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A study of the amount of time required to open a business as a key element in the implementation of innovative digital technologies in the system of strategic development of startup projects

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Abstract:

Modern trends in economic development involve the use of various forms of doing business, among which the so-called startup projects stand out. Such projects allow creating innovative digital technologies for strategic development. At the same time, the time factor is significant, which affects the implementation of such projects. Taking this into account, the work analyzes the time characteristics required to open a business and the number of permitting procedures. The wavelet coherence procedure was used for the analysis.

Key words: Business, Analysis, Innovation, Startup, Time factor, Digital technologies, Permitting procedures, Gender factor

Introduction

Modern economic development involves the use of various forms and directions of doing business. At the same time, special attention should be paid to the innovative aspects of the formation of new ways of implementing business ideas [1]-[3]. Among such forms of implementing innovative solutions, startup projects stand out [4], [5], which are able to attract the necessary resources in a short time and implement the tasks in the shortest possible time. At the same time, the implementation of startup projects can be considered as a certain form of doing business.

One of the characteristics of doing business should be considered the time required to open it. Such time can be a key characteristic of the implementation of innovative digital technologies in the system of strategic development of startup projects. In turn, such time characterizes the ease and accessibility of implementing startup projects from the point of view of a separate country where such projects are implemented. This approach allows for a comparative assessment of the effectiveness of implementing innovative digital technologies based on startup projects. It is important to consider countries for comparison according to the relevant criterion, for example: common territorial distribution, level of economic development, etc. For the purposes of such comparison, various methods and approaches are used, both classical from the point of view of economic science [6]-[17], and special ones that can give certain hints for the implementation of innovative ideas of the corresponding analysis [18]-[22].

At the same time, the time required to open a business is affected by the number of permitting procedures, which allows for extensive comparative studies. Here, various methods and approaches can also be used to conduct the necessary research [23]-[32].

Thus, the main objective of this study is to conduct a comparative analysis of the amount of time required to open a business as a key element of the implementation of innovative digital technologies in the system of strategic development of start-up projects. For these purposes, it is

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necessary to consider both the time characteristics and the number of necessary procedures from the point of view of individual countries. It is also advisable to consider the gender aspect in this matter (for example, taking into account the gender of the business manager).

Related work

There are many works on the topic of this study that concern both theoretical and practical aspects of solving individual problems. For a better understanding of the purpose of our study, let us consider some of them.

J. I. Halman and G. T. Burger study the issues of startup project launch efficiency [33]. In this case, special attention is paid to the relationship between the project owner and its management. This allows for a better understanding and implementation of the project goals, scope and objectives at an early stage. Attention is also paid to the time of implementation of such goals, which correlates with the tasks set in our study.

A. Kolosok and I. Koniukh consider a number of theoretical and practical issues related to the prospects for the creation, implementation of startup projects and their further development [34]. The authors conduct a comprehensive analysis of the stages of startup projects and components, where attention is also paid to the time of opening the relevant business, the number of necessary permitting procedures in Ukraine. This allows for a better understanding of the problems of startup projects. However, the work does not include a comparative analysis, which does not allow for broad generalized conclusions.

In the study [35], the authors conduct a comprehensive literature review to examine key issues in the strategic communication of startup projects. The results of the review allow us to identify a number of areas in which startups face strategic communication problems. Among such problems are the collection of necessary permits and the time required to open the relevant business. Therefore, it is important to plan each stage of the implementation of startup projects, where it is important to take into account the communication channels. This emphasizes the importance of various forms of planning and appearance in the strategic communication of startups [35].

R. Gattringer and M. Wiener also analyze the key factors of startup projects implementation, where they highlight the initial stage of creation of this type of business [36]. The authors show that trust and fear of losing know-how are not too worrying, due to the less binding form of cooperation and choice of company (lack of competitors) [36]. Here the time factor for implementation of the decisions taken is more significant.

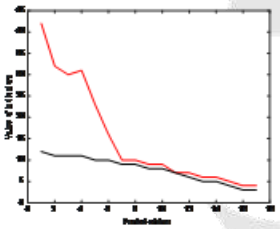
G. Krzos and K. Olek consider the theoretical prerequisites for managing startup projects in the context of their development trajectories [37]. At the same time, the authors emphasize the growing interest in startups among scientists and practitioners. For these purposes, data from a number of European countries are considered to unify their results and make recommendations. This study also emphasizes the importance of the topic under consideration in our study.

At the same time, it is necessary to emphasize the importance of conducting a comparative analysis, which will allow a deeper understanding of the research problem. Therefore, a number of countries are considered below, for which the corresponding analysis is conducted. Among such

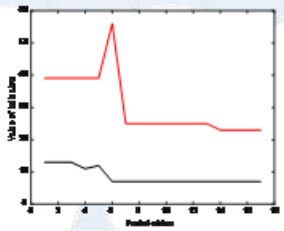
countries, the following were chosen: Moldova, Bulgaria, Estonia and Latvia. This choice is related to approximately the same socio-economic conditions of their development.

Time costs for starting a business and the number of permit procedures for a number of studied economies of individual countries

This section examines the time it takes to start a business and the number of permit procedures for individual countries used in the study. On Fig. 1 and Fig. 2 present the relevant data in the form of graphs for the period 2003-2019 (all data from https://data.worldbank.org/indicator).



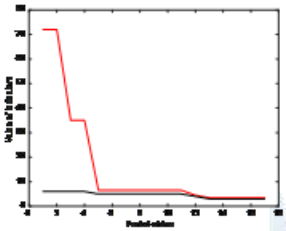
a) Moldova



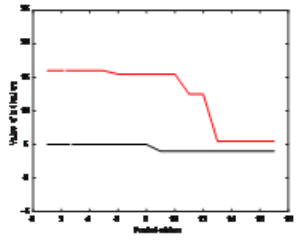
b) Bulgaria

Figure 1: Time costs for opening a business and the number of permit procedures in Moldova and Bulgaria

On Fig. 1 and Fig. 2, the time required to open a business (days) is shown in red, and the number of permit procedures (quantity) is shown in black.



a) Estonia



b) Latvia

Figure 2: Time costs for opening a business and the number of permit procedures in Estonia and Latvia

First of all, it should be noted that the time costs significantly exceed such an indicator as the number of permitting procedures. This is understandable, since each permitting procedure requires some time to resolve it. Thus, the reduction of such procedures naturally leads to a reduction in the

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time costs of starting a business. Consequently, this can be considered as one of the key factors in the implementation of innovative digital technologies in the system of strategic development of startup projects.

For example, for Moldova, the number of permitting procedures has decreased from 12 in 2003 to 3 in 2019 (Fig. 1a). Accordingly, the time spent on starting a business has decreased from 42 days to 4 days. Until 2008-2009, time costs were reduced at a faster rate than the number of permitting procedures. Most likely, against the background of the reduction of permitting procedures, there was also a simplification of such procedures themselves. A more qualified answer to this question will help to conduct a comparative dynamics of the indicators under consideration. This will be done in the next section.

The data from Bulgaria also shows a reduction in both permitting procedures and the time to open a business – from 13 to 7 and 39 to 23, respectively (Fig. 1b). But compared to the data for Moldova, the reduction is not as significant. Therefore, in Moldova, the conditions for implementing innovative digital technologies through start-up projects are more attractive.

Estonia is characterized by the greatest reduction in the time to start a business in the period under study. Their data in Fig. 2a show that the time to start a business in Estonia has decreased from 72 days to 3.5 days. At the same time, the number of permit procedures has decreased from 6 to 3. Thus, it can be said that the time to complete such permit procedures has decreased. Such a significant reduction in time costs has been observed since 2007.

The corresponding data from Latvia show that the time to open a business has decreased from 16 days to 5.5 days, and the number of permitting procedures from 5 to 4 (Fig. 2b). Again, there is a significant reduction in the time spent on completing such permitting procedures. However, such a significant reduction in time costs occurred only in 2015.

Based on the above, we can say that Estonia is a leader in terms of starting a business, including the implementation of innovative digital technologies through startup projects. These data should be considered as a benchmark in forming the conditions for the development of startup projects, the development of appropriate forms of doing business.

At the same time, despite the different trends in the dynamics of the data under consideration (time spent on opening a business and the number of permitting procedures), the same trends should be noted. The essence of such trends lies in both reducing time costs and reducing permitting procedures. Although the timing of such changes for each country is individual, this emphasizes their differences in economic development, the need to use start-up projects, and the possibility of their effective implementation.

If we talk about the gender factor in starting a business in Moldova, Bulgaria, Estonia and Latvia, it should be noted that such differences are not observed. The time costs and the number of permit procedures in the countries under study for starting a business are the same in the gender aspect and reflect the general corresponding indicators (Fig. 1, Fig. 2).

Next, we will look in more detail at the analysis of the mutual dynamics between the data that reflect the time spent on opening a business and the number of corresponding permitting procedures. This will help to understand some of the interrelations between the data under study.

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Comparative assessment of the mutual dynamics of the studied data

To examine the relationship between time costs and the number of permit procedures, various methods and approaches can be used, among which it is advisable to highlight the wavelet coherence methodology [11], [20], [25], [29]. This methodology operates with data presented in the form of time series and allows us to evaluate the mutual dynamics on different time horizons. For these purposes, the concept of the depth of cross-links is used. This allows us to evaluate in detail the dynamics of mutual links and understand the essence of the study.

Let's consider two time series ($k(t)$ and $d(t)$), each of which reflects the dynamics of an indicator over time t, then we can determine the value of wavelet coherence between the following series of data using the following formula [38]-[40]:

$$Q^2(a,c) = \frac{\left|\Omega(a^{-1}W_{k(t)d(t)}(a,c))\right|^2}{\Omega(a^{-1}\left|W_{k(t)}(a,c)\right|^2)\Omega(a^{-1}\left|W_{d(t)}(a,c)\right|^2)},$$

where:

$W(a,c)$ – values of transverse wavelet spectra,

a,c – the scale and center of time localization that determine the scale of the wavelet transform,

$k(t)$, $d(t)$ – series of data that we study,

Ω – smoothing operator,

$Q^2(a,c)$ – square of the wavelet coherence coefficient. $0 \le Q^2(a,c) \le 1$. If these values tend to zero, then we have a weak correlation. Otherwise we have a strong correlation [39], [40].

On Fig. 3 presents estimates of wavelet coherence between the time characteristics required to open a business and the number of permitting procedures in countries such as Moldova and Bulgaria.

a) Moldova b) Bulgaria

Figure 3: Wavelet coherence estimates between the time characteristics required to start a business and the number of permit procedures in countries such as Moldova and Bulgaria

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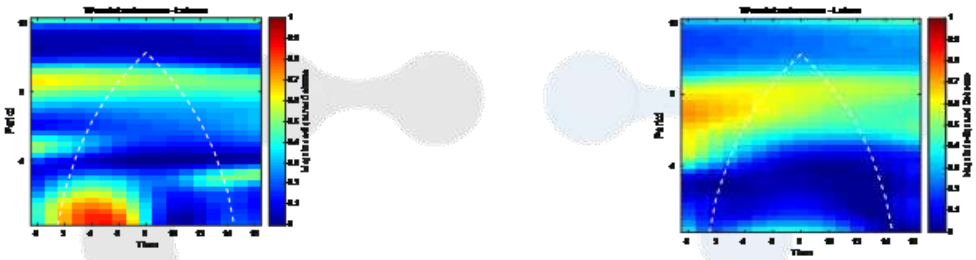
On Fig. 4 presents estimates of wavelet coherence between the time characteristics required to open a business and the number of permitting procedures in countries such as Estonia and Latvia, respectively.

The data presented in Fig. 3 and Fig. 4 reflect the mutual dynamics of the data, which is shown in Fig. 1 and Fig. 2, respectively, taking into account the factor of reducing the time of each permitting procedure.



a) Estonia b) Latvia

Figure 4: Wavelet coherence estimates between the time characteristics required to start a business and the number of permit procedures in countries such as Estonia and Latvia

Analyzing the data in Fig. 3a, we can talk about the coincidence of the trends between the time characteristics required to open a business and the number of permitting procedures in the short term. This fully explains the changes in both the time required to open a business and the reduction in the number of permitting procedures.

A similar conclusion applies to the data for Bulgaria (Fig. 3b).

Based on the data for Estonia (Fig. 4a), it follows that the absolute agreement between the time required to start a business and the number of permit procedures is fragmented.

Wavelet coherence estimates for Latvian data show no significant correlation between the time required to start a business and the number of permit procedures (Fig. 4b).

Thus, it should be said that in Estonia and Latvia there is a significant reduction in the time required to formalise doing business due to a reduction in the time required for individual permit procedures, and not due to their number as a whole.

Conclusion

The article considers the conditions for the effective implementation of the initial stage of startup projects development. For these purposes, the amount of time required to open a business as a key element in the implementation of innovative digital technologies is considered. The relationship with this time and the number of permitting procedures for doing business is also analyzed.

For the purposes of analysis, the relevant data are considered for individual countries: Moldova, Bulgaria, Estonia and Latvia.

Based on wavelet coherence estimates, the relationship between the dynamics of the parameters under study within each individual country is considered. A conclusion is made about the factors reducing the time to open a business.

The results obtained can be used to plan the organization of opening and running startup projects as a direction for the implementation of innovative digital technologies.

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