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by

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Yama Temouri*, Alexander Vogel** and Joachim Wagner***

Abstract: This study reports results from an empirical investigation of business services sector firms that (start to) export, comparing exporters to firms that serve the national market only. We estimate identically specified empirical models using comparable enterprise level data from France, Germany, and the United Kingdom. Exporters are more productive and pay higher wages on average in all three countries. Results for profitability differ across borders – profitability of exporters is significantly smaller in Germany, significantly larger in France, and does not differ significantly in the UK. The results for wages and productivity hold in the years before the export start, which indicates self-selection into exporting of more productive services firms that pay higher wages. The surprising finding of self-selection of less profitable German business services firms into exporting does not show up among firms from France and the UK where no statistically significant relationship between profitability and starting to export is found.

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1   Motivation

One of the stylized facts that is being uncovered in the emerging literature on the micro-econometrics of international firm activities is the self-selection of "better firms into export markets. Such firms are found to be, among other characteristics, more productive, pay higher wages, and have a higher rate of profit vis-a-vis firms that serve only the national market in the years before these firms start to export. So far this empirical evidence for the role of self-selection is based almost entirely on studies investigating firms in the manufacturing sector.[1] Comparable information for firms from services industries is scarce. One exception is Vogel (2011) who finds that larger, more productive German business services firms which on average pay higher wages indeed self-select into export markets. While this finding is in line with results from econometric studies using data for firms from manufacturing industries, Vogel and Wagner (2010) report that export-starters from business services industries are *less* profitable than non-starters, even two years before they begin to export, pointing to self-selection of *less* profitable firms into export markets.

Given that Germany is one of the leading actors on the world market for services[2], evidence on self-selection of less profitable firms into exporting is interesting, not least for its apparent anomaly. What is even more interesting is whether similar evidence can be discovered for other countries as well. Do larger, more productive business services firms that pay higher wages on average, but that are less profitable, self-select into export markets in other OECD countries as well? Comparable empirical studies that can help to answer this question are, to the best of

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[1] For productivity, see the comprehensive survey by Wagner (2007); for wages, see Schank, Schnabel and Wagner (2010); for profits, see Fryges and Wagner (2010).

[2] Germany is ranked third in the world market for services export in 2007.

our knowledge, not available. We therefore contribute to the literature by estimating identically specified empirical models using comparable enterprise level data from the business services sectors in France, Germany, and the United Kingdom.

The rest of the paper is organized as follows. Section 2 discusses the data used in the empirical investigation. Section 3 presents descriptive evidence on export participation of business services firms and a comparison of exporting and non-exporting firms. Section 4 reports results for the estimated exporter premia – the ceteris paribus differences of firm characteristics between exporters and non-exporters. Results for self-selection into exporting are presented and discussed in section 5. Section 6 concludes.

2   Data

The dataset used in this paper for France and the United Kingdom (UK) has primarily been drawn from ORBIS which is a comprehensive and rich firm-level dataset and has been widely used (e.g. Helpman et al. 2004; Budd et al. 2005; Konings and Murphy 2006). It is provided by Bureau van Dijk[3], a leading electronic publisher of annual account information on several million private and public firms around the world.[4]

Bureau van Dijk collects financial, economic and other firm-level information from various sources, including official bodies such as Companies House in the UK and similar regional commercial registries in France. Every company in the UK whether it is trading or not, is legally obliged to keep accounting records and send a

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[3] BvD is best known for databases, such as BANKSCOPE and FAME, which are widely subscribed to by European universities. It can also be compared with COMPUSTAT which is extensively used in the US.
[4] For further details on the data see www.bvdep.com.

copy of the annual accounts to the Registrar at Companies House. France also has similarly strict filing requirements.

Thus, the coverage of French and UK firms in ORBIS is fairly comprehensive and financial information is mostly detailed. However, below certain thresholds, small companies are allowed to file abbreviated accounts in the UK and France which due to their limited financial information are dropped from the analysis in this paper.[5] Moreover, ORBIS reports firm accounts in either consolidated or unconsolidated form. In the analysis part of the paper, we include only unconsolidated accounts as they represent the domestic activities of firms and exclude any information from affiliates at home or abroad. In contrast, consolidated accounts aggregate the activities of all firms belonging to a group, regardless of location and industrial affiliation.

Information on export turnover is not reported for most countries in ORBIS with the exception of France and the UK. Apart from this key variable, we gather figures for annual turnover, the number of employees, averages wages of employees (calculated as the total wage bill divided by number of employees), value-added (calculated as sales minus material input costs), turnover-profitability (calculated as value-added minus total wage bill divided by total turnover or sales) and the industry in which the firm is operating in at the 4-digit NACE rev. 1.1 code. Based on these variables, a large dataset of several thousand export and non-exporting firms was compiled for France and the UK spanning the period 2003-2007.

For Germany, we use the business services statistics (*Strukturerhebung im Dienstleistungsbereich*) established by the German Federal Statistical Office and the statistical offices of the Federal States (*Länder*). The statistics were first compiled for

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[5] The UK sample includes firms that are, on average, larger in size compared with the French and German sample (see table 2). This may be due to the fact that much larger UK firms tend to report exporting information. This, however, does not represent a problem in our estimation procedure, as we control for firm size in our subsequent analysis.

the year 2000 on the initiative of the European Union. The data covers the enterprises and professions (*Freie Berufe*) of the NACE divisions I (transport, storage and communication) and K (real estate, renting and business activities) with an annual turnover of €17,500 or more. A stratified random sample is used to select the enterprises. The stratification is based on the federal states, 4-digit industries, and 12 size ranges (in terms of turnover or employees). Because the sample of enterprises required to give information in 2003 was also used in 2004 to 2007, it is possible to merge the cross-sectional datasets to a panel dataset that covers the years 2003 to 2007.

The business services statistics include, among other data, information about the economic sector, the number of persons employed (not including temporary workers), total turnover, salaries and wages, and export – defined as turnover for business with companies located abroad, including exports to foreign affiliates. Unfortunately, information on the target countries of exports is not included in the statistics and we cannot distinguish between service and goods exports as well as the different types of services exported by the firm. Also, no information is obtained about other forms of companies' activities abroad, such as cooperation, direct investments, exports via commercial presence, or imports. Furthermore, small enterprises with an annual turnover lower than 250,000 € are given a shorter questionnaire, so important information, such as information about export activities, is missing for these enterprises. For more details about the dataset see Vogel (2009).

For the purpose of analysing the relationship between exporting firms and profitability, we collect data for German, French and UK firms operating in the business service sector based on the 4-digit NACE sector classification 72-74, covering the period 2003-2007. Due to the limitation of the German dataset, only enterprises with an annual turnover over 250,000 € are considered.

The data used in this study are not exclusive; information on how to access the German data via the research data centres of the Federal statistical office and the statistical offices of the Länder is provided in Zühlke et al. (2004) and Vogel (2009). Information and access to the data for France and the UK are available from www.bvdep.com. To facilitate replication and extensions Stata code for the analysis of France and the UK is available from the fist author, and the Stata do-files used to analyse the German data are available from the second author on request.

3   Descriptive Overview

3.1   Export Participation of Business Services Firms

The firm's export activities are measured by the export intensity, defined as the percentage of exports in total turnover. Regarding all business services industries, the share of exporters in all enterprises ranges from about 18 percent in Germany up to nearly 30 percent in France in 2007. In the United Kingdom we find an export participation of more than 27 percent.[6] Table 1 shows that in 2003 and 2007 the distribution of the export intensity was highly skewed in France and Germany – most of the exporters sold a relative small share of their total production abroad, and only a few firms exported a very high share. In the UK the picture is slightly different. Here, around 8 percent of all enterprises have an export intensity of more than 50 percent in 2003 and 2007. That is approximately 30 percent of the exporting enterprises in this country.

[Table 1 about here]

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[6] Note that only enterprises with a turnover greater than 250,000 Euro are considered. We do not have information about the export participation of small business services firms.

3.2 Comparison of Exporting and Non-Exporting Firms

In this section a first comparison of exporting and non-exporting enterprises is presented. In a first step we compare the average wage, productivity (in terms of turnover and value added per employed person) and the number of employees (that is our control variable in Section 4 and 5) of exporting and non-exporting enterprises. This is in line with previous studies about the relationship between exports and enterprise performance

In a second step we extend the comparison of exporting and non-exporting business services firms by looking at the turnover profitability.[7] This rate of profit of a firm is computed as a rate of return, defined as gross firm surplus (computed as gross value added at factor costs minus gross wages and salaries paid by the firm) divided by total sales (net of VAT).[8]

$$rate\ of\ profit = \frac{gross\ value\ added - gross\ wages}{total\ sales}$$

Our profit measure is a measure for the price-cost margin which, under competitive conditions, should on average equal the required rental on assets employed per money unit of sales (see Schmalensee 1989, p. 960f.). Differences in profitability between firms, therefore, can follow from productivity differences, but also from different mark-ups of prices over costs and from differences in the capital intensity. Given that our data set does not have information on the capital stock employed by

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[7] Note that the data set does not have any information on the capital stock, or the sum of assets or equity, of the firm, so that it is not possible to construct profit indicators based thereon like return on assets or return on equity.

[8] For Germany we computed additionally the rate of profit as gross firm surplus (computed in line with the definition of the European Commission (1998) as gross value added at factor costs minus gross wages and salaries minus costs for social insurance paid by the firm) divided by total sales (net of VAT) minus net change of inventories. However, the descriptive results as well as the estimation results are almost identical.

the firms in our econometric investigations we control for differences in the capital intensity by including a complete set of industry dummy variables at the most disaggregated (4-digit) level.[9]

Table 2 reports the results from the comparison of exporting and non-exporting business services enterprises in the year 2007. In line with previous studies of the services and manufacturing sector, exporting business services enterprises pay on average higher average wages than enterprises that serve only the domestic market. This is true for all three considered countries. In France and Germany exporting enterprises are on average also more productive (i.e. have a higher turnover and value added per employed person) and larger (in terms of the number of employees) than non-exporting enterprises.

However, only in France and the UK is the mean profitability level of exporters slightly higher than the profitability level of non-exporters. In contrast, German non-exporting enterprises tend to have a higher rate of profit than German exporters.

[Table 2 about here]

Note that these mean values give only an indication and overview of the differences between exporters and non-exporters without controlling for other firm characteristics like size and industries. Particularly in the heterogeneous business services sector it is important to control for industry effects. Therefore, a more thorough comparison between exporters and non-exporters is presented in section 4.

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[9] One important problem with the profitability measurement we use, arises due to the fact that two main components of profitability, profits and capital costs, need not to show a monotone relationship between each other. This may bias the results.

4   Exporter Premia

The next step in our empirical investigation consists of the estimation of so-called exporter premia that indicate the ceteris paribus differences of enterprise attributes between exporting and non-exporting enterprises, controlling for other characteristics of the enterprises. In line with the now standard approach in the micro-econometric literature on exports and productivity (see The International Study Group on Exports and Productivity 2008) pooled data are used to regress several variables (*X*) on the export activity of the enterprise plus a set of control variables:

$$(1) \ X_{it} = \text{ß}_0 + \text{ß}_1 \ \text{export}_{it} + \text{ß}_2 \ \text{control}_{it} + e_{it},$$

where *i* is the enterprise index, *t* is the index of the years between 2003 and 2007, *e* is the error term, and *X* indicates the enterprise characteristics, namely the turnover profitability in percent as well as the logarithm of the average wage, turnover per employed person, and value added per employed person. The vector *control* contains the number of employed persons, its squared value and a full set of interaction terms of year and economic activity (4-digit) dummies. In addition to the pooled regression of equation 1, the panel structure of the datasets is used to estimate a fixed effects model that controls for unobserved, time-invariant heterogeneity.[10]

Export activity of an enterprise is measured by a dummy variable that takes on the value of one if an enterprise is an exporter (and zero otherwise). Concerning the turnover profitability, the exporter premia (ß_1) shows the average difference between exporters and non-exporters in percentage points, controlling for the characteristics

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[10]   Both the pooled regression and the fixed effects model are estimated with cluster robust standard errors.

included in the vector control. In the case of the logarithmic variables, the exporter premia (computed as $100*(\exp(ß_1)-1)$) shows the average percentage difference of the characteristics between exporting and non-exporting enterprises, controlling for the characteristics included in the vector control.

The results of the estimations of the enterprise characteristics on the export status are presented in Table 3. In line with previous studies for the manufacturing sector, the results of the pooled regression show notable positive export premia concerning average wage and productivity (in terms of the turnover per employee and the value added per employee). Exporting enterprises pay ceteris paribus from 12.5 percent (in France) up to 21 percent (in the UK) higher average wages than non-exporting enterprises. With regards to the turnover per employee, the differences between exporting and non-exporting enterprises range from around 22 percent in the UK to nearly 29 percent in France. Regarding the value added per employee, the export premia range from nearly 16 percent in Germany to around 21 percent in France and the UK.

[Table 3 about here]

After controlling for unobserved heterogeneity by including fixed enterprise effects, no significant differences concerning average wage are found. This is true for all three considered countries. Significant productivity differences are only found in France and Germany, even though on a much lower scale. These much smaller and mostly insignificant export premia in the fixed effects model (compared to the pooled regression) are also often found in the literature for the manufacturing sector and suggest that the exporter status variable is positively correlated with the unobserved effect. This drop in the premia is consistent with the idea that enterprises that are

more "able" are also more likely to export. Thus, in the pooled regression, a large part of the export premia reflect that, exporting enterprises would be more productive and would pay higher wages, even prior to exporting.

The differences between the results for the empirical models with and without fixed firm effects indicate that unobserved firm heterogeneity does matter. However, before disregarding the estimates based on pooled data without fixed effects, it is crucial to note that the estimated fixed effects coefficients of the exporter status variable are by construction identified only by observations that change their exporter status (at least once) during the period under investigation. In our sample the share of firms that start or stop to export at least once is rather large (21 percent in France, 16 percent in Germany, and 16 percent in the UK).[11] Furthermore, we know that firms that enter or exit the export market are different from firms that persistently stay in or out of it. Using a panel of German manufacturing establishments Wagner (2008) finds that firms that stop exporting in year t were in t-1 less productive than firms that continue to export in t, and that firms that start to export in year t are less productive than firms that export both in year t-1 and in year t. This means that the coefficient of the exporter status variable that gives us the estimate for the exporter productivity premium is in a sense estimated for quite different samples when models with and without firm fixed effects are used.

While we find statistically and economically significant positive export premia concerning average wage and productivity (at least based on the pooled regression), this is not the case for turnover profitability. According to the results of the pooled regression, exporting firms in France have a rate of profit that is only 0.7 percentage points higher than in non-exporting firms. Even if this difference is statistically significant, it is economically rather small. In the UK we find no significant difference

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[11] Tables reporting the status switches in detail are available in the Appendix (Tables A1 to A3).

concerning the rate of profit between exporting and non-exporting firms. However, in Germany we find a significant negative export profitability premia for both specifications. Based on the pooled regression model, exporters have a rate of profit that is 3.2 percentage points lower than the profitability level of non-exporters. In the model with fixed effects, German exporters show a statistically significant lower profitability level of nearly one percentage point.

5   Pre-Entry Premia of Export Starters

The exporter premia reported in section 4 above do not provide any information about the causality between exporting and the performance variables under consideration. This section tests whether the exporter premia reflect self-selection effects by analysing the differences between export starters and firms that continue to serve the national market only, several years before the export starters begin to export.[12]

Again following the now standard approach in the micro-econometric literature on exports and productivity (see The International Study Group on Exports and Productivity 2008) the next step in our empirical investigation consists in testing whether we can document differences between enterprises that begin to export and non-exporters, even before the export starters begin to export. Therefore, with only those enterprises with no export activities between *t-2* and *t-1* taken into consideration, the average differences of several enterprise characteristics in periods

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[12] In addition to the self-selection hypothesis, it has been hypothesised in the literature that exporting improves the performance of the enterprises (cf., e.g., Bernard & Jensen, 1999). For the manufacturing sector evidence concerning this hypothesis is mixed (cf., e.g., Wagner, 2007). Given that the data sets used in our study cover only five years it is not possible to follow the export starters of year t over the years t+1 to t+3 to test for positive effects of starting to export on firm performance.

t-2, t-1 and *t* from enterprises that start to export in period *t* and enterprises that do not export in any period are estimated. These pre-entry differences are estimated from a regression of several variables (*X*) in *t, t-1*, and *t-2* on an export starter dummy (in *t*) and a set of control variables:

(2) $X_{it-\rho} = \beta_0 + \beta_1 \text{ export starter}_{it} + \beta_2 \text{ control}_{it-\rho} + e_{it}$,   with $0 \leq \rho \leq 2$

and where *i* is the enterprise index, *t* represents the starting year 2007, ρ represents the time-lag to the starting year, *e* is the error term and *X* indicates the considered characteristics, namely the turnover profitability in percent as well as the logarithm of average wage, turnover per employed person, and value added per employed person. The vector *control* contains dummies for the economic activities (4-digit), the number of employed persons and its squared value.

Export starter is a dummy variable that indicates the export status in *t* (1 if the enterprise starts to export, 0 if it does not). Regarding turnover profitability, the estimated coefficient β_1 shows the average difference between exporter starters and non-starters in percentage points at *t-2, t-1* and *t*. In the case of the logarithmic variables, the average percentage differences in the specific characteristics at *t-2, t-1* and *t* between enterprises that begin to export at *t* and enterprises that do not is computed from the estimated coefficient β_1 by $100*(\exp(\beta_1)-1)$.

Table 4 presents the pre-entry premia of enterprises that began to export in 2007 for two years before starting to export, one year before starting to export and at the starting year.

[Table 4 about here]

First, we look at the ceteris paribus percentage difference between export starters and non-starters in 2007, the year of start. In line with the results in Section 4, the presented pooled regression results export starters in the three countries pay statistically and economically significant higher average wages and show statistically and economically significant higher productivity (in terms of at least one of the productivity variables) in t. Concerning turnover profitability, no significant differences between export starters and non-exporters are found in France and in the UK. In Germany export starters are even less profitable than non-starters in the starting year.

In a next step we look at the periods before the prospective exporters begin to export. Even two years before starting to export, prospective exporters pay, on average, 7 percent (France) up to nearly 15 percent (UK) higher average wages, and have a productivity that is nearly 8 percent (value added per employee in France) up to 17 percent (turnover per employee in Germany) than in enterprises that continue to serve the domestic market only. One year before the prospective exporters start to export the picture is similar. These results are statistically significant, at least at the 0.05 level (in the UK, however, the ex-ante premia concerning the turnover per employee is not statistically significant). Thus, in line with evidence from the literature about the manufacturing sector, the results for the business services sectors in France, Germany and the UK indicate a self-selection into export markets of enterprises that are more productive and pay higher average wages.

In contrast, the results concerning the turnover profitability do not confirm the intuitive hypotheses that there exists a self-selection of enterprises with a higher profitability level into export markets. For France and the UK we find no significant profitability differences between prospective exporters and non-exporters. This is true for all time lags. For Germany we even have evidence that in the two periods before

the export starters begin to export, the non-starters have a higher level of profit than the starters. These differences are not only statistically significant but also economically large. Thus, in 2005 (t - 2) the rate of profit of the non-starters is on average more than 3 percentage points higher than the profitability of the export starters and in 2006 (t – 1) the rate of profit of the non-starters is still 2.6 percentage points higher.

6   *Concluding remarks*

Services industries, and services exports, are of a large and fast growing importance. A more complete understanding of the causes and consequences of services exports, therefore, is crucial for a better understanding of international firm activities. We contribute to the literature by performing an empirical investigation of business services sector firms that (start to) export, comparing these services exporters to firms that serve the national market only, estimating identically specified empirical models using comparable enterprise level data from France, Germany, and the United Kingdom.

Our most important findings can be summarized as follows. Compared to non-exporting business services firms exporters are more productive and pay higher wages on average in all three countries, while results for profitability differ across borders – profitability of exporters is significantly smaller in Germany, significantly larger in France, and does not differ significantly in the UK. Results for wages and productivity hold in the years before the export start, and this indicates self-selection into exporting of more productive services firms that pay higher wages on average. Again, results for profitability differ between the three countries. The surprising

finding of self-selection of less profitable German business services firms into exporting does not show up among firms from France and the UK where no statistically significant relationship between profitability and starting to export is found.

Our study can be viewed as an exercise in what Daniel Hamermesh (2007, p. 727) termed *scientific replication,* meaning "re-examining an idea in some published research by studying it using a different data set chosen from a different population from that used in the original paper". Results generated from data for one economy in one period – here, the results for German business services exporters reported by Vogel (2011) and Vogel and Wagner (2010) - cannot generally be expected to hold for another economy or the same economy in another period due to differences in institutions or its changes over time, or to time and region specific shocks. "If our theories are intended to be general, to describe the behavior of consumers, firms, or markets independent of the social or broader economic context, they should be tested using data from more than just one economy" (Hamermesh 2007, p. 728). We use the approach of *within-study replication* here by analyzing different data sets for different countries in one study (Hamermesh 2007, p. 730) to maximize the chances that all the details of the empirical study are identical (or at least very similar) across the data sets.

Following this approach we subscribe to the credo that "the credibility of a new finding that is based on carefully analyzing two data sets is far more than twice that of a result based only on one." Hamermesh (2000, p. 376) The bottom line, then, is that we still have no empirical evidence for the relationship between profitability and exporting in business services firms that qualifies as a stylized fact that can be used to guide, among others, theoretical modeling efforts or the design of policy measures.

Evidently, more empirical investigations of the international activities of services firms are needed.

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Tables

TABLE 1
Export participation of business services enterprises 2003 and 2007

Year	Export intensity	France	Germany	United Kingdom
		Share of exporting enterprises in all enterprises in %		
2003	0%	69.75	86.34	72.88
	> 0% and < 5%	15.46	6.43	6.51
	≥ 5% and < 10%	3.71	1.93	3.46
	≥ 10% and < 25%	5.01	2.24	5.24
	≥ 25% and < 50%	2.93	1.59	4.27
	≥ 50% and < 75%	1.69	0.69	3.56
	≥ 75%	1.46	0.78	4.09
2007	0%	70.41	82.39	72.36
	> 0% and < 5%	14.61	7.93	5.82
	≥ 5% and < 10%	3.72	2.10	2.73
	≥ 10% and < 25%	4.83	3.30	5.23
	≥ 25% and < 50%	3.02	2.05	5.20
	≥ 50% and < 75%	1.81	1.13	3.63
	≥ 75%	1.59	1.10	5.04

Source: France and the UK: Bureau van Dijk, ORBIS 2003-2007, Germany: Research Data Centres of the Federal Statistical Office and the statistical offices of the Länder, The German Business Services Statistics Panel 2003-2007, Author's own calculations.
Note:
Only enterprises with a sum of turnover and other operating income greater than or equal to €250,000 and with one or more employees are considered. All values are weighted with cross-sectional weights.

TABLE 2
Exporters vs. non-exporters in the business services sector 2007

	Non-exporters		Exporters	
	Mean	Standard deviation	Mean	Standard deviation
France				
Number of employees	26.33	92.75	34.13	84.08
Average wage (in € 1,000)	43.15	24.25	49.97	23.43
Turnover per employee (in € 1,000)	147.02	274.76	213.33	576.72
Value added per employee (in € 1,000)	107.75	125.67	136.65	176.19
Turnover profitability (in %)	41.23	18.46	43.41	18.26
Number of observations (unweighted)	9,268		3,894	
Germany				
Number of employees	25.77	90.83	27.42	80.10
Average wage (in € 1,000)	28.51	21.19	34.93	21.89
Turnover per employee (in € 1,000)	117.17	370.57	149.3	396.73
Value added per employee (in € 1,000)	61.95	118.72	70.53	110.63
Turnover profitability (in %)	32.09	23.81	26.99	23.59
Number of observations (unweighted)	20,028		5,166	
United Kingdom				
Number of employees	225.46	1030.57	170.74	517.01
Average wage (in € 1,000)	48.95	29.01	58.05	28.26
Turnover per employee (in € 1,000)	614.14	7620.22	371.71	2535.47
Value added per employee (in € 1,000)	95.41	302.66	93.07	101.38
Turnover profitability (in %)	5.99	30.77	7.34	26.14
Number of observations (unweighted)	5,945		2,271	

Source: France and the UK: Bureau van Dijk, ORBIS 2003-2007, Germany: Research Data Centres of the Federal Statistical Office and the statistical offices of the Länder, The German Business Services Statistics Panel 2003-2007, Author's own calculations.
Note:
Only enterprises with a sum of turnover and other operating income greater than or equal to €250,000 and with one or more employees are included. The 1st and 99th percentiles of the wage, turnover profitability and value added distributions are excluded from all computations. All values are weighted with cross-sectional weights.

TABLE 3
Exporter premia of business services enterprises (2003-2007)

	Estimation of enterprise characteristics on export status and controls in t	
	pooled regression	fixed effects model
France		
Average wage (log)	12.5**	0.4
Turnover profitability (in percent)	0.7**	0.1
Turnover per employee (log)	28.9**	1.8**
Value added per employee (log)	20.8**	1.2*
Number of observations	68,982	68,982
Germany		
Average wage (log)	20.0**	0.2
Turnover profitability (in percent)	-3.2**	-0.7**
Turnover per employee (log)	24.5**	0.9*
Value added per employee (log)	15.6**	-0.8
Number of observations	114,075	114,075
United Kingdom		
Average wage (log)	21.0**	-0.1
Turnover profitability (in percent)	-0.8	0.5
Turnover per employee (log)	21.7**	1.3
Value added per employee (log)	20.8**	1.5
Number of observations	38,321	38,321

Source: France and the UK: Bureau van Dijk, ORBIS 2003-2007, Germany: Research Data Centres of the Federal Statistical Office and the statistical offices of the Länder, The German Business Services Statistics Panel 2003-2007, Author's own calculations.
Note:
The estimated regression coefficients and the levels of significance (+ indicates significance at the 10% level, * at the 5% level, and ** at the 1% level, based on cluster robust standard errors) are presented for estimations of the turnover profitability and the logarithmic average wage, turnover per employed persons and value added per employed persons on the export status at t. Model 1 controls for a full set of interaction terms of year and economic activity (4-digit) dummies, the number of employed persons and its squared value. Model 2 also controls for fixed enterprise effects. To facilitate the interpretation, the estimated coefficient for the export dummy on the logarithmic variables has been transformed by $100(\exp(\beta)-1)$. The transformation shows the average percentage difference of the respective variables (ceteris paribus) between exporters and non-exporters. The 1st and 99th percentiles of the wage, turnover profitability and value added distributions are excluded from all computations.

TABLE 4

Self-selection into export markets of business services enterprises 2007

	OLS estimation of the (logarithmised) characteristics on export start in t=2007 and controls in t, t-1 and t-2		
	Two years before starting (t-2)	One year before starting (t-1)	In the starting year (t)
France			
Average wage (log)	7.3**	8.2**	8.6**
Turnover profitability (in percent)	-0.6	-0.3	-0.3
Turnover per employee (log)	11.6**	11.7**	15.8**
Value added per employee (log)	7.7*	8.9*	10.9*
Number of export starters	242		
Number of firms that sell on the national market only	3,382		
Germany			
Average wage (log)	10.4**	13.1**	12.3**
Turnover profitability (in percent)	-3.3**	-2.6**	-4.4**
Turnover per employee (log)	16.6**	19.3**	16.1**
Value added per employee (log)	8.9**	11.4**	8.8**
Number of export starters	674		
Number of firms that sell on the national market only	12,490		
United Kingdom			
Average wage (log)	14.9**	15.1**	18.1**
Turnover profitability (in percent)	-0.2	0.9	0.3
Turnover per employee (log)	8.4	8.8	9.9
Value added per employee (log)	16.4*	18.6**	18.6**
Number of export starters	164		
Number of firms that sell on the national market only	3,398		

Source: France and the UK: Bureau van Dijk, ORBIS 2003-2007, Germany: Research Data Centres of the Federal Statistical Office and the statistical offices of the Länder, The German Business Services Statistics Panel 2003-2007, Author's own calculations.
Note:
The estimated regression coefficients and the levels of significance (+ indicates significance at the 10% level, * at the 5% level, and ** at the 1% level, based on robust standard errors) are presented from OLS estimations of the turnover profitability and the logarithmic average wage, turnover per employed persons and value added per employed persons at t-2, t-1 and t. It is controlled for a full set of economic activity (4-digit) dummies, the number of employed persons and its squared values. To facilitate the interpretation, the estimated coefficient for the export starter dummy on the logarithmic variables has been transformed by 100(exp(ß)-1).The transformation shows the average percentage difference in the respective variables at t-2, t-1 and t between enterprises that begin exporting ("export starters") at t and enterprises that do not start to export. The 1st and 99th percentiles of the wage, turnover profitability and value added distributions are excluded from all computations.

Appendix

TABLE A1
The 100 most export participation patterns in the French Dataset 2003 - 2007

No.	Pattern	Number of enterprises	share of enterprises
1	00000	1,720	13.87
2	000xx	1,169	9.43
3	00xxx	1,089	8.78
4	0xxxx	894	7.21
5	0000x	676	5.45
6	11111	670	5.40
7	11xxx	379	3.06
8	111xx	326	2.63
9	1xxxx	323	2.60
10	000x0	318	2.56
11	0x0xx	277	2.23
12	1111x	256	2.06
13	00x00	178	1.44
14	0x000	154	1.24
15	00x0x	147	1.19
16	00xx0	128	1.03
17	0xxx0	127	1.02
18	0x00x	122	0.98
19	111x1	115	0.93
20	0xx0x	115	0.93
21	01xxx	113	0.91
22	00001	100	0.81
23	10xxx	91	0.73
24	11x11	87	0.70
25	01111	83	0.67
26	1x111	79	0.64
27	10000	78	0.63
28	100xx	78	0.63
29	1x1xx	77	0.62
30	001xx	69	0.56
31	0xx00	69	0.56
32	011xx	67	0.54
33	110xx	61	0.49
34	00011	61	0.49
35	11110	57	0.46
36	00111	57	0.46
37	00100	52	0.42
38	11x1x	50	0.40

39	0x0x0	49	0.40
40	1000x	48	0.39
41	01000	48	0.39
42	11000	47	0.38
43	11xx1	45	0.36
44	00010	44	0.35
45	1x11x	43	0.35
46	0001x	43	0.35
47	11100	42	0.34
48	10111	39	0.31
49	010xx	38	0.31
50	1xxx1	37	0.30
51	11101	36	0.29
52	11011	34	0.27
53	1100x	34	0.27
54	0111x	34	0.27
55	000x1	33	0.27
56	0x1xx	31	0.25
57	1110x	29	0.23
58	1x0xx	28	0.23
59	0011x	28	0.23
60	0xxx1	28	0.23
61	101xx	27	0.22
62	10011	27	0.22
63	0010x	27	0.22
64	1xx11	26	0.21
65	1xx1x	26	0.21
66	0100x	26	0.21
67	01100	25	0.20
68	111x0	22	0.18
69	11001	22	0.18
70	00101	21	0.17
71	00110	20	0.16
72	00xx1	20	0.16
73	1011x	19	0.15
74	1xxx0	19	0.15
75	01011	19	0.15
76	001x0	19	0.15
77	011x1	17	0.14
78	1101x	16	0.13
79	10x0x	16	0.13
80	01110	16	0.13
81	0x001	16	0.13
82	11xx0	15	0.12
83	1001x	15	0.12

84	100x0	15	0.12
85	1x1x1	15	0.12
86	00x1x	15	0.12
87	0xx1x	15	0.12
88	11x0x	14	0.11
89	10x00	14	0.11
90	1x000	14	0.11
91	00x11	14	0.11
92	1x00x	12	0.10
93	001x1	12	0.10
94	10110	11	0.09
95	1xx0x	11	0.09
96	0110x	11	0.09
97	0x111	11	0.09
98	0x100	11	0.09
99	11x00	10	0.08
100	10001	10	0.08
Remaining Patterns		362	2.84
Total		12,403	100.00

Source: Bureau van Dijk, ORBIS 2003-2007, Author's own calculations.

Note: A pattern 00000 (11111) indicates that the enterprises exports in no year (all years) between 2003 – 2007; a pattern 01010 indicates that the enterprise exports in the second and fourth year (2004 and 2006), etc. A "x" indicates that the enterprise is not in the dataset in the particular year.

TABLE A2
The 100 most export participation patterns in the German Dataset 2003 - 2007

No.	Pattern	Number of enterprises	share of enterprises
1	00000	8,562	24.78
2	xxxx0	2,679	7.75
3	0xxxx	2,034	5.89
4	xxx00	1,829	5.29
5	x0000	1,505	4.36
6	xx000	1,488	4.31
7	00xxx	1,104	3.2
8	11111	1,073	3.11
9	0000x	741	2.14
10	000xx	741	2.14
11	xxx0x	697	2.02
12	x0xxx	691	2
13	xx0xx	610	1.77
14	xxxx1	588	1.7
15	00x00	384	1.11
16	00001	357	1.03
17	01111	347	1
18	x00xx	318	0.92
19	10000	300	0.87
20	xx00x	295	0.85
21	1xxxx	293	0.85
22	xxx11	286	0.83
23	00011	262	0.76
24	x000x	246	0.71
25	000x0	242	0.7
26	0x000	240	0.69
27	00111	231	0.67
28	00010	215	0.62
29	01000	202	0.58
30	00100	179	0.52
31	xx111	175	0.51
32	xxx01	171	0.49
33	x1111	158	0.46
34	11000	132	0.38
35	x0x00	132	0.38
36	xxx10	130	0.38
37	10111	129	0.37
38	11xxx	119	0.34
39	11110	116	0.34
40	11100	113	0.33
41	0xx00	107	0.31

42	00x0x	101	0.29
43	xx0x0	97	0.28
44	xxx1x	94	0.27
45	11011	92	0.27
46	00xx0	91	0.26
47	xx011	88	0.25
48	xx001	85	0.25
49	xx100	83	0.24
50	01xxx	82	0.24
51	x1xxx	82	0.24
52	00110	75	0.22
53	0x0xx	75	0.22
54	11101	74	0.21
55	01100	72	0.21
56	10011	71	0.21
57	111xx	70	0.2
58	10xxx	69	0.2
59	x0011	69	0.2
60	x00x0	69	0.2
61	xx1xx	68	0.2
62	x0001	65	0.19
63	01110	64	0.19
64	0xxx0	64	0.19
65	0x00x	60	0.17
66	0xx0x	60	0.17
67	x0111	60	0.17
68	1111x	59	0.17
69	01011	59	0.17
70	00101	56	0.16
71	x0x0x	55	0.16
72	10001	54	0.16
73	x1000	54	0.16
74	x0xx0	52	0.15
75	xx110	46	0.13
76	11001	45	0.13
77	10100	44	0.13
78	x0010	44	0.13
79	x0100	41	0.12
80	100xx	40	0.12
81	xx010	40	0.12
82	01101	39	0.11
83	01010	39	0.11
84	xx11x	39	0.11
85	01001	37	0.11
86	x1100	35	0.1

87	0001x	32	0.09
88	1000x	31	0.09
89	xx101	30	0.09
90	11x11	29	0.08
91	10110	29	0.08
92	x1110	29	0.08
93	0x0x0	28	0.08
94	110xx	26	0.08
95	x11xx	26	0.08
96	011xx	25	0.07
97	x111x	25	0.07
98	10010	24	0.07
99	1x111	24	0.07
100	010xx	24	0.07
Remaining patterns		1,092	3.09
Total		34,553	100.00

Source: Research Data Centres of the Federal Statistical Office and the statistical offices of the Länder, The German Business Services Statistics Panel 2003-2007, Author's own calculations.

Note: A pattern 00000 (11111) indicates that the enterprises exports in no year (all years) between 2003 – 2007; a pattern 01010 indicates that the enterprise exports in the second and fourth year (2004 and 2006), etc. A "x" indicates that the enterprise is not in the dataset in the particular year.

TABLE A3
The 100 most export participation patterns in the UK Dataset 2003 - 2007

No.	Pattern	Number of enterprises	share of enterprises
1	00000	2,237	33.76
2	11111	771	11.64
3	00xxx	679	10.25
4	000xx	436	6.58
5	0000x	407	6.14
6	11xxx	157	2.37
7	111xx	115	1.74
8	0xxxx	114	1.72
9	00001	111	1.68
10	1111x	109	1.65
11	00x00	103	1.55
12	000x0	77	1.16
13	01111	60	0.91
14	0x000	60	0.91
15	00011	59	0.89
16	11110	56	0.85
17	10000	54	0.81
18	00111	53	0.80
19	11011	52	0.78
20	11000	47	0.71
21	11101	44	0.66
22	1xxxx	41	0.62
23	11100	35	0.53
24	0x0xx	29	0.44
25	0xx00	29	0.44
26	110xx	27	0.41
27	10111	27	0.41
28	00x0x	27	0.41
29	0x00x	27	0.41
30	11x11	26	0.39
31	00xx0	25	0.38
32	0xxx0	25	0.38
33	10xxx	21	0.32
34	00100	21	0.32
35	111x1	18	0.27
36	001xx	18	0.27
37	0011x	17	0.26
38	00010	17	0.26
39	100xx	16	0.24
40	01xxx	15	0.23

	41	1x111	14	0.21
	42	01000	13	0.20
	43	0001x	12	0.18
	44	0xx0x	12	0.18
	45	101xx	11	0.17
	46	1110x	10	0.15
	47	01110	10	0.15
	48	0111x	10	0.15
	49	11010	9	0.14
	50	1100x	9	0.14
	51	011xx	9	0.14
	52	01011	9	0.14
	53	00110	9	0.14
	54	1000x	8	0.12
	55	1xxx1	8	0.12
	56	00101	8	0.12
	57	1101x	7	0.11
	58	11xx1	7	0.11
	59	01101	7	0.11
	60	0010x	7	0.11
	61	00x11	7	0.11
	62	10011	6	0.09
	63	1xxx0	6	0.09
	64	0110x	6	0.09
	65	00x1x	6	0.09
	66	0xx01	6	0.09
	67	11x01	5	0.08
	68	10010	5	0.08
	69	100x0	5	0.08
	70	01100	5	0.08
	71	00x01	5	0.08
	72	11001	4	0.06
	73	11x00	4	0.06
	74	1011x	4	0.06
	75	1x101	4	0.06
	76	1xx00	4	0.06
	77	010xx	4	0.06
	78	111x0	3	0.05
	79	11x10	3	0.05
	80	11x1x	3	0.05
	81	10100	3	0.05
	82	1x000	3	0.05
	83	1xx11	3	0.05
	84	1xx1x	3	0.05
	85	1xx01	3	0.05

86	01001		3	0.05
87	000x1		3	0.05
88	0x111		3	0.05
89	0xx1x		3	0.05
90	1x11x		2	0.03
91	1x1xx		2	0.03
92	1x011		2	0.03
93	1x00x		2	0.03
94	1x0xx		2	0.03
95	01010		2	0.03
96	01x11		2	0.03
97	01x00		2	0.03
98	0x01x		2	0.03
99	0x0x0		2	0.03
100	0xx11		2	0.03
Remaining patterns			31	0.44
Total			6,626	100.00

Source: Bureau van Dijk, ORBIS 2003-2007, Author's own calculations.

Note: A pattern 00000 (11111) indicates that the enterprises exports in no year (all years) between 2003 – 2007; a pattern 01010 indicates that the enterprise exports in the second and fourth year (2004 and 2006), etc. A "x" indicates that the enterprise is not in the dataset in the particular year.

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