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Export Behaviour of SMEs in the Swedish Computer Service Industry

Martin Falk and Eva Hagsten

Abstract

Export participation of SMEs in Swedish computer services has increased rapidly over the last decade. Despite the increase, export participation rates of SMEs including micro enterprises remain rather low at 13 percent in 2010. Based on uniquely linked firm-level datasets with full coverage of micro enterprises and sole proprietors, this study investigates the determinants of export participation of Swedish SMEs in the computer service industry. Exports include both goods and services. Estimates based on the conditional logit model show a significantly positive relationship between initial labour productivity and the decision to export. An interesting and new finding is that the magnitude of the relationship between the probability to export and initial labour productivity is low once firm effects are controlled for. Surprisingly, the impact of labour productivity on exporting does not differ between micro enterprises and the remaining SMEs (10–249 employees). Furthermore, skill intensity is significantly related to the probability of exporting with low marginal effects. Overall, labour productivity and skill intensity only explain a small proportion of the export boom of Swedish software SMEs.

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Keywords Exports; productivity; computer service industry; human capital; conditional logit model

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Introduction

Export participation of small and medium sized enterprises (SMEs) in Swedish computer services has increased rapidly over the last decade. For instance, export participation of micro enterprises (defined as goods or service exports) has increased from 6 to 11 percent, whereas that of SMEs with between 10 and 249 employees increased from 62 to 73 percent (Table 3). Despite such a general increase in exporting among Swedish software firms, micro enterprises face a significant disadvantage in exporting. The increased tradability of services can be explained by advances in ICT and logistics, reduced trade barriers for services and new forms of international financial transfer options (OECD 2013).

In recent years there have been a number of studies investigating the export behaviour of small and medium-sized firms (SMEs). Size, labour productivity, innovation activities, skills and foreign ownership are found as key determinants of export participation and export intensity (see Leonidou et al. 2007 for a survey, Greenaway and Kneller 2007 or Wagner 2007 for surveys on productivity and exporting). However, micro enterprises are often omitted in these studies due to data availability. The lack of studies for micro enterprises is a result of the difficulty of obtaining information on exports and other relevant firm-specific information (besides employment and age, which can be found in the business registers or structural business statistics). For instance, Eickelpasch and Vogel (2011) report that for German business service statistics, small enterprises with an annual turnover of 250,000 euros or less are not obliged to provide information about export activities (equal to a firm with five employees assuming an average sale per employee of 50,000 euros). Thus, firms with marginal exports are difficult to capture based on official trade statistics.

Despite the increasing number of firm level studies on the drivers of export, few studies have exclusively focused on services SMEs. An exception is Lejárraga and Oberhofer (2015) who study the export behavior of French SMEs in the service sector based on the AMADEUS

database. Previous studies based on Swedish firm level data are often limited to manufacturing firms (including firms with 10 or more employees, see Hansson and Lundin 2004; Greenaway, Gullstrand and Kneller 2004; Andersson and Lööf 2009; for including micro enterprises see Andersson, Lööf, and Johansson 2008; Eliasson, Hansson and Lindvert 2012).

Studying the export behaviour of SMEs including micro enterprises is particularly interesting because these firms are very dynamic and often young, with higher growth rates but also high exit rates. Therefore, there are good reasons to believe that the firm-specific determinants of exporting differ between SMEs and micro enterprises. Besides, large software firms already export to 100 percent making an analysis of their export decisions less informative,

In this paper the determinants of export participation of Swedish SMEs in the computer service industry (NACE rev 1.1 72) are analysed. A strength of the study is the use of uniquely linked and representative firm-level datasets for the computer services industry. In particular, the data consists of the linked business register, the VAT database for exports and the structural business statistics. The empirical model employed is a conditional logit model which makes it possible to control for unobservable firm effects. For the sample of Swedish service SMEs, exporting is a rare event. In 2010 13 percent of SMEs (including micro enterprises) in computer services exported goods or services. Therefore, this analysis focuses on the extensive margin rather than the intensive margin.

The computer service industry is an appealing case for our purposes for a number of reasons. First, it belongs to knowledge intensive business services with a high level of innovativeness. Second, the tradability of computer and software services has rapidly due to the Internet and other technological developments. Third, in computer services the provision of a service can be spatially separated from its consumption. Therefore, the service does not necessarily have to be consumed at the same time and in the same place as it is offered, as is the case for many

other services (Hill, 1999). Fourth, the computer services industry consists of many small enterprises and belongs to the fastest growing industries in the economy. Previous studies on ICT and software companies are often based on small surveys (see Bell 1995, 1997; Coviello and Munro 1997; Garvey and Brennan 2006; Ojala and Tyrväinen 2007; Terjesen et al. 2008). This study employs the total population of firms with less than 250 employees. Fifth, we focus on the export participation of the computer service industry because it is one of the few service industries where we see an increase in export participation over time (see Table 2 in appendix).

The structure of this paper is as follows: Section 2 presents the theoretical background and empirical model. Summary statistics are presented in section 3, and section 4 offers a range of empirical results. Section 5 contains concluding remarks.

Theoretical background and empirical model

To examine the determinants of export behaviour this study builds on the recent stream of literature on firm heterogeneity and international trade based on work by Melitz (2003). Theoretical studies and empirical work that follow this seminal paper have paid special attention to the interaction of sunk costs entering export markets and firm productivity. The decision to go international will be determined by this interaction and productive firms will merely self-select into export markets. Sunk costs include costs caused by finding information on foreign markets and possible clients, and variable costs include shipping costs. Therefore, only firms with superior performance become exporters (Dunning 1970, Melitz 2003). For SMEs and micro firms in particular, sunk costs can be higher than for larger firms.

A large number of studies have investigated the relationship between exporting and productivity (see Greenaway and Kneller 2007 or Wagner 2007). A general finding is that more productive firms are more likely to export. Furthermore, another stylized fact of the

literature is that larger firms are more prone to export and also have higher export performance (see Wagner 1995, 2001; Harris and Li 2009). However, there are differences between manufacturing and service SMEs with lower export size dependency for service firms (Lejárraga and Oberhofer 2015).

Empirical studies also find that human capital, capital intensity, age and foreign ownership are main determinants of exporting (Greenaway and Kneller 2007). In a study on the export decision of manufacturing firms in the United States, Bernard and Jensen (2004) show that, besides favourable exchange rate shocks, size, productivity, labour quality, ownership structure, introduction of product innovations and past successes in export markets, are factors that increase export probability. Studies of determinants of the export behaviour of SMEs reveal similar results. Hollenstein (2005) concludes that the most important drivers of the internationalisation of SMEs are the advantages arising from the availability of human knowledge and physical capital as well as some firm-specific assets in fields like marketing, organisation and finance. A firm-level study focusing on SMEs in transition economies also finds that both human capital and technology-related factors are important sources of international competitiveness as well as industry linkages, firm size, foreign capital share, sector of activity, availability of external finance, and membership in business associations (Gashi, Hashi and Pugh 2014). Schott (2004) adds further evidence of the importance of highly skilled employees in determining the export activities of a firm.

Taking into account the findings of previous research on international trade, export behaviour will be modelled as a function of labour productivity skill intensity and control variables.

Thus, the following logit model is specified:

$$XD_{it}^* = \beta_0 + \beta_1 \log\left(\frac{Y}{L}\right)_{it-1} + \beta_2 HK_{it-1} + \beta_3 FOROWN_{it.1} + \beta_4 Size_{it} + \beta_5 Age_{it} + \varepsilon_{it}$$

Here XD_{it}^* represents the probability to export and the observed variable takes on the value of 1 if the firm is an exporter, 0 otherwise:

$$XD_{it} = \begin{cases} 1 & \text{if } XD_{it}^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

Y/L_{it-1} indicates labour productivity. Size and age denote the size and age of the firm. FOROWN is a dummy variable indicating majority foreign ownership with 50 per cent or more of foreign-owned equity. HK_{it-1} denotes the proportion of highly skilled human capital in firms. All explanatory variables except size and age are lagged one year in order to avoid, to a certain extent, endogeneity problems.

The standard logit model is likely to lead to biased estimates because it cannot control for any unobservable firm effects that influence the decision to export. In order to account for firm effects, a fixed or random effect logit model may be used:

$$XD_{it}^* = Y_{it}\beta + e_{it} \quad e_{it} = \delta_i + d_t + \varepsilon_{it}$$

The error term can be decomposed into three parts: a time-invariant unobserved characteristic, time effects and a normally distributed random error with zero mean and unit variance. The model can be estimated by the fixed effects or random effects logit model. However, the random effects model makes the assumption that unobserved firm characteristics are uncorrelated with the error term. The random effect logit model is inconsistent in case of correlation between the unobservable firm characteristics and the error term. The advantage of the fixed effects model is that there is no assumption about the correlation between the firm effect and the error term. Therefore we use the conditional logit model introduced by Chamberlain (1980). Nevertheless, the estimation approach drops all cases in which the dependent variable does not change (no exports or persistent exports). Given that SMEs consist of a heterogeneous group with respect to age and firm size, separate estimation results are conducted for micro enterprises and the remaining SMEs.

Data and descriptive statistics

In order to analyse the export behaviour of SMEs, information from the Swedish business register, education register and structural business statistics has been linked with the VAT database for exports of goods and services. The data consists of computer services (NACE rev. 1.1. industry 72) for the period 2002-2010. Employment is measured as full-time equivalent employees. We do not exclude self-employed persons because it is unclear to what extent the owner of one person business is actually involved in the work.

A common feature of the databases is good coverage of micro enterprises which accounts for 95 percent of the total population of firms. Another joint feature of the data is availability of panel data, which makes it possible to account for lagged impacts and firm effects. An advantage of the use of VAT statistics on exports is that there are no reporting thresholds unlike in trade statistics. It is worth noting that the export variable does not suffer from measurement error since it is based on the VAT. Note that the trade statistics exhibit minimum reporting threshold for exports. These reporting thresholds are different for intra- and extra-EU exports. The motive for reporting thresholds for exports is to reduce the reporting burden on small exporters and the costs of data processing and collection for statistical offices. A minimum reporting threshold in trade statistics most likely lead to an underestimation of the percentage of SME exporters but will not have a large impact on the SME export value. This particularly holds true for the group of micro and small enterprises which are often marginal exporters. In contrast, there are no reporting thresholds in the data based on the VAT statistics. In order to check the extent of the differences across the two data sources the percentage of exporters (goods and/or services) is calculated based on data for the Swedish business sector for the year 2010.

Table 1 in the Appendix shows that there are large differences between the two data sources. For the SMEs (defined as 0 to 249 employees) in the total business enterprise sector the percentage of exporters is 3.7 percent based on the trade statistics linked with the structural

business statistics and 6.9 percent based on the VAT statistics linked with the structural business statistics. For micro enterprises the corresponding shares based on trade and VAT statistics are 2.7 percent and 5.7 percent. Thus, the share of exporters among SMEs based on VAT statistics is almost twice as large as that of trade statistics. This clearly shows that VAT statistics or alternatively survey based information (such as the Community Innovation Survey) are more appropriate than the trade statistics for calculating the share of exporting SMEs. However, few statistical offices in the EU countries can provide information for the number of exporters by firm size based on the VAT database.

Descriptive statistics for the sample of computer services firms shows that few SMEs are exporting. In 2010, 13 percent of SMEs in the business enterprise sector exported goods and/or services (see Table 3). However, the export participation of SMEs is much higher, at about 70 percent, when micro enterprises are excluded. It is interesting to note that export participation of micro enterprises and SMEs between 10 and 249 increased rapidly over time. The increase is about 11 percentage points for SMEs and 4 percentage points for micro enterprises during the period 2001-2010. Table 4 shows that exporting SMEs are more productive on average and also employ a higher share of workers with a tertiary degree. It is interesting to note that the differences are more pronounced for micro firms than for small and medium sized software firms.

Empirical results

Table 5 reports the results of the fixed effects conditional logit model of the decision to export for Swedish SMEs in the computer service industry for the period 2002-2010.¹ Two specifications are provided: one with the share of university graduates and control variables and the other with both the share of university graduates and the log output to employment ratio both lagged one period. The regressions with the log output to workers ratio exclude one

¹ The STATA command xtlogit with the FE option is used to estimate the export decision.

person businesses because this variable is not defined for firms with zero employees. The table includes both coefficients and the marginal effects. Regressions contain year fixed effects. The year dummy variables are significant at the five percent level in the majority of cases. However, there is no clear pattern over time.

The results for the total sample of SMEs show that firm size, skill intensity and labour productivity are all significantly positively related with the probability of exporting of goods and/or services. This means that SMEs with a higher tertiary worker share and a higher productivity level are more likely to start exporting. However, the magnitude and significance of the tertiary graduates share decreases markedly when the output to employment ratio is included in specification (ii). This implies that high output to employment ratio is more important than a high share of university graduates in determining the decision to export. The marginal effects show that an increase in labour productivity by 10 percent leads to an increase in the probability of exporting by 0.2 percentage points. This implies that the size of the effect of labour productivity on exporting is rather small. For comparison, results of the standard logit model are provided. Table 7 shows that the impact of labour productivity is significantly overestimated when firm effects are not controlled for.

Firm age measured as the dummy variable for SMEs five years or younger is not significant, suggesting that young micro enterprises in computer services do not have a disadvantage in exporting. Similarly, for the group of micro enterprises, firm size and labour productivity are again positive and significant determinants of the probability of exporting (see Table 4). A striking result is that the impact of labour productivity does not differ much between SMEs with between 10 and 249 employees and micro enterprises. An increase in labour productivity by 10 percent is associated with an increase in the probability of exporting by 0.23 percentage points for the total group of SMEs and 0.16 percentage points for micro enterprises.

Another important result is that a small firm size remains a disadvantage in exporting of SMEs even when other factors such as labour productivity and skill intensity are controlled for. However, the strength of the firm size exporting link decreases when labour productivity is controlled for. In particular, for SMEs in computer services the coefficient of the size class dummy 10-49 of 0.094 means that small SMEs with between 10 and 49 employees have a higher probability of exporting by about 10 percentage points than compared with micro enterprises. Similarly, large SMEs have a higher probability of exporting by 10 percentage points than micro enterprises. This indicates that the gap in exporting between micro enterprises and large SMEs is larger than that between small and large SMEs. A possible explanation of the negative dependence of exporting on firm size is that micro enterprises have lower resource capacities in terms of finance, knowledge, and managerial experience.

Conclusions

This paper has investigated the export behaviour of Swedish SMEs in the computer service industry. The data consisted of unique firm level data based on the total population of firms in that specific industry for the period 2002-2010. The results show that export participation of SMEs is significantly positively related to a lagged level of labour productivity, share of workers with a tertiary degree and firm size. This indicates that more productive and larger SMEs, and those with a higher share of workers with a tertiary degree are more likely to export. Furthermore, there are little differences in the impact of labour productivity between SMEs and micro enterprises.

With regard to possible future work, the determinants of export intensity would be of interest to estimate. Specifically, the two-part model makes it possible to jointly investigate the extensive margin (“decision of export”) and intensive margin (“export share”). Another research avenue is to explore the determinants of exports beyond Europe. However, this

would require additional data on exports by destination. Finally, export activities of SMEs also depend on innovation activities (Anon Higón and Driffield 2010; Cassiman and Golovko, 2011). Nevertheless, information on innovation activities is generally not available for firms with less than 10 employees.

References

- Andersson, M., and Lööf, H. (2009), 'Learning-by-Exporting Revisited: The Role of Intensity and Persistence', *The Scandinavian Journal of Economics*, 111(4), pp. 893-916.
- Andersson, M., Lööf, H., and Johansson, S. (2008), 'Productivity and international trade: Firm level evidence from a small open economy', *Review of World Economics*, 144(4), pp. 774-801.
- Añón Higón, D., and Driffield, N. (2010), 'Exporting and innovation performance: Analysis of the annual Small Business Survey in the UK', *International Small Business Journal*, 29, 4-24.
- Bell, J. (1995), 'The internationalisation of small computer software firms. A further challenge to "stage" theories', *European Journal of Marketing*, 29, 60-75.
- Bell, J. (1997), 'A Comparative Study of the Export Problems of Small Computer Software Exporters in Finland, Ireland and Norway', *International Business Review*, 6, 585-604.
- Bernard, A. B. and Jensen, J. B. (2004), 'Why Some Firms Export', *The Review of Economics and Statistics*, 86(2), 561-569.
- Cassiman, B., and Golovko, E. (2011), 'Innovation and Internationalisation through Exports', *Journal of International Business Studies*, 42, 56-75
- Chamberlain, G. (1980). 'Analysis of covariance with qualitative data', *Review of Economic Studies* 47: 225-238.
- Coviello, N. E. and Munro, H. J. (1997), 'Network Relationships and the Internationalisation Process of Small Software Firms', *International Business Review*, 6, 361-386.
- Dunning, J.H. (1970), *Studies in International Investments*, London, Allen & Unwin.
- Eickelpasch, A., and Vogel, A. (2011), 'Determinants of the export behaviour of German business services companies', *The Service Industries Journal*, 31(4), 513-526.
- Eliasson, K., Hansson, P., and Lindvert, M. (2012), 'Do firms learn by exporting or learn to export? Evidence from small- and medium-sized enterprises', *Small Business Economics*, 39, pp. 453-472.
- Fernández, Z., & Nieto, M. J. (2005). Internationalization Strategy of Small and Medium-Sized Family Businesses: Some Influential Factors. *Family Business Review*, 18(1), 77-89
- Garvey, D., and Brennan, L. (2006), 'The Internationalisation of Indigenous Irish Software Technology Companies: An Exploratory Study', *Irish Journal of Management*, 26, 81-108.

- Gashi, P., Hashi, I., & Pugh, G. (2014). Export behaviour of SMEs in transition countries. *Small Business Economics*, 42(2), 407-435.
- Greenaway, D. and Kneller, R. (2007), 'Firm heterogeneity, exporting, and foreign direct investment', *The Economic Journal*, 117(517), 134–161.
- Greenaway, D., Gullstrand, J., and Kneller, R. (2005). 'Exporting may not always boost firm productivity'. *Review of World Economics*, 141(4), pp. 561-582.
- Hansson, P. and Lundin N. N.. (2004). 'Exports as an Indicator on or Promoter of Successful Swedish Manufacturing Firms in the 1990s', *Review of World Economics* 140, pp. 415-445.
- Harris, R., and Li, Q. C. (2009). 'Exporting, R&D, and absorptive capacity in UK establishments', *Oxford economic papers*, 61, 74-103.
- Hill, P. (1999). 'Tangibles, intangibles and services: a new taxonomy for the classification of output', *Canadian Journal of Economics*, 32(2) 426-446
- Hollenstein, H. (2005), 'Determinants of international activities: Are SME's different?', *Small Business Economics* 24, 431-450.
- Lejárraga, I., and Oberhofer, H. (2015), 'Performance of small-and medium-sized enterprises in services trade: evidence from French firms', *Small Business Economics*, forthcoming.
- Leonidou, L. C., Katsikeas, C. S., Palihawadana, D., and Spyropoulou, S. (2007). 'An analytical review of the factors stimulating smaller firms to export: Implications for policy-makers', *International Marketing Review*, 24(6), pp. 735-770.
- Melitz, M. J. (2003), 'The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity', *Econometrica*, 71(6), 1695-1725.[^]
- Ojala, A., & Tyrväinen, P. (2007). Market entry and priority of small and medium-sized enterprises in the software industry: An empirical analysis of cultural distance, geographic distance, and market size. *Journal of International Marketing*, 15(3), 123-149.
- OECD (2013), *Fostering SMEs' Participation in Global Markets: Final Report, Entrepreneurship and Local Development*, Paris.
- Schott, P. K. (2004), 'Across-Product Versus Within-Product Specialization in International Trade', *Quarterly Journal of Economics* 119, 647-78.
- Terjesen, S., O'Gorman, C., and Acs, Z. (2008), 'Intermediated mode of internationalisation: new software ventures in Ireland and India', *Entrepreneurship & Regional Development*, 20, 89-109.

- Wagner, J. (1995). 'Exports, firm size, and firm dynamics', *Small Business Economics*, 7, 29-39.
- Wagner, J. (2001). 'A note on the firm size–export relationship', *Small Business Economics*, 17, 229-237.
- Wagner, J. (2002), 'The causal effects of exports on firm size and labor productivity: first evidence from a matching approach', *Economics Letters*, 77, 287-292.
- Wagner, J. (2007), 'Exports and Productivity: A Survey of the Evidence from Firm-level Data', *The World Economy*, 30, 60–82.

Table 1: Export participation based on trade and VAT statistics in the Swedish business enterprise sector, 2010 (in percent)

Firm size (employees)	number of firms	number of exporters (goods & services)		export participation in percent	
		SBS/ER	trade statistics	VAT data	trade statistics
0	740,840	7,404	20,489	1.0	2.8
1-9	226,967	19,086	34,433	8.4	15.2
0-9	967,807	26,490	54,922	2.7	5.7
0-249	1,001,049	37,231	69,228	3.7	6.9
1-249	260,209	29,827	48,739	11.5	18.7
10-249	34,240	11,444	15,087	33.4	44.1
250+	998	703	781	70.4	78.3
total	1,002,047	37,934	70,009	3.8	7.0

Note: Exports include both exports of goods and services not distinguished between Intra and Extra EU. ER denotes Employment register. SBS denotes structural business statistics.

Source: Statistics Sweden.

Table 2: Change in export participation based on VAT statistics in services industries

Nace rev	2001	2010	Change in percentage points
1.1			
50 Sale, repair of motor vehicles	8.5	10.7	2.2
51 Wholesale trade	29.4	28.1	-1.3
52 Retail trade	9.1	8.2	-0.9
55 Hotels and restaurants	0.9	1.1	0.2
60 Land transport	10.4	10.7	0.3
61 Water transport	15.6	9.8	-5.8
62 Air transport	34.6	27.8	-6.8
63 Supporting transport activities	30.9	28.2	-2.7
64 Post and telecommunications	13.5	4.9	-8.6
65 Financial services	17.2	13.6	-3.6
67 Act. auxiliary to financial interm.	20.3	10.1	-10.2
71 Renting	6.6	8.3	1.7
72 Computer services	9	12.9	3.9
73 Research and development	13.6	18.7	5.1
74 Other business activities	7	8.4	1.4
90 Sewage and refuse disposal	4.7	5.8	1.1
91 Activities of membership organizations n.e.c.	5.4	5.6	0.2
921t2 Motion picture and video activities , Radio and television activities	13.6	14.6	1.0
923t7 Artistic act., news agencies, library,	2.8	5.7	2.9
93 Other service activities	0.5	0.9	0.4

Source: Statistics Sweden.

Table 3: Evolution of export participation of SMEs in computer services over time

	SMEs 0-249	SMEs 10-249	SMEs 0-9
2001	9.0	62.0	6.0
2002	8.9	64.8	6.2
2003	9.0	69.4	6.6
2004	10.4	72.1	8.2
2005	10.3	71.6	8.0
2006	10.9	71.9	8.6
2007	12.0	71.1	9.6
2008	12.1	70.2	9.7
2009	12.5	71.4	10.1
2010	12.9	73.3	10.5
Change	3.9	11.3	4.5

Source: Statistics Sweden ESSLait.

Table 4: Difference in output per employee and skill intensity between exporters and non-exporters

	Output per employee (in 1000 SEK)		
	1-249	SMEs 10-249	SMEs 1-9
non exporting	907.3	1045.9	612.3
Exporting	1106.9	997.9	908.4
	Share of tertiary graduates in percent		
	1-249	SMEs 10-249	SMEs 1-9
non exporting	30.6	36.7	30.5
Exporting	36.7	44.2	34.2

Source: Statistics Sweden ESSLait.

Table 5: Conditional logit model of the determinants of exporting of Swedish SMEs (1-249) in computer services for the period 2003-2010

	(i)					(ii)				
	coef	z	m.e.	z	coef	z	m.e.	z		
size 10-49	1.45 ***	20.35	0.276 ***	25.41	1.17 ***	15.66	0.094 ***	7.02		
size 50-249	2.55 ***	14.14	0.347 ***	26.24	2.12 ***	11.17	0.109 ***	6.73		
young SMEs	-0.17 ***	-4.17	-0.040 ***	-4.04	-0.21 ***	-3.81	-0.022 ***	-3.08		
foreign-owned t-1	-0.10	-0.96	-0.023	-0.95	-0.09	-0.79	-0.010	-0.77		
share of tertiary graduates t-1	0.18 ***	3.06	0.044 ***	3.08	0.15 *	1.80	0.016 *	1.80		
log output per employees t-1					0.24 ***	10.35	0.026 **	17.40		
yr2003	0.03	0.48	0.006	0.48	0.04	0.70	0.005	0.72		
yr2004	0.38 ***	7.32	0.087 ***	8.26	0.24 ***	3.70	0.024 ***	4.02		
yr2005	0.28 ***	5.38	0.065 ***	5.85	0.01	0.11	0.001	0.11		
yr2006	0.35 ***	6.63	0.081 ***	7.46	0.14 **	2.06	0.014 **	2.25		
yr2007	0.48 ***	8.74	0.108 ***	10.49	0.26 ***	3.67	0.025 ***	4.03		
yr2008	0.38 ***	6.74	0.087 ***	7.70	0.17 **	2.37	0.017 **	2.59		
yr2009	0.36 ***	6.23	0.082 ***	7.06	0.21 ***	2.80	0.021 ***	3.06		
yr2010	0.35 ***	5.88	0.080 ***	6.63	0.25 ***	3.33	0.025 ***	3.68		
number of obs	45180				24338					
number of firms	6731				3891					

Notes: The table reports coefficients and marginal effects of the conditional logit model of the probability of exporting of SMEs in computer services (Nace rev. 1.1). ***, ** and * denotes significance at the 1, 5 and 10 per cent significance levels.

Source: Statistics Sweden ESSLait.

Table 6: Conditional logit model of the determinants of exporting of Swedish micro enterprises and SMEs (10-249) in computer services

	micro enterprises					SMEs 10-249				
	coef		z	m.e	z	coef		z	m.e	z
log employment size 50-249	0.78 ***		18.22	0.043 ***	5.88	0.58 ***		2.92	0.097 **	2.19
young SMEs	-0.17 ***		-2.68	-0.009 **	-2.18	-0.27 **		-1.99	-0.053	-1.57
foreign-owned t-1	-0.06		-0.35	-0.003	-0.34	-0.21		-1.00	-0.040	-0.91
share of tertiary graduates t-1	0.11		1.18	0.006	1.18			-0.41	-0.035	-0.39
log output per employees t-1	0.30 ***		11.43	0.017 ***	9.46	0.12		1.37	0.023 **	2.27
year dummies	yes									
number of obs	18809									
number of firms	3225									

Notes: The table reports coefficients and marginal effects of the conditional logit model of the probability of exporting of SMEs in computer services (Nace rev. 1.1). ***, ** and * denotes significance at the 1, 5 and 10 per cent significance levels. Time dummy variables are included but not reported.

Source: Statistics Sweden ESSLait.

Table 7: Standard logit model of the determinants of exporting of Swedish micro enterprises and SMEs (10-249) in computer services

	SMEs 0-249		SMEs 10-249		Micro enterprises	
	m.e	z	m.e	z	m.e	Z
log employment t-1	0.152 ***	37.32	0.063 ***	3.88	0.153 ***	24.57
young firms	0.021 **	2.51	-0.018	-0.67	0.025 ***	2.79
foreign owned firms t-1	0.110 ***	5.84	0.065 **	2.06	0.131 ***	5.88
share of tertiary graduates t-1	0.018 *	1.67	0.208 ***	4.47	0.004	0.33
log output per employees t-1	0.069 ***	12.09	0.106 ***	5.00	0.063 ***	10.77
# of observations	9711		1391		8320	

Notes: The table reports the marginal effects of the standard logit model of the probability of exporting of SMEs in computer services (Nace rev. 1.1) for the year 2010. ***, ** and * denotes significance at the 1, 5 and 10 per cent significance levels.

Source: Swedish ESLAIT data, Statistics Sweden.

Please note:

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The Editor