SERVICE EXPORTERS IN ICT-INDUSTRIES: MEASURING DIGITAL SERVICE TRADE OF ESTONIA

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> The advance of technology is based on making it fit in so, that you don't really even notice it, so it's part of everyday life."
>
> **Bill Gates**

Abstract

In the ecosystem of digital and green transition service exporters play a vital role, particularly in exporting highly valued information and communication technology (ICT) services. In 2020, after the COVID-19 outbreak, Estonia's service exports declined by 20% while ICT service exports increased by 12% compared to 2019. This shows that Estonian ICT firms adapted quickly to seize the opportunities brought by the pandemic to retain their competitiveness. Therefore, the aim of this paper is to investigate the characteristics (**size**, **ownership** and **export intensity)** of the Estonian firms. The study also contributes to the EU´s objective to promote greater transparency on service traders (European Commission, 2021), as we provide new information for policy-makers and support the Estonian and European digital agendas (Estonia, 2018; European Commission, 2020, 2021). Our findings show that among services exporters the firms that export ICT services are more export-intensive and smaller and have more foreign ownership than non-ICT firms.

Keywords: Service exports, ICT- sectors, firm-level data, digital economy, logistic regression, globalization, international trade,

JEL Classification Codes: F1, F140

1. Introduction

Global economy has witnessed rapid growth of international trade in services. In 2020, global services exports were valued at US$5 trillion, representing 5.9 per cent of world GDP and 22.6 per cent of total world trade in both goods and services (UNCTAD, 2020, 2021). Recent developments in information and communication technologies

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(ICT) are commonly cited explanation that accounts for this rise (Kneller and Timmis, 2016). Digital economy may be partly measured by services delivered mainly digitally as services trade by mode 1 (World Trade Organization, 2009; Lemma, 2021)

EU is the world´s largest trader of services[2], with services exports exceeding 900 billion per year in 2021(OECD, 2022), thus our study aims also to enhance the transparency of the typology of exporting firms.

Usually, large American digital platforms are seen as beneficiaries of the Covid pandemic as they increased their market capitalization and dominance in the digital ecosystems (Vlassis, 2021). The pandemic reinforced already existing trends towards stronger market concentration.

However, this study focusing on Estonian digital service firms demonstrates that many smaller players adjusted to the changing circumstances well and increased their export revenue. Many Estonia-specific factors are vital for understanding the export competitiveness of digital companies.

Estonia, well-known also as e-Estonia, is internationally positioned as a hub for knowledge-intensive and digital firms and start-ups. Being a small Nordic country with an open market economy already for almost 30 years, Estonia´s business environment is an excellent basis for knowledge intensive service firms to be involved in international activities. A firm in Estonia can be established entirely online in just a few hours and from almost anywhere in the world. Furthermore, Estonia is the first country to offer e-Residency to non-residents, offering the freedom to start and manage a firm remotely. This way, it is relatively convenient to run a firm, explaining also a large share of small-size service exporting firms (84% for ICT-firms, 79% for all).

The emphasis on small firms transacting in global market is quite different from traditional understanding by scholars which considers market mechanisms to be vital, but emphasizes much economic activity occurs within firms (Barnard, The economy of incentives, 1938). Generally, firms emerge due to the uncertainty and thus high transaction costs in the markets (Coase 1937). However, many small firms may also arise due to the firm-friendly environment with low transaction costs where it is not necessary to internalize all externalities within a firm or its tightly controlled value-chain.

Indeed, it takes a few hours to launch a firm in Estonia from anywhere in the world. Moreover, there is no corporate income tax for undistributed and potentially reinvested profits . This may contribute to the establishment of services firms. Furthermore, the Estonian government keeps the electronic "Company Registration Portal" allowing entrepreneurs to submit electronic applications and other documents to the Estonian Commercial Register to start or manage a firm. Hence, both residents and e-residents

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[2] https://data.oecd.org/trade/trade-in-services.htm

may easily register a firm in Estonia, thus, may boost also the internationalization of firm activities.

Estonian digital agenda (Estonia, 2018) underscores the importance of enhancing the knowledge on firms that export services. Therefore, the results of this study can be a valuable input for the decision-makers while supporting the digital agendas for information and communication technology (ICT) firms related to employment and export strategy.

This study aims to fill in the data and methodology gap of the knowledge on service traders, thus exploring firms by their characteristics. The goal is to refine the international trade and the theory of firm from the perspective of service traders. Due to the friendly e-business environment and the openness of Estonian economy, we assume that the population under study includes a substantial number of foreign-owned firms. Consequently, we have two research questions:

1. Do the firms exporting ICT services differ from non-ICT firms regarding ownership, size, export intensity, and other characteristics?
2. What are the most prominent differences between ICT and non-ICT firms?

The study will proceed as follows. First, it will discuss some conceptual considerations based on international trade and nature of firms. This is followed by a brief discussion of characteristics of Estonian ICT sector and its export. Then research methods are outlined through which we shed light on firms´ typology in Estonia using descriptive and regression methods. The paper will follow by exploring the behaviour and characteristics of the Estonian service exporting firms. It concludes by discussing key findings and implications as the results of the study can be a valuable input for the decision-makers to support employment and export strategies.

2. Conceptual considerations

Exporting is still the most predominant form of a firm's internationalization activities (Benkovskis *et al.*, 2019; Wagner, 2021). However, we do not know much about the service exporting firms, for example, whether their size matters. There is some consensus in the literature that firm size is related to the firm's export strategy (Bonaccorsi, 1992; Wagner, 1995; Verwaal and Donkers, 2002). However, few studies on service traders explain that theory, as most previous research investigates the manufacturing exporting firms.

This paper combines "new trade theory" and transaction cost theory, the latter as the firm´s modern theory (Foss and Klein, 2005). Transaction costs arise immediately whenever the non-resident wants to make a deal with a resident. Transaction cost is a cost incurred in making an economic exchange of ownership in searching for the best supplier or customer, whether located in the home or host economy (Williamson, 1996)

Service exports, means partly also the removing of transport and tariff costs from firm´s transaction costs, as transport and tariff costs are discussed while exporting goods, not services, thus making the services exporters different from goods exporters.

Firm´s international activities are generally represented by exports, imports and technological collaboration (Lal, 2004) .The central debates discuss the relationship between firm size and export strategy and performance, the latter measured by exports volume ratio to total sales. However, some studies have found no significant relationship and others have suggested a negative association between firm size and export strategy (Verwaal and Donkers, 2002; Amador, Cabral and Ringstad, 2019). For example, firms have to set up the costs of governance structures to begin trading with an exchange partner, including costs of procurement, appointments with a potential foreign buyer, making an offer, setting up contract relationships and communication channels, and scheme of control (Nooteboom, 1993). Furthermore, the costs of setting up governance structures may be higher for smaller firms due to the lack of a systematic and reliable formal information system in smaller firms (Verwaal & Donkers, 2002) (Nooteboom, 1993). Thus, small exporters may aim to go for a different strategy than large firms. Hence, in the first phases of developing an export relationship, small firms have higher costs in setting up their governance structures (Verwaal & Donkers, 2002) . However, smaller firms may adapt quicker in foreign markets, than larger firms due to their structural simplicity (Chen and Hambrick, 1995). Therefore, small firms may be more efficient in responding to the requirements of foreign buyers. Such an adaptation may consequently reduce the costs of governance structures for smaller firms.

Already Coase (1937) aimed to define the "firm" and to emphasize its size and other characteristics. As uncertainty and transaction costs play a vital role in the emergence of firms, firms have to predict what and how to produce and trade (Coase, 1937). Small firms can adapt quicker. Launching a service trading firm, the entrepreneurs start to export services with only one or two employees. Compared to goods' exporters, the service exporters do not have transport costs and border tariffs to serve the foreign markets. The uncertainty is relatively high also because of the difficulty of enforcing contracts across borders and the information asymmetry and geographical distance between the exchange partners (Verwaal & Donkers, 2002).

Firm size might have an impact on export strategy (Bonaccorsi, 1992). Thus, many researchers have included firm size as an independent variable in their empirical studies. For example, in Italy, small firms are deeply involved in foreign trade in the most successful export sectors (Bonaccorsi, 1992).

Firm-level data analysis started with Bernard and Jensen's (Bernard and Jensen, 1999) papers on firms' characteristics within the countries and industries, however considered mainly firms that exported manufactured goods. Thus, there has not been much research separately done on service firms, as services have sometimes been considered out of the scope of international trade, being intangible money flows covered by the banks´ transactions. From those times, it has also been continuously repeated that not the countries export, but the firms do. The empirical findings on firms´characteristics (firm size, ownership, number of exported products etc) have made this research direction

more promising for further developing the "new new trade theory", explaining firms´export strategies using their specific characteristics(Bernard and Wagner, 1997, 2001; Melitz, 2003). Regarding ownership, more stronger links to multinational groups have been found, differences of services exporters were found (Lööf, 2009; Conti, Lo Turco and Maggioni, 2010; Federico and Tosti, 2017). Furthermore, there exists evidence that firm characteristics affect the firm´s decision to export (Temouri, Vogel and Wagner, 2013; Minondo, 2014).

In the line of new new trade theory very different digital firms have emerged around the globe. While there are still many small and domestically oriented ICT firms, a few digital platforms from the United States and China dominate global services trade (Kitsing, 2022). These global platforms exploit networks effects by serving as both marketplaces and gate-keepers in digital ecosystems for both other firms and consumers.

3. Research Methods

Service traders are firms that export or import services. Services generally include transport, travel, construction, financial, cultural, and legal services etc. However, this study highlights the computer and information services, that comprise 14% of total service exports in Estonia in 2018 and 26% in 2021 (Figure 1). One reason of this increase is also the decline of travel services during Covid-19 times. However, the volumes of ICT-services exports have also increased in volume, by 12% compared to 2019 (1.1 billion vs 1.3 billion euros in 2019 and 2020, respectively) (Figure 2).
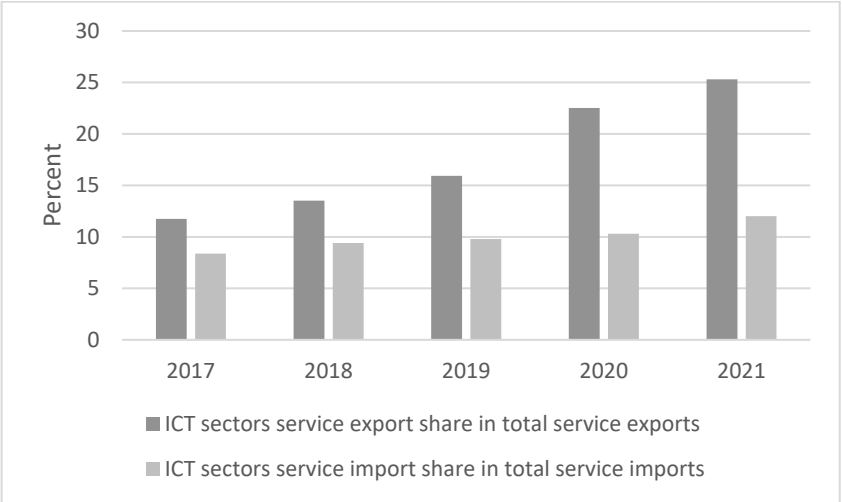

Figure 1. ICT sectors share of total services exports in Estonia, %
Data for 2021 is based on 3 quarters, Statistics Estonia (accessed 13.01.2022), table VKT10, author's calculations

The study is based on the firm-level data, which have been collected for the international trade in services annual statistics and for balance of payment purposes from a population of over 7400 **service** exporting firms in Estonia. The annual export and import value is measured as firms´ transactions with non-residents. Based on Estonian Business Register, the following firms´ characteristics were used: number of employees, ownership (domestic or foreign-owned), sales or turnover volume, exports volume, firm´s activity sector by NACE.

For ICT split, the classification of economic activities (sectors) NACE Rev.4 [3] (Eurostat, Statistical classification of economic activites in the European Community, 2008) was applied and the following sectors were included: electronic communication (J 61), computer programming (J 62), information activities (J 63), repair of computers (S 95) (EU, 2019).

Services exporters' data is conventionally compiled by the Bank of Estonia, based on enterprise survey. Exporters' dataset is a subset of the Estonian Business Register dataset. Therefore, by linking trade data with business register using the firm registration ID, the impact of firm´s characteristics on firms´ export strategies can be further investigated.

International Trade in Services Statistics methodology is determined by Balance of Payments (IMF, 2014) and international trade in services statistics methodological frameworks (UNSD, 2012).
Our dataset is of secondary nature, as data has not been collected primarily for this research purposes. However, the dataset was adjusted for this research by the authors, using linking, aggregation, classification and other statistical methods. The research was conducted using descriptive and logistic regression analysis.

It is well acknowledged that trade in services drives the exchange of ideas, know-how and technology, although it is often restricted by barriers such as domestic regulations (OECD, 2022). However, the trade barriers have not been discussed in this study but remains open for further research.
The software used in statistical analysis was IBM SPSS version 27 and Stata 17.

4. Estonian ICT sector and exports characteristics

In 2020, since the pandemic Covid-19 began, 21% decline was registered in Estonia´s total service exports (Statistics Estonia, table VKT1). However, ICT-services exports were affected less and continued to increase also in 2021, with 12% growth rate in 2020 compared to 25% in 2019. This shows that ICT service exporters have managed to continue with the strategy to increase exports, being more resilient and competitive to adapt in the pandemic situation. These developments have pushed ICT services exports to the forefront of the global trading system (Ronen, 2021)

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[3] EMTAK – Estonian Classification of Economic Activities; (NACE for the European context) and the EU regulation (2020/1197)

Covid-19 has made it even easier to sell services at distance, digital technology allowing service providers in one nation to sell to service buyers in another nation without elaborate investments (Baldwin, Cárdenas and Fernández, 2021).

Firms do export, not countries. Currently, most trade statistics is published on the industry and country level. Publicly available aggregated data on services trade[4] do not yield insight to firms´ characteristics. Since 2013, ICT-sector firms **service** exports increased by almost threefold, from 0.5 billion in 2013 to 1.3 billion EUR in 2020 (Figure 2), having reached more that fifth of total services (Figure 1).

Exporting ICT goods and services contribute to the economic development of a nation. Previous studies have focused on ICT services exports and the relationship with economic growth (Sinha, 2018).

Thus, we know the overall trends in services exports, but not much about the firms themselves. However, for the decision-making process and to study trade patterns, the firm-level analysis is extremely valuable for policymakers and trade negotiators to better support the decisions on export strategies.

The study is based on 2018 annual data collected from 7414 service exporting firms located in Estonia, comprising 14% of total Estonian service exports in 2018 and 23% in 2020 (figure 1).
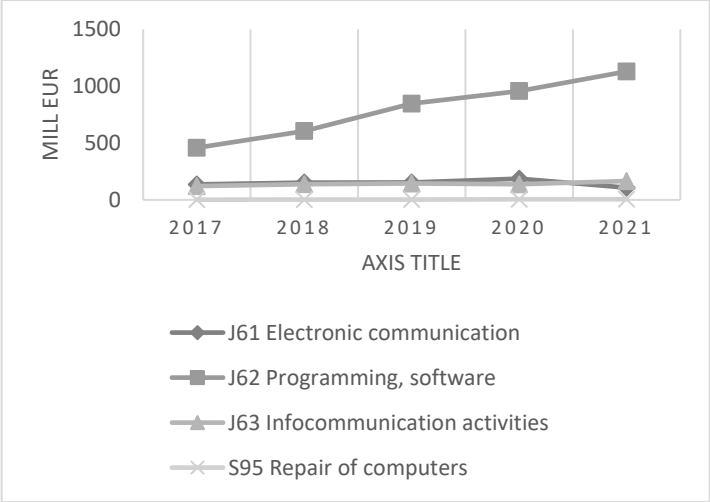

Figure 2. Service exports by ICT sectors in Estonia, 2018-2021 (2021 is based on 3 quarters)
Statistics Estonia database (accessed 13.01.2022), table VKT10, author's calculations

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[4] https://andmed.stat.ee/en/stat/majandus__valiskaubandus__valiskaubandus-alates-2004/VK06

5. Empirical evidence

5.1 Descriptive analysis

For ICT, 1158 firms data were used related to information and communication activities (NACE activity codes J582, J61, J62, J631 and S95), assuming that those firms also export knowledge intensive services. Firstly, some basic statistics are presented and aimed to answer the first research question. In table 1, mean values and standard deviations, calculated separately for ICT and non-ICT groups, are given.

Table 1. Descriptive statistics for ICT, non-ICT and all service traders,

Variable	Mean			St.deviation			p-value
	ICT	non-ICT	All firms	ICT	non-ICT	All firms	
Firm ownership (0=domestic; 1=foreign)	0,48	0,3	0,34	0,49	0,46	0,47	p=0,000
Employees number	12,1	20,6	19,3	64,9	144,4	135,1	p=0,026
Export intensity	64,8	55	56,6	36,7	40,03	39,7	p=0,000
Number of firms	1158	6256	7414				

It is observed that for the ICT-group export intensity is larger than in case of the non-ICT group: 65% vs 55%. In contrast, the ICT-group number of employees is 12 compared to 20 for non-ICT, which means that the ICT-services exporters tend to be more oriented to the export markets and are smaller compared to non-ICT which are more oriented to local markets.

Table 2. Employees number for ICT and non-ICT service exporters (chi-square test). Pearson chi2 = 15.7988; p=0.001

Firm size	ICT	non- ICT	All firms
micro (1-9 empl.)	967 (84%)	4917 (79%)	5884(79%)
small (10-49)	129 (10%)	955 (15%)	1084(15%)
medium (50-249)	53 (5%)	314 (5%)	367(5%)
large (250 and more)	9 (1%)	70 (1%)	79(1%)
Total	1158 (100%)	6256 (100%)	7414

The Pearson chi-squared statistics shows that there is statistically significant difference between the size distributions of ICT firms and non-ICT firms, as the share of micro-firms (1-9 employees) comprised 84%, compared to 79% in non-ICT firms.

5.2 Logistic regression

The analysis above showed that there are several characteristics where the ICT and non-ICT companies differ significantly. Next we try to aggregate all this information into one single statistical model – logistic regression. A logistic regression model allows to identify type of the firm (ICT or non-ICT) on the basis of measurable firm characteristics.

Based on firm-level dataset (N=7414), the goal is to reveal the determinants that differentiate the most between the ICT-exporters and non-ICT exporters (group 1 is ICT; group 0 is non-ICT). The initial list of variables included: export type (end-use or intermediate services), NACE category, product mix (number of services in the export basket), firm size (number of employees), export intensity (exports share in total sales), firm´s ownership.

Our strategy in logistic regression analysis was to follow stepwise method. According to this, one starts with the full model which includes all the independent variables available. Then, based on statistical significance (p-values) of the regression coefficients obtained, all insignificant variables are excluded, one by one, from the model, thus reaching finally a logistic regression model with only significant regressors.

Applying the strategy described, we first detected that there is a considerable skewness in the "number of employees" variable, and hence its logarithmic transform was used instead of the original variable. After evaluating the full logistic regression model and examining statistical significances of the variables used, we identified only three variables that have significant influence on the probability of the ICT group: firm size (log), ownership and export intensity. The model containing the three predictors was statistically significant (chi2 = 171; N=7414, p < 0.000). This indicates that the model is able to distinguish between the ICT and non-ICT service exporting firms.

Table 3. Logistic regression (with log), n=7414

ICT exporter	Coef.	Std. Err.	z	P>|z|	Odds
Firm ownership	0.65	0.07	9.8	0.00	1,90
Log employees in firm	-0.19	0.06	-3.4	0.001	0,83
Export intensity	0.004	0.00	5.12	0.00	1,004
Constant	-2.12	0.08	-28.38	0.00	0,12

Log likelihood = -3127 chi2 = 171.02 Prob > chi2, p < 0,000; Area under ROC curve = 0,6176

The beta coefficient of the "log employees in firm" variable is equal to -0.19, which means that if that variable is increased by 1 unit (i.e. number of employees increases 10 times) then the log odds $\ln(p/(1-p))$ of probability p that the firm belongs to ICT sector decreases by -0.19 or, equivalently, the odds $p/(1-p)$ itself decreases by the factor

exp(-0.19)=0.83. Of course, one has to keep in mind that, according to the *ceteris paribus* principle, all other variables are assumed to be unchanged.

Next, we analyze the quality of the regression model obtained (Table 3 and Figure 3). The model´s chi-square (chi2 = 171.02) and its significance (p-value 0,000) shows no doubt that the regression model has a certain degree of explanatory power.

Another measure of quality of a logistic regression model is its AUC (area under the ROC curve) which in our case equals AUC=0.6176. This is an indicator of only a rather modest discriminating power of the model. One can conclude that, although the model itself is highly significant, the significance mainly comes from the relatively big sample size (N=7414).
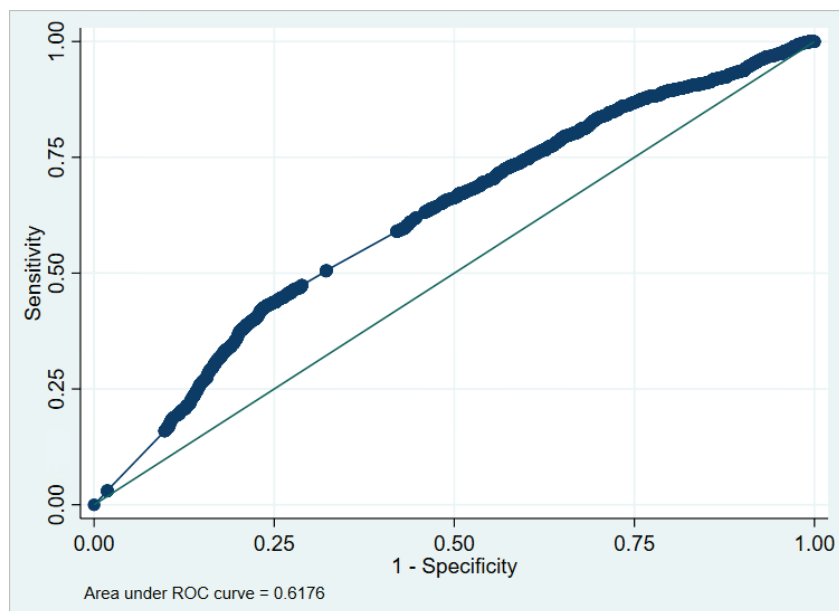

Figure 3. Model quality: area under curve (AUC)

Next, it would also be informative to see how the probability of ICT firm depends on each individual independent variable while keeping other variables at their mean level. For this, we present the marginplots by the regressor variables (export intensity, firm size and firm ownership), with predicted probabilities (on y-axis) of ICT-firms and with 95% confidence intervals (Figures 4,5,6).
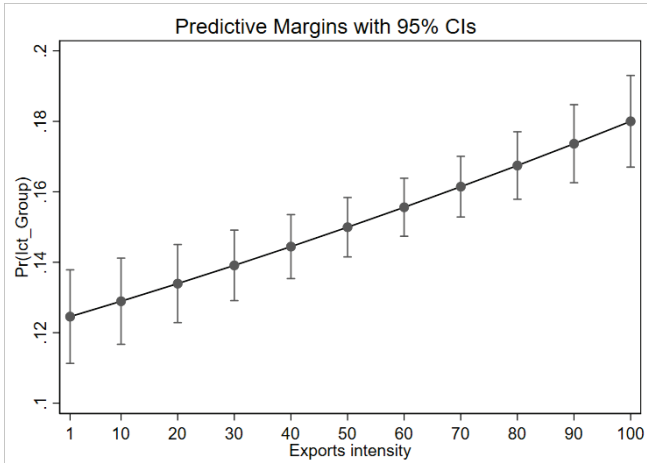
Figure 4. Logistic regression model predictions for export intensity to belong into ICT-group.

It is easy to see from the figure 4 that as the value of export intensity increases the probability of being an ICT firm is also increasing from a probability of 0.12 to a probability of 0.18.

However, the marginsplot looks differently when the effect of firm size is considered. From the figure 5 one can see that as the firm size increases the probability of being an ICT firm is decreasing from a probability of 0.18 to a probability of 0.07.
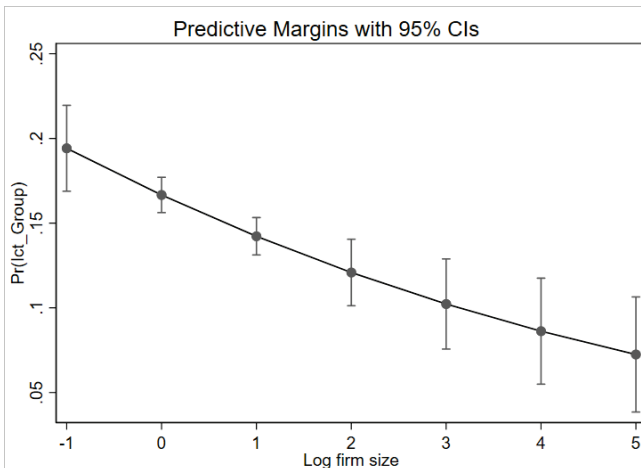

Figure 5. Logistic regression model predictions for firm size to belong into ICT-group
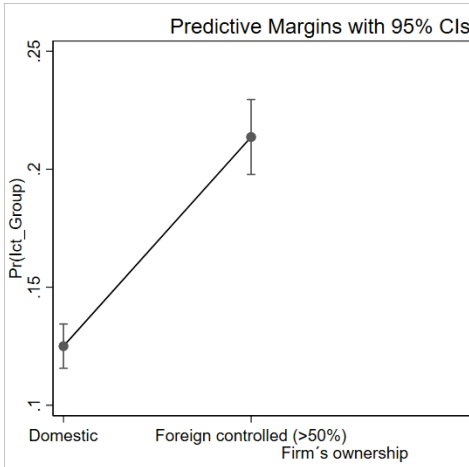
Figure 6. Logistic regression model predictions for firm ownership to belong into ICT-group

Finally, the figure 6 demonstrates that foreign controlled companies have much higher probability of being ICT firm (p=0,22) as compared to domestic firms (p=0,12).

6. Discussion

Indeed, due to the advances in technology development and the business-friendly environment, ICT exports have increased also in Estonia. Furthermore, since COVID-19 outbreak when total services trade declined by fifth, ICT exports still increased by 12%.

This paper presents the first evidence on services traders regarding the effect of firms´ characteristcs on ICT firms. Firm-level business register dataset was combined with international service transaction data for measuring service trade across ICT and non-ICT firms. We constructed the variables to capture the differences between ICT and non-ICT traders.

Logistic regression analysis showed that the quality of the model was good, as area under ROC curve was 62%. The number of ICT-firms was 1158 (16% of all service exporters (7414)). Non-ICT traders or less information-intensive types of service traders were more large, more domestic and with lower export-intensity scores. The limitation is that we considered only the enterprises that exported services through the particular sectors (J58, J61, J62, J63, S951). We assume that they also export ICT-services, however, we have already excluded goods trading values from the turnover of those firms.   In addition, many sectors are now highly digitalized and this study do not capture all of these sectors. The key implication of the study is to emphasize considerable role of policies in removing bottlenecks for global recruitment in the Estonian ICT services

sector. Furthermore increased public and private funding for ICT research and development can contribute to exports of high value-added services . The ICT sector is a potential source of exports, both for ICT services but also for high-tech goods. ICT export strategy could involve new supporting funding initiatives to ICT-service exporters (Lemma, 2021). The ICT export strategy could tie exporters with other sectors, supporting micro and small firms, as well as ICT-start-ups. For future research, ICT goods and highly digitalized non-ICT sectors such as financial services should also be involved in the analysis to have the integral approach on Estonian digital trade.

7. Conclusion

Our analysis suggests that ICT services exporting firms differ significantly by the following characteristics: firm's size (number of employees), firm´s ownership and export intensity. We found that ICT-services firms are smaller in size and more export-intensive than rest of the service exporters.

With the unique firm-level service exporters database from Statistics Estonia and logistic regression, we provide new information for policy-makers and support the Estonian and European digital agendas (Estonia, 2018; European Commission, 2020, 2021). Our findings show that among services exporters the firms that export ICT services are more export-intensive and smaller and have more foreign ownership than non-ICT firms. Firms take the decision in their strategy whether to export or to sell domestically. A low export intensity score means that they sell more in the domestic markets and a high intensity score means that they mainly sell internationally. We found that smaller ICT firms are keener to export than large firms. Thereby the study shows that small and medium size ICT firms are able to grow and keep up with technological and market changes

References

1. **Amador, J., Cabral, S. and Ringstad, B.** (2019) 'International trade in services: firm-level evidence for Portugal', *Portuguese Economic Journal*, 18(3), pp. 127–163. doi:10.1007/s10258-019-00161-4.

2. **Baldwin, R.E., Cárdenas, J. and Fernández, C**. (2021) *Telemigration and digitally enabled service exports*. [Graduate Institute of International and Development Studies, Centre for ….

3. **Benkovskis, K. *et al*.** (2019) 'Export and productivity in global value chains: Comparative evidence from Latvia and Estonia', *Review of World Economics*, pp. 1–21.

4. **Bernard, A.B. and Jensen, J.B**. (1999) 'Exceptional exporter performance: cause, effect, or both?', *Journal of international economics*, 47(1), pp. 1–25.

5. **Bernard, A.B. and Wagner, J.** (1997) 'Exports and success in German manufacturing', *Weltwirtschaftliches Archiv*, 133(1), pp. 134–157.

6. **Bernard, A.B. and Wagner, J**. (2001) 'Export entry and exit by German firms', *Weltwirtschaftliches Archiv*, 137(1), pp. 105–123.

7. **Bonaccorsi, A**. (1992) 'On the Relationship Between Firm Size and Export Intensity', *Journal of International Business Studies*, 23(4), pp. 605–635. doi:10.1057/palgrave.jibs.8490280.

8. **Chen, M.-J. and Hambrick, D.C**. (1995) 'Speed, stealth, and selective attack: How small firms differ from large firms in competitive behavior', *Academy of management journal*, 38(2), pp. 453–482.

9. **Conti, G., Lo Turco, A. and Maggioni, D**. (2010) 'Exporters in services: New evidence from Italian firms', *Available at SSRN 2375627* [Preprint].

10. **Estonia**. of (2018) 'Digital Agenda 2020 for Estonia'. Government of Estonia. Available at: https://www.mkm.ee/sites/default/files/digitalagenda2020_final_final.pdf.

11. **European Commission** and Directorate General for Communications Networks, C. and T. (2020) *Shaping Europe's digital future.* Available at: https://op.europa.eu/publication/manifestation_identifier/PUB_KK0320102ENN (Accessed: 30 December 2021).

12. **Federico, S. and Tosti, E**. (2017) 'Exporters and importers of services: Firm-level evidence on Italy', *The World Economy*, 40(10), pp. 2078–2096.

13. **Foss, N.J. and Klein, P.G.** (2005) 'The theory of the firm and its critics: a stocktaking and assessment'.

14. **Kitsing, M**. (2022) *The political economy of digital ecosystems: scenario planning for alternative futures*. London ; New York, NY: Routledge, Taylor & Francis Group (Routledge studies in the economics of innovation).

15. **Kneller, R. and Timmis, J.** (2016) 'ICT and Exporting: The Effects of Broadband on the Extensive Margin of Business Service Exports', *Review of International Economics*, 24(4), pp. 757–796. doi:10.1111/roie.12237.

16. **Lemma, A.F**. (2021) 'Promoting Exports of ICT Goods and Services from Bangladesh'.

17. **Lööf, H.** (2009) 'Are services different exporters?' CESIS, The Royal Institute of Technology, Stockholm.

18. **Melitz, M.J**. (2003) 'The impact of trade on intra-industry reallocations and aggregate industry productivity', *econometrica*, 71(6), pp. 1695–1725.

19. **Minondo, A**. (2014) 'The Relationship between Export Status and Productivity in Services: A Firm-Level Analysis for Spain', *Bulletin of Economic Research*, 66(S1), pp. S138–S146.

20. **OECD** (2022) 'Trade in services'. OECD. doi:10.1787/3796b5f0-en.

21. **Ronen, E.** (2021) 'ICT Services Exports and Labour Demand: A Global Perspective and the Case of Israel', *Changing Skills for a Changing World: Understanding skills demand in EU neighbouring countries. European Training Foundation. ed. Fetsi A., Bardak U. and Rosso F* [Preprint].

22. **Sinha, A**. (2018) 'Impact of ICT exports and internet usage on carbon emissions: a case of OECD countries', *International Journal of Green Economics*, 12(3–4), pp. 228–257.

23. **Temouri, Y., Vogel, A. and Wagner, J**. (2013) 'Self-selection into export markets by business services firms–Evidence from France, Germany and the United Kingdom', *Structural Change and Economic Dynamics*, 25, pp. 146–158.

24. **UNCTAD** (2020) *UNCTAD HANDBOOK OF STATISTICS.* NEW YORK: UNITED NATIONS PUBLICATIO.

25. **UNCTAD**, Factsheet 5 (2021) *Total trade in services*. Available at: https://unctad.org/system/files/official-document/tdstat46_FS05_en.pdf (Accessed: 5 February 2022).

26. **Verwaal, E. and Donkers, B**. (2002) 'Firm Size and Export Intensity: Solving an Empirical Puzzle', *Journal of International Business Studies*, 33(3), pp. 603–613. doi:10.1057/palgrave.jibs.8491035.

27. **Vlassis, A.** (2021) 'Global online platforms, COVID-19, and culture: The global pandemic, an accelerator towards which direction?', *Media, Culture & Society*, 43(5), pp. 957–969. doi:10.1177/0163443721994537.

28. **Wagner, J.** (1995) 'Exports, firm size, and firm dynamics', *Small Business Economics*, 7(1), pp. 29–39.

29. **Wagner, J.** (2021) 'The causal effects of exports on firm size and labor productivity: first evidence from a matching approach', in *MICROECONOMETRIC STUDIES OF FIRMS'IMPORTS AND EXPORTS: Advanced Methods of Analysis and Evidence from German Enterprises*. World Scientific, pp. 47–55.

30. **World Trade Organization (**ed.) (2009) *A handbook on reading WTO goods and services schedules*. Cambridge, UK ; New York: Cambridge University Press.