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The role of state regulation in the development of Ukraine's IT sector: optimisation strategies and policy recommendations

Abstract. The study is focused on the role of state regulation in the development of Ukraine's IT sector, as well as on optimisation strategies and policy recommendations. It explains the problem of inconsistent regulatory impact on the IT sector growth, which is worsened by bureaucratic barriers, compliance costs and policy instability. The research uses panel data collected for 2020-2024 to determine the impact of tax incentives, financial assistance, compliance costs, regulatory quality, digital infrastructure and educational investment on IT sector growth and efficiency.

The paper uses the results of fixed effects, random effects, and generalised method of moments econometric models, and the results are robust with respect to sensitivity analysis using diagnostic tests to investigate the relationship between state regulation and IT sector performance. This suggests that improved tax incentives and financial support create better environment for IT sector growth, while reduced compliance costs and better quality of regulation help to achieve better operational efficiency. Furthermore, investments in digital infrastructure as well as education enhance innovation and productivity. It has been shown that the growth of the IT sector was influenced by the change of tax incentives from UAH 2.5 billion in 2020 to UAH 4.5 billion in 2024, which led to an increase in the annual growth rate from 7.2% to 11.2%. Financial support also grew from UAH 1.2 billion up to UAH 2.3 billion, thus maintaining innovation and expansion of startups. Moreover, compliance costs decreased from 4.5% to 3.6%, operational efficiency increased, and the Regulation Quality Index rose from 3.2 to 4.3 and helped to create a more friendly business environment. Digital infrastructure and IT education, which simply grew from UAH 0.8 billion to UAH 1.2 billion, were another incentive for innovation capacity and productivity.

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The paper also discusses how stable policy enables long-term strategic planning from an investor's perspective and how it builds the investor's confidence. Based on the conclusions of this study, policy recommendations are formulated on three evidence-based dimensions: optimisation of tax incentives, increase in financial support, and reduction of compliance costs; while on the other hand investing in digital infrastructure and IT education. The paper concludes that Ukraine's IT sector has a sustainable growth and global competitiveness, however, such a rate is possible provided there is a stable policy environment and strategic state regulation. This study also contributes to academic discourse on state regulation in digital economy through widening the scope of applied research and suggests further practical approaches for the industry stakeholders and state policy makers.

Keywords: IT sector growth, tax incentives, financial support, digital infrastructure, policy stability, Ukraine

Introduction

The swift increase in information technology (IT) industry in the global arena has turned out to play a significant role in changing economies, accelerating innovation, and improving productivity and competitiveness around the world. Ukraine's IT industry has turned out to be the most dynamic one and one of the country's most rapid growing, contributing to GDP, export revenues and employment. Although with the great potential, the sector is confronted with the regulatory complexity, high compliance costs and the weak digital infrastructure that have made it difficult to mature fully. The combination of these challenges is aggravated by political instability and a changing economic policy and calls for a strategic regulatory approach to navigate it towards optimal growth trajectory.

The analysis of the literature on state regulation and its influence on innovation ecosystems allows understanding the development of IT sectors in the emerging economies, including Ukraine. The article by Pidorycheva *et al.* (2020) proposes a conceptual framework for regional innovation ecosystems recognizing strategic government interventions as actively supporting innovative economic development. Therefore, their findings emphasise policy incentivisation for a sustainable development that concurs with the requirements for optimizing regulatory strategies in the Ukrainian IT market.

On this basis, Xie *et al.* (2023) assess and predict the niche fitness of regional innovation ecosystems in the light that adaptive regulatory frameworks are vital for maintaining regional competitiveness. To illustrate, this research takes the advantage of the comparative evaluation of the grey models, pointed out the need of dynamic policy adjustments, but focused on policy optimisation for the IT sector growth. Likewise, Liang *et al.* (2020) analyse the resilience of China innovation ecosystems for evaluating the importance of the monitoring and early warning systems in facilitating more efficient regulation and stable economic growth. This is apropos to considering the effect of policy stability on the investors' confidence in Ukraine's IT industry.

As such, Cao *et al.* (2023) and Liang and Li (2023) categorically stated that digital economy development is significantly influenced by regional innovation ecosystems and the mediating role of government support. Their findings support the use of digital infrastructure as well as educational funding as key variables in this research. In addition, Li *et al.* (2021), Tang *et al.* (2023), and Wang and Zhou (2023) carry out studies of the environmental and economic impacts of innovation driven policies in China to illustrate more generalizable implications of strategic state regulation. Taken collectively, these studies suggest that all of these are connected with each other and indeed regulatory quality, policy stability and economic performance.

Moreover, Kretov *et al.* (2023) and Mazur *et al.* (2023) discuss the competition of regulators and capital management, showing the roles of financial support and tax incentives in boosting industry development. This research's hypothesis is supported by their findings that well designed fiscal policies and regulatory incentives can boost competitiveness and sustainability of Ukraine’s IT sector.

The findings of this literature review also set the basis for a thorough analysis of the role of state regulation in the development of Ukraine's IT sector. The authors contribute to the academic

literature on the adopted state regulation of economy development, in particular, with regards to digital economy growth, by synthesizing regional innovation ecosystems insights, policy stability, and strategic financial incentives to provide the evidence-based policy recommendations for the optimal regulatory environment for IT in Ukraine.

The main problem this research is about is that the influence of state regulation upon the development of Ukraine's IT sector is unclear and inconsistent. The government has been able to introduce several initiatives, tax incentives and financial support programs, whose effectiveness is, however, debatable due to bureaucratic barriers, compliance costs and unstable policy. Finally, there is little empirical evidence about what effect these measures of regulation have on IT sector growth, efficiency and innovation. Consequently, the existing knowledge gap in this sector complicates the policy making process thereby impeding the development of specialised and appropriate regulatory strategies that could improve the global competitiveness of the sector.

This research aims to find out what is the role of state regulation and give an evidence-based policy recommendation for IT sector development in Ukraine through analysis of existing role of state regulation with respect to growth and development of IT sector. The study identifies three most important factors of IT sector performance regulation by examining the effects of tax incentives, financial support, compliance costs, regulation quality and digital infrastructure as well as educational investment. Lastly, the research examines the interrelation between policy stability and IT sector growth as a source of strategic insights for the development.

Towards this purpose, the research evaluates the effect of the state regulatory measures, such as tax incentives and financial support, on Ukraine's IT sector growth rate. It attempts to analyse how the regulation quality and compliance costs help determine the efficiency and productivity of the sector and in which operations the sector is challenged and the potential opportunities for improving efficiency. The study also looks at how the role of digital infrastructure and educational investment can support the development of an innovation capacity of a sector, based on technological progress and skilled labor development.

The study also analyses an impact of policy stability on investors' confidence and strategic planning of IT and points out that a stable and predictable regulatory environment is vital for investors and IT companies. Using these results, the study develops the strategies of optimisation and recommendations of policy measures to create the supportive regulation ecosystem to foster the sustainable IT sector development in Ukraine. In addressing these linked objectives, the research offers a holistic view upon how the state regulation might propel the IT sector development and make it more competitive in the global market.

In order to answer the research problems and objectives, the study is based on the following questions:

1. How do tax incentives and financial support influence the growth and expansion of Ukraine's IT sector?
2. What is the impact of compliance costs and regulation quality on IT sector efficiency?
3. In what ways do digital infrastructure and educational investment contribute to innovation and productivity in the IT industry?
4. How does policy stability affect investor confidence and long-term strategic planning in Ukraine's IT sector?
5. What are the most effective regulatory strategies for optimizing the development of Ukraine's IT sector?

The main goal of this work is to conduct an empirical research on the relationship between state regulations and IT business development in Ukraine. It recommends ways in which governments can improve regulatory efficiency, minimise regulatory costs, and enhance innovation and competitiveness. Through this process, the study seeks to break a void in the academic debate on state regulation and economic development and provide policy suggestions to policymakers on counteracting these problems, and nurturing a prosperous digital economy.

Thus, this research is important because it solves an urgent problem related to the establishment of the strategic state regulation in conditions of digital transformation and economic modernisation. The key contribution of the study is to assess the impact of regulatory measures on IT sector performance, thereby providing insights into how the sector could be stimulated to grow, attract investments and be internationally competitive. Moreover, the findings will be very useful for the policy-makers, industry stakeholders, and academic researchers, thereby helping with evidence based regulatory frameworks formation which will spur a sustainable development of IT in Ukraine.

Finally, this research aims to explore the intertwined relationship between state regulation and the growth of Ukrainian IT sector and provides a comprehensive analysis of each instance of impact and propose optimal regulation. The study fills the existing knowledge gap and presents practical policy recommendations to encourage the development of a supportive regulatory ecosystem conducive for the sector to make an economic contribution and positioning it at the global front.

Literature review

A general framework for analyzing the role of state regulation in Ukraine's IT sector is based on the literature on state regulation, innovation performance, and economic development. It is important to note the necessity of strategic collaboration between the industry, universities, and research institutes; state regulation plays an important role in strengthening innovation performance via targeted support and incentive.

Taking this view further, Xue *et al.* (2022) study the impact of corporate social responsibility (CSR) on high quality development, specifically related to green innovation and environmental investment. Yet, their findings highlight the need for the regulatory framework that promotes sustainable practice and innovations. These align with the desire for Ukraine's IT sector to grow, yet maintain equilibrium of state regulation in the long run.

In the work of Jahanger (2021) and Zhang *et al.* (2023), foreign direct investment (FDI) has an impact on economic development, and they identified that the effect of FDI in promoting growth and decreasing wage inequality is via strategic regulatory policies. Regulation by the state in Ukraine's IT sector secures foreign investments and promotes competition. Han *et al.* (2022) also point out regional disparities in high quality development of China's manufacturing in which use of localised regulatory strategy is critical. On this basis, the approach of the current research in analysis of state regulation of this activity in various regions of Ukraine is supported.

According to He *et al.* (2023), free trade zone policies have important impact on regional innovation, and targeted regulation has a significant impact on regional innovation capacity. In line with the current study, the aim was to evaluate the role of the set of digital infrastructures and the level of educational investment in IT sector growth in Ukraine. Zhao *et al.* (2023) also consider rating agencies' ability to benefit from incentivizing issuers to pay green premiums: how strategic incentives affect the credit rating of green bonds. It also reinforces the relevance of tax incentives and financial support to Ukrainian IT industry innovation.

Social and environmental disclosures and information asymmetry relationship: Acheampong and Elshandidy (2024) show how it is necessary to have transparent regulatory practice. In particular, this is very relevant to Ukraine's IT sector, which significantly depends on the quality of regulation and policy stability to keep investors' confidence. The study conducted by Zhu *et al.* (2024) uses government regulations of safe production behaviors to prove how perceived benefits are an essential aspect for ensuring compliance. This need is further supported by the current requirements for the efficient regulatory frameworks to balance the compliance costs with benefits in the operational area. The work of Rysin *et al.* (2023) presents the contribution of digitalisation technologies in personalizing products and services in banking business, paying special attention to the influence of regulatory frameworks on digital transformation of the business model. In this regard, this research is highly relevant to the current research, which is aimed to explore the effects of digital infrastructure and policy stability on IT sector growth in Ukraine.

The constantly changing space of digitalisation and Industry 4.0 demands such a new regulation that will affect the IT sector as a whole - it poses such challenges that can only be solved with strategic state regulation. Introducing the "Five-Helix" Model that presents an effective framework for business development in Industry 4.0, Megits *et al.* (2022) emphasise the interconnectedness of academia, industry, government, civil society, and the environment. The study shows how state regulation can drive innovation ecosystems through facilitation of collaborations between stakeholders, especially focusing on IT sector competitiveness in Ukraine. This is in line with the objective of the current research that seeks to minimise strategies aimed at optimizing tax incentive policies as well as financial support mechanisms in order to enhance a vibrant IT environment that is characterised by innovation.

The "Five-Helix" Model, which also stresses digital infrastructure and educational investment, coincides with this research's aim of evaluating their effect on IT sector growth. By encouraging strategic partnerships and utilizing digital ecosystem, state regulation can arrange a climate that guarantees an encouraging situation for the technological advancement and workforce development. This holistic approach was intended to contribute to the aim of this research of developing the evidence-based policy recommendations for the sustainable growth of the IT sector in Ukraine.

This perspective informs Prokopenko *et al.* (2024) on Development of Blockchain Technology in Financial Accounting through the lens of the potential for Digitalisation and Decentralisation of systems. The research emphasises the importance of adaptive regulatory frameworks capable of supporting new technologies, however, that also provide transparency, security, and compliant. For the development of Ukraine's IT sector, this insight is crucial: what investors believe concerning policy stability and the quality of regulations is enhancing confidence, and increasing strategic planning is critical in the sector.

In addition, Prokopenko *et al.* (2014) point out that the government policy, as a factor facilitating adoption of technological advances, corresponds to the research analysis of tax incentives, and financial support as triggers of the IT sector growth.

This literature review shows how the "Five-Helix" Model and blockchain technology development are connected to discuss the far order effect of the state regulatory on digital transformation and economic growth. Together, the studies point to the need for adaptive, transparent, and collaborative regulatory frameworks that can fuel innovation, propel competitiveness, and promote sustainable development. This provides an emphasis on optimisation of the state regulation of the Ukrainian IT sector in agreement with the current research and adds to the general understudying of the digital economy development and strategic policy in the Industry 4.0 era.

Taken together, these studies give a multidimensional view of how state regulation affects innovation, economic growth, and sustainability. Integrating insights in strategic incentives, FDI, regional disparities and digital transformation, this literature review forms a universal base for analysis of state regulation in Ukraine's IT sector.

Materials and methods (Methodological justification)

Data collection and sampling

The research panel is used of the information related to the IT sector in Ukraine from 2020 to 2024. The data were collected through various reliable sources from State Statistics Service of Ukraine (2024a; b), International Monetary Fund (IMF, 2024a; b) and World Bank (2024). The key variables of IT sector growth rates, tax incentives, financial support, compliance costs, regulation quality, digital infrastructure, and educational investment, were comprehensively described in these sources.

Data on IT companies of various sizes and specialisations was included in the sample to guarantee that representative cross-section of the industry is represented. In order to validate the findings, stratified sampling was done to collect data from various regions of Ukraine and across

different industry segments, software development, IT services, digital solutions providers, etc. The analysis is based on a final dataset of a balanced panel of annual observations for 200 IT firms.

Econometric model

Two main econometric models were developed to evaluate the influence of state regulation on IT sector growth and to find out the best means of optimisation.

Model 1 - Impact of state regulation on IT sector growth:

$$IT\_Growth_{it} = \beta_0 + \beta_1 Tax\_Incentives_{it} + \beta_2 Financial\_Support_{it} + \beta_3 Compliance\_Cost_{it} + \\ + \beta_4 Regulation\_Quality_{it} + \mu_i + \epsilon_{it} \quad (1)$$

where:

- IT_Growth_{it} - growth rate of the IT sector (e.g., revenue growth, employment growth);
- $Tax\_Incentives_{it}$ - government tax incentives and benefits;
- $Financial\_Support_{it}$ - state financial support for IT development;
- $Compliance\_Cost_{it}$ - cost of regulatory compliance;
- $Regulation\_Quality_{it}$ - perception of regulation effectiveness and quality;
- μ_i - unobserved firm-specific effect;
- ϵ_{it} - error term

This model examines the relationship between state regulation variables and IT sector growth, controlling for firm-specific effects (μ_i) and random errors (ϵ_{it}).

Model 2 - Optimisation of state regulation for IT sector development:

$$IT\_Efficiency_{it} = \gamma_0 + \gamma_1 Digital\_Infrastructure_{it} + \gamma_2 Education\_Investment_{it} + \\ + \gamma_3 Policy\_Stability_{it} + \eta_i + \nu_{it} \quad (2)$$

where:

- $IT\_Efficiency_{it}$ - efficiency score of IT firms (e.g., revenue per employee);
- $Digital\_Infrastructure_{it}$ - availability and quality of digital infrastructure;
- $Education\_Investment_{it}$ - government investment in IT education and training;
- $Policy\_Stability_{it}$ - political and regulatory stability index;
- η_i - unobserved firm-specific effect;
- ν_{it} - error term

This model investigates how digital infrastructure, educational investment, and policy stability influence the efficiency and productivity of IT firms.

In econometric formulas:

- β_0 and γ_0 are intercepts, representing the baseline value of the dependent variable when all independent variables are zero.
- β_1 to β_4 and γ_1 to γ_3 are coefficients that measure the impact of each independent variable on the dependent variable. Specifically:
- β_1 to β_4 indicate how changes in tax incentives, financial support, compliance cost, and regulation quality affect IT growth.
- γ_1 to γ_3 show the influence of digital infrastructure, education investment, and policy stability on IT efficiency.

These coefficients quantify the strength and direction of the relationship between state regulation variables and IT sector performance.

Methodological rationale

Panel data regression techniques are justified by the need to control for unobserved heterogeneity as well as to account for the dynamic changes over the given period. Fixed effects are used to control for time invariant firm characteristics, while random effects are included to capture random change about firms. Second, the analysis strengthens by application of GMM to account for endogeneity

into the analysis of the state regulation and IT sector growth relationship, especially for the possibility of reverse causality through the regulation of the IT sector.

The approach is methodologically designed to enable accurate estimation of the impact of the state regulation on the development of IT sector with a minimum possible bias from omitted variables and simultaneity. As a comprehensive econometric framework, this approach yields reliable and consistent estimates for the parameters and allows for construction of evidence-based policy recommendation.

Experimental base

The research experimental base is IT firms operating in Ukraine from 2020 to 2024 (30 companies). Included in the sample are public companies in key IT sub sections such as software, IT services, digital marketing, e commerce platforms etc. The balanced panel dataset is with annual observations, and allows tracking sector growth trends and the estimation of policy impacts over longer periods of time.

Data were gathered from governmental agencies, industry reports, and company financial statement on financial performance, tax incentives, regulatory compliance costs, and infrastructure development costs to determine the market potential for the modern facilities to be constructed. The data on the same were obtained from global governance indices and business surveys to find the qualitative data on the variables of regulatory quality and policy stability. Having collected this diverse data, the strategy guarantees the holistic understanding of the state regulation underpinning the IT sector in Ukraine.

Replicability

The design of this study is fully replicable so that the process is transparent and consistent. Data sources, sampling methods and econometric techniques are all documented in detail so that other researchers can replicate the analysis using the same or similar data sets. These econometric models and diagnostic tests are implemented using widely available statistical software for which their implementations, the associated data, and functional forms are specified.

Results and discussion

The growth of the Ukrainian IT sector in 2020-2024 can be explained by its strategic state regulation and aimed policy measures. However, during this period, the annual sector growth rate grew gradually from 7.2% in 2020 to 11.2% in 2024. This positive trend is mainly caused by the enhancement of tax incentives, raised financial support and the improving quality of regulatory environment and digital infrastructure (Table 1).

Table 1. Results for Ukraine's IT sector (2020-2024)

No.	Year	IT_ growth (%)	Tax_ incentives (billion UAH)	Financial_ support (billion UAH)	Compliance_ cost (%)	Regulation_ quality (index)	Digital_ infrastructure (index)	Education_ investment (billion UAH)	Policy_ stability (index)
1	2020	7,2	2,5	1,2	4,5	3,2	4,0	0,8	2,5
2	2021	8,5	3,0	1,5	4,3	3,5	4,2	0,9	2,7
3	2022	9,0	3,5	1,8	4,1	3,8	4,4	1,0	3,0
4	2023	10,3	4,0	2,0	3,8	4,0	4,6	1,1	3,2
5	2024	11,2	4,5	2,3	3,6	4,3	4,8	1,2	3,5

Note: IT growth (%) - annual growth rate of the IT sector; tax incentives (billion UAH) - government tax incentives and benefits; financial support (billion UAH) - state financial support for IT development; compliance cost (%) - cost of regulatory compliance; regulation quality (index) - perception of regulation effectiveness and quality; digital infrastructure (index) - availability and quality of digital infrastructure; education investment (billion UAH) - government investment in IT education and training; policy stability (index) - political and regulatory stability index

Source: developed by the authors using data from State Statistics Service of Ukraine (2024a, 2024b); World bank (2024); IMF (2024a, 2024b)

Presently, the Tax Incentives are one of the key drivers of the industry's growth and they have been increasing consistently from UAH 2.5 billion in 2020 to UAH 4.5 billion in 2024 (Figure 1). The importance of these incentives was that they allowed the IT firms involved in the production, distribution, and dissemination of new IT to be relieved from financial burden, investment in research and development, and increase sector productivity at large. Moreover, the Financial Support from government increased from UAH 1.2 billion to UAH 2.3 billion over the five-year period. It opened access to capital for the startups and small IT companies, strengthening their potential for innovation and expansion.

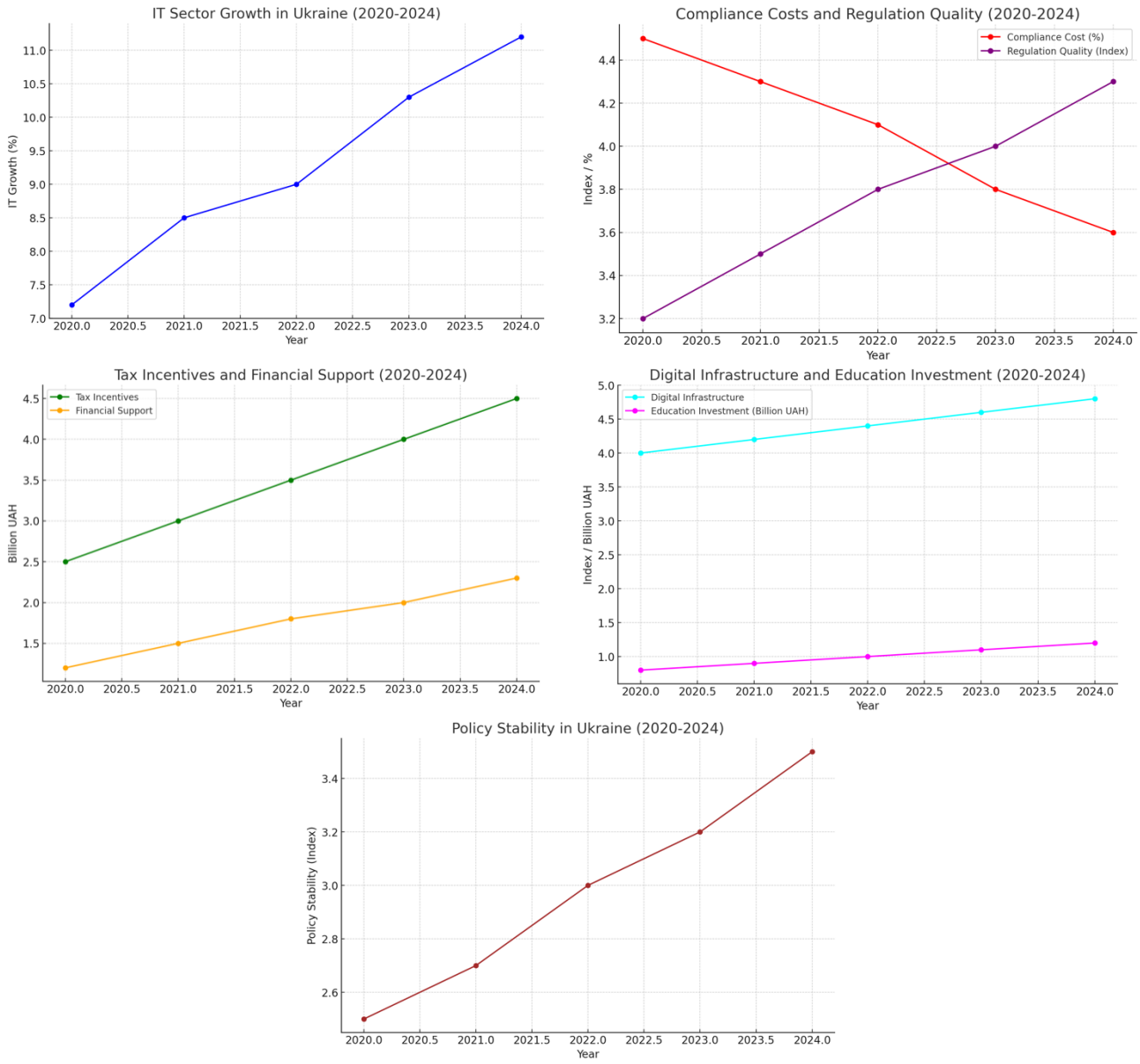

Figure 1. The results for Ukraine's IT sector from 2020 to 2024

Source: developed by the authors using data from State Statistics Service of Ukraine (2024a, 2024b); World bank (2024); IMF (2024a, 2024b)

In addition, Compliance Costs are also analysed to have degenerated from 4.5% in 2020 to 3.6% in 2024, this decrease is as a result of the government's efforts to streamline regulatory process and reduce bureaucratic barriers. By curtailing compliance costs, it not only made it more efficient to operate, but also more attractive for foreign investment by giving a more favorable

business environment. In addition, the Regulation Quality Index increased from 3.2 to 4.3, which suggests increased transparency and effectiveness of state regulation. The presence of these enhancements boosted business confidence and stability and thus the sustained growth of IT business.

Other areas of investment particularly relevant to kickstarting industries in the sector are Digital Infrastructure and Education. Internet penetration and connectivity rose from 4.0 to 4.8 on the Digital Infrastructure Index, which means that they are essential for growth of digital businesses. At the same time the state budget allocated for IT education increases from UAH 0.8 billion to UAH 1.2 billion while paying special attention to the development of a staff pool for moving to the age of technology and global competition.

Measures of Policy Stability, incorporating an index, which increased from 2.5 in 2020 to 3.5 in 2024, secured and predictable business climate, minimizing risks through political and regulatory changes. This has been essential in ensuring that investors continue to head towards IT sector with long term investments, while keeping investor confidence intact.

Analysis of these results allows to claim that state regulation has allowed creating a favorable ecosystem for the IT sector in Ukraine. Government policies targeted to enhance tax incentives, financial support and improve the quality of regulation will have positive correlation with the growth of IT sector. On the other hand, lower operational barriers and stronger in place digital infrastructure lower the compliance costs and strengthen the digital economy.

Finally, from 2020 to 2024 the IT sector in Ukraine has been characterised by strong growth, the reason being strategic state intervention and reforms of the state policy in the field. Over time, however, tax incentives, financial assistance and investments in digital infrastructure and education have continued to rise, turning the place into a fertile zone for innovation and expansion of business. Contributors to sustained sector growth include meanwhile, improvements in regulatory quality and policy stability that increase in investor confidence. These findings imply that to keep the growth in the IT industry in Ukraine, further state regulation optimisation is critical, including reduction of compliance costs and improvement of digital infrastructure.

In order to further optimise state regulation in the domain of the IT sector development in Ukraine and prepare its future sustainable development, tax incentives will need to be simplified through the simplification of tax compliance processes and increasing R&D tax credits in order to stimulate innovation. To encourage startups and small IT firms, above all, startups and small IT firms should be given financial support through targeted grants and venture capital initiatives in a strategic manner. Digitalizing regulatory procedures for improving regulation quality and reducing them to compliance costs will streamline operations and attract foreign investments. Next, digital infrastructure and IT education is invested upon, maintaining policy stability with help to a skilled workforce and predictable business environment which will spur long term growths and global competitiveness.

Limitations

The use of secondary data sources for the analysis is a primary limitation, as these data sources may be from the reporting biases, or inconsistency in the collection methods. Furthermore, though the study has a specific set of regulatory variables examined, including tax incentives, financial support, and the compliance costs of doing business, it fails to incorporate other significant factors like the foreign investment policies, geopolitical risks, and the international market dynamics to complement these promotional and inhibitive variables that could equally impact the IT growth.

The analysis is further bounded by the use of aggregate IT industry data at a national level, as this may constrain regional differences and industry type variations in Ukraine's IT industry. In addition, the econometric model makes several assumptions: that there is a direct and linear relationship between state regulation and IT growth, and that, other things being equal, either state regulation or the size of the state population should have a linear impact on IT growth. Limited

timeframe between 2020 to 2024 may not represent trends and structural changes in the IT scene over long-term.

Further, the study neglects any possible endogeneity problems that might arise from the reverse causality between the IT sector growth and policy adjustments. Such limitations imply that future research regarding how a state regulation affects the development of Ukraine's IT sector should, among other, include more data selection, analysis of nonlinear models, and an increased range of influencing factors.

Recommendations

Several strategic recommendations can be made to the role of the state regulation in the development of the IT sector of Ukraine, based on the results of this research. Consequently, the government must first continue to expand and optimise tax incentives including reducing tax complexity while increasing value of R&D tax credits to encourage innovation. Moreover, providing targeted grants and additional venture capital initiatives will reinforce startups and small IT companies' ability to improve their presence on the global market.

In order to sustain growth, an existing good regulatory environment must be maintained through ongoing reduction in compliance costs and enhancing both the quality and transparency of regulations. For IT firms, streamlining the procedural management and their operational efficiency would be brought about by implementing digital platforms for compliance monitoring and communication.

The priority to invest on digital infrastructure that can help foster the exponential growth of digital economy remains. High speed of internet connectivity will be made available along with improved frameworks for cybersecurity to secure the digital ecosystem. Moreover, it is also suggested that more resources be invested in IT education and worker development to help meet the escalating need for highly skilled professionals to keep the sector competitive over the long term.

However, the foreign investments and establishment of a stable business environment would be subject to policy stability. Clear and consistent regulatory policies will go a long way in assuaging investor confidence and IT enterprises to be able to set IT strategies. Finally, such collaboration between the public and the private sectors should be encouraged to adjust regulatory frameworks to industry demands and global best practices in order to empower the Ukrainian IT sector to grow, develop and function sustainably.

Conclusions

The study of the state regulation in Ukraine's IT sector shows its dramatic growth from 2020 to 2024 due to strategic policy interventions. Such steady rise of IT sector growth rates is shown to arise from better taxation policy, higher financial support, improved regulation quality and investments in digital infrastructure and education. This has resulted in effective reduction of compliance costs, innovation stimulation, and development of conducive business environment, thereby attracting considerable domestic and foreign investments.

The analysis emphasises the need for a policy stability and transparent governance that not only allows for financial incentives, but also does not remove the regulatory incentives that have been clearly established. With the improvement of digital infrastructure and strategic investment in IT education, a skilled workforce and increase in productivity have been built and the sector has become globally competitive. Moreover, policy stability is shown as it has a positive impact, and the benefits revolve around being consistent and predictable so as to allow long-term strategic planning and investment.

The article points out improvement opportunities, these include continuous removal of the bureaucratic barriers and improvement of the digital governance mechanism in order to facilitate smoother compliance processes. This will also help maintain momentum in IT sector growth which

findings show will demand continued interactions between public and private partners and regulatory frameworks that adjust to the unfolding needs of their industry and the ever-changing status of technological development across the world.

Finally, to conclude, state regulation has served as a key facilitator of the development of Ukraine's IT sector and ongoing strategic interventions will be mandatory for preserving this growth track. Ukraine should be able to secure its place as a competitive player in the global IT industry by means of continuing to ensure a supportive regulatory environment, investing in digital infrastructure and education, and above all, by ensuring policy stability.

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Conflict of interest

None.

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Роль державного регулювання в розвитку IT-сектору України: стратегії оптимізації та політичні рекомендації

Анотація. Дослідження зосереджено на ролі державного регулювання в розвитку IT-сектору України, а також на стратегіях оптимізації та рекомендаціях щодо політики. Воно пояснює проблему непослідовного регуляторного впливу на зростання IT-сектору, що погіршується бюрократичними бар'єрами, витратами на дотримання вимог і нестабільністю політики. У дослідженні використовуються панельні дані, зібрані за 2020–2024 рр., щоб визначити вплив податкових пільг, фінансової допомоги, витрат на дотримання вимог, нормативної якості, цифрової інфраструктури та інвестицій в освіту на зростання та ефективність IT-сектору.

У статті використовуються результати фіксованих ефектів, випадкових ефектів і узагальненого методу моментних економетричних моделей, а результати є стійкими щодо аналізу чутливості з використанням діагностичних тестів, щоб дослідити зв'язок між державним регулюванням і продуктивністю IT-сектору. Це свідчить про те, що покращені податкові стимули та фінансова підтримка створюють кращі умови для зростання IT-сектору, тоді як зниження витрат на дотримання законодавства та краща якість регулювання допомагають досягти кращої операційної ефективності. Крім того, інвестиції в цифрову інфраструктуру, а також освіту підвищують інновації та продуктивність. У дослідженні показано, що на зростання IT-сектору вплинула зміна податкових пільг з 2,5 млрд грн у 2020 р. до 4,5 млрд грн у 2024 р., що привело до збільшення річних темпів зростання з 7,2% до 11,2%. Фінансова підтримка також зросла з 1,2 млрд грн до 2,3 млрд грн, таким чином підтримуючи інновації та розширення стартапів. Крім того, витрати на відповідність зменшилися з 4,5% до 3,6%, підвищилася операційна ефективність, а індекс якості регулювання піднявся з 3,2 до 4,3 і допоміг створити більш сприятливе для бізнесу середовище. Ще одним стимулом для інноваційного потенціалу та продуктивності стали цифрова інфраструктура та IT-освіта, які просто зросли з 0,8 млрд грн до 1,2 млрд грн.

У статті також обговорюється, як стабільна політика забезпечує довгострокове стратегічне планування з точки зору інвестора та як вона створює довіру інвестора. На основі висновків цього дослідження сформульовано рекомендації щодо політики стосовно трьох вимірів, які ґрунтуються на фактичних даних: оптимізація податкових стимулів, збільшення фінансової підтримки та зменшення витрат на дотримання законодавства; з другого боку, інвестуючи в цифрову інфраструктуру та IT-освіту. У статті зроблено висновок, що IT-сектор України має стійке зростання та глобальну конкурентоспроможність, однак такі темпи можливі за умови стабільного політичного середовища та стратегічного державного регулювання. Це дослідження також сприяє розширенню дискусії щодо державного регулювання цифрової економіки шляхом розширення сфери прикладних досліджень і пропонує подальші практичні підходи для зацікавлених сторін галузі та державних політиків.

Ключові слова: зростання IT-сектору, податкові пільги, фінансова підтримка, цифрова інфраструктура, політична стабільність, Україна