Volume 35, Issue 2

Export status and firm growth of European SMEs

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Abstract

This paper provides new evidence on the link between the export status and growth of small and medium-sized enterprises. The data consists of CIS 2010 data for 20 EU countries with about 113,000 firm-level observations. The results show that growth rates of both output and employment of exporting SMEs are significantly higher than those for non exporting SMEs. On average exporting SMEs have a 0.6 percentage points higher average employment growth rate and a 0.9 percentage points higher average output growth rate (in current prices) per year for the period 2008-2010. However, there is a large variation in the strength of the link between firm growth and export status with higher magnitudes for SMEs in manufacturing and business services and lower in the remaining service industries.

1. Introduction

Exporting is the main mode of internationalisation of small and medium sized enterprises (SMEs) and is also often employed as a growth strategy (Lu and Beamish, 2001). By selling abroad, SMEs broadens their consumer base and thereby expand their market. In the literature there is a general consensus that the growth rates of employment and output are higher for exporting than for non-exporting firms (Bernard and Jensen, 1999). However, few studies have empirically tested the relationship between export status and growth of SMEs using internationally comparable data. Little is also known about whether this link differs across industries.

By using internationally comparable data this paper investigates the relationship between the export status of SMEs and firm growth. Both employment and output growth is considered, including the variation across industries. The data consists of the Community Innovation Survey 2010 (CIS) for 20 EU countries with about 113,000 observations. To the best of the knowledge of the authors, CIS data have not before been used to rigorously study the link between exporting and growth of SMEs for a larger set of countries. The analysis is restricted to SMEs with between 10 and 249 employees. The key question is whether data for a large set of countries confirm that growth rates of turnover and employment of exporting SMEs are higher than for those only active in the domestic market. Another question is whether there are differences in the magnitude of relationships across broad industry groups (manufacturing versus different service industries).

Numerous studies have investigated the relationship between the export status and firm growth of SMEs (Wagner, 1995; McDougall and Oviatt 1996; Bernard and Wagner, 1997; Robson and Bennett, 2000; Lu and Beamish, 2001; Becchetti and Trovato, 2002; Voulgaris, Asteriou and Agiomirgianakes, 2003; Yasuda, 2005; Filatotchev et al., 2009; Golovko and Valentini, 2011), with a majority of these studies finding a positive link. However, the majority of these studies are limited to manufacturing firms for individual countries. Furthermore, the results of these studies are difficult to compare because of difference in industry coverage (inclusion of service firms), sample period, measurement of the export variable (export status or export to sales ratio), definition of exports (exports of goods only or exports of goods and services) and treatment of marginal exporters (i.e. export threshold in official trade statistics).

Another striking feature of the literature is that few studies have used internationally comparable firm level data to study the link between exporting and growth of SMEs. An exception is the study of Hessels and Parker (2013) which investigates the relationship between export status and both employment and turnover growth. The data consists of 7,700 SMEs from 18 European countries. The authors find a significant relationship between export status and employment growth. However, the relationship between exporting and turnover growth is not significant when foreign purchasing is accounted for.

The CIS data makes it possible to study the link between exporting and firm growth for both service and manufacturing firms for a broader set of EU countries. Another advantage of the data is that the definition of exporting encompasses both goods and services as well as marginal exporters. Unlike in trade statistics there is no threshold for exports to the EU internal market. The CIS 2010 data are accessible at the Eurostat Safe Centre. Information on turnover and employment is available for the year 2008-2010, making it possible to calculate the average annual change in turnover and employment. A limitation of the CIS data is that information on micro enterprises (firms with less than 10 employees) is generally not

available. The empirical analysis is conducted for the total business enterprise sector and for nine broad industry groups. The firm growth equation is estimated by the robust regression method to account for influential observations.

The paper is structured as follows: Section two introduces the empirical model. Section three describes the data, while section four presents the empirical results, and section five concludes.

2. Empirical model

Firm growth is specified as a function of initial size and a number of control variables (Evans, 1987). These control variables include innovation output indicators, relative productivity level, ownership characteristics, industry affiliation and country effects. The firm growth equation augmented by the exported status is specified as follows:

$$\left(\ln Y_{ijct} - \ln Y_{ijct-2}\right)/2 = \beta_0 + \beta_1 \ln Y_{ijct-2} + \beta_2 (\ln Y)^2_{ijct-2} + \beta_3 EX_{ijct,\cdot t-2} + \beta_4 NEWMKT_{ijct,\cdot t-2}$$

$$+ \beta_5 INPS_{ijct,\cdot t-2} + \beta_6 FOROWN_{ijct} + \beta_7 GROUP_{ijct} + \gamma DCO_{ijct} + \eta DSEC_{ijct} + \varepsilon_{ijct}.$$

Here i denotes firm, j industry, c country and t time. The dependent variable, $\Delta \ln Y_{ijc} = \left(\ln Y_{ijct} - \ln Y_{ijct-2}\right)/2$, measures the average annual change in turnover (in current prices) or employment over the period 2008-2010. The independent variables are as follows:

$\ln Y_{ijct-2}$: Logarithm of turnover or employment in 2008,

$\ln Y^2_{ijct-2}$: Logarithm of turnover or employment squared in 2008,

$EX_{ijct,\cdot t-2}$: Dummy variable for the current export status (1 if the firm exports (goods or services)) between 2008-2010 and zero otherwise,

$NEWMKT_{ijct,\cdot t-2}$: Introduction of market novelties between 2008-2010,

$INPS_{ijct,\cdot t-2}$: Introduction of new production processes between 2008-2010,

$FOROWN_{ijct}$: Dummy variable equal to one if in 2010 the firm is foreign-owned and zero otherwise,

$GROUP_{ijct}$: Dummy variables equal to one if in 2010 the firm is part of a domestic group and zero otherwise,

DCO_{ijct} , $DSEC_{ijct}$: Country and (two-digit) industry dummy variables.

The key variable is the export status. The parameter ß$_3$ gives the difference in growth rate of output or employment between exporting and non-exporting SMEs measured in percentage points controlling for other firm characteristics. A negative coefficient for ß$_1$ means that small firms grow faster than larger firms. A significant coefficient of the squared term of initial size, ß$_2$ means that there is a non-linear relationship between firm growth and size.

The firm growth equation can be estimated using OLS with heteroscedasticity consistent standard errors. As an alternative, the robust regression method can be used to account for the possible impact of influential observations. The robust regression method is an iterative estimator which gives influential observations a lower weight based on absolute residuals. Standard errors are calculated using the pseudo values approach described in Street, Carroll, and Ruppert (1988).

The firm growth equation is estimated separately for nine industry groups. It is likely that there is not only a strong link between exporting and firm growth of manufacturing SMEs but also for service SMEs. Note that service exports become increasingly tradable in the last decade.

3. Data and descriptive statistics

The data are based on the CIS 2010 which is accessible at the Eurostat Safe Centre. The CIS is a representative random sample of firms with 10 or more employees that is stratified by industry, firm size, and region. The CIS data exhibits a high degree of coherence with the structural business statistics. The response rates are generally high, exceeding 80 percent in all countries. The survey contains firms in the business enterprises sector in a wide range of industries: mining (B), manufacturing (C), energy and water supply (DtE), wholesale trade (G), transportation (H), information and communication services (J), financial and insurance activities (K), and professional scientific and technical services. In addition, construction firms are included for a subset of countries (ES, FR, HR, IT, LT, NL, NO, PT and SK). Firms in the remaining industries (retail sector, accommodation and food services, real estate, administrative and support services) are only partially or not at all covered and are therefore not representative for the total population of firms in these industries. Note that in retail services, hotels and restaurants, and real estate, exporting is not the main internationalisation mode. Instead firms in the hotel, restaurant and retail trade industry choose to enter the foreign market through franchising and licensing and to a lesser extent through equity capital rather than exporting. In real estate, FDI is the dominant mode of internationalisation.

The key variable of interest is the export status measured as whether or not firms sold goods or services during a three-year period (2008-2010). Exporting is defined as when a firm either sells to European countries (within EU, EFTA or EU candidate country) or to non-European countries. Employment is defined as the average number of employees for a given year. Turnover is defined as the market sales of goods and services in current prices (Euro), exclusive of VAT. It would be preferable to deflate turnover by detailed producer prices indexes. However, harmonised producer prices indices for non-manufacturing industries across countries are not available. Manufacturers in the Euro area experienced producer price rises by approximately 1 percent during the years 2008-2010 (source: OECD Statistics). Given the low inflation rate during the period studied the bias occurring by not using deflators is likely to be negligible.

The CIS also provides a wide range of information on innovation activities and includes data on ownership, which is based on self-reported information. In this study two types of technological innovations are used: (i) introduction of new or significantly improved goods or services into the market ahead of competitors ("new market products"); and (ii) implementation of a new or significantly improved production process, distribution method, or support activity for goods or services ("process innovations"). All measures of technological innovations refer to the period 2008-2010. The number of firm level observations is approximately 160,000. Ireland and Finland had to be excluded because of missing data for some of the variables. Firms with less than 10 employees and industries which are not representative of the total population of firms (i.e. Nace rev 2. I, L and P-S) are excluded. The estimation sample consists of about 113,000 observations.

Table 1: Export participation (goods or services) of SMEs by broad industry groups in 20 European countries between 2008 and 2010 (in percent)

	SMEs (10-249)	large firms (250+)	difference in percentage points
Mining and carrying	27.8	56.4	28.6
Manufacturing	51.7	88.9	37.2
Electricity, gas, water supply	14.0	16.8	2.8
Construction	4.8	39.9	35.1
Wholesale trade	35.8	47.1	11.3
Transport and storage	36.3	50.0	13.7
Information and communication	40.8	54.8	14.0
Financial and insurance activities	19.1	25.1	6.0
Professional, scientific, technical activities	26.7	62.9	36.2

Note: Data is used for the following countries: BG, CY, CZ, DE, EE, ES, FR, HR, HU, IE, IT, LT, LU, LV, NL, PT, RO, SE, SI, and SK plus NO. Weighted by sample weights. Number of firm-level observations is 139,000 (unweighted).

Source: CIS 2010 Eurostat, Safe Centre and own calculations.

Table 1 reports the export participation rates of SMEs by broad industry groups in comparison with large firms. Export participation of SMEs varies widely across industries. Export participation of SMEs is highest in manufacturing (52 percent) followed by information and communication services (41 percent), wholesale trade and transport, and storage (both 36 percent). At the lower end of export participation construction (5 percent), financial and insurance activities (19 percent) and electricity, gas and water supply (14 percent) are found. It is interesting to note that the gap in exporting between SMEs and large firms is highest in manufacturing and business services and lowest in energy and water supply.

In order to obtain first insights into the relationship between firm growth and export status the percentage of firms with growing employment by initial firm size is calculated (Figure 1).

Figure 1: Percentage of SMEs with growing employment in EU-20 between 2008 and 2010 by number of employees in the initial year

Note: The number of observations ranges between 3,000 or more for firms with 10 employees and decreases to about 250 for firms with 50 employees. Country coverage: BG, CY, CZ, DE; EE, ES, FR, HR, HU, IT, LT, LU, LV, NL, NO, PT, RO, SE, SI and SK.

Source: CIS 2010. Eurostat Safe Centre.

One can see that the percentage of firms with an increase in employment is higher among exporters than among non-exporters. However, the gap narrows with increase in firm size.

4. Empirical results

Table 2 shows the results of the robust regression method on the determinants of the average output and employment growth of SMEs for the total business enterprise sector for the period 2008-2010.[1] Separate results are provided for the nine broad industry groups (see Table 3 for output growth and Table 4 for employment growth). The number of observations for the total sample is about 113,000 of which 51,600 are manufacturing SMEs.

Table 2: Results of the robust regression model of the relationship between exporting and firm growth of SMEs: Evidence for 20 European countries

Dependent variable :	Output growth			Employment growth		
	coeff.		t	coeff.		t
ln output 2008	-0.064	***	-23.60	-0.204	***	-107.79
ln output squared 2008	0.001	***	15.33	0.023	***	87.11
export status 2008-2010	0.009	***	8.17	0.006	***	8.25
new market products 2008-2010	0.011	***	6.78	0.014	***	13.47
process innovations 2008-2010	0.021	***	15.95	0.016	***	18.54
foreign ownership 2010	0.036	***	18.08	0.011	***	8.67
domestic group 2010	0.020	***	13.41	0.078	***	6.78
country and industry dummies	yes			yes		
constant	0.420	***	25.42	0.417	***	109.96
# of observations	113192			113674		

Note: *$p<0.1$, ** $p<0.05$, ***$p<0.01$. The dependent variable is the average annual growth of output (in current prices) or the average annual employment growth for the period 2008-2010. The coefficient on the export dummy measures the differential in the output growth rate between exporters and non-exporters in percentage points. Country coverage: BG, CY, CZ, DE, EE, ES, FR, HR, HU, IT, LT, LU, LV, NL, NO, PT, RO, SE, SI and SK.

The results show that exporting SMEs have a significantly higher average annual growth rate of employment for the period 2008-2010 than non-exporting SMEs when controlling for size, innovation output, ownership, industry affiliation, and country effects. For the total sample, the annual average employment growth rate of exporting SMEs is 0.6 percentage points higher on average than for the non-exporting SMEs between 2008 and 2010. The corresponding result for the difference in the output growth rate is 0.9 percentage points per year (in current prices). The positive relationship between SMEs' exporting and firm growth deserves particular attention given the time period examined in this study, which was characterised by economic and financial crisis of 2008-09. This indicates that exporting SMEs recovered faster from the crisis than SMEs that were only present in their respective domestic markets. An alternative interpretation is that the crisis induced SMEs to increase their export activities given that domestic demand was imploding.

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[1] Estimates are perforemdn using the STATA rreg command.

Table 3: Robust regression method of the relationship between SME exporting and output growth: Evidence for 20 European countries

	mining		manufacturing		energy and water supply	
	coeff.	t	coeff.	t	coeff.	t
ln output 2008	-0.096 ***	-2.79	-0.081 ***	-19.59	-0.025 ***	-3.00
ln output squared 2008	0.002 *	1.87	0.002 ***	13.36	0.000	1.51
export status 2008-2010	0.072 ***	6.00	0.030 ***	17.48	-0.001	-0.10
new market products 2008-2010	0.049 **	2.07	0.013 ***	5.57	0.008	0.97
process innovations 2008-2010	0.007	0.49	0.026 ***	13.60	0.013 **	2.45
foreign ownership 2010	0.026	1.42	0.040 ***	13.17	0.019 **	2.16
domestic group 2010	0.024 *	1.68	0.015 ***	6.66	0.014 ***	2.77
country dummies	yes		yes		yes	
constant	0.602 ***	2.89	0.502 ***	19.88	0.198 ***	3.73
# of observations	1303		51463		4347	

	construction		distribution		transportation	
	coeff.	t	coeff.	t	coeff.	t
ln output 2008	-0.367 ***	-18.40	-0.084 ***	-11.53	-0.047 ***	-4.97
ln output squared 2008	0.011 ***	15.87	0.002 ***	9.32	0.014 ***	2.80
export status 2008-2010	0.024 ***	2.76	0.004	1.56	0.001 **	2.45
new market products 2008-2010	-0.003	-0.31	0.005	1.15	0.018 **	1.99
process innovations	0.036 ***	5.02	0.017 ***	5.24	0.015 ***	2.94
foreign ownership 2010	0.040 *	1.85	0.014 ***	3.36	0.026 ***	3.68
domestic group 2010	0.029 ***	4.05	0.003	0.79	0.020 ***	5.46
country dummies	yes		yes		yes	
constant	2.966 ***	19.75	0.569 ***	11.83	0.331 ***	5.92
# of observations	8582		19754		8345	

	Information and communication		financial sector		professional and technical services	
	coeff.	t	coeff.	t	coeff.	t
ln output 2008	-0.055 ***	-5.41	-0.028 **	-2.08	-0.050 ***	-5.23
ln output squared 2008	0.023 ***	4.56	0.000	-0.67	0.001 **	2.10
export status 2008-2010	0.001 ***	2.78	-0.026 ***	-2.70	0.019 ***	4.87
new market products 2008-2010	0.019 ***	4.00	0.017	1.44	0.024 ***	4.83
process innovations	0.021 ***	4.56	0.029 ***	3.38	0.017 ***	4.12
foreign ownership 2010	0.037 ***	5.68	0.058 ***	5.97	0.034 ***	5.01
domestic group 2010	0.008 *	1.93	0.023 ***	2.66	0.020 ***	4.52
country dummies	yes		yes		yes	
constant	0.382 ***	6.49	0.275 ***	3.12	0.340 ***	6.40
# of observations	7544		3185		8595	

Note: *p<0.1, ** p<0.05, ***p<0.01. The dependent variable is the average annual growth of output (in current prices) for the period 2008-2010. See Table 2.

Source: CIS 2010. Eurostat Safe Centre.

The control variables show the expected sign. The introduction of market novelties and process innovations are significantly positively related with firm growth. The coefficients of market novelties of 0.011 and 0.014 indicate that SMEs with new market products have 1.1 and 1.4 percentage points higher output and employment growth rate per year between 2008 and 2010. It is interesting to compare the coefficients of the export status with those for technological innovations. Exporting appears to have the same impact on growth prospects as the introduction of new market products. SMEs that are part of a larger group with headquarters abroad or in the home country show higher growth rates of employment and output.

Table 4: Robust regression estimates of the relationship between SME exporting and employment growth: Evidence for 20 EU countries

	mining			manufacturing			energy and water supply		
	coeff.		t	coeff.		t	coeff.		t
ln employment 2008	-0.139	***	-7.39	-0.143	***	-50.54	-0.088	***	-11.73
ln employment squared 2008	0.014	***	5.26	0.014	***	37.16	0.009	***	9.08
export status 2008-2010	0.025	***	3.60	0.014	***	13.08	0.005		1.41
new market products 2008-2010	0.006		0.44	0.012	***	8.85	0.016	***	3.02
process innovations 2008-2010	0.015	*	1.94	0.015	***	13.24	0.009	***	2.81
foreign ownership 2010	0.014		1.34	0.015	***	7.99	0.010	*	1.95
domestic group 2010	0.012		1.52	0.013	***	9.10	0.006	*	1.74
country dummies	yes			yes			yes		
constant	0.300	***	8.33	0.303	***	54.14	0.196	***	13.91
# of observations	1312			51633			4367		

	construction			distribution			transportation		
	coeff.		t	coeff.		t	coeff.		t
ln employment 2008	-0.300	***	-36.20	-0.274	***	-62.34	-0.266	***	-39.59
ln employment 2008 squared	0.036	***	30.43	0.034	***	52.86	0.031	***	32.68
export status 2008-2010	0.026	***	5.20	0.007	***	4.36	0.009	***	3.38
new market products 2008-2010	0.010		1.49	0.011	***	3.57	0.010		1.35
process innovations	0.024	***	5.97	0.010	***	4.54	0.023	***	5.61
foreign ownership 2010	0.004		0.34	0.002		0.83	-0.003		-0.50
domestic group 2010	0.009	**	2.14	0.003		1.30	0.005		1.41
country dummies	yes			yes			yes		
constant	0.56	***	34.72	0.522	***	45.11	0.541	***	39.49
# of observations	8593			19761			8377		

	Information and communication			financial sector			professional and technical services		
	coeff.		t	coeff.		t	coeff.		t
ln employment 2008	-0.497	***	-61.39	-0.136	***	-15.13	-0.369	***	-50.67
ln employment 2008 squared	0.062	***	52.84	0.015	***	12.13	0.046	***	43.01
export status 2008-2010	0.011	***	3.31	0.007		1.39	0.021	***	7.38
new market products 2008-2010	0.019	***	4.95	0.007		1.25	0.020	***	5.45
process innovations	0.017	***	4.68	0.014	***	3.17	0.018	***	5.96
foreign ownership 2010	0.015	***	2.84	-0.004		-0.85	0.013	***	2.69
domestic group 2010	0.010	**	2.55	-0.014	***	-3.17	0.013	***	4.27
country dummies	yes			yes			yes		
constant	0.94	***	59.28	0.29	***	15.31	0.686	***	51.95
# of observations	7596			3255			8706		

Note: *p<0.1, ** p<0.05, ***p<0.01. The dependent variable is the average annual growth of employment between the period 2008 to 2010. See table 2.

Source: CIS 2010. Eurostat Safe Centre.

The results also show that the link between firm growth and the export status varies widely across industries. For output growth, the magnitude of the link between exporting and firm growth is highest for SMEs in mining, manufacturing, construction, and professional and technical services, and lowest in transportation, and information and communication services. Furthermore, the association between exporting and firm growth is insignificant in energy and water supply, distribution and in the financial sector. When firm growth is measured by employment the results are quite similar. The large difference in the magnitude of the association in non-manufacturing industries is not surprising given that service industries are highly heterogeneous and often use other modes of internationalisation (FDI, franchising, licensing) than exporting.

5. Conclusions

This study investigated the link between export status and firm growth for small and medium-sized industries based on CIS 2010 data for 19 European countries. Results obtained from the robust regression method unambiguously show that the growth rate of both output and employment of exporting SMEs is significantly higher than those for non-exporting SMEs when controlling for other firm characteristics. On average exporting SMEs have a 0.6 percentage points higher average employment growth rate and a 0.9 percentage points higher average output growth rate (measured in current prices) per year between 2008 and 2010. However, there is a large variation of this link across industries. In general, the magnitude is highest for SMEs in manufacturing, information and communication services, and professional and technical services, and lowest in distribution. Furthermore, the association between exporting and firm growth is insignificant in energy and water supply as well as in the financial sector. In summary, the findings suggest that exporting SMEs tend to create more jobs and achieve higher output growth than non-exporting SMEs in the same period after controlling for firm size, ownership and innovation activities. The results point to a justification for export promotion policies that are widely used in EU countries.

The main limitation of this study is related to the nature of the data. The use of cross section data and the absence of good instrumental variables do not allow for the drawing of conclusions about the causal effects of exporting on firm growth. Both firm growth and exporting refer to the same time period, 2008-2010. Good instrumental variables that are highly correlated with exporting but not with employment or output growth are difficult to find. One solution for overcoming the endogeneity problem is to use pseudo-panel methods applied to several waves of the CIS, with lagged level variables as instruments for current changes. Also the CIS data do not allow for distinguishing between continuous exporters and export starters. It is likely that the performance effects of an export starter are larger than those for continuous exporters.

There are several suggestions for future research. For example, the impact of exporting on labour productivity growth is an important area of research this study leaves to future investigation. Another mode of internationalisation is international innovation cooperation. The CIS data make it possible to analyse the relationship between performance and innovation cooperation with partners abroad. Further ideas for future work include interaction terms between the export status and the relative productivity level of SMEs. The underlying hypothesis is that the relationship between export status and firm growth is higher for high productivity firms. The positive dependence of exporting on productivity is known as the self-selection of high-productivity into exporting. Another idea for future work is the use of quantile regressions. The advantage of quantile regressions is that they provide information about the impact of the independent variable on different points in the conditional distribution of the dependent variable other than the conditional mean. Firm growth is also likely to depend on the skill intensity of the firm. However, skill intensity measured as the share of workers with a tertiary degree cannot be included because this information is not available for a subset of European countries (i.e. ES, FI, FR, NO and SE).

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