.8	333.6	1	28	1,408
Number of employees	149.5	239.1	22	83	1,026
Human capital intensity	33,216	10,670	13,221	32,355	62,286
R&D intensity	2.77	6.07	0.0	0.0	30.47
Medium aged firm (Dummy)	0.1817				
Young firm (Dummy)	0.1877				
Foreign owned firm (Dummy)	0.1238				

No. of observations	6,196				

Note: For a definition of variables see text. The minimum and maximum values of variables are confidential because they (may) refer to a single firm.

Table A.1 - 2010: Descriptive statistics for samples of firms

Exports, 2010	Mean	Std.dev.	p1	p50	p99
Profits	49.7	19.6	4.4	50.3	87.9
Number of markets	39.2	65.6	1	18	307
Number of employees	150.6	219.4	22	85	1,028
Human capital intensity	34,297	10,882	13,963	33,553	64,257
R&D intensity	2.78	6.04	0.0	0.0	30.47
Medium aged firm (Dummy)	0.1911				
Young firm (Dummy)	0.1944				
Foreign owned firm (Dummy)	0.1337				

No. of observations	6,225				

Imports, 2010	Mean	Std.dev.	p1	p50	p99
Profits	49.2	21.1	2.3	49.7	87.3
Number of markets	127.1	367.6	1	31	1,624
Number of employees	147.7	217.8	22	83	1,019
Human capital intensity	34,219	10,833	13,885	33,427	64,257
R&D intensity	2.80	6.03	0.0	0.0	30.16
Medium aged firm (Dummy)	0.1850				
Young firm (Dummy)	0.1951				
Foreign owned firm (Dummy)	0.1314				

No. of observations	6,265				

Note: For a definition of variables see text. The minimum and maximum values of variables are confidential because they (may) refer to a single firm.

Table A.1 - 2011: Descriptive statistics for samples of firms

Exports, 2011	Mean	Std.dev.	p1	p50	p99
Profits	51.1	23.2	5.1	52.0	88.2
Number of markets	41.5	68.6	1	19	325
Number of employees	155.3	224.6	22	88	1,067
Human capital intensity	35,515	11,114	14,550	34,844	65,448
R&D intensity	2.78	6.06	0.0	0.0	30.21
Medium aged firm (Dummy)	0.1861				
Young firm (Dummy)	0.2005				
Foreign owned firm (Dummy)	0.1343				

No. of observations	6,330				

Imports, 2011	Mean	Std.dev.	p1	p50	p99
Profits	50.8	23.0	6.7	51.5	87.9
Number of markets	138.1	387.9	1	33	1,848
Number of employees	152.3	223.6	22	86	1,059
Human capital intensity	35,520	11.021	14,550	34,715	65,263
R&D intensity	2.81	6.06	0.0	0.0	29.41
Medium aged firm (Dummy)	0.1844				
Young firm (Dummy)	0.1966				
Foreign owned firm (Dummy)	0.1312				

No. of observations	6,303				

Note: For a definition of variables see text. The minimum and maximum values of variables are confidential because they (may) refer to a single firm.

Table A.1 - 2012: Descriptive statistics for samples of firms

Exports, 2012	Mean	Std.dev.	p1	p50	p99
Profits	48.7	116.7	3.8	51.2	89.2
Number of markets	41.3	70.6	1	19	343
Number of employees	154.5	226.2	21	85	1,063
Human capital intensity	36,257	11,544	13,566	35,447	67,093
R&D intensity	2.72	6.13	0.0	0.0	29.69
Medium aged firm (Dummy)	0.1790				
Young firm (Dummy)	0.2811				
Foreign owned firm (Dummy)	0.1422				

No. of observations	6,447				

Imports, 2012	Mean	Std.dev.	p1	p50	p99
Profits	49.8	33.1	4.0	50.8	88.2
Number of markets	139.4	409.4	1	30	1,889
Number of employees	151.75	224.5	21	83	1,054
Human capital intensity	36,238	11,512	13,198	35,403	67,093
R&D intensity	2.71	6.09	0.0	0.0	29.69
Medium aged firm (Dummy)	0.1784				
Young firm (Dummy)	0.2752				
Foreign owned firm (Dummy)	0.1387				

No. of observations	6,490				

Note: For a definition of variables see text. The minimum and maximum values of variables are confidential because they (may) refer to a single firm.

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