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Andrii A. Oliinyk, Ph.D. in Economics, Associate Professor of the Department of International Management, Kyiv National University of Trade and Economics. Kyiv, Ukraine.

ORCID 0000-0002-4589-703X

Oksana V. Piankova, Ph.D. in Economics, Associate Professor, Associate Professor of the Department of International Management, Kyiv National University of Trade and Economics. Kyiv, Ukraine.

ORCID: 0000-0002-7491-6543

Liudmyla P. Sierova, Ph.D. in Economics, Associate Professor of the Department of International Management, Kyiv National University of Trade and Economics. Kyiv, Ukraine.

ORCID 0000-0002-0739-1978

Maryna G. Slokva, Ph.D. in Economics, Associate Professor of the Department of International Management, Kyiv National University of Trade and Economics. Kyiv, Ukraine.

ORCID 0000-0003-1912-1235

The Role of the ICT Sector in Foreign Economic Activity of Ukraine

Abstract: This article explores the role of Ukraine's Information and Communication Technology (ICT) sector in shaping the nation's foreign economic activities. It analyses the sector's trajectory, market positioning, challenges faced, and strategic approaches adopted by Ukrainian IT companies. The study encompasses a comprehensive methodology involving quantitative analysis of trade data, qualitative examination of sector growth and challenges, and comparative assessment of strategies for international market entry. The analysis reveals the transformative impact of the ICT sector on Ukraine's foreign economic activities, highlighting its role in reshaping trade patterns and market access. Despite challenges posed by geopolitical events, including a full-scale war, the ICT sector demonstrates resilience and adaptability. The authors offer insights for policymakers and industry leaders to foster a conducive business environment, promote innovation, and sustain the sector's growth. Ukraine's engagement with the ICT sector positions it as a significant contender in the global technology landscape, contributing to the transformation of the international economic order.

Keywords: ICT, foreign economic activity, export, import, world market.

Андрій Анатолійович Олійник, кандидат економічних наук, доцент кафедри міжнародного менеджменту, Державний торговельно-економічний університет, Київ, Україна.

ORCID: 0000-0002-4589-703X

Оксана Василівна П'янкova, кандидат економічних наук, доцент, доцент кафедри міжнародного менеджменту, Державний торговельно-економічний університет, Київ, Україна.

ORCID: 0000-0002-7491-6543

Людмила Петрівна Серова, кандидат економічних наук, доцент кафедри міжнародного менеджменту, Державний торговельно-економічний університет, Київ, Україна.

ORCID: 0000-0002-7491-6543

Марина Григорівна Слоква, кандидат економічних наук, доцент кафедри міжнародного менеджменту, Державний торговельно-економічний університет, Київ, Україна.

ORCID: 0000-0003-1912-1235

Роль сектору ІКТ у зовнішньоекономічній діяльності України

Анотація. У цій статті досліджується роль сектору інформаційно-комунікаційних технологій (ІКТ) України у формуванні зовнішньоекономічної діяльності країни. Стаття аналізує траєкторію розвитку сектору, позиціонування на ринку, виклики, з якими стикаються, і стратегічні підходи українських ІТ-компаній. Дослідження охоплює комплексну методологію, що включає кількісний аналіз даних, якісний аналіз розвитку сектора та викликів, а також порівняльну оцінку стратегій виходу на міжнародний ринок. Аналіз розкриває трансформаційний вплив сектору ІКТ на зовнішньоекономічну діяльність України, підкреслюючи його роль у зміні структур торгівлі та доступу до ринку. Незважаючи на виклики, викликані геополітичними подіями, включаючи повномасштабну війну, сектор ІКТ демонструє стійкість і адаптивність. Стаття пропонує розробникам політики та лідерам галузі шляхи щодо створення сприятливого бізнес-середовища, сприяння інноваціям і підтримки зростання сектора. Залучення України до сектору ІКТ позиціонує її як значущого конкурента на світовому технологічному ландшафті, сприяючи трансформації міжнародного економічного порядку.

Ключові слова: ІКТ, зовнішньоекономічна діяльність, експорт, імпорт, світовий ринок.

Abbreviations:

B2B is Business-to-Business,

GDP is Gross Domestic Product,

ICT is Information and Communication Technology,

IT is Information Technology,

R&D is research and development.

Introduction

The contemporary global economic landscape has witnessed a transformative influence stemming from the rapid proliferation of ICT. This pervasive phenomenon has not only revolutionized domestic economies but has also engendered profound shifts in foreign economic activities, redefining trade patterns, market access, and economic interdependencies. In this context, Ukraine's evolving engagement with the ICT sector and its role in shaping the nation's foreign economic endeavours warrant comprehensive scrutiny, especially in terms of Russian's full-scale aggression against Ukraine, starting from 24th February.

The purpose of this article is to assess the role of the ICT sector in foreign economic activity, determine the features and problems of the ICT market. This undertaking necessitates a nuanced exploration of several key dimensions, encompassing the sector's trajectory, market positioning, challenges encountered, and strategic approaches employed by Ukrainian IT companies to navigate international markets. The object of the article is the Ukraine's ICT sector, including its services market.

The methodology used in the article involves a combination of quantitative analysis of trade data, qualitative examination of the ICT sector's growth and challenges, and comparative assessment of strategies for international market entry.

The theoretical and methodological approaches of the article include the results of scientists, such as Dubyna M., Kholiavko N., Zhavoronok A., Safonov Y., Krylov, Tochylna Y. (*Dubyna et al., 2022*), Irawan T. (*Irawan, 2014*), Oliinyk A. (*Oliinyk, 2023*), Bilan Y., Mishchuk H., Samoliuk N., Grishnova O. (*Bilan et. al., 2019*), Dahmani M., Mabrouki M., Ben Youssef A. (*Dahmani et. al., 2022*), Ahmedov I. (*Ahmedov, 2020*), Melnyk T., Zavorodnya E. (*Melnyk, & Zavorodnya, 2023*).

Through an analytical dissection of these facets, this article endeavours to offer an understanding of Ukraine's multifaceted interaction with the ICT sector in the context of its foreign economic activities. This article is intended for researchers, economists, policymakers, business professionals, and anyone interested in understanding the significance of the ICT sector in Ukraine's foreign economic activity.

The article unfolds as a systematic inquiry, divided into several chapters that sequentially scrutinize distinct yet interconnected aspects. The ensuing chapters are meticulously structured to provide a comprehensive account of Ukraine's engagement with the ICT sector in its pursuit of foreign economic objectives.

Literature Review

Different studies dealt with the understanding of ICT sector role in national economy and foreign economic activity.

Some authors (*Dubyna et al., 2022*) analysed the economic growth of selected countries from 2010 to 2019, focusing on the ICT sector's influence on GDP formation. The findings indicate that the rapidly developing ICT sector plays a pivotal role in national economic advancement, with faster-growing sectors corresponding to better overall economic performance.

Learning from the literatures regarding the ICT and country's economic performance demonstrates three key points (*Irawan, 2014*). First, more developed countries are expected to benefit greater than less developed countries. Second, the impact of ICT will depend on the intensity of ICT utilization. Third, the size and structure of ICT sector of country's economy does matter. More developed countries do not always benefit greater than less developed countries from ICT development. The magnitude of ICT impact on the economy depends on the intensity of ICT utilization and the structure of ICT sector. The impact of countries' participation in the ICT services market on their economic parameters demonstrates stronger ICT services export and import correlation with GDP for economies with lower GDP per capita (*Oliinyk, 2023*).

For developing countries steep ICT development can enforce new impulse of economic progress (*Bilan et. al., 2019*). Policy should be aimed mainly at Internet access outspread and web technologies effective use, particularly in the field of international e-commerce. Some authors (*Dahmani et. al., 2022*) also suggest that the use of ICT has a long-term relationship with value added and increased economic growth in developed countries.

The impact of digitalization on international trade, the impact of changes in the structure and form of international trade, the intensification of global competition and its transition to the

intangible sector; the emergence of new formats and opportunities for international business through digitization, the expansion of cross-border commerce and invisible employment, and the reduction of cross-border and internal operations in a globalized digital environment (*Abmedov, 2020*). Factors such as the rapid growth of digital commerce with companies, businesses and households, the emergence of new generation science related to the regulation of commercial relations in the transboundary virtual space, the emergence of new changes in international trade regulation have been explored.

In summary, the literature review provides a comprehensive insight into the multifaceted relationship between the ICT sector and a country's economic performance. Studies emphasize the significant role of the ICT sector in driving economic growth, with its impact varying based on factors such as development level, intensity of ICT utilization, and sector size and structure. The digitalization's influence on international trade, global competition, and cross-border commerce has emerged as a crucial area of exploration, highlighting the transformative potential of ICT in reshaping economic landscapes and trade dynamics. This emphasizes the relevance of studying the role of the ICT sector in international activity of a certain country.

Methods

The article employs a comprehensive methodology to analyse the role of Ukraine's ICT sector in its foreign economic activity. The study consists of three main aspects: Ukraine's market position on the global stage, analysis of the ICT sector's growth, and strategies adopted by Ukrainian IT companies for international expansion.

Analysis of Ukraine's market position focuses on the utilization on trade data of 2013–2022 to assess fluctuations in goods and services exports and imports, identifying key events, investigation of challenges posed by geopolitical events and economic instability on trade flows and investments.

Analysis of the ICT sector is focused on evaluation of Ukraine's IT industry, highlighting the features of the IT sector, its contribution to the national economy, the emergence of unicorn companies, utilized employment data to showcase the sector's workforce composition and growth trends, investigation of the impact of the full-scale war on IT companies, their adaptation to challenges, and resilience in the face of war-related disruptions.

The ICT services export analysis consists of analysed export trends in ICT services from 2013 to 2022, calculated trade measures of the ICT services export and import, identification of top partner countries for ICT services export and explored their export-to-GDP ratios.

Strategies for IT companies entering international markets explored strategic approaches used by Ukrainian IT companies to expand globally.

The methodology used in the article involves a combination of quantitative analysis of trade data, qualitative examination of the ICT sector's growth and challenges, and comparative assessment of strategies for international market entry. The study provides a comprehensive understanding of Ukraine's market position, ICT sector dynamics, and strategic considerations for IT companies in the context of foreign economic activity.

Results

Ukraine's Position on the World Markets

Analysis of Ukraine's export of goods for the 2013–2022 period demonstrated fluctuations over the years (*Table 1*). It peaked in 2013 at \$63,320 billion and declined steadily until 2016 when it hit its lowest point of \$36,361 billion. This period is characterized with political and economic instability in country. In 2014 after Russia annexed Crimea and invaded Donbas region Ukraine companies had to reorient their exports from Russia to another countries, which caused such decline in 2014–2016. Afterward, there was a gradual recovery with a significant increase in 2021, reaching \$68,072 billion, but it dropped again to \$44,443 billion in 2022 mainly because of Russian aggression. Ukraine's import of goods peaked in 2013 at \$76,986 billion and experienced steady decline until 2017, when it reached its highest level of \$60,800 billion in 2019. In 2020 there was a decrease, but it rose again to \$72,843 billion in 2021. The rising import figures suggest increased demand for foreign goods and services within Ukraine, which may impact the country's trade balance. The trade balance improved slightly from 2013 to 2016 but worsened in subsequent years, reaching its lowest point in 2022 with a trade deficit of -\$10,781 billion.

The reasons behind the above-mentioned facts are that Ukraine was heavily dependent on energy imports, particularly natural gas. High energy imports led to a significant portion of the trade deficit. Ukraine's exports are often dominated by commodities such as agricultural products and raw materials. While these commodities can generate revenue, their prices are subject to international market fluctuations, which can affect the trade balance.

Ukraine has faced periods of political and economic instability, including a full-scale Russia's invasion in 2022. Such instability can disrupt trade flows, deter foreign investment, and affect export and import activities.

Ukraine's export of services shows decline in 2013–2014 from \$22,613 to \$14,884 billion and an upward trend during the 2014–2021 period. The import of services also increased over the years, reflecting the growing demand for foreign services in Ukraine. The figure rose from \$16,119 million in 2013 to \$25,375 billion in 2022, indicating a rise in services consumption in the country.

Unlike the goods sector, Ukraine experienced a trade surplus in services, which means it exported more services than it imported. Although the trade balance of services decreased from \$6,494 billion in 2013 to \$2,522 billion in 2014, remaining at the corridor of 1–4 billion surplus each year, except for 2022, reaching estimated -\$8,769 billion.

Ukraine had a negative trade balance in goods and services during the analysed period, with the deficit worsening from -\$7,172 million in 2013 to -\$19,550 million in 2022, with the exception of 2014 and 2015.

Ukraine's position on the world markets has been characterized by a series of fluctuations in its export and import figures over the 2013–2022 period. The country faced challenges stemming from political and economic instability, including the impact of Russia's actions such as the annexation of Crimea and the invasion of the Donbas region. These events led to shifts in trade patterns, necessitating the reorientation of exports from Russia to other countries. The energy dependence, particularly on natural gas imports, played a significant role in contributing to the trade deficit. The export of goods primarily consisted of commodities subject to international market price volatility, affecting the trade balance. The invasion of 2022 further disrupted trade flows and foreign investment. In the services sector, Ukraine experienced an

upward trend in exports and imports, resulting in a trade surplus. However, the overall trade balance remained negative for goods and services, with a deteriorating deficit. The analysis underscores the impact of geopolitical events and sector-specific challenges on Ukraine's trade dynamics, influencing its global market position.

ICT Sector Analysis

Positioned as an entrepreneurial hub, Ukraine boasts 87 research centers that collaborate with international giants such as Samsung, Dell, Oracle, Bosch, Comodo, Rakuten, and Huawei. The nation thrives with 22 IT clusters, 7 associations, and 10 accelerators. Notably, Ukraine is the birthplace of renowned unicorn companies like Grammarly, GITLab, BitFury, and People.ai. Over the recent years, the Ukrainian IT sector has witnessed robust growth. By December 2021, the sector engaged more than 290,000 IT professionals—a remarkable surge of 24.3% from 2020. Among these, computer programming accounts for 68,5% of the workforce, consulting on informatization constitutes 13.8%, and data processing and website information hosting make up 12.1% (*Melnyk, & Zavorodnya, 2023*).

The full-scale war has changed dramatically the national economical surface. Absolutely all IT companies faced problems related to the war. According to the data obtained so far, more than 34.3% of IT companies have successfully adapted to the new realities, 61.3%—i.e., the vast majority of IT companies have not overcome all challenges, but in general work stably (*Do It Like Ukraine, 2022*).

Among the biggest challenges for IT companies are:

- migration of employees and their families, relocation of companies;
- the ban on the departure of IT specialists abroad;
- recruitment of IT specialists;
- retention of clients and minimization of risks in working with clients;
- currency regulation and restrictions introduced by the National Bank of Ukraine.

Ukraine created favourable conditions for its IT industry to flourish for only one decade. The nation has a favourable business climate, highly educated professionals, and many industries looking for IT services. However, some pre-2022 government actions opened new horizons for Ukraine's IT segment:

- massive deregulation with more than 450 outdated regulations cancelled;
- a new Privatization Law and a more transparent VAT refund system;
- the creation of the High Anti-Corruption Court of Ukraine.

These were among government-based actions aimed at improving the business climate triggering the IT segment's growth. Yet, in addition to promoting its global outreach, the Ukrainian IT segment supports innovation as a part of the national agenda. In such a case, bringing the IT segment even further is delivered through projects like the following:

- Diia City. It is a massive project establishing a free economic zone for IT companies and creative representatives. Propagated by the Ministry of Digital Transformation, Diia City is expected to become an enormous platform where domestic and international tech firms can open businesses and R&D centers in just several clicks.

- IT Generation. This program is dedicated to preparing new ICT professionals. The goal is to find Ukrainian talent and fuel the growing IT industry with new experts.
- IT Cluster. There are various IT clusters in different tech hubs across Ukraine. These communities include Ukrainian IT companies, educational institutions, and local authorities. Their core goal is to integrate technologies into projects directed at local, regional, and national development (*U.S. Chamber of Commerce, 2022*).

Ukraine's ICT sector stands as a testament to its rapid progress, underpinned by strategic initiatives, a growing talent pool, and a commitment to innovation. The ongoing journey to harness the potential of its IT industry not only bolsters the nation's economic resilience but also positions it as a formidable contender in the global technology landscape.

The ICT services export has consistently shown an upward trajectory over the years. This sector has experienced remarkable growth, more than doubling its export volume from \$1,782 billion in 2013 to an impressive \$7,315 billion in 2022 and has been remaining a leader in export of services structure, taking around 44.05% (*Table 2*). Furthermore, the import of the ICT services presents only \$0,558 billion, while the trade surplus is \$6,757 billion—the biggest one among the services.

The structure of the ICT services export (*Figure 1*) demonstrates its prevailing in computer services (74.11%), following by information services (22.54%), and telecommunication services (3.35%). The ICT services import structure is similar to export with a slightly bigger share of telecommunication services (22.01%).

TOP 10 partners in the export of ICT services in 2021 consists of (*Do It Like Ukraine, 2022*) the USA (2,728.4 billion USD), the UK (697.6 billion USD), Malta (481.1 billion USD), Israel (481.1 billion USD), Cyprus (287.6 billion USD), Switzerland (285.4 billion USD), Germany (268.6 billion USD), the Netherlands (145.5 billion USD), Estonia (130.7 billion USD), Canada (126.1 billion USD)

Ukraine's share in the world export of ICT services equals 0.81% in 2022. The analysis of leading countries in the ICT services exporting (*Figure 2*) demonstrates the factors contributing to their positions and possibilities for Ukraine to use or generate such factors.

Ireland has the biggest ICT services export/GDP of 39.03%, as well as ICT services export of 206.59 billion USD. Its high position can be attributed to its favourable business environment, low corporate tax rates, and strong tech industry. The country has attracted numerous multinational tech companies, which significantly contribute to its ICT services exports.

Singapore takes the 2nd place with 4.97% ICT services export/GDP and 23.19 billion USD in the ICT services export. It has invested heavily in becoming a tech hub in Asia. Its strategic location, well-developed infrastructure, and pro-business policies have attracted tech companies to establish their presence in the country, leading to substantial ICT services exports.

Ukraine has 4.69% of ICT services export/GDP which is a result of notable IT outsourcing due to its skilled workforce and competitive labour costs.

Finland (ICT services export/GDP is 4.39% and ICT services export is 12.33 billion USD) is known for its strong focus on innovation and technology. The presence of renowned tech companies and a culture of technological advancement contribute to its significant ICT services exports.

Netherlands contributes 3.77% of ICT services export/GDP and 37,330 billion USD of ICT services export. The Netherlands benefits from its strategic location, advanced infrastructure, and open economy. It has a well-established tech sector and serves as a gateway to Europe for tech companies.

Sweden (ICT services export/GDP is 3.52% and ICT services export is 20,650 billion USD) is home to several global tech giants and has a culture of technological innovation. Its investments in research and development, along with a skilled workforce, contribute to its ICT services exports.

Romania has ICT services export/GDP of 3.26% and ICT services export of 9.81 billion USD. Romania has shown growth in its IT industry, fuelled by a skilled workforce and cost-effectiveness. The country has become a preferred outsourcing destination.

Belgium's (ICT services export/GDP is 3.18% and ICT services export is 18,420 billion USD) central location in Europe, advanced infrastructure, and strong connectivity have contributed to the growth of its tech industry and subsequent ICT services exports.

India (ICT services export/GDP is 2.93% and ICT services export is 99,230 billion USD) is renowned for its IT and software services industry. A large English-speaking workforce, cost advantages, and a thriving outsourcing sector play a significant role in its substantial exports.

Austria's (ICT services export/GDP is 2.14% and ICT services export is 10,080 billion USD) position can be attributed to its stable economy and technological advancements.

Based on the analysis provided and the competitive factors highlighted in the case of other countries, here are several competitive factors that Ukraine could take into account in order to strengthen its ICT export potential:

- Continue to invest in developing a highly skilled workforce in the ICT sector. This involves focusing on education and training programs that cater to the evolving technological landscape and industry demands.
- Encourage innovation and R&D activities within the ICT sector. Collaborate with universities, research institutions, and private enterprises to drive technological advancements and create cutting-edge solutions.
- Enhance the business environment by streamlining regulations, reducing bureaucracy, and providing incentives for foreign tech companies to establish a presence in Ukraine.
- Invest in modern infrastructure, including robust digital connectivity and technology parks, to create an ecosystem that supports the growth of the ICT industry.
- Collaborate with the government to establish policies and initiatives that foster the growth of the ICT sector, such as tax incentives for tech companies and startup support programs.
- Develop and promote technology hubs or clusters where startups, entrepreneurs, and established companies can collaborate, share knowledge, and innovate together.
- Focus on improving English language proficiency across the workforce, as it is a key requirement for effective communication in the global tech industry.
- Identify niche areas within the ICT sector where Ukraine has a competitive advantage, such as cybersecurity, software development, or AI research. Developing expertise in these niches can set Ukraine apart on the global stage.

- Strengthen intellectual property protection mechanisms to in still confidence in international partners and investors regarding the security of their technological innovations (*OECD, 2022*).

Thus, Ukraine's ICT sector has demonstrated remarkable growth and resilience, positioning the country as a significant player in the global technology landscape. With a burgeoning talent pool, strategic initiatives, and a commitment to innovation, Ukraine's IT industry has experienced substantial expansion, highlighted by the rise of unicorn companies and impressive export figures. The sector's adaptability, even in the face of challenges like the recent war, showcases its potential for continued development. To further enhance its ICT export potential, Ukraine should focus on nurturing its skilled workforce, fostering innovation and R&D, improving the business environment, investing in modern infrastructure, and collaborating with both the government and private enterprises. By capitalizing on its strengths and competitive factors, Ukraine can solidify its position as a prominent contributor to the international ICT services market.

Strategies of Ukrainian IT Companies to Enter International Markets

Ukrainian IT companies seeking to penetrate international markets employ a range of strategic approaches to effectively expand their global presence. The main approaches are: *Direct export of IT services*. Direct export is a prevalent method through which Ukraine's IT services are introduced to international markets. This approach encompasses distinct features that contribute to the successful export of IT services abroad.

It involves direct engagement with international clients. Ukrainian IT firms establish direct communication channels, fostering personalized interactions, understanding client requirements, and tailoring solutions to meet specific needs. Ukrainian IT companies extensively research and comprehend the target market's dynamics, including cultural preferences, industry regulations, and competition. This knowledge informs the customization of services for optimal market fit. Direct export empowers Ukrainian IT services to present a compelling value proposition to potential clients. Companies articulate their expertise, competitive pricing, and unique offerings directly to the client, showcasing the advantages of their solutions. Establishing strong client relationships is pivotal in direct export. Ukrainian IT firms prioritize building trust, credibility, and long-term partnerships through effective communication and reliable service delivery.

Partner assistance. Another option for entering a foreign market is to involve a partner in the process of providing IT services. For the effective implementation of such an option, it is necessary to have a reliable partner in the country targeted by the Ukrainian IT company. This option is quite profitable for IT companies, because through a foreign partner, especially one with a reliable reputation and "name", it is easier to attract investments and sell product abroad. The involvement of partners in entering the international market is especially widespread among B2B companies, which find it quite difficult to independently calculate all the features of another market, so it is quite logical to use the experience of a local partner, who will mostly be responsible for marketing and sales. Working through a reliable partner allows companies to combine resources and connections, which increases the likelihood of a long-term and profitable game in the foreign market. However, there are certain risks. In particular, a partnership always implies a branching of opinions, which can lead to the complexity of making the necessary

business decisions, and in some cases a partner can turn into a competitor (especially in the absence of a well-drafted detailed partnership/cooperation contract).

Name for sale. When a Ukrainian company has developed a good reputation in its country and has a ready-made product for entering the foreign market, there is an option to sell its franchise or license. This model is not traditional in the IT sphere, but it has the right to exist. This option is considered especially relevant for companies that develop certain useful services that can operate in different countries. By selling its name, information about business processes and support, a Ukrainian company can get many advantages: quick access to a foreign market, popularity, notoriety, product adaptation to the market of another country, etc. However, as in the case of a partnership, the counterparty may eventually turn into a competitor, because there is always a risk of non-renewal of the contract and termination of the business relationship (*Stadnyk, 2023*).

According to the survey 54.7% of IT companies planned to open new offices and branches in 2022. However, only a quarter have managed to do so, the others had their plans frustrated by the war. As a result of the full-scale invasion, 70.8% of IT companies had to resort to unplanned relocation, including a quarter who have relocated in full (*Do It Like Ukraine, 2022*).

In summary, Ukrainian IT companies have adopted diverse strategies to successfully venture into international markets. Direct export stands as a significant approach, emphasizing personalized interactions, market research, and tailored solutions to engage international clients effectively. Partner assistance offers a collaborative route, leveraging reliable local partners for market entry, although it entails the potential for diverging opinions and competition. Another avenue involves selling the company's name and product through franchising or licensing, offering quick market access but carrying risks of contract termination or competition. This underscores the sector's resilience and determination to overcome obstacles in pursuit of global growth.

Discussion

The analysis presented in this article underscores the transformative influence of the ICT sector on Ukraine's foreign economic activities. ICT sector has emerged as a pivotal driver of economic advancement, reshaping global trade patterns, market access, and economic interdependencies. Ukraine's engagement with the ICT sector is reflective of its efforts to leverage technological prowess for economic growth and resilience. The nation's IT industry, characterized by innovation, a skilled workforce, and strategic initiatives, has played a crucial role in enhancing its global market position. By nurturing a conducive business climate, investing in education and training, and fostering innovation, Ukraine has positioned itself as a formidable contender in the global technology landscape.

The discussion also addresses the challenges faced by Ukrainian IT companies, particularly in light of the full-scale war initiated by Russia. The war has disrupted trade flows, impeded foreign investment, and introduced various impediments to the operations of IT businesses. The migration of employees, restrictions on specialist mobility, and client retention concerns are among the key challenges highlighted. However, it is noteworthy that a significant proportion of IT companies have demonstrated adaptability and resilience in the face of these challenges, illustrating the industry's capacity to navigate through adversities.

The findings of this study offer valuable insights for policymakers and industry leaders. The necessity of a favourable business environment, government support through deregulation, and investment in infrastructure emerge as critical factors for sustaining the growth of Ukraine's ICT sector. Policies aimed at fostering innovation, supporting start-ups, and promoting research and development can further enhance the sector's potential and global competitiveness.

Conclusions

This article has undertaken a comprehensive exploration of Ukraine's interaction with the ICT sector within the context of its foreign economic activities, considering key dimensions such as market positioning, sector growth, challenges faced, and strategic approaches adopted by Ukrainian IT companies.

The literature review highlighted the significant role of the ICT sector in national economies and its impact on foreign economic activities. It underscored the nuanced relationship between ICT development, GDP growth, and economic structure, revealing that factors such as intensity of ICT utilization and the structure of the ICT sector also play vital roles. The study further revealed that developing countries, including Ukraine, can harness ICT development as a catalyst for economic progress, primarily through increased internet access and effective utilization of web technologies. The emergence of digitalization, changes in international trade structures, and the rise of cross-border commerce in a digital environment were also identified as key trends shaping global economic dynamics.

Through a meticulous analysis of Ukraine's market position, the article delineated fluctuations in goods and services exports and imports over the period of 2013–2022. It highlighted the impact of geopolitical events, such as Russia's annexation of Crimea and invasion to Ukraine. The examination of Ukraine's ICT sector revealed a dynamic landscape marked by robust growth and technological innovation. The sector's resilience and adaptability were evident in its response to the challenges posed by the war. The strategies employed by Ukrainian IT companies to enter international markets encompassed direct exports, partnering with foreign companies, and selling franchises or licenses. These strategies facilitated market entry and leveraged the strengths of the local industry.

The article's analysis underscores the pivotal role of the ICT sector in shaping Ukraine's foreign economic activities. The sector's growth, innovation, and resilience have positioned Ukraine as a competitive player in the global technology landscape. While challenges such as geopolitical instability and the full-scale war have presented obstacles, the sector's adaptability and strategic approaches have enabled it to navigate through adversities. Policymakers and industry leaders can draw from these insights to craft policies that foster a conducive business environment, promote innovation, and sustain the growth of Ukraine's ICT sector. As the nation continues to engage with the evolving ICT landscape, it is poised to further enhance its global market position and contribute to the transformation of the international economic order.

Future scientific prospects of this study could be focused on different areas. A deeper analysis could be conducted to understand how geopolitical events influence the resilience, strategies, and adaptability of IT companies in conflict zones. Another way is to define and deeper analyse strategies and factors that contribute to the successful expansion of IT services into international markets.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Appendix

Table 1. Ukraine's export and import of goods and services for 2013-2022 period

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Export of goods	63320	53913	38127	36361	43264	47335	50054	49192	68072	44443
Import of goods	76986	54381	37516	39250	49607	57187	60800	54336	72843	55224
Trade balance of goods	-13666	-468	611	-2889	-6342	-9852	-10745	-5144	-4770	-10781
Export of services	22613	14884	12442	12448	14243	15836	17465	15564	18391	16606
Import of services	16119	12362	11349	11959	13324	14500	15715	11164	14420	25375
Trade balance of services	6494	2522	1093	489	919	1336	1750	4400	3971	-8769
Trade balance of goods and services	-7172	2054	1704	-2400	-5423	-8516	-8995	-744	-799	-19550

Source: Authors' calculations based on UNCTADstat ([UNCTADstat, 2023](#))

Table 2. Ukraine's export and import of services for 2013-2022 period

Product/Sector	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 (estimate)
Export										
Goods-related services	2324	1577	1270	1358	1663	1941	1909	1590	1841	1300
Transport	8478	6231	5322	5348	5922	5949	6253	5089	4760	3365
Travel	5083	1612	1082	1078	1261	1445	1620	356	950	774
Construction	275	209	288	182	96	153	117	93	52	25
Insurance and pension services	40	13	14	24	12	19	15	15	20	23
Financial services	349	221	190	85	150	148	165	130	103	152
Charges for the use of intellectual property <u>n.i.e.</u>	167	118	85	73	72	92	82	74	69	44
Telecommunications, computer, and information services	1782	2042	2105	2310	2760	3473	4331	5181	7107	7315
Other business services	3239	2495	1807	1643	1963	2264	2596	2685	3073	3062
Personal, cultural, and recreational services	114	64	39	36	37	52	66	66	94	51
Government goods and services <u>n.i.e.</u>	762	302	240	313	307	300	311	285	322	495
Total export of services	22613	14884	12442	12448	14243	15836	17465	15564	18391	16606
Import										
Goods-related services	135	136	149	97	73	86	87	63	87	102
Transport	4041	2727	1947	1934	2109	2237	2516	1920	2834	1987
Travel	5763	5061	5101	5970	7121	7899	8517	4691	6251	20172
Construction	220	60	17	44	59	54	77	58	48	15
Insurance and pension services	151	92	67	95	77	68	71	66	83	19
Financial services	1011	801	874	561	601	529	581	636	706	461
Charges for the use of intellectual property <u>n.i.e.</u>	1072	552	358	358	430	592	606	495	735	258
Telecommunications, computer, and information services	763	582	627	495	508	618	701	748	934	558
Other business services	2056	1527	1132	1259	1325	1620	1621	1339	1588	480
Personal, cultural, and recreational services	326	164	113	92	104	106	127	109	118	21
Government goods and services <u>n.i.e.</u>	581	660	964	1054	917	691	811	1039	1036	1302
Total import of services	16119	12362	11349	11959	13324	14500	15715	11164	14420	25375

Source: Authors' calculations based on UNCTADstat ([UNCTADstat, 2023](#))

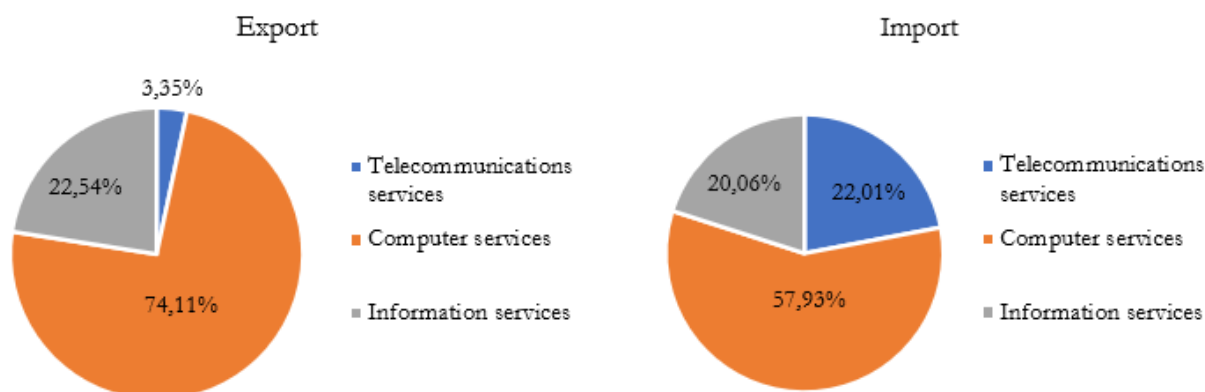


Figure 1. Export and import of ICT services structure of Ukraine in 2022, %.
Source: Authors' calculations based on UNCTADstat ([UNCTADstat, 2023](#))

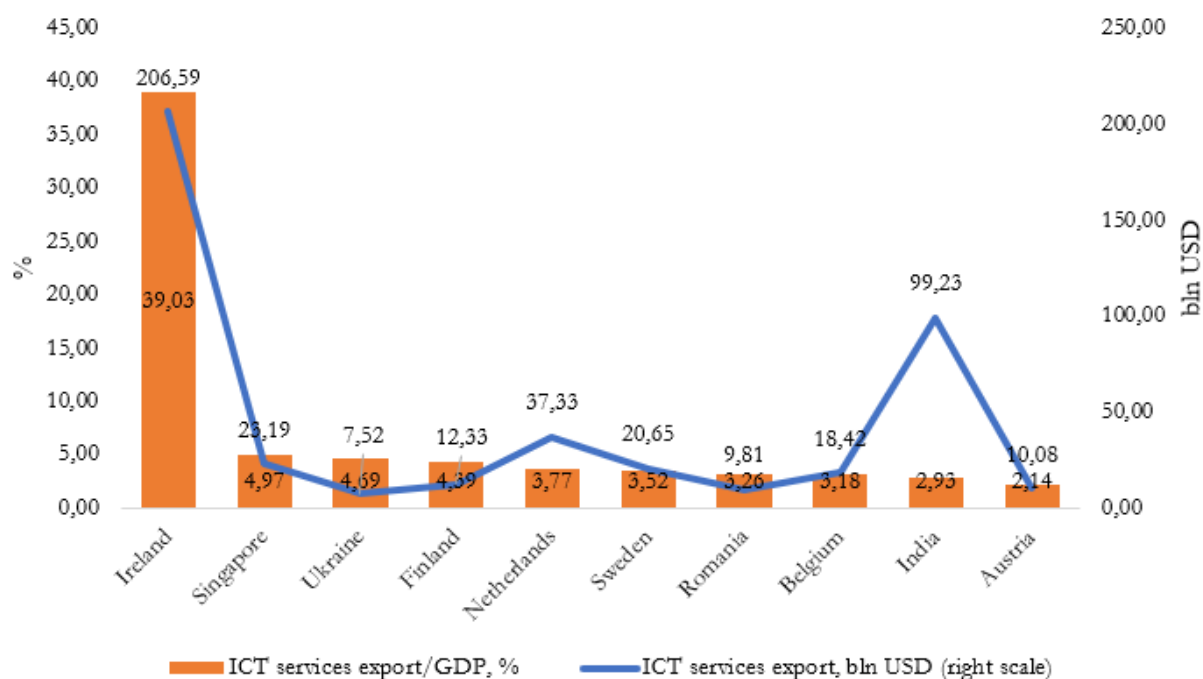


Figure 2. Leading ICT services export/GDP countries in 2022.
Source: Authors' calculations based on ([UNCTADstat, 2023](#))