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STAKEHOLDER PERCEPTIONS AND MODEL OF ENGAGEMENT FOR SUSTAINABLE TOURISM DEVELOPMENT IN ADJARA AUTONOMOUS REPUBLIC

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ABSTRACT

As travel and tourism became one of the sectors most affected by the Covid-19 pandemic, the concept of sustainable tourism development becomes inevitable. In order to achieve sustainable development, special value is assigned to stakeholder engagement at all the stages of the development, from the policy formation to the project implementation. The paper analyses the stakeholder perceptions towards the sustainable tourism development based on the example of Autonomous Republic of Adjara, elaboration of necessary directions for practical realization of their engagement in the decision-making process is concluded. The quantitative data needed for research purposes were collected through a structured questionnaire. Respondents' opinions were established on the current state of tourism in the Autonomous Republic of Adjara and the strategy of subsequent development of the industry. The results show that different groups of stakeholders have different perceptions towards different attitudes, some of which are expressed in critical positions. On the basis of research results, the views of different groups of stakeholders is set out to ensure the further steps in the sustainable development of tourism and the stakeholder engagement model in the planning process is proposed.

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Introduction. Sustainable tourism development comprises three direction - ecological, social and economic aspects. Yet success lies in keeping balance between those three. Literature suggests that tourism will reach higher level of sustainability, if all stakeholders are involved in its development. The following paper aims to analyse the one of the most important issues of sustainable development - stakeholder perceptions and their engagement in decision-making process.

Over the last decade, tourism is acknowledged as the state priority in Georgia and large amount of investments were directed in the related fields. As a result, the entire country and Adjara Autonomous Republic (Adjara A.R.) itself has made considerable progress concerning attraction of tourists, that can be evidenced by the constant tendency of increasing number of tourists from year to year.

It is noteworthy that there is still a little experience of developing stakeholders' policies in the state. To achieve the target indicators set in "Georgian Tourism Strategy 2025" (Georgian National Tourism Administration), there are eight strategic tasks to be challenged and cooperation with stakeholders is one of them; However, it is not clarified what mechanisms will be involved in their engagement in the planning process. Nevertheless, the degree of performance of this task determines the quality of successful implementation of the remaining tasks.

Nowadays, special importance must be given to the stakeholder engagement at all the stages of sustainable development, starting from the establishment of the policy to the project implementation stage. According to the common opinion, joint work can bring the significant benefits, while there is a clear consensus that different stakeholder engagement in the overall global solutions of multi-aspect is of vital importance.

Therefore, in order to find out how stakeholders can be more effectively involved in the implementation of sustainable tourism development in Adjara A.R. the following tasks are considered in the proposed paper:

1. Based on research, to analyse the perceptions of different stakeholder groups towards tourism development in Adjara Autonomous Republic;
2. Find out their views concerning the desirable actions of planning and decision-making process;
3. To determine means of perfection of stakeholder engagement in sustainable tourism development.

Literature review. For the effective development of tourism, it is essential to predict the expected changes and analyse their impact. Taking into consideration all these, touristic destinations have to find and develop sustainable tourism development models, because the failure to achieve this goal has most likely succession to the short-term perspective (Abuselidze&Devadze, 2018).

After the study of existing literatures on sustainable development (Healey 1998; Wahab & Pigram 1998; Bramwell & Sharman 1999; Hardy, Beeton & Pearson, 2002; Dodds, 2007; Bell & Morse, 2008; Logar, 2010; Abuselidze & Johann, 2017; Putkaradze & Abuselidze, 2019; Salukvadze & Backhaus, 2020), we can consider that tourism will reach higher level of sustainability, if all stakeholders are involved in its development. for successful implementation of sustainable tourism, it is necessary to evolve the following - vision, policy, planning, management, monitoring, public learning processes and total involvement of society in the process of its development (Choi & Sirakaya, 2005).

Analyzing the literature in the field demonstrates, that the main challenges for sustainable tourism development are: Its practical implementation (Dodds, 2007; Hardy, Beeton, & Pearson, 2002; Logar, 2010); Practical issues of sharing capacity, agreement, coordination, co-operation and responsibility (Butler, 1999; Jamal & Getz, 1995); Issues related to stakeholders (Bell & Morse, 2008; Dodds, 2007, Cooper et al., 2009). Among them, the most obvious is the lack of stakeholder engagement, lack of government support, lack of leadership, lack of information and lack of coordination (Dodds, 2007). All these lead to the creation of problems among stakeholders such as bureaucracy and coordination difficulties, decrease of power, change of common interests, and failure of goals establishment, unwillingness to make significant changes and so on. (Cooper et al., 2009; Dodds & Butler, 2009).

Research methodology. Since the concept of sustainability comprises many economic, social and ecological aspects, that in its turn implies a wide range of stakeholders, it is almost incredible to involve all of them in the research process. Accordingly, for the given paper key groups of stakeholders were interviewed during the research.

The quantitative data needed for research purposes were collected through a structured questionnaire. Respondents' opinions were established on the current state of tourism in the Autonomous Republic of Adjara and the strategy of subsequent development of the industry.

A number of questions in the questionnaire were adapted from Byrd, Reid, Hapitoglu, Choi and Sirakaya studies (Byrd et al., 2009, Reid et al., 2009, Hatipoglu et al., 2014, Choi and Sirakaya, 2005). The questionnaire consisted of 40 statements and the answers were evaluated using the 5 graded Likert scale, where 1 corresponds to the answer "totally disagree" and 5 corresponds to "completely agree".

After the questionnaire, the Qualtrics online server was used and the questionnaire was sent to the various interested stakeholders of the tourism industry. Part of the returned questionnaires were half filled, which would not be appropriate for analysis. Therefore, we had to sort out the completed questionnaires and finally we got 390 filled questionnaires, which is about 75% of respondents, 95% of confidence interval and 5% of the sampling error, which means that the survey results are representative for the stakeholders of the Autonomous Republic of Adjara. The data downloaded from the Qualtrics server were processed through the SPSS program.

Results and discussion. The research results show a comparison of means of five-point Likert-scale type statements of the different stakeholder groups. The part of statements aimed to learn how do stakeholders evaluate the ongoing situation of tourism development in the Autonomous Republic of Adjara, and what are their thoughts concerning the planning of future development path.

Table 1. Comparison of stakeholder perceptions

	Stakeholder Groups											
	Local Government		Central Government		Educational Establishment		Non-Governmental Organisation		Hotel		Travel Agency/Tour-operator	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Tourism is important for Adjara A.R. and the local community	4.64	1.21	5.00	.000	4.95	.218	4.50	1.243	5.00	.000	4.83	.408
Tourism is well developed in Adjara A.R	3.82	1.25	3.75	.500	3.62	.740	3.25	1.138	3.43	1.016	3.50	.837
Tourism industry has developed over the past five years	4.55	.93	4.25	.957	4.33	1.065	3.50	1.087	4.00	.877	4.17	.753
Local community supports the tourism development in region	4.09	1.45	4.50	.577	4.48	.602	4.25	.866	4.29	.914	4.33	.516
Personally, I like the way tourism is developing in Adjara A.R.	3.82	1.25	4.00	.816	3.52	.680	2.92	1.240	3.71	1.069	3.67	1.033
Tourism development in Adjara corresponds to the sustainable development principles	3.91	1.30	4.25	.500	2.29	.902	1.75	1.138	3.64	1.393	3.17	1.329
There is no clear plan when problem occurs	3.00	1.34	3.00	1.414	3.57	1.028	4.55	.622	4.00	1.109	3.50	1.225
Local community and business society has no information about the future direction of tourism development	3.27	1.27	3.50	.577	3.57	1.248	4.33	.651	4.07	.917	4.00	1.265

Source: Data processed by SPSS

It is worth to remark, that the mean for the whole sample was 4.83 for the following statement: “Tourism is important for Adjara A.R. and for people living here”. This approves and verifies the definite support to tourism industry development from all the participating stakeholder groups. However, at the same time, research reveals that they are not satisfied with the existing state of tourism development. The corresponding statement – “Tourism is well-developed in Adjara A.R.” showed the mean of only 3.5, that is close to the neutral evaluation point 3 of Lykert scale.

The similar evaluation was shown for the logical extension of the previous statement – “Personally, I like the way tourism is developing in Adjara A.R.” with the sample mean equal to 3.5. Although, here should be emphasized that compared to other groups, the least point (mean=2.9) was given by the representatives of non-governmental organisations group. If we follow and discuss the evaluations from same group, NGO representatives think that tourism development does not meet the sustainable tourism development principles. (“Tourism development in Adjara corresponds to the sustainable development principles”– mean=1.75), that demonstrated the most critical evaluations compared to other groups.

The second half of questionnaire aimed to find out stakeholder perceptions towards the stakeholder management process (Table 2).

Table 2. Comparison of stakeholder perceptions.

	Stakeholder Groups											
	Local Government		Central Government		Educational Establishment		Non-Governmental Organisation		Hotel		Travel Agency/Tour-operator	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
The tourism related decisions in Adjara A.R. should be made by the local government	4.09	.70	3.75	.500	4.00	.707	4.08	.900	3.71	.994	4.17	.753
The tourism related decisions in Adjara A.R. should be made by the central government	3.00	1.34	3.75	.957	3.10	1.044	2.67	1.231	3.57	1.016	3.00	1.095
The tourism related decisions should be made by the involvement of different stakeholder groups	3.73	1.35	3.00	.816	4.57	.870	4.67	.492	3.86	1.099	3.50	1.517
Local community should be actively involved in tourism planning	3.91	1.14	4.75	.500	4.43	.870	4.50	.522	4.57	.756	4.00	.894
Personally, I feel that I am involved in the tourism development process in Adjara A.R.	4.18	1.08	2.50	1.000	2.95	1.322	2.08	1.165	3.29	1.541	2.67	1.366
I would like to participate in the tourism related decision-making process	4.27	.79	4.00	.816	4.58	.769	4.83	1.193	4.50	.760	4.50	.548

Source: Data processed by SPSS

Based on the research objectives respondents were asked to state their opinion – if they would like to participate in the planning process. As we supposed, majority had the positive feedback, with a total mean 4.4, that means that in case of government's political will, it is easily manageable to gather different stakeholders and their feedbacks, and therefore share their knowledge, views and experience between the different stakeholders of tourism industry. Besides, the respondents were offered to choose all the possible options from the selection of stakeholder engagement techniques we think would be beneficial and easily achievable (Figure 1).

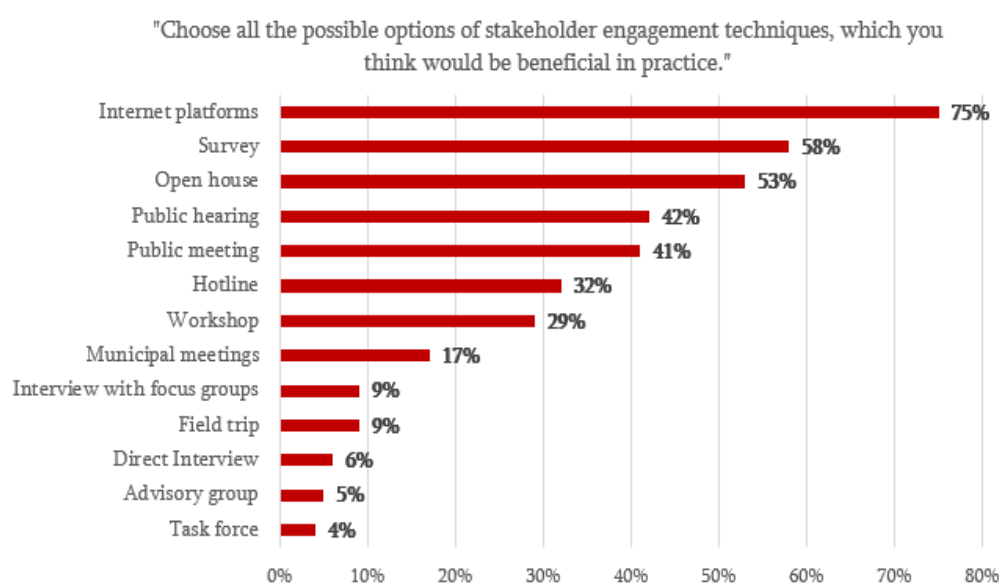


Fig. 1. Percentage distribution of respondents.

Source: Processed by authors

Based on the discussed above, a recommended frame of stakeholder engagement model is proposed (Figure 2). As far as all the governmental entities are accountable to the Government of Adjara Autonomous Republic, we think that they should take the responsibility of the stakeholder engagement. Therefore, should be entitled the group of people responsible on stakeholder management (SM responsible authority). The SM responsible authority could be any person or group of people, or the whole division employed in the government administration, that means there is no necessity of new employees. The authority will ensure the implementation of the stakeholder engagement strategy and corresponding provisions.



Fig. 2. The recommended model of stakeholder engagement

Source: Processed by authors

Conclusions. It is necessary to elaborate the plan for increasing stakeholder engagement in the different stages of planning. The study showed that the overwhelming majority of the respondents are willing to be involved in tourism development process of Adjara Autonomous Republic. Even though the Department of tourism and resorts of Adjara A.R is the main governmental organization in tourism industry, because of absence the relevant authority, it could not guarantee the coordination between the different governmental entities. As far as all the governmental entities are accountable to the Government of Adjara Autonomous Republic, we think that they should take the responsibility of the stakeholder engagement. Therefore, should be entitled the group of people responsible on stakeholder management (SM responsible authority). The SM responsible authority could be any person or group of people, or the whole division employed in the government administration, that means there is no necessity of new employees. The authority will ensure the implementation of the stakeholder engagement strategy and corresponding provisions.

The recommended techniques of stakeholder engagement are offered, which should be implemented in the process of tourism policy planning. These are: advisory group, task force, focus group, field trip, internet platforms, hotline, public meetings, open house and surveys. In order to increase the local community awareness and ensure to get feedbacks from them, it is recommended to use the following mass communication techniques: open house, public meetings, surveys, hotline, internet platforms.

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ПРОБЛЕМА ОБҐРУНТУВАННЯ ЧАСТКИ ДЕРЖАВИ У ПРОЄКТІ ДОРОЖНЬОГО БУДІВНИЦТВА НА ЗАСАДАХ КОНЦЕСІЇ

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ABSTRACT

In the proposed article, an attempt is made to resolve one of the most pressing issues that arise when justifying the implementation of road construction projects on a concession basis. This is a question of state participation in co-financing the project. The task has a double limitation. On the one hand, the opportunities for state participation in such projects are limited by the financial resources of the State Road Fund. On the other hand, the state's participation is limited by the project's internal capacity to provide sufficient cash flow.

The criteria for selection of projects implemented in the transport sector were studied. Additional requirements for the adequacy of expected cash flows have been formulated for projects that are expected to be implemented on a concession basis. The first step involves determining the creditworthiness of the project. The second is to ensure the required rate of return for private investors. The third step determines the need for state participation in co-financing the project and its respective share.

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1. Вступ. Однією з передумов стабільного функціонування економіки, забезпечення суспільного добробуту та збалансованого розвитку територій є наявність сучасної розвинутої мережі автомобільних доріг. Важливість цієї мережі пояснюється значною часткою перевезень вантажів, що припадають на автомобільний транспорт. У 2019 році у країнах Європи ця частка становила 75%, в Україні – 72%. Чим вищою є щільність автомобільних доріг, тим коротшими є шляхи доставки вантажів та перевезень пасажирів, що впливає, в кінцевому рахунку, на собівартість перевезень і відповідні тарифи.

В той же час забезпечення розвитку мережі автомобільних доріг потребує значних обсягів інвестицій. Зважаючи на те, що бюджет жодної країни не в змозі забезпечити потреби транспортної інфраструктури в інвестиційних ресурсах, уряди країн активно використовують механізм державно-приватного партнерства (ДПП).

Однією з найрозвиненіших та складних форм ДПП є концесії. На відміну від контрактних відносин, вони мають багатопільовий та довгостроковий характер, що дає можливість обом сторонам здійснювати стратегічне прогнозування та планування своєї діяльності. Крім того, за договорами концесії відповідальність і ризики проєктів перерозподіляються між усіма його учасниками: державою, концесіонером, інвесторами, фінансовими інститутами, страховими компаніями тощо, завдяки чому суттєво підвищується життєспроможність таких проєктів. У концесіях приватний партнер має більш високу, а часто й повну свободу у прийнятті інвестиційних, адміністративно-господарських та управлінських рішень. При цьому у держави залишається достатньо важелів впливу на концесіонера у випадку порушення ним умов концесійного договору або загального законодавства, а також за необхідності захисту інтересів

суспільства. За наявності суспільної необхідності держава має право в односторонньому порядку припинити концесію з виплатою концесіонеру компенсації.

Питання концесій у дорожньому будівництві перебувають у колі інтересів багатьох зарубіжних та вітчизняних науковців: Bousquet F. та Fayard A. [2], Wirahadikusumah R. D., Sapitri S., Susanti B. [5], Abednego, M. P., & Ogunlana, S. O. [1], Ullah, F., Thaheem, M. J., Sepasgozar, S. M. E. [4], Ping Ho, S., Ho, S. P., Levitt, R., Tsui, C.-W., & Hsu, Y. [3], Горбачова А.І. [10], Бондар Н.М. [7, 8], Шкарлет С.М. [18], Соколова Н.М. [17], Шпиг А.Ю. [19], Білик О.І. [6] та низка інших. Це проблеми оцінювання та розподілу ризику між учасниками партнерства, грошова оцінка вартості земельних ділянок, відведених під будівництво автомобільних доріг із застосуванням концесії; фактори, що визначають розмір плати за проїзд платною дорогою, обчислення очікуваних транспортних потоків тощо.

В той же час проблема обґрунтування частки держави у проєкті дорожнього будівництва на засадах концесії є недостатньо висвітлена в роботах науковців.

Метою статті є вивчення проблеми обґрунтування частки держави у проєкті дорожнього будівництва на засадах концесії та розробка пропозицій щодо шляхів її вирішення.

2. Матеріали та методи дослідження. Під час написання статті використовувались системний підхід, загальнонаукові методи аналізу та синтезу, монографічний, а також спеціальні методи аналізу (групування, порівняння), математичний апарат економічних та фінансових обчислень.

3. Результати. Успішна реалізація проєктів дорожнього будівництва на засадах концесії потребує відповідної підтримки з боку держави. Відповідними напрямками державної підтримки є: формування і розвиток правового та інституційного середовища, забезпечення сприятливого інвестиційного клімату;

безпосередня пайова участь у складі проєктної компанії, що реалізує проєкт дорожнього будівництва на засадах концесії;

фінансова підтримка (надання державних позик; надання субсидій; придбання акцій або облігацій проєктної компанії, що реалізує проєкт на засадах концесії; надання гарантій (за міжнародними позиками, інших видів гарантій); надання податкових і митних пільг та преференцій;

підтримка та захист прав інвестора (зміна з часом договірних зобов'язань, що влаштовує державного і приватного партнерів; захист від конкуренції).

Більшість зазначених напрямів державної підтримки пов'язана з запровадженням нормативно-правового регулювання питань інвестування, умов надання гарантій, створення переваг інвестору для захисту його від конкуренції тощо. відповідних нормативно

В той же час питання безпосередньої пайової участі (або частки) у складі проєктної компанії, що реалізує проєкт дорожнього будівництва на засадах концесії потребує додаткового аналітичного обґрунтування.

Джерелом формування державних коштів, що може залучатись для підтримки проєктів дорожнього будівництва на засадах ДПП, у тому числі у вигляді державного співфінансування таких проєктів, є Державний дорожній фонд [14, 16].

Доходна частина цього фонду формується за рахунок:

1) акцизного податку з вироблених в Україні пального і транспортних засобів;
2) акцизного податку з ввезених на митну територію України пального і транспортних засобів;

3) ввізного мита на нафтопродукти і транспортні засоби та шини до них;

4) плати за проїзд автомобільними дорогами транспортних засобів та інших самохідних машин і механізмів, вагові або габаритні параметри яких перевищують нормативні;

5) коштів спеціального фонду Державного бюджету України, отриманих шляхом залучення державою кредитів (позик) від банків, іноземних держав і міжнародних фінансових організацій на розвиток мережі та утримання автомобільних доріг загального користування;

6) плати за проїзд платними автомобільними дорогами загального користування державного значення, максимальний розмір та порядок справляння якої встановлюються Кабінетом Міністрів України, крім випадків будівництва (нового будівництва, реконструкції, капітального ремонту) та подальшої експлуатації відповідної автомобільної дороги загального користування на умовах концесії;

7) концесійних платежів - у разі будівництва та експлуатації автомобільних доріг на умовах концесії;

8) інших надходжень, передбачених Державним бюджетом України, в обсягах, що визначаються законом про Державний бюджет України на відповідний рік, а також надходжень, визначених статтею 5 закону «Про джерела фінансування дорожнього господарства України.

Визначено три напрями використання коштів, пов'язаних із підтримкою проєктів дорожнього будівництва на засадах ДПП:

1) фінансове забезпечення будівництва, реконструкції, ремонту і утримання автомобільних доріг загального користування державного значення, включаючи проведення конкурсів і підготовку договорів щодо виконання робіт з будівництва, реконструкції, ремонту і утримання автомобільних доріг загального користування за рахунок коштів міжнародних фінансових організацій, інших кредиторів та інвесторів, співфінансування зазначених робіт згідно з відповідними договорами, здійснення контролю за їх виконанням і прийняття доріг в експлуатацію, управління дорожнім господарством, виплату приватному партнеру/концесіонеру плати за експлуатаційну готовність автомобільної дороги загального користування державного значення та здійснення інших виплат у порядку та на умовах, передбачених договором, укладеним у рамках державно-приватного партнерства, у тому числі концесійним договором. На цей напрям передбачено використання 60% коштів Державного дорожнього фонду;

2) фінансове забезпечення будівництва, реконструкції, ремонту і утримання автомобільних доріг загального користування місцевого значення, виплату приватному партнеру/концесіонеру плати за експлуатаційну готовність автомобільної дороги загального користування та здійснення інших виплат у порядку та на умовах, передбачених договором, укладеним у рамках державно-приватного партнерства, у тому числі концесійним договором. На цей напрям передбачено використання 35% коштів Державного дорожнього фонду;

3) виконання боргових зобов'язань за запозиченнями, отриманими державою або під державні гарантії на розвиток мережі та утримання автомобільних доріг загального користування. На цей напрям передбачено використання 5% державного дорожнього фонду.

Порядок розподілу коштів державного дорожнього фонду визначено [16]. Так, обсяг бюджетних коштів за першим напрямом обчислюється за формулою:

$$Д = Д_1 \times 60/100, \quad (1)$$

$$\text{де } Д_1 = A + B + C + D + E + F + G + H - Z, \quad (2)$$

де $Д_1$ – обсяг коштів державного дорожнього фонду, у вартісних вимірниках; А - акцизний податок з вироблених в Україні пального і транспортних засобів (крім акцизного податку, визначеного пунктом 6 частини першої статті 66 [9]), що зараховується до спеціального фонду державного бюджету в плановому році, у вартісних вимірниках; В - акцизний податок із ввезених на митну територію України пального і транспортних засобів, що зараховується до спеціального фонду державного бюджету в плановому році, у вартісних вимірниках; С - ввізне мито на нафтопродукти і транспортні засоби та шини до них, що зараховується до спеціального фонду державного бюджету в плановому році, у вартісних вимірниках; D - плата за проїзд автомобільними дорогами транспортних засобів та інших самохідних машин і механізмів, вагові або габаритні параметри яких перевищують нормативні, у вартісних вимірниках; E - плата за проїзд платними автомобільними дорогами загального користування державного значення, крім випадків будівництва (нового будівництва, реконструкції, капітального ремонту) та подальшої експлуатації відповідної автомобільної дороги загального користування на умовах концесії, у вартісних вимірниках; H - концесійні платежі - у разі будівництва та експлуатації автомобільних доріг на умовах концесії, у вартісних вимірниках; F - 50 відсотків надходжень від адміністративно-господарських штрафів за порушення законодавства про автомобільний транспорт, передбачене абзацами чотирнадцятим - шістнадцятим частини першої статті 60 [13] (крім штрафів, визначених пунктом 13⁻⁵ частини третьої статті 29 [9]), у вартісних вимірниках; G - 50 відсотків надходжень від адміністративних штрафів за правопорушення, передбачені частиною другою статті 122⁻² та частиною другою статті 132⁻¹ [12] (крім штрафів, визначених пунктом 13⁻⁵ частини третьої статті 29 [9]), у вартісних вимірниках; Z - загальний обсяг необхідних платежів у плановому році з виконання боргових зобов'язань за запозиченнями, отриманими державою або під державні гарантії, на розвиток мережі та утримання автомобільних доріг загального користування, визначений згідно з пунктом 7 [16].

Обсяг бюджетних коштів за другим напрямом, розраховується у вигляді субвенції з державного бюджету місцевим бюджетам (далі - субвенція) між бюджетом Автономної Республіки Крим, обласними бюджетами та бюджетами м. Києва та Севастополя за формулами:

$$S_j = D_1 \times 31,5/100 \times P_j/P; \quad (3)$$

$$S_k = D_1 \times 3,5/100, \quad (4)$$

де S_j - обсяг субвенції з державного бюджету бюджету Автономної Республіки Крим, обласному бюджету, бюджету м. Севастополя, у вартісних вимірниках; S_k - обсяг субвенції з державного бюджету м. Києва, у вартісних вимірниках; j - індекс, що застосовується для позначення відповідного місцевого бюджету (бюджету Автономної Республіки Крим, обласних бюджетів, бюджету м. Севастополя); P_j - протяжність автомобільних доріг загального користування місцевого значення у відповідній адміністративно-територіальній одиниці (області, м. Севастополі, Автономній Республіці Крим) станом на 1 січня року, що передує плановому, кілометри; P - загальна протяжність автомобільних доріг загального користування місцевого значення в цілому в Україні станом на 1 січня року, що передує плановому, кілометри.

Розподіл бюджетних коштів на будівництво, реконструкцію, ремонт і утримання автомобільних доріг загального користування місцевого значення здійснюється відповідно до методики визначення обсягу фінансування будівництва, реконструкції, ремонту та утримання автомобільних доріг, яка затверджується спільним наказом Міністерства інфраструктури і Міністерства фінансів України.

Таким чином, маємо чітко регламентований порядок використання коштів Державного дорожнього фонду, що можуть бути спрямовані на участь держави у проєктах дорожнього будівництва на засадах концесії.

Згідно Інструкції з оцінки та відбору інвестиційних проєктів (проєктних пропозицій) у сферах транспорту, дорожнього господарства та надання послуг поштового зв'язку [11], проєкт буде відібрано для подальшого розгляду у разі його відповідності критеріям:

1. Стратегічного розвитку. Вивчається:

а) відповідність інвестиційного проєкту (проєктної пропозиції) стратегічним та актуальним програмним документам (галузевій програм, програмам стратегічного розвитку регіонів, міст тощо);

б) сприяння інвестиційного проєкту розширенню TEN-T мережі, тобто: 1) безпосередньо спрямований на розширення та знаходиться на мережі TEN-T; 2) буде сприяти розширенню мережі TEN-T;

в) покращення регіональної інтеграції або міської мобільності. Буде сприяти вирішенню існуючих проблемних питань розвитку: 1) більше ніж одного регіону (області) або реалізація інвестиційного проєкту буде сприяти міській мобільності; 2) одного регіону (області);

г) сприяння усуненню «вузьких місць». Зокрема: 1) де вже спостерігається недостатня пропускна спроможність / існує нестача рухомого складу; 2) буде сприяти усуненню «вузьких місць», які виникнуть згідно з прогностичними оцінками у середньостроковій перспективі (до 5 років), де буде спостерігатись недостатня пропускна спроможність / нестача рухомого складу);

2. Соціально-економічні критерії. Розглядаються:

а) ефективність вигід від реалізації проєкту (відношення вигід до витрат - В/С): 1) більше 1,5; 2) дорівнює від 1,01 – 1,49;

б) створення робочих місць. Реалізація інвестиційного проєкту буде сприяти створенню: 1) більше 150 нових робочих місць (не враховуючи ті, які створено безпосередньо до введення об'єкта в експлуатацію); 2) від 50 до 150 нових робочих місць (не враховуючи ті, які створено безпосередньо до введення об'єкта в експлуатацію);

в) забезпечення транспортної доступності: реалізація проєкту забезпечить покращення якості надання транспортних послуг для населення у соціальній сфері або покращення умов ведення бізнесу, або у випадку не реалізації інвестиційного проєкту погіршаться існуючі умови для населення або бізнес-середовища);

г) покращення безпеки на транспорті. Інвестиційний проєкт передбачає підвищення рівня безпеки для користувачів результатами проєкту (зменшення кількості ДТП, аварій на транспорті, нещасних випадків на виробництві, у т.ч. випадків з летальними наслідками, травмованими особами, тощо);

д) вплив на навколишнє середовище. Передбачається: 1) зменшення негативного впливу на навколишнє середовище, відтворення і збереження природних ресурсів, зменшення забруднення повітря, води або ґрунту, або інвестиційним проєктом передбачено застосування екологічно безпечних ресурсів для його впровадження; 2) рівень впливу на навколишнє середовище не зміниться, відтворення і збереження природних ресурсів не відбудеться, або

інвестиційним проектом не передбачено застосування екологічно безпечних ресурсів для впровадження інвестиційного проекту;

3. Технічні критерії. Вивчаються такі аспекти, як:

а) сприяння інноваційному розвитку. Передбачається що загальні експлуатаційні витрати, які виникнуть в рамках життєвого циклу проекту: 1) буде зменшено на 30% і більше відсотків; 2) буде зменшено від 20 до 30%; 3) буде зменшено до 20%;

б) готовність до реалізації інвестиційного проекту. Реалізацію інвестиційного проекту: 1) вже розпочато, виконано більше 50% від загальної вартості будівництва, або інвестиційний проект спрямований на придбання рухомого складу, оновлення транспортного парку, модернізацію (оновлення) об'єктів інфраструктури, що не передбачає будівництво; 2) реалізацію інвестиційного проекту вже розпочато, виконано до 50% від загальної вартості будівництва; 3) ТЕО проекту розроблено та затверджено, експертизу здійснено, немає потреби у його корегуванні; 4) розроблено передне ТЕО проекту;

в) енергоефективність: реалізація інвестиційного проекту передбачає зменшення енерговитрат на існуючих потужностях або встановлення енергозберігаючих технологій на нових;

г) забезпечення майновими правами на земельну ділянку: 1) земельна ділянка, необхідна для реалізації інвестиційного проекту, відведена та документально оформлена, або немає потреби у її відведенні; 2) процес оформлення земельної ділянки, необхідної для реалізації інвестиційного проекту, розпочато та буде завершено протягом одного року; 3) процес оформлення земельної ділянки, необхідної для реалізації інвестиційного проекту, розпочато та буде завершено до запланованого початку його реалізації;

4. Критерій ризику реалізації інвестиційного проекту. Може мати: 1) низький відповідно до заяви про розгляд інвестиційних проектів; 2) середній відповідно до заяви про розгляд інвестиційних проектів;

Для визначення можливості проекту дорожнього будівництва бути реалізованим на засадах концесії необхідно дослідити більш детально формування очікуваних за ним грошових потоків з точки зору їх достатності для окупності проекту та забезпечення необхідної норми прибутку інвесторам.

Враховуючи, що реалізація проектів дорожнього будівництва на засадах концесії здійснюється за принципом проектного фінансування, обчислення часток учасників, у тому числі держави, у загальному обсязі інвестицій пропонується здійснювати у наступному порядку:

1. Визначення кредитоспроможності концесійного проекту (фактичного значення коефіцієнту обслуговування боргу) ($K_{об}^{\Phi}$)

$$K_{об}^{\Phi} = \frac{\Gamma_{ПР}}{r}, \quad (5)$$

де $\Gamma_{ПР}$ – обчислені значення річних грошових потоків, у вартісних вимірниках; r вартість залучення кредитних ресурсів, у вигляді десяткового дробу.

Згідно світової практики, нормативне значення коефіцієнту обслуговування боргу для проектів дорожнього будівництва на умовах концесії ($K_{об}^H = 1,25$). Проводиться перевірка виконання умови $K_{об}^H \leq K_{об}^{\Phi}$. У разі, виконання умови - проект розглядається далі. У випадку, коли умова не виконується, для реалізації проекту неможливо буде залучити кредитні ресурси. Враховуючи капіталомісткість дорожніх проектів та недостатні обсяги очікуваних грошових потоків, слід відмовитися від реалізації зазначеного проекту на умовах концесії.

2. Обчислення суми кредитного (боргового) капіталу, що може бути залучений для фінансування проекту дорожнього будівництва на умовах концесії (БК):

$$BK = \Gamma_{П1} / \left(K_{об}^H \cdot \left(\frac{1}{T_{кр}} + r \right) \right), \quad (6)$$

де $T_{кр}$ - можлива тривалість строку кредитування проекту дорожнього будівництва на умовах концесії, у роках.

3. Визначення потреби у додаткових джерелах фінансування проекту дорожнього будівництва на засадах концесії (ДДФ)

$$ДДФ = KI - BK, \quad (7)$$

де KI – сума капітальних інвестицій, приведена на початок року експлуатації автомобільної дороги, у вартісних вимірниках;

Перевіряється виконання умови $ДДФ > 0$. Якщо виконується – необхідно залучати інші додаткові джерела фінансування; якщо ні – проєкт може бути реалізований на засадах концесії виключно за рахунок кредитних ресурсів.

4. Обчислення грошового потоку, що залишається після виплати відсотків та погашення частини основної суми боргу ($ГП_6$)

$$ГП_6 = (D_p - EB_p - AB_p - PB) \cdot (1 - s_{пп}) + AB_p - ПК, \quad (8)$$

де D_p - обчислені річні значення доходу від надання послуг користувачам, у вартісних вимірниках; EB_p - обчислені значення річних експлуатаційних витрат концесіонера, у вартісних вимірниках; AB_p - обчислені значення амортизаційних відрахувань, у вартісних вимірниках; PB - обчислені суми річних відсотків, що підлягають сплаті, у вартісних вимірниках; $ПК$ - Обчислені суми частини основного боргу, що підлягає сплаті в кінці року, у вартісних вимірниках.

5. Обчислення очікуваного обсягу акціонерного капіталу, що може бути залучених до складу додаткових джерел фінансування (AK)

$$AK = \frac{\sum_{t=1}^{T_k} ГП_6}{(1+r_{н.с})}, \quad (9)$$

де $r_{н.с}$ - необхідна ставка доходності на фінансовому ринку за довгостроковими вкладеннями капіталу, у вигляді десяткового дробу;

6. Визначення потреби в участі держави у фінансуванні проєкту дорожнього будівництва на засадах концесії ($ДДФ_Б$)

$$ДДФ_Б = KI - BK - AK, \quad (10)$$

де KI - сума капітальних інвестицій, приведена на початок року експлуатації автомобільної дороги, у вартісних вимірниках.

Перевіряється виконання умови $ДДФ_Б > 0$. Виконання умови свідчить про необхідність залучення державного фінансування для фінансування проєкту. Якщо умова не виконується – проєкт може бути реалізований на засадах концесії виключно за рахунок кредитного (боргового) та акціонерного капіталу.

7. Обчислення структури джерел фінансування проєкту дорожнього будівництва на засадах концесії:

$$KI = BK + AK + ДДФ_Б, \quad (11)$$

$$\alpha_{бк} + \alpha_{ак} + \alpha_{дк} = 1 \quad (12)$$

де $\alpha_{бк} = \frac{BK}{KI}$ - частка кредитного (боргового) капіталу, у вигляді десяткового дробу; $\alpha_{дк} = \frac{ДДФ_Б}{KI}$ - частка державних інвестицій, у вигляді десяткового дробу; $\alpha_{ак} = \frac{AK}{KI}$ - частка акціонерного капіталу приватних інвесторів, у вигляді десяткового дробу.

4. Висновки. У запропонованій статті здійснена спроба розв'язання одного з найактуальніших питань, що постають при обґрунтуванні реалізації проєктів дорожнього будівництва на засадах концесії. Це питання участі держави у співфінансуванні проєкту. Поставлена задача має подвійне обмеження. З одного боку, можливості участі держави у таких проєктах обмежені фінансовими ресурсами Державного дорожнього фонду. З іншого боку, участь держави обмежується внутрішніми можливостями проєкту забезпечувати достатні грошові потоки.

Було досліджено критерії відбору проєктів, що реалізуються у транспортній сфері та сформульовані пропозиції щодо додаткових вимог до достатності очікуваних грошових потоків. На першому кроці передбачається визначення кредитоспроможності проєкту. На другому - забезпечення необхідної ставки доходності приватним інвесторам. На третьому кроці визначається потреба участі держави у співфінансуванні проєкту та її відповідна частка.

Наступним напрямом подальших досліджень бачиться завдання узгодження загальних потреб у державному фінансуванні сукупності проєктів дорожнього будівництва, реалізація яких передбачається на засадах концесії, із наявним джерелом фінансування – коштів Державного дорожнього фонду. Це дозволить сформулювати додаткові критерії відбору проєктів дорожнього будівництва, яким буде надаватися державне співфінансування, та знизить ризики інвесторів.

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DEMOGRAPHIC AND SOCIO-ECONOMIC DETERMINANTS OF WOMEN EMPLOYMENT IN BANGLADESH

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Wealth.

ABSTRACT

The purpose of the present study is to examine the major factors related to the participation of women in the economic activities of Bangladesh, using the data of the nationally representative provided by the Bangladesh Demographic and Health Survey (BDHS) 2017/18. The survey interviewed a total of 20127 women aged 15-49 on social, economic, and demographic factors. The study used women's occupations as the dependent variable to understand the patterns and dynamics of women's participation in economic activities in Bangladesh. The result shows that 49.6% of women didn't associate with any work, 7.9% of women worked as a professional, technical or managerial specialist, and 42.5% of women worked as non-professional, such as: in agriculture, and domestic-related work. Two policy implications emerged from the study: 1) The economic activity of women in Bangladesh is still low, most of them earn their livelihood utilizing non-professional works; 2) Women who are relatively from poorer families, not very well educated, located in the rural area are largely seen in economic activities in Bangladesh. Finally, the study indicates an idea about important determinants of women's employment, as poor women with little formal education remain economically active. The study recommends that women must be provided with new skills and knowledge to expand their ability and the education of women must be given the highest priority, which is the fundamental problem.

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1. Introduction. Empowerment is an active multi-dimensional process that enables women to fully realize their identity and strength in all walks of life. Power is not a commodity to be transacted nor can it be given away. Power has to be acquired and once acquired it needs to be exercised, sustained, and preserved (Islam, 2014)). Half of the world's population is women, if only half of the world's population eliminates social, familial, economic discrimination, just being a woman can increase the risk of beatings, attacks, and other problems. Women's empowerment and rights have been documented in many ways, but discrimination and gender inequality continue around the world (Menon, 2015). It has a very serious dependence on geological status, social status, educational status, and age. Political, social, and economic equality for women is essential for achieving all the Millennium Development Goals. All over the world, many women live in fear of violence. There is a big difference between the actual scenario at the policy level and the policy-making against violence.

According to World Trade Organization (2013), the employment of women is primarily to strengthen the social, economic, cultural, and political position of women in society, traditionally backward, neglected women. Numerous studies show that women are more likely than men to spend a

large portion of their household income on the welfare and education of their children. When women can make money, accumulate assets, and improve their economic security, they provide industrial support and promote economic growth by creating new jobs and redistributing the pool of skills and human resources available in a country. It is increasingly recognized that women in business are the new drivers of sustainable development and emerging stars of the economy in developing countries. Although more women are opening businesses around the world, they still run fewer businesses than men and run businesses in less profitable sectors that grow slowly and are more likely to fail in the end.

UNDP (1990) first introduced the concept of the Human Development Index (HDI). It initially developed as a comprehensive indicator of a country's socio-economic progress, but it was an indicator of average outcomes in human development for men and women. This is why the gender dimension has been emphasized to focus on human development and the inequality women have been facing since 1995 (Nayak & Mahanta, 2011). The report states that human overall growth is not possible without the empowerment of women. Empowerment is a multifaceted concept that includes four key components: First, inner strength: it allows women to express their aspirations and strategies for change. Second, allow women to develop the skills they need and access the resources they need to achieve their goals. Third, power allows women to analyze and articulate their collective interests and to organize for them. Fourth, power transcends fundamental inequalities in power and resources that limit women's aspirations and ability to achieve them (J. Khan, 2020).

According to the BBS (2008), the female workforce went from 5.4 million in 1995-1996 to 12.1 million in 2005-2006, while the male workforce went from 30.6 million to 37 in the same period: 3 million people of the total workforce, 80.8% of women are engaged in domestic work. Regarding the participation of women at different age levels, in the age group 40 to 49 years, female participation in the labor force reached a maximum of 35.1 percent. However, it was quite shocking to find that in 2002-03, 38.2 percent of working women were between the ages of 15 and 19 (H. Khan & Kabir, 2014).

Gender Gap Statistics of Bangladesh (2018) for the population aged 15 years and over by sex and locality revealed that the national level men's labor force had increased from 42.5 million in 2013 to 43.5 million in 2016-17 while the women labor force increased from 18.2 million to 20.0 million in the same period. In the urban areas, the male labor force jumped from 12.0 million in 2013 to 12.9 million in 2016-17. On the other hand, the percentage of the women labor force remains almost the same during this period. However, in rural areas, the volume of the men's labor force had increased from 30.5 million in 2013 to 30.7 million in 2016-17. While for women it was respectively 13.1 million in 2013 and 15.0 million in 2016-17.

According to the World Economic Forum (2018) and Gender Gap Statistics of Bangladesh (2018), the number of working women increased from 18.6 million in 2016-17 to 16.2 million in 2010. According to the Global Gender Gap Report, Bangladesh ranks 47th out of 144 countries in 2017, while India, Sri Lanka, Nepal, Bhutan, and Pakistan rank 108, 109, 111, 124, and 143 respectively (World Economic Forum, 2018). Simply put, empowering women means developing society by creating a social system in which they can make decisions for their personal development and the evolution of society as a whole. Empowerment achieves the process of women's greater control and participation in decision-making, which ultimately helps them achieve equal footing with men in various fields - social, cultural, economic, political, and civil.

Literature Review. Dijkstra & Hanmer (2000), in a critical review of both measures, identified their strengths and weaknesses and proposed a new scale called the Standardized Gender-Equality Index (EMIS) that encompasses all possible aspects of gender equality. Tries and avoids the theoretical and methodological aspects. He further stressed that EMIS could serve as the first estimate of such a global index. Geske Dijkstra (2002) argued that UNDP needed to take the lead in constructing new indicators to measure gender equality or developing revised GDI and GEM. He made detailed recommendations for both possibilities, based on a brief review of the alternatives presented in the literature. Geske Dijkstra (2006) believed that women's economic empowerment is key to gender equality and the well-being of the nation. This not only enhances women's decision-making ability but also reduces corruption, armed conflict, and violence against women.

Panda & Agarwal (2005) investigated the effects of women's empowerment on contraceptive use and how women's empowerment affects contraceptive use. A total of 840 eligible women in four stages were interviewed from two different socio-cultural and religiously different regions (Cumilla and Sylhet Sadar Upazilas) according to a two-stage cluster sampling method. Besides, expert opinion

on weight gain, and empowerment measures, was investigated. Analysis of the study suggests that the greater the number of empowered women, the greater the likelihood of current use of contraception. Among the various factors of empowerment, reproductive rights, decision-making and awareness contribute significantly to the current use of contraception. The impact of the findings was discussed in terms of women's education.

In discussing the current situation of women in Bangladesh, Biswas & Kabir (2002) considered that women as mothers enjoy a high level of individual respect, understanding of women's empowerment as a process of awareness and capacity development that leads to greater participation but it is not clear at the time of making decisions and taking control of their own lives.

2. Materials and Methods. The 2017-18 Bangladesh Demographic and Health Survey (BDHS) is the eighth this type of survey conducted in Bangladesh. Launched in 1993, BDHS is the longest-running healthcare survey in Bangladesh. The 2017-18 BDHS survey was organized in association with the National Institute of Population and Research and Training (NIPORT), ICF, and the USA. The investigation was funded by the United States Agency for International Development (USAID) in Bangladesh. The study was based on data extracted from the Bangladesh Demographic and Health Survey (2017-2018). The survey interviewed a total of 20127 women aged 15-49 on social, economic, and demographic factors. The main purpose of BDHS 2017-18 is to provide up-to-date information on fertility and child mortality, infertility preferences, raise awareness, approve and use family planning methods, breastfeeding practices, nutritional levels, and maternal and child health, including newborn care, women empowerment, etc.

Variable. The variables were carefully selected from Bangladesh Demographic and Health Survey (BDHS) 2017-18 data to examine their impact on women's empowerment in Bangladesh. Variables were further classified according to their cause and use of statistical models.

Dependent Variable. To conduct this study we used women's occupations as the dependent variable. Women's occupations are the structure of their economic activity according to their socio-economic and demographic characteristics. Women's occupations had a long list of professional categories, which were then reduced to the following categories: i) didn't work, ii) professional, and iii) non-professional.

Independent Variable. From a huge number of variables, we have selected 13 independent variables including demographic and socio-economic characteristics. The list of selected variables is given below: current age, marital status, religion, residence, division, pregnancy status, number of living children, family size, educational level, wealth status, electricity opportunity, type of cooking fuel, and media exposure.

Analysis. To see the effect of each explanatory variable on the dependent variable appropriate statistical analysis is crucial for every study. To meet the objective of the study univariate, bivariate, and multivariate analysis has been applied throughout our study. To ensure guarantee, validity for additional examination, the independent variables were checked for multicollinearity. All the explanatory variables in this study have tolerance > 0.01 and VIF < 10 which indicates no multicollinearity among the independent variables.

Univariate Analysis. We analyzed a variable and provided detailed information about the pattern and women's participation in employment activities based on selected variables. For this, we performed univariate analysis to see the descriptive information of a particular variable.

Bivariate Analysis. Bivariate associations of women's occupations with each selected independent variable (including P-values of the test statistic) were given based on the Chi-square test. In this stage, to see the group differences in terms of women's occupations over all the independent variables Pearson Chi-square test, as well as cross-tabulation, was performed.

Chi-square (χ^2) test. The chi-squared test of independence is used to determine whether there is a significant relationship between two nominal (hierarchical) variables. The frequency of each category for the nominal variable is compared to the ranges of the second nominal variable. Data can be displayed in a contingency table, in which each row represents a range for one variable and each column represents a range for another variable.

The Chi-square test statistic is,

$$\chi^2 = \sum_{i=1}^p \sum_{j=1}^q \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where, $O_{ij} = n_{ij}$ is the observed frequency in the i^{th} row and j^{th} column and $E_{ij} = \frac{n_i n_j}{N}$ is the expected frequency in the i^{th} row and j^{th} column (Ugoni & Walker, 1995).

Multinomial Logistic Regression Analysis. We analyzed multinomial logistic regression to see the simultaneous effect of every explanatory variable. In this stage, we used those variables which showed the significant result in bivariate analysis and calculated the odds ratio, Wald test statistic, p-value, and 95% confidence intervals (CI) to show the summary results of the multivariate model.

The multinomial logistic regression model assumes that the log-odds of an observation p can be expressed as a linear function of the j input variables. Mathematically, the multinomial logistic model can be expressed as:

$$\text{logit}(p) = \log \frac{p(x)}{1 - p(x)} = \sum_{j=0}^k b_j x_j$$

Wald Test Statistic. For a large sample size, the hypothesis can be tested based on the Wald statistic, which has a chi-square distribution. When a variable has single degrees of freedom, the Wald statistic is just the square of the ratio of the coefficient to its standard error.

The Wald test statistic is calculated as,

$$W = \frac{\hat{\beta}_i}{\text{S.E.}(\hat{\beta}_i)}$$

Which follows a chi-square distribution with 1 degree of freedom (Basu et al., 2017).

3. Results and Discussion. Table 1 illustrates that about 30.7% of women were aged between 15 and 25 years, 34.5% women were aged between 26 and 36 years, and other women were aged higher than 36 years to 49 years. It also demonstrates that 93.9% of women were married at the time of the interview where 3.3% of women were divorced or widowed and 2.8% of them did not lie above the two-mentioned categories. It depicts that Islam was the major religion among the respondent with 90.1% where 9.2% followed Hinduism, 0.4% followed Buddhism and only 0.2% followed Christianity. It is noted that 63.4% of women lived in rural areas and 36.6% of women lived in urban areas in Bangladesh. From Table 1, it can be easily seen that most of the people lived in the Dhaka division (14.8%). However, 10.7% lived in Barisal, 14.4% in Chittagong, 13.1% in Khulna, 10.8% in Mymensingh, 12.8% in Rajshahi, 12.4% in Rangpur and 11.1% lived in Sylhet division. However, only 5.6% of women were pregnant. It is noted that 10% of women had no child, 23% of women had one child, 31% of women had two children, 20% of women had three children, 9% women had four children and 7% of women had more than four children.

From Table 1, we can see that 95.5% of the respondents have family members between one and ten where only 4.5% of the respondents have higher than ten family members. Table 1 also demonstrates that 42.7% of women were rich, 38.1% of women were poor, and others were in the middle class. Analysis shows that 75.6% of the household had electricity at the time of the interview and other households were absent from this opportunity. We can easily understand that only 0.5%, 6.1%, and 12.1% of women used electricity, LPG, and Gas respectively as means of cooking fuel where 81.3% of women used another type of fuel for their cooking. The result shows that 65.3% of women were connected with media exposure and 34.7% of women didn't use it.

Table 1. Percentage distribution of the respondent characteristics

Characteristics	Category	Number of Respondents	Percentage
Current age	15-25	6185	30.7
	26-35	6953	34.5
	36-49	6989	34.7
Marital status	Married	18895	93.9
	Divorced/Widowed	663	3.3
	Other	569	2.8
Religion	Islam	18136	90.1
	Hinduism	1861	9.2
	Buddhism	84	0.4
	Christianity	46	0.2
Residence	Urban	7374	36.6
	Rural	12753	63.4
Division	Barisal	2154	10.7
	Chittagong	2905	14.4
	Dhaka	2974	14.8
	Khulna	2630	13.1
	Mymensingh	2167	10.8
	Rajshahi	2576	12.8
	Rangpur	2492	12.4
	Sylhet	2229	11.1
Pregnancy status	No or unsure	18998	94.4
	Yes	1129	5.6
Number of living children	No child	2099	10.4
	1 Child	4639	23
	2 Children	6241	31
	3 Children	3990	19.8
	4 Children	1834	9.1
	> 4 Children	1324	6.6
Family size	1-10	19219	95.5
	> 10	908	4.5
Wealth status	Poor	7659	38.1
	Middle	3883	19.3
	Rich	8585	42.7
Electricity opportunity	No	4920	24.4
	Yes	15207	75.6
Type of cooking fuel	Electricity	99	0.5
	LPG	1231	6.1
	Gas	2438	12.1
	Other	16359	81.3
Media exposure	No	6981	34.7
	Yes	13146	65.3

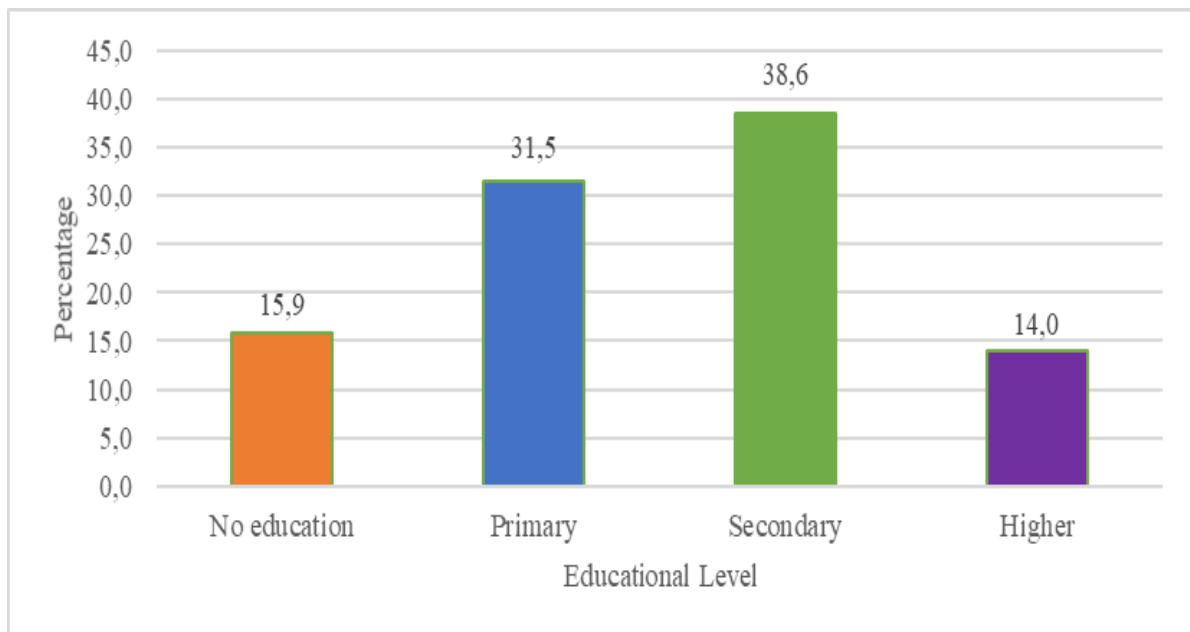


Fig. 1. Percentage distribution of the respondent educational level

Figure 1 shows that women were mostly involved up to secondary studies (38.6%) which are higher than no education (15.9%), primary education (31.5%), and higher education (14.0%).

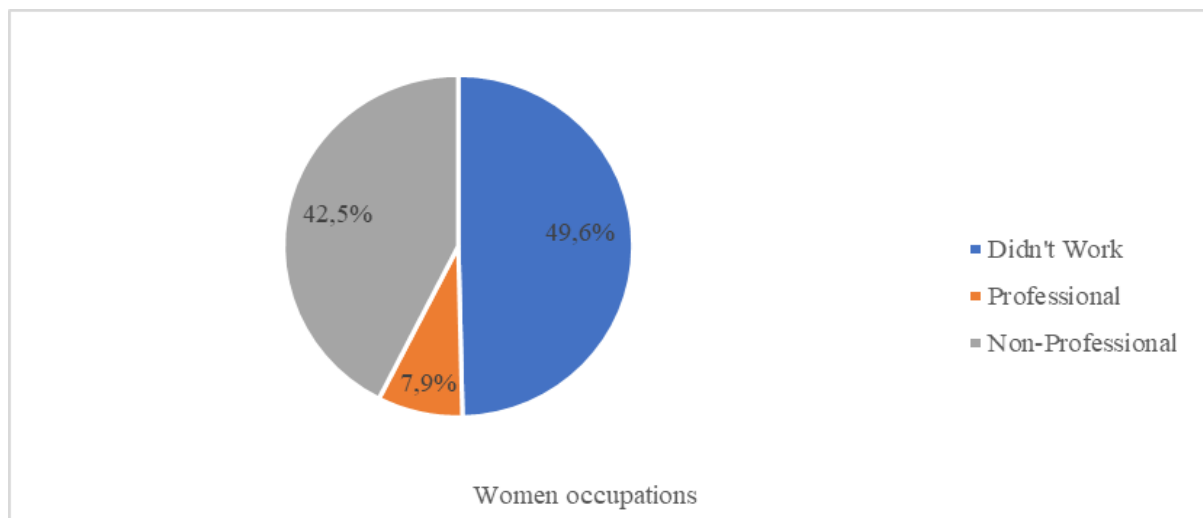


Fig. 2. Percentage distribution of the respondent occupations

Figure 2 demonstrates that 49.6% of women didn't associate with any work, 7.9% of women worked as a professional, technical or managerial specialist, and other (42.5%) of women worked as non-professional, such as: in agriculture, and domestic-related work.

Table 2. Contingency table for women occupations with selected demographic characteristics

Characteristics	Category	Occupations of respondent			Chi-square value	P-value
		Didn't Work	Professional	Non-Professional		
Current age	15-25	3069.3	487.4	2628.3	40.070	0.000
	26-35	3450.4	547.9	2954.7		
	36-49	3468.3	550.7	2970.0		
Marital status	Married	9376.6	1488.9	8029.5	44.395	0.000
	Divorced/Widowed	329.0	52.2	281.7		
	Other	282.4	44.8	241.8		
Religion	Islam	9000.0	1429.1	7706.9	2.581	0.859
	Hinduism	923.5	146.6	790.8		
	Buddhism	41.7	6.6	35.7		
	Christianity	22.8	3.6	19.5		
Residence	Urban	3659.3	581.1	3133.6	8.129	0.017
	Rural	6328.7	1004.9	5419.4		
Division	Barisal	1068.9	169.7	915.3	131.29	0.000
	Chittagong	1441.6	228.9	1234.5		
	Dhaka	1475.8	234.4	1263.8		
	Khulna	1305.1	207.2	1117.6		
	Mymensingh	1075.4	170.8	920.9		
	Rajshahi	1278.3	203.0	1094.7		
	Rangpur	1236.7	196.4	1059.0		
	Sylhet	1106.1	175.6	947.2		
Pregnancy status	No or unsure	9427.7	1497.0	8073.2	1.700	0.427
	Yes	560.3	89.0	479.8		
Number of living children	No Child	1041.6	165.4	892.0	0.039	0.000
	1 Child	2302.1	365.6	1971.4		
	2 Children	3097.1	491.8	2652.1		
	3 Children	1980.0	314.4	1695.6		
	4 Children	910.1	144.5	779.4		
	> 4 Children	657.0	104.3	562.6		
Family size	1-10	9537.4	1514.4	8167.1	2.087	0.352
	>10	450.6	71.6	385.9		

Table 2 illustrates that no cell has an expected count less than 5, we can use Chi-square for testing the independence of the variables. Table 2 depicts that the test statistic values are significant at a 5% level of significance ($p\text{-value} < 0.05$) for every variable except currently pregnant, religion, and family size. So we may conclude that there exist significant associations between women's occupations with all most selected explanatory variables.

Table 3. Contingency table for women occupations with selected socio-economic characteristics

Characteristics	Category	Occupations of Respondent			Chi-square value	P-value
		Didn't Work	Professional	Non-Professional		
Educational level	No education	1589.0	252.3	1360.7	42.972	0.000
	Primary	3146.2	499.6	2694.2		
	Secondary	3852.9	611.8	3299.3		
	Higher	1399.9	222.3	1198.8		
Wealth status	Poor	3800.8	603.5	3254.7	54.414	0.000
	Middle	1926.9	306.0	1650.1		
	Rich	4260.3	676.5	3648.2		
Electricity opportunity	No	2441.5	387.7	2090.8	0.481	0.786
	Yes	7546.5	1198.3	6462.2		
Type of cooking fuel	Electricity	49.1	7.8	42.1	11.942	0.063
	LPG	610.9	97.0	523.1		
	Gas	1209.9	192.1	1036.0		
	Other	8118.1	1289.1	6951.8		
Media exposure	No	3464.3	550.1	2966.6	18.332	0.000
	Yes	6523.7	1035.9	5586.4		

Table 3 illustrates that no cell has an expected count less than 5, we can use Chi-square for testing the independence of the variables. Table 3 also depicts that the test statistic values are significant at a 5% level of significance ($p\text{-value} < 0.05$) for every variable except electricity opportunity, and type of cooking fuel. So we may conclude that there exist significant associations between women's occupations with most of the selected explanatory variables.

Table 4. Multinomial logistic regression model for women occupations with selected demographic characteristics

Demographic characteristics	$\hat{\beta}$	Wald Statistic	P-value	Exp. ($\hat{\beta}$)	95% C. I. for Exp. ($\hat{\beta}$)		
					Lower	Upper	
1	2	3	4	5	6	7	
Intercept	-2.262	89.262	.000				
Professional	Current age						
	15-25	.286	10.323	.001	1.331	1.118	1.586
	26-35	.237	11.033	.001	1.268	1.102	1.459
	36-49 ®				1		
	Marital status						
	Married	.551	7.196	.007	1.735	1.160	2.595
	Divorced/Widowed	-.401	1.596	.206	.670	.359	1.248
Other ®				1			

Continuation of table 4

	1	2	3	4	5	6	7
Professional	Residence						
	Urban	-.043	.552	.458	.957	.854	1.074
	Rural ®				1		
	Division						
	Barisal	-.289	6.824	.009	.749	.603	.930
	Chittagong	-.529	25.234	.000	.589	.479	.724
	Dhaka	-.598	29.102	.000	.550	.443	.684
	Khulna	-.456	16.970	.000	.634	.510	.787
	Mymenshingh	-.550	23.389	.000	.577	.461	.721
	Rajshahi	-.245	5.461	.019	.783	.638	.961
	Rangpur	-.131	1.652	.199	.877	.719	1.071
	Sylhet ®				1		
	Number of living children						
	No Child	-.048	.088	.767	.953	.694	1.309
	1 Child	.184	1.691	.194	1.202	.911	1.587
	2 Children	.091	.489	.484	1.095	.849	1.413
	3 Children	.139	1.144	.285	1.149	.891	1.483
	4 Children	-.130	.736	.391	.878	.651	1.182
	> 4 Children®				1		
Non-Professional	Intercept	-.141	1.606	.205			
	Current age						
	15-25	.066	1.859	.173	1.069	.971	1.175
	26-35	.103	7.259	.007	1.109	1.028	1.195
	36-49 ®				1		
	Marital status						
	Married	-.048	.294	.588	.953	.801	1.134
	Divorced/Widowed	.244	4.254	.039	1.277	1.012	1.610
	Other ®				1		
	Residence						
	Urban	.022	.493	.483	1.022	.961	1.088
	Rural ®				1		
	Division						
	Barisal	-.066	1.059	.303	.936	.826	1.061
	Chittagong	-.209	12.406	.000	.811	.722	.911
	Dhaka	.042	.487	.485	1.042	.928	1.171
	Khulna	.039	.400	.527	1.039	.922	1.172
	Mymenshingh	-.271	17.983	.000	.763	.673	.864
	Rajshahi	-.120	3.798	.051	.887	.786	1.001
	Rangpur	-.237	14.487	.000	.789	.698	.891
	Sylhet ®				1		
	Number of living children						
	No Child	.230	7.515	.006	1.258	1.068	1.483
	1 Child	.116	2.434	.119	1.123	.971	1.300
	2 Children	.020	.086	.769	1.020	.893	1.165
	3 Children	-.043	.394	.530	.958	.838	1.095
	4 Children	.088	1.356	.244	1.092	.942	1.266
	> 4 Children®				1		

Note: Reference category is: Didn't Work.

The overall intercept of the model is negative and the p-value is significant in terms of professional category. However, the overall intercept of the model is negative and the p-value is insignificant in terms of the non-professional category.

Table 4 depicts that women of age 15- 25 years and 26-35 years have 1.331 and 1.268 times more tendency to engage in professional work than women of age 36-49 years. Moreover, women of age 15- 25 years and 26-35 years have 1.069 and 1.109 times more tendency to engage in non-professional work than women of age 36-49 years. Married women are 1.735 times more likely to have a professional job and divorced or widowed women have 1.277 times more likely to have a non-professional job than women with another marital status. Women from the urban areas are 0.957 times less likely to have a professional job than women of the rural areas. On the other hand, women from urban areas are 1.022 times more likely to have a non-professional job than women from rural areas. Women from any other division rather than Sylhet are less likely to get a professional job compared to women from the Sylhet division. However, women from Dhaka and Khulna divisions are 1.042 and 1.039 times more likely to get a non-professional job compared to the Sylhet division. Women who have one child are approximately 1.202 times more likely to get a professional job compared to women who have more than four children. Similarly, women who have no children are approximately 1.258 times more likely to get a non-professional job compared to women who have more than four children. From Table 5, it is observed that the overall intercept of the model is negative and the p-value is significant in terms of professional category. However, the overall intercept of the model is negative and the p-value is insignificant in terms of the non-professional category.

Table 5. Multinomial logistic regression model for women occupations with selected socio-economic characteristic

Socio-economic characteristics	$\hat{\beta}$	Wald Statistic	P-value	Exp.($\hat{\beta}$)	95% C. I. for Exp.($\hat{\beta}$)	
					Lower	Upper
Professional	Intercept	-2.072	628.081	.000		
	Educational level					
	No Education	-.077	.480	.489	.926	.745 1.151
	Primary	.211	4.899	.027	1.235	1.024 1.490
	Secondary	.188	4.278	.039	1.207	1.010 1.443
	Higher ®			1		
	Wealth status					
	Poor	.080	1.530	.216	1.083	.954 1.230
	Middle	.046	.355	.551	1.047	.901 1.216
	Rich ®			1		
	Media exposure					
	No	.162	8.439	.004	1.176	1.054 1.312
	Yes ®					
Non-Professional	Intercept	-.035	.697	.404		
	Educational level					
	No Education	-.109	3.684	.055	.896	.801 1.002
	Primary	-.031	.375	.541	.970	.880 1.070
	Secondary	.042	.812	.367	1.043	.952 1.143
	Higher ®			1		
	Wealth status					
	Poor	-.189	28.473	.000	.827	.772 .887
	Middle	-.067	2.616	.106	.936	.863 1.014
	Rich ®			1		
	Media exposure					
	No	-.075	5.802	.016	.928	.873 .986
	Yes ®			1		

Note: Reference category is: Didn't Work

Table 5 shows that women with primary and secondary are 1.235 times and 1.207 times more likely to get involved in professional work compared to women with higher education. However, women with no education are 0.926 times less likely to get involved in professional work compared to women with higher education. Women with secondary studies are 1.043 times more likely to get a non-professional job compared to women with higher education. Results also depict that, women from poor and middle-income families are 1.083 times and 1.043 times more likely to involve in professional work than women from rich families. However, women from poor and middle-income families are 0.827 times and 0.936 times less likely to involve in non-professional work than women from rich families. Women who are not aware of media exposure are 1.176 times more likely to engage in professional work than women with aware of media exposure. However, women who are not aware of media exposure are 0.928 times less likely to engage in non-professional work than women who are aware of media exposure.

Table 6. Multicollinearity of the data

Women occupations	Multicollinearity		Women occupations	Multicollinearity	
	Tolerance	VIF		Tolerance	VIF
Educational level	.654	1.530	Sex of household head	.932	1.073
Currently pregnant	.937	1.067	Place of residence	.757	1.322
Current age	.562	1.779	Division	.970	1.031
Electricity opportunity	.832	1.202	Media exposure	.989	1.011
Type of cooking fuel	.728	1.374	Family size	.966	1.035
Wealth index	.593	1.687	Husband occupations	.902	1.109
Living children	.552	1.811	Marital status	.892	1.121
Religion	.977	1.023			

4. Conclusions. This study focused on identifying the factors that have a significant impact on women's occupations in Bangladesh. Findings indicate that the unemployment rate of women was higher than the employment rate among Bangladeshi women. Almost half of the women are unemployed and it proves that women in Bangladesh are still lag. Most of the women worked in the non-professional field. The majority of the women did not take higher education as they ended their education at the secondary level. The working rate among currently pregnant women is relatively lower and the employment rate among relatively older women is higher as expected. Moreover, the employment rate among rural women is higher than urban women in Bangladesh. This study also reveals that the majority of the women are still engaged in non-professional work especially in agriculture and farm activities. Rural women's education and quality of employment are still unsatisfactory.

The present study suggests that the government of Bangladesh should be given more emphasis on women's opportunities to join the alternative job market such as the pharmaceutical sector, engineering sector, and telecommunication industries. Education and working skills are very important factors for women's participation in economic activities. So, they should be well educated and well trained for workforce activities in Bangladesh.

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DIGITAL GENERATION'S MOTIVATIONAL ADVANTAGES IN CREATIVE ECONOMICS OF DIGITAL ERA

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ABSTRACT

To produce a quality media product, professionals who can generate creative ideas and have sufficient skills, abilities, knowledge, intellectual potential and are also able to creatively and effectively implement it into a competitive product, are needed in the age of informatization and digitalization. However, due to transformation processes, including robotization of the media industry, the emergence of artificial intelligence, integration of creative industries with Internet resources, increasing not only of the number of products on the media market, but also their producers, including bloggers, YouTubers, prosumers, the competition to attract the audience's attention is strengthening in various segments of the media.

The digital generation of centenarians Z, who are now 20-25 years old, are becoming leading specialists in production processes at the media company in the era of creative economy, knowledge economy. This means that their intellectual potential must be so high that they can constantly generate new creative ideas and be ready for the constant regeneration of knowledge in order to create a competitive media product in a competitive environment. This study aims to examine digital generation's preferences, creativity, skills, motivational advantages to determine the resourcefulness of the human factor in the production processes of media companies, in particular to improve communication between employees and create a quality competitive media product that can capitalize manufacturing processes on the basis of a properly chosen competitive strategy.

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Introduction. Creativity, innovation, intellectual resources, emotional intelligence are obtaining clearer and clearer contours and meanings in the era of information technology, complete digitalization and are becoming the main developmental concepts of the information society of the XXI century. In this regard, the crucial role is played by the creative economics, which affects the economic development of all areas of the information society and, accordingly, the creative class, which becomes the driver of the media industry, including audiovisual, printed media, the Internet.

Owing to the availability of a wide range of media products for different tastes, such as news, movies, TV series, talk shows, etc., intensifying the development of niche channels related to sports, cooking, music, environment, healthy lifestyle, etc., immersion of the media space in social networks, the modern consumer of media products is increasingly often faced with a difficult choice, which media content to choose, what to watch, read, listen. In such a way, the competition to get audience's attention in the media market is constantly growing in different segments of the media.

Apart from the fact that the world is changing rapidly, becoming more pseudo-creative and virtual, in particular, due to the pandemic; it is vivid that the world is no longer human-centered.

Robots, artificial intelligence, innovative technologies are more closely rooted in the structure of modern life, and not only the employees of other industries are becoming the competitors of the media sphere, but also bloggers, YouTubers, prosumers (content users), and recently even robots, that have been creating journalistic materials since 2012 and becoming news presenters as well.

Thus, only useful and interesting media product that has competitive advantages is able to increase media consumers' attention to the value characteristics of the product, and, accordingly, to monetize media content. That is why the doctrine of the competitive strategy, which is of strategic importance for gaining stronger market positions than competitors, is becoming increasingly important nowadays. Currently sustainable competitive advantages in creating high-quality competitive media product can be gained through motivational tools for human resource management, which are able to effectively increase professionals' working capacity, implementing their intellectual abilities, creativity and creative potential.

Mental work professionals' intellectual potential is now becoming a competitive advantage and the most valuable asset of the creative economics in modern media companies. Therefore, employers, managers, HR specialists in the creative industries-the media, in particular, need to know not only what their consumer wants, but also what their intellectual worker lives, what inspires him to work, what his basic needs are; or if he has enough knowledge and skills to create a modern media product, what habits he forms in the process of professional activity; whether the previous experience does not prevent him from generating new ideas and implementing them; because now, on the one hand, his unique ideas can effectively capitalize business activities of the media company; on the other hand, ideas and knowledge only may not be enough, because such managers are needed who are likely to believe in these ideas and put them into practice effectively. These aspects are in the range of problems of creative industries, creative economy, knowledge economy.

Literature Review. "Creative economy" or innovative economy of "ideas" is penetrating deeper into all spheres of humanity in all countries, creativity is becoming a new attribute of life of many members of society. The concept of "creative economy" was first mentioned in "Business Week" journal in 2000 and resonates closely with the concept of "creative industries", which was recorded in a number of documents connected with the economic and cultural development of British public policy in 1998. According to the first official document, the Blair Government's Manifesto for the Implementation of the Creative Economy - the Creative Industries Mapping Document (2001), a list of creative industries, including the media industry was identified (p. 3). The concept of "cultural industry" appears in the middle of the XX century in the Western European scientific discourse. British scientists D. Hezmondalsh, D. Trosby's interdisciplinary approaches are somehow similar in many ways to the public policy of Great Britain. According to Hezmondals's (2014), "Cultural industries are those branches of the economy that are involved in industrial production and understanding the relationship between culture and economy, texts and industry, meaning and function. They are all connected by a common product - the text in the broadest meaning, as a product of social significance" (p. 32).

Trosby's model is based on the concentrated circles that are contained in each other. Various arts that need financial support due to the lowest level of commercialization are in the central circle. This level is gradually increasing in other circles. The end result of cultural production is a cultural product based on the creative activity of individuals - specific producers (creators) or their team, creating an idea and then developing the technology of its implementation in the form of a tangible medium of symbolic content, services or technology itself (humanitarian, in particular) and carried out in serial production for profit. According to Trosby's model (2008), "Creative industries include advertising, architecture, design, fashion industries - those sectors whose value is determined primarily by utilitarian value, rather than cultural" (p.147). According to Ukrainian scientists O. Barzylovykh et al. (2017) creative industries define in such a way: "industries in which the maximum of creative work is used, and the result of activity is products with a high share of symbolic value, which is capitalized by intellectual property. They include the media sphere, which currently has a high rate of return and it is attractive for innovation" (p.10).

Regarding the understanding of the term "creative economy", two methodological approaches are essential, namely the sectoral approach by J. Hawkins and the labor approach by R. Florida. Based on the sectoral approach, Cambridge University Professor J. Hawkins (2011) identified 15 creative industries that produce intellectual property and obtain patents for copyrights,

trademarks (p. 8). His concept resonates with Hezmondalsh's classification (2014), in particular "Radio and television with the latest formats, the film industry, aspects of the Internet, the music industry, printing, video and computer games, advertising and marketing" (p.33). D. Hezmondalsh attributes all this to key cultural industries.

Unlike J. Hawkins, the American economist and sociologist R. Florida (2005) refers to classifications according to occupation by major professional groups. He defines the creative economics as "large-scale and continuous practice, with a constant modification, renewal, improvement of products and processes. Creativity acts as the most valuable commodity of the economy, but it is not actually a commodity, because the employee's creative abilities can not be bought (p.18). To the creative class he refers people who "produce economic values in the creative process", whose main task is the ability to "create new, unusual, non-standard ideas, quickly and effectively find and implement effective strategies for socio-economic development" (p. 82).

As we can see, there is a lot in common in the terms "creative industries" and "creative economy", and the most important is the fact that creativity, innovative ideas, intellectual property are becoming a measure of success and efficiency of the company. Florida (2005) outlines two main subgroups in the creative class: "the supercreative core" (professions in programming and mathematics, architecture and engineering, social sciences, education, upbringing and library services, art, design, entertainment, sports, media) and "creative professionals (management professions in business and finance, law, health care, professions related to sales, sales management) (p. 94). We support Florida's approach as for the classification of major groups and we suggest to divide the authority of these subgroups, in particular, to give the "super-creative core" to high-quality professionals, performers who are creative employees of companies capable of generating creative ideas, and to provide "creative professionals" who can effectively implement ideas, in particular, through promotion and to get profit in such a way, with managerial functions.

The paradigm of organization of production, labor productivity in manufacturing processes is constantly developing, improving and requires the detailed study not only of business processes, but also of the place and role of human potential in them. This was claimed by the classics of management F. Taylor (1911), P. Drucker. According to Drucker (2004), "The increase of productivity of mental work, and at the same time - increase of productivity of mental work specialist" - the most important achievement of the management of the XXI century. In his opinion, "Specialists of mental labor have the means of production, and workers of physical - only experience" (p.75). Therefore, specialists of intellectual work, including specialists in the media industries, "Using mental work and having their own means of production" (p. 81), they can be characterized as more mobile, calmer, more resistant to change, because their main capital - the mind - is always in their heads. These concepts are in the plane of such a concept as "knowledge economy", which is becoming the basis for the development of modern economy.

Multimedia technologies need multimedia specialists. The constant development of technical means of production in the field of media is constantly growing and allows to perform high-quality technological processes, which, on the one hand, simplifies the work of intellectuals, and on the other - complicates the process of lifelong learning, especially for older workers. Knowledge is now becoming the basis for the development of not only economic branches, but also for creative industries. The type of modern economy created on the basis of knowledge is called "creative economy" (knowledge economy). The model of knowledge economy contributes to the continuous development of intellectual abilities that can become the main competitive advantages of a media company.

We agree with the statement of the American sociologist, futurologist Toffler (2002), who aptly noted that "the main skill of today is to be able to learn again", because "knowledge in the modern world is a perishable product" (p. 449). After the study of existing literatures on the theories of the knowledge economy Boden (2003), Demidenko and Zdorenko (2016), Drucker (2004), Khusainov, Yanchenko, and Rudenko (2015), we can consider that media managers should carefully study the value benefits of the digital generation in acquiring knowledge, their attitude to the learning process to improve coordination and communication between employees and effective personnel management, given that employees are creative media industries, especially audiovisual media, mostly young, are representatives of generation Z.

According to the Organization for Economic Cooperation and Development (1996), "the knowledge economy, or knowledge-based economy, is an economy that is directly based on the creation, distribution and use of knowledge and information". The World Bank structures the knowledge economy

into such elements as education and training, dynamic innovation infrastructure (availability of information and communication technologies), economic incentives and legal regime, innovation systems (research centers, universities, private institutions engaged in knowledge production). According to Khusainov, Yanchenko, Rudenko (2015), "The knowledge index is defined as an average value consisting of three sub-indices - education, innovation, information technology and communications".

After the study of existing literatures on the doctrine of competitive strategy (Dubrova, (2010), Porter, (1980, 2016); Kotler, (2006), Lamben, (2007), Lupak, (2010), Smolenyuk, (2012), Thompson & Strickland, (1984), Posnova, (2018), we concluded that there is no universal approach to the classification of competitive strategies in the scientific community. Each company in each specific case should find the most necessary competitive strategy and, act accordingly to effectively ensure competitive advantage. The competitive strategy of differentiation of M. Porter, which is to ensure high quality products, seems to be the most appropriate for us. According to the Porter (1980), "The company can implement alternative strategies, but to achieve this concentration of resources, it should be carried out in accordance with certain areas of activity, and production - with different basic advantages, concentrated in different production units" (p. 13). It means that several separate specialized productions should be created, which would implement their individual strategy, based on the competitive advantage in the level of costs or in product differentiation. In this case, the main task of the enterprise is to coordinate the work of all production units for a more complete and high-quality implementation of the goals, facing the organization as the whole. Under these circumstances, the company should become a corporation with a number of independent structural units that will implement their own competitive strategies in individual markets.

The need for constant acquisition and updating of knowledge, the growing consumption of natural resources, which disturbs the ecological balance and leads to a negative impact on the environment, drastic changes in climatic conditions, new risks to human health that have acquired the global level of importance. According to Voroshilov (2021) The World Economic Forum in Davos the factors that are one of the biggest challenges for the world related to pandemics have been named: "The fragility of the economy, multiplied by the risks of debt crises, commodity shocks and price instability, the era of "lost opportunities" for a new generation of young people, as well as the risks of new pandemics and the ongoing destruction of human habitation".

These and many other challenges related to economic development, social policy, environment formed the basis of the theory of sustainable development. The concept of the sustainable development is so multifaceted and interdisciplinary, that it sometimes provokes the opposite scientific discourse in terms of whether we can achieve harmonious development of economic, social and environmental components while continuing to work in the paradigm of economic growth without significant risks to the environment. We are interested in this concept from the point of view of education, namely, the acquisition by future generations (in our case digital generation Z) of awareness and readiness for constant regeneration of knowledge, understanding that current skills, knowledge should be constantly updated.

Analyzing the literature in the field (Brundtland, (1987), Dyllick & Hockerts, (2003), Forrester, (2003), Pechchei, (1985), Karintseva, (2018), Kanaevoy & Sopina (2010), Medouz, D. Renders, J. Medouz, D., and Berens, V. (1999), Mesarovich (1991), Pearce & Atkinson (1998), Pestel (1988), Perelet, (2003), Schumpert, Tebini, M'Zali, Lang and Perez-Gladish (2016), Zaitseva (2019), Lopatinskiy & Megley (2016) demonstrates that the main challenges for the digital generation in implementing sustainable development in Ukraine are: Its practical implementation, after all, Ukraine does not yet have such important strategic documents as the National Strategy for Sustainable Development and the National Action Plan for Environmental Protection (2021); achieving justice in the distribution of social wealth within one generation (a task that has no clear solutions within traditional economic theory, Zaitseva (2019); sustainable development can be considered as: first, the process (harmonization of integrated components); secondly, the model of the desired state of development of society on the basis of optimization of the national economy with the conditions and resource constraints of the environment, and thirdly, the managed strategic goal (paradigm of social growth) Lopatinskiy & Megley (2016).

According to the theory of generations developed by the American scientists Neil Howe and William Strauss, (Strauss & Howe, 1991) the first digital generation Z was born between 1995 and 2012 (Ladyka, 2018).

Methodology and Research. In the period starting from 13th of November till 29th of December 2020, a quantitative research of 425 respondents was conducted through an online survey using Google-Forms to determine the resourcefulness of the human factor in the production processes of media companies, including the digital generation Z. Respondents whose age categories were limited by age frames, namely, born from 1995 to 2005, took part in the survey, as this category of the centenarians was 15-25 years old at the time of the study. This means that they are part of either the student community or the working community, or they are combining these positions. Previously mentioned was important for us, so the preferences of the youngest members of this generation, who were under 15 years old, were not taken into consideration. We did not take this category of Generation Z into account due to the fact that their worldviews have not been fully determined yet. The survey was conducted by the author through the distribution of questionnaires among young people and students of this age of Taras Shevchenko National University of Kyiv, where I taught a course in "Media Management", "Video Content in Touristic Journalism", "Television Genres", as well as among students of Kyiv National University of Culture and Arts in the classes of the course "Media Management and Marketing", "TV Journalism". The research was also carried out with the help of students of these higher educational institutions, who distributed questionnaires among their friends and acquaintances of the specified age.

Sampling was formed out by a probable (random) one-time irreversible method. As a result of the online survey, 425 respondents were interviewed, which is about 100% of respondents, 95% of confidence interval and 4% of the sampling error, which indicates the high reliability of the results and means that the survey results are representative for the stakeholders of the Ukraine. The sum of answers in some questions, in particular in 1, 2, 3, 6, exceeds 100%, because the respondents had the opportunity to choose several options to answer. The data downloaded from the Google-Forms were processed through the Google-Forms and Excel-program.

The questionnaire consisted of two blocks. The first - the passport block - clarifies the identification characteristics of the recipients in terms of age, education, region of residence. At the beginning of the questionnaire, a filter question on the age of the respondents was used, as this is what is decisive for this study on the digital generation. All those who were not subject to the parameters of this age range were not able to participate in the survey. The second block focuses on the following questions of the questionnaire: 1. What do you consider the basic need for the development of your personality (healthy lifestyle, realization of entrepreneurial ambitions, higher education, empathy for others, preservation of the environment, the need for hedonism (from Greek-pleasure), procrastination, your option). 2. What do you like more (working full time, being a freelancer, combining freelance with part-time employment, your option). 3. What profession do you want to obtain (IT specialist, manager, marketer, advertiser, entrepreneur, financier, lawyer, engineer, salesman, your option). 4. How do you feel about advertising (I like to consume, it doesn't matter, it annoys me, it influences me). 5. What do you like more when you get information (read, listen, watch, combine all options). 6. What education do you prefer (university, I attend paid courses, trainings; I attend free courses, trainings; studying online). 7. How many devices do you use at the same time (one, two, three, more than four). 8. Your screen time spent on the Internet, social networks is (2, 3, 4, 5, 6, 7 and more hours).

Results and discussion. Presentation of the main material of the study. The Generation Z survey (425 people) helped to study the attitude of the digital generation to the basic needs of personal development, to clarify the main priorities in life, including the organization of working conditions, education, professional preferences, consumption and reorganization of information, interaction with the digital environment.

Among the respondents, 47.8% were born between 1995 and 2000, it means that at the time of the survey they represented the age category of 20-25 years old (Figure 1), and 55.3% between 2000 and 2005, respectively 15-20 years old (Figure 2).

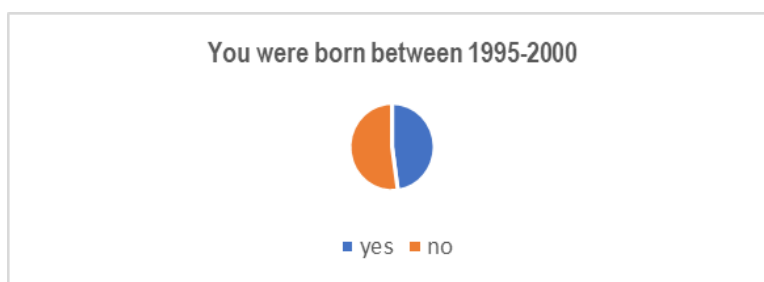


Fig. 1. Respondents' age
Sources: developed by the authors.



Fig. 2. Respondents' age
Sources: developed by the authors.

The range of their future professions is quite wide. Taking into account that the questionnaires were distributed mainly among young people in creative specialties, the range of future professions is quite diverse.

As Figure 3 shows, the most basic needs for personal development, the vast majority of respondents chose a healthy lifestyle - 287 (67.5%). This shows the great potential of Ukrainian youth on the path to the recovery of the nation, which will become more significant in the future and will have a positive impact on future generations.

The digital generation is consciously ready to live longer and better. This gives great advantages to employers, managers of media companies, if we apply the formula of the CLTV customer life cycle (customer lifetime value), where the customer will not be a consumer, but an employee of the company. This approach has been implemented by marketing practitioners Nir Eyal and Ryan Hoover (2014), who believe that “One of the most effective ways to increase a company's value is to develop the right consumer habits, leading to an increase in the average customer life cycle (CLTV)” (p. 27). This figure is equal to the amount that the company will receive from the customer (in our case, a company specialist), until “He wants to go to a competitor, stop using this product or die” (p. 27). If we use this approach in relation to the company’s specialists, both parties will benefit: employers and employees, because in a fast-paced media environment, the longer a conscious specialist works in the company, monitors his diet, plays sports, leads a healthy lifestyle, the more benefits, opportunities and competitive advantages he will bring to the company, even as a freelancer.

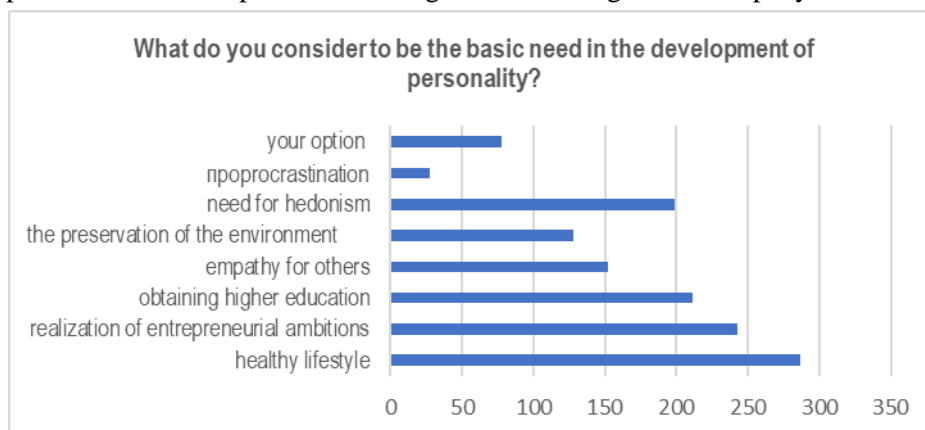


Fig. 3. Basic needs for a personality development
Sources: developed by the authors.

Table 1 shows that quite a large percentage of respondents is ready to realize their entrepreneurial ambitions - 243 people (57.2%), which means that they already know how to succeed, ready to work on it, spend their time and implement innovative ideas, including the implementation of startups, which contributes to the development of the creative economy. These data are the key to creating quality communication "manager-performer", as well as creative solutions for the application, for example, the strategy of competitive differentiation, which is to establish quality communication between many departments of the company through a mutually beneficial partnership.

Table 1. What do you consider to be the basic need in the development of personality?

Meaning	Quantity
healthy lifestyle	287
realization of entrepreneurial ambitions	243
obtaining higher education	213
empathy for others	152
the preservation of the environment	128
need for hedonism (pleasure)	199
procrastination	27
your option	78

Sources: developed by the authors

Education turned out to be an important resource for many centenarians. Figure 3 and Table 1 shows that 213 (50.1%) respondents are interested in obtaining higher education. This demonstrates the younger generation's understanding that for the development of personality, obtaining and maintaining leadership positions in a period of permanent change requires constant replenishment and updating of knowledge. However, managers should keep in mind that, although, 65,6% of respondents chose higher education (figure 8), this generation is not able to study one subject, they are interested in interdisciplinary connections, so they will be able to see the whole picture of the world. They are ready to receive information from everywhere, from all channels of communication. Therefore, the traditional approach to learning should be changed, in connection with the pandemic, in particular; online classes and distance learning should be used, and so on.

Figure 3 and Table 1 shows that the great asset of the digital generation has been the choice to show empathy for others. This virtue was chosen by 152 (35.8%) respondents. These figures demonstrate young generation's understanding that for the development of personality, obtaining and maintaining leadership positions in a period of permanent change, constant replenishment and updating of knowledge is required. However, managers should take into consideration that, although, according to our research 65.6% of respondents (figure 8) chose traditional university education, this generation is not able to study one subject, they are interested in interdisciplinary links, so they will be able to see the whole picture of the world. They are ready to receive information from everywhere, from all channels of communication. Therefore, the traditional approach to learning should be changed, in particular, because of the pandemic, online classes and distance learning should be introduced and so on.

The great asset of the digital generation has been the choice to show empathy for others. This virtue was chosen by 152 (35.8%) respondents (Figure 3). This indicates a possible manifestation of the spirit of collectivism in case of need and refutation of the concept that this generation likes to work not in a team, but individually, separately from the team. The preservation of the environment is of great importance for Generation Z - 128 (30.1%), as they all understand and are aware of the danger and real threat to life in the case of continued neglect of the environment and non-resource use of natural resources. This concept of sustainable development, which is to harmonize the economic, social and environmental components of society in any country, acquires global significance today, it has many points of reference with our research and correlates with our questions about healthy living, environment, education and more.

A fairly large percentage of respondents have a key need for hedonism (pleasure) – 199 (46.8%), which is of great value to the creative worker. The capitalization of the company will depend on how much the creative industry specialist will be satisfied with the result of his work. This approach for performing the so-called relationship marketing has five levels of company's investment, belongs to the F. Kotler. These include the following resources: basic marketing, when the manufacturer simply sells

goods; reactive, when the company sells goods and offers the buyer immediate communication in case of any questions, suggestions or complaints; proactive, when producers turn to consumers with the offer of more modern innovative products; responsible, when the manufacturer after a short period of time after the sale of the product is interested in whether the quality of the product meets the expectations of consumers, learns about their suggestions to improve the product or service; partnership, when the company permanently interacts with consumers as partners, looking for ways to improve the results of cooperation (Kotler, 2006). Proactive and responsible level of relations are the milestones of an effective intercommunication structure of the manufacturer with the buyer, each of whom enjoys the joint interaction and qualitatively implements a competitive strategy of differentiation.

According to Figure 3 and Table shows that a relatively small percentage of people, namely – 27 (6.4%) is concerned with procrastination, which can manifest itself in apathy and laziness, that is lack of energy to perform certain actions, because this feature is inherent in creative individuals. But managers should pay attention to this fact, because these specialists should be kept in the spotlight and motivated, if necessary, by additional incentives to improve their productivity. Other basic needs related to personal development motivate 22 (5.2%) of the recipients and are based on self-improvement, professional realization, worldview expansion, creative activity, humanism, development of emotional intelligence, some of them dream of leaving their mark on history.

We observe new realities in the organization of labor. Figure 4 shows that recipients see the combination of freelancing with part-time employment as the main resource of their employment (272, 64%). It means that, the vast majority of centenarians are only partially willing to devote all their free time to the company, firm, employer. New information for HR managers and employers is that only 115 respondents (27.1%) are ready to work full time. Therefore, the organization of work at the media company to ensure the efficiency and productivity of specialists, which will contribute to the capitalization of the firm, is one of the key issues today.

A small number of respondents - 65 respondents (15.3%) dream of becoming a freelancer and manage their time. Probably, this is the part of centenarians who are ready to start their own business, being entrepreneurs, have their own startups and develop society in such a way. 6 (1.4%) respondents suggested their own options, the main difference among them lies in the fact that it does not matter what they will do, the aim is to enjoy it.



Fig. 4. Criteria of labor organization conditions

Sources: developed by the authors

As Figure 5 shows, according to Generation Z, the most popular professions are marketers, in particular, 113 people (26.6%), journalists 95 (22.4%), entrepreneurs 94 (22.1%), advertisers 93 (21.9%), IT specialists 69 (16.2%), managers 49 (11.5%), lawyers 48 (11.3%). Respondents gave the lowest number of votes to such professions as financier – 30 (7.1%), barista 21 (4.9%), engineer 18 (4.2%). Rather large number of respondents – 63 (14,8%) indicated their own option to answer. Among the answers the popular professions are doctors, dentists, biologists, psychologists, political scientists, pilots, actors, translators, designers, producers and others. (Pic. 6). If we apply the approach of R. Florida to the classification of major groups into subgroups of "supercreative core" and "creative professionals", it can be pointed out that among generation Z there are slightly less "creative professionals" (95 journalists) than professionals related to "supercreative core" (113 marketers). The difference is small, so managers and employers need to understand that all professionals will have enough space to effectively apply their skills, knowledge, experience and creative ambitions to achieve the ultimate goal, including profit from their activity.

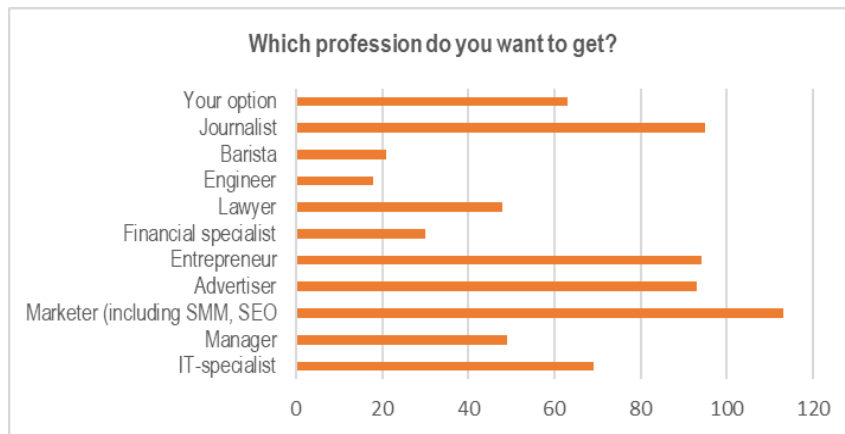


Fig. 5. Popular professions
Sources: developed by the authors

Advertising usually irritates consumers, but not this generation. According to Figure 6 shows that Generation Z is overwhelmingly indifferent to advertising - 181 people (42.6%), it irritates a much smaller number of recipients, including 104 respondents (24.3%). If Generations X and Y do not always acknowledge the impact of advertising on them, the new generation openly states the impact of advertising on them 87 (20.5%). A sufficient number of respondents like to consume advertising - 86 people (20.2%). These data fully confirm that the media industry will be able to monetize media content thanks to these respondents, they are able to become professionals in this field, if they are into it.

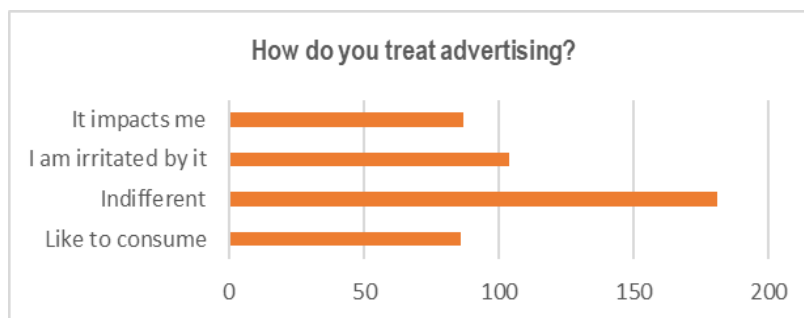


Fig. 6. Attitude to advertising
Sources: developed by the authors

Multimedia is to the taste of the generation born with "devices in hand". As Figure 7 shows, the vast majority of respondents 233 (60.9%) like to read, listen and watch at the same time- consume information in a multimedia version. The digital generation also likes video content, in particular 132 (31.1%) people. 79 (18.6%) respondents like to read and 51 (12%) like to listen. This means that this generation is able to obtain information simultaneously from many channels, it does not prevent them from concentrating and assimilating it, and, consequently, it develops and stimulates them to acquire new permanent knowledge.

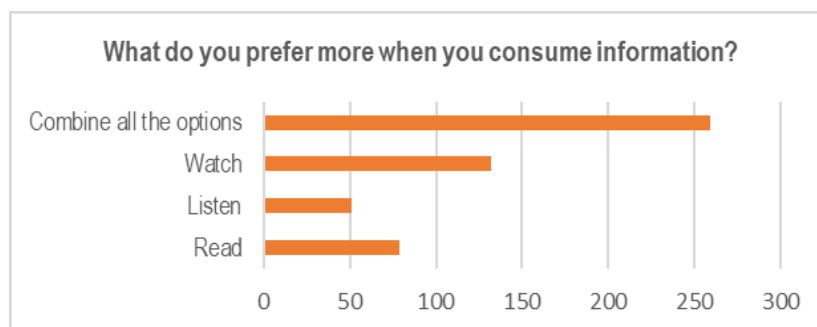


Fig. 7. The method of obtaining information
Sources: developed by the authors

According to Figure 8 shows, the vast majority of respondents (240, 65.6%) pointed out that it is better to get an education at the university but generation Z (176, 48.1%) also like attending paid courses and trainings. 125 (29.4%) recipients are ready to consume free courses and trainings, and the situation with the pandemic greatly contributed to this, as many courses and trainings were offered online, remotely and free of charge. The pandemic has made adjustments to the educational process, 144 respondents (33.9%) prefer online learning, which informs managers and employers about leaving old traditional forms of education and the transition to new modern convergent methods. A small percentage of those who chose their option 12 (2.8%) preferred self-education, which is also an effective resource of the digital generation for personal development.

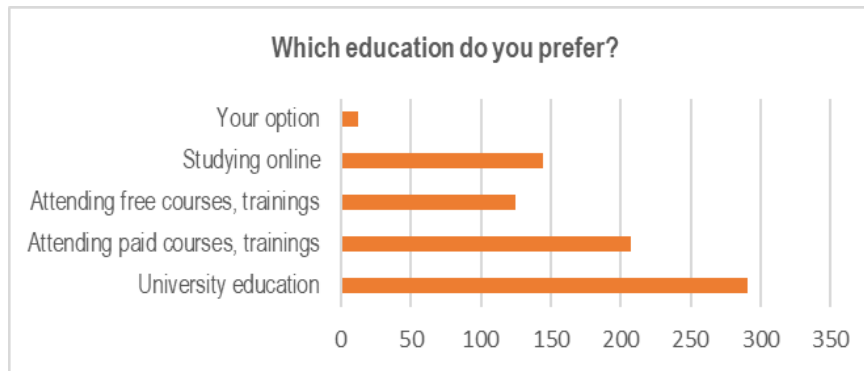


Fig. 8. Motivational advantages in obtaining education
Sources: developed by the authors

Figure 9 shows the vast majority (60.1%) of respondents consume information simultaneously with the help of two devices. One device is used by 13.9% of recipients, however, there are those who are willing (17.6%) to get information at the same time from three devices, and 8.5% - even from more than from three. Probably, this was facilitated by the pandemic, in particular, because many people had to be in several places at the same time, use a large number of technical means and use many devices. And again, many of them liked this situation, it helped them to concentrate and focus on the main thing, rather than disperse attention, which is often blamed on Generation Z.

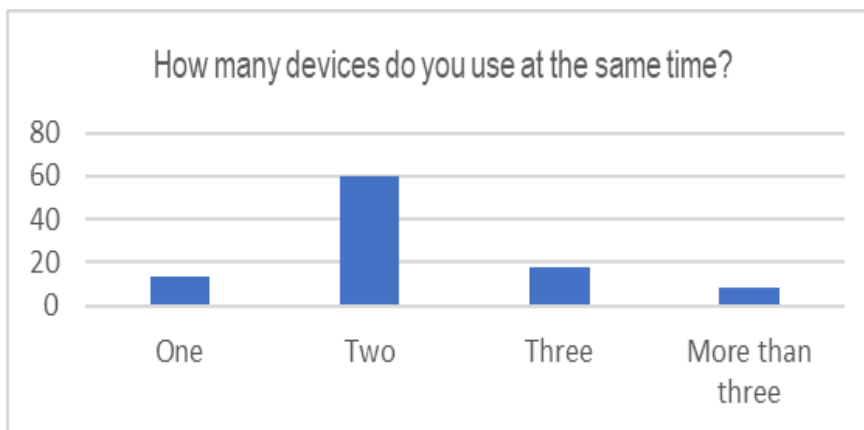
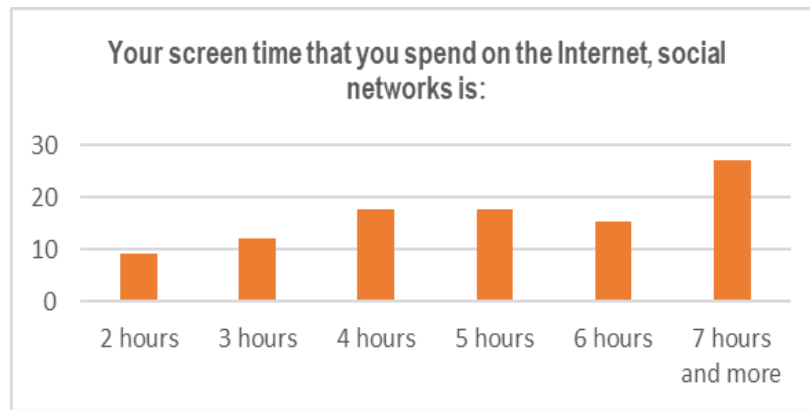


Fig. 9. Devices for obtaining information
Sources: developed by the authors

The biggest number of respondents (27.1%) spend 7 or more hours on the Internet (Figure 10). And this is a big challenge for employers and managers, because it is almost a full 8-hour working day. Therefore, it is necessary to better understand this issue so that centenarians' productivity does not interfere with the effective development of the media company.



*Fig. 10. Amount of time spent on the Internet
Sources: developed by the authors*

Recipients are online quite a big part of the time, namely, five and four hours (17.9%), as well as six hours (15.5%). These motivations of the digital generation can be explained by the fact that since childhood, most respondents used devices that calmed them down, gave answers to most questions, including the period of crises such as the pandemic. Fewer people spend three hours (12.2%) and two (9.4%) on the Internet, including social networks. And this data should also be skillfully used by managers.

Conclusions. In such a way, it can be stated that today the basis of the creative economy is the intellectual potential of specialists in the creative media industries, moreover, their skills, new knowledge, creativity, innovative ideas contribute to the competitiveness. The study found that nowadays young people, who represent the digital generation of centenarians and are 20-25 years old, become employees of the creative media industries, and a survey of their resource benefits provides employers, media managers with useful information and helps to understand how to capitalize production processes in a competitive environment, and how to transform this generation's skills, abilities, knowledge into management processes in the new working conditions and cooperation of the digital age. On the other hand, it is a generation of media consumers who already are or may become a potential, and later, the target audience of any media company. Therefore, knowledge of their motivational advantages also provides a key to understanding what media product the digital generation needs today.

The study showed that the generation of centenarians is well aware of their basic needs that will promote personal development, because today, these young professionals must become creators of innovative ideas as well as the intellectual potential of the "creative economy", understand non-standard methods of solving standard problems, be able to implement large-scale projects, establish team habits, communication relations with managers, be in demand and be competitive in a fleeting environment, to monetize activities- to be producers of business processes of various media enterprises and to create competitive goods in media industries. The vast majority of them consider their motivational advantages to be a healthy lifestyle, higher education, awareness of environmental protection, empathy for others, and the realization of their entrepreneurial ambitions. These indicators correspond to the theory of sustainable development, and therefore can be useful for further research and implementation of this concept in Ukraine.

The results of the study also show that the young generation considers creative professions-drivers of creative industries, to be an important competitive advantage. Most of them want to combine freelance with part-time employment. This means that they are not ready to spend all the time on employers, they have a desire to do business. The digital generation of centenarians likes to consume multimedia information as well as video content from at least two devices, but also many of them consume information from three or more devices. Advertising does not irritate them, the vast majority are indifferent to it, but there are those representatives who like it. In such a way, the results of the study are valuable for practitioners, including employers, managers of any enterprise of creative industries in Ukraine to build quality horizontal and vertical communication among all the departments, as well as to realize their creative and intellectual potential in creating a competitive media product that can capitalize production processes based on the correctly chosen competitive strategy.

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DIGITAL TECHNOLOGIES IN INNOVATIVE AND STRUCTURAL TRANSFORMATION OF UKRAINE'S ECONOMY

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ABSTRACT

The article substantiates the role of artificial intelligence in procuring the management of innovation and structural transformation of the economy. The analysis of structural shifts in gross value added in the economy of Ukraine during 2002–2019 is carried out. Solow's residuals are calculated for the primary, secondary and tertiary sectors. The expediency of managing the innovative and structural transformation of Ukraine's economy on the basis of changes in the level of Solow's residual in that sector and in the period of time determined by big data analysis by artificial intelligence is proved. A VAR model was built in the EViews environment for Solow's residuals in three sectors of the Ukrainian economy. Based on variance decomposition and IRF, it is established that increasing the share of intermediate consumption by the secondary sector of education, ICT, professional, scientific and technical services will increase Solow's residual in the secondary sector in two years, in the tertiary sector in three years and in the primary sector in four years, which will affect the increase in output in Ukraine during these three years.

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1. Introduction. In today's world, innovation is an integral part of economic growth, and innovative development is the basis for ensuring long-term prosperity. That is why the process of structuring the national economy must take into account the possibility of creating such conditions that would facilitate the transition to an innovative model of development.

The use of digital technologies in various socio-economic spheres not only promotes innovative development, but also serves as a mean of managing changes in the sectoral structure of the economy. In this aspect, the digital technologies is important tool for ensuring the innovative and structural transformation of the primary, secondary and tertiary sectors of the economy.

The research of digital technologies importance in the transformation processes of the Ukrainian economy is devoted to the research of the following scientists: Kraus N., Kraus K., Pigarev Y., Kosteniuk N., Putzenteilo P., Humeniuk O., Tulchynska S., Korzun L. and others. Despite the breadth of the concept of “digital technology”, in this study attention is paid to the use of artificial intelligence in modeling changes in the sectoral structure of the economy to form an innovative model of development.

The first model to describe the role of technology in economic growth is the Solow-Swan model, which became the basis for modern theoretical and empirical work on economic growth. Modern models of economic growth focus on the study of economic growth factors, which mainly reflect the “development of educational and scientific and technical factors” (Grossman, 2017; Romer, 1986), such as: innovation and externalities, for example, in the model of Agion F. and Havitta P. (Aghion, 1992), Schultz T. (Schultz, 1961); accumulation of physical and human capital, for example, in the model of Guarini J. (Guarini, 2009) etc.

The aim of the study is to substantiate the theoretical provisions and provide practical recommendations for modeling structural and innovative transformations of the Ukrainian economy using artificial intelligence.

2. Materials and methods. The research used a set of general and specific methods at the empirical and theoretical levels to test hypotheses, such as: method of VAR analysis; impulse response functions (IRF); variance decomposition (VDC); method of graphic interpretation; methods of systematization, grouping and logical generalization for systematization of information, drawing conclusions and making scientific proposals of the research paper.

The study of the structural transformation of Ukraine's economy was conducted on the basis of Clark K. three-sector model (Clark, 1940), where the primary sector includes sectors A and B, the secondary sector – C, D, E and F, and the tertiary sector the rest economic activities (G–U) according to ISIC rev.4.

The calculation of structural changes in the economy by three sectors of the economy was carried out on the basis of the Kazynets method, which was supplemented by Romanova T. (Romanova, 2016).

$$K_K = \sqrt{\frac{(d_t^I - d_{t-1}^I)^2 + (d_t^{II} - d_{t-1}^{II})^2 + (d_t^{III} - d_{t-1}^{III})^2}{3}}, \quad (1)$$

K_K – the quadratic coefficient of “absolute” structural shifts of Kazynets, d_t^I – share of value added of the primary sector in the current year, d_t^{II} – share of value added of the secondary sector in the current year, d_t^{III} – share of value added of the tertiary sector in the current year, $d_{t-1}^I, d_{t-1}^{II}, d_{t-1}^{III}$ – shares of sectors in the previous year.

Based on the Cobb-Douglas production function with a constant return to scale, the Solow's residuals were calculated for three sectors of the economy (Cobb, 1928).

$$\ln(A) = \ln(Y) - \beta \cdot \ln(L) - \alpha \cdot \ln(K); \quad (2)$$

$$A = e^{\ln(Y) - \beta \cdot \ln(L) - \alpha \cdot \ln(K)}; \quad (3)$$

Output (Y) is a function of capital (K) with elasticity α , labor (L) with elasticity β and knowledge (A). The function (3) suggests that output can be increased for any given amount of capital and labor by expanding the stock of knowledge.

The relationship between Solow's residuals in three sectors of Ukraine's economy is determined by building a VAR model using artificial intelligence. Based on the IRF and VDC, the sector of the economy in which the Solow's residual has the greatest impact on the residuals in other sectors was identified, as well as the impact of intermediate consumption by the target sector of innovation development driving services.

The study was conducted on the basis of data on value added, employment, capital in three sectors of the Ukrainian economy during 2002-2019, as well as intermediate consumption by the secondary sector of education, ICT, professional, scientific and technical services. The empirical basis of the study is the data of the State Statistics Service of Ukraine (SSSU, 2019), the International Labor Organization (ILO, 2019) and UNCTADstat (UNCTAD, 2019).

3. Results. Economic growth is a process that significantly depends on the specifics of the transformation in the structure of the economy. It should be noted that the dynamic characteristics are important in the analysis of changes in the national economy in terms of primary, secondary and tertiary sectors, because the current trends allow to identify potential deviations from the desired trajectory of development.

The macroeconomic indicator that plays a significant role in the study of the sectoral structure of the economy is gross value added. The analysis and assessment of the sectoral structure of the economy according to this indicator was conducted in the works of Peleh O. (Peleh, 2019), Herrendorf B., Rogerson R. and Valentini A. (Herrendorf, 2014), Trubnik T. (Trubnik, 2014), Karintseva O. (Karintseva, 2018), Maryanovych V. (Marjanović, 2015), Kołodziejczak V. (Kołodziejczak, 2020).

In 2019, the volume of gross value added in Ukraine increased 3.6 times compared to 2010, and in the sectoral context: the value added of the primary sector – 4 times, the secondary – 3.1 times, and the tertiary – 3.6 times. The primary and secondary sectors are quite close in terms of value added during 2010–2019, and the tertiary sector exceeds their sum by an average of 1.6 times (Fig. 1).

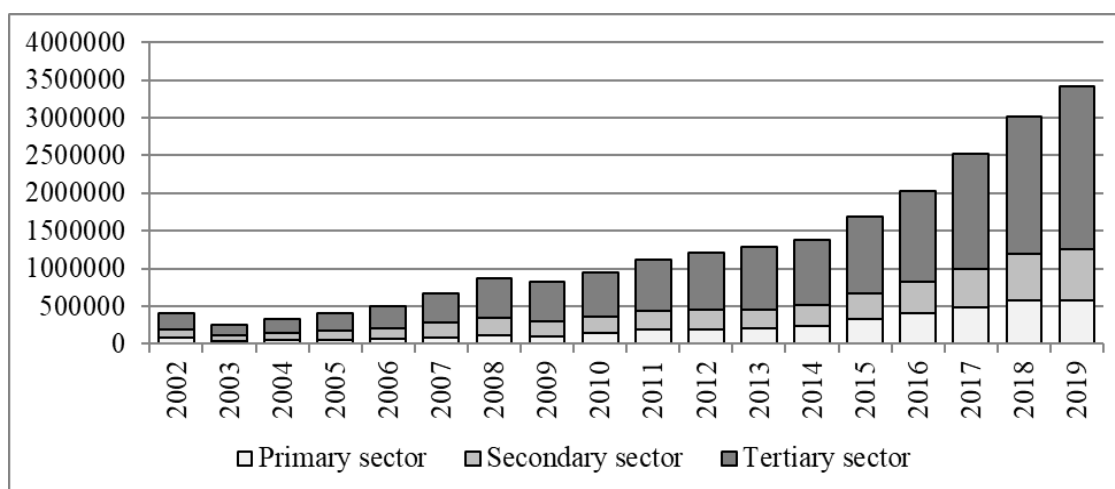


Fig. 1. Gross value added by sectors of the Ukraine's economy during 2002–2019, UAH million (SSSU, 2019; UNCTAD, 2019)

During the period, the average annual growth for the entire economy was +177027 million UAH, of which: +29489 million UAH for the primary sector, +32677 million UAH for the secondary sector, +114861 million UAH for the tertiary sector. The average annual growth rate of the primary sector was 115.20%, the secondary sector – 112.34%, the tertiary sector – 116.09%, and in general – 114.83%. The sectoral structure of Ukraine's economy by value added differs markedly from the structure by GDP, as the tertiary sector of the economy accounts for a larger share of value added than GDP.

During 2002–2019, the share of value added of the primary sector ranged from 11.8–20.3% (-0.14% of average annual growth), the secondary sector – from 19.5% to 30.5% (-0.55% of average annual growth), the tertiary sector – from 51.5% to 64.1% (+0.69% of average annual growth). It is worth noting that the share of the primary sector in GVA increased by 2016 (5.3% more than in 2010), and by 2019 had a declining trend (in 2019 it decreased by 3.4% compared to 2016). The share of the secondary sector of the economy in GVA tended to decrease throughout the study period, and in 2019 was 2.9% less than in 2010. The share of the tertiary sector in GVA had an inversely proportional trend to the primary sector (decrease until 2016 by 3.4% compared to 2010 and growth till 2019 by 4.5% compared to 2016).

The results of calculations of quadratic coefficients of «absolute» structural shifts indicate that the transformations of the Ukrainian economy according to this indicator during 2002–2018 were insignificant (did not exceed 1.8%). In 2019, the ratio reached 2.1%, which was due to a decrease in the share of GVA in the primary sector (-2.1%) and the secondary sector (-0.6%), as well as an increase in the share of value added in the tertiary sector economy (+2.8%). In primary production the share decreased both in agriculture, forestry and fisheries (-1.54%) and in extractive industry (-0.6%), in secondary production only in processing industry (-1.06%) and supply electricity, gas, steam and air conditioning (-0.06%). The main sections of ISIC rev.4, which ensured the growth of value added of the tertiary sector in 2019, were the following: information and telecommunications (+0.74%), public administration and defense, compulsory social insurance (+0.74%), professional, scientific and technical activities (+0.38%), real estate transactions (+0.23%), health care and social assistance (+23%), transport, warehousing, postal and courier activities (+0.21%), activities in the field of administrative and support services (+0.21%), temporary accommodation and catering, provision of other types of services (+0.17%), financial and insurance activities (+0.11%).

An assessment of the residual growth indicators of the three sectors of the Ukrainian economy during 2002–2019 was made (Table 1). The calculations give grounds to claim the instability of the formation of Solow's residual (A) within the specified period. Thus, in the primary sector of the economy, the Solow's residual had the lowest level in 2011 (close to zero) and the highest – in 2019 (191813.3023), but the figure exceeded one only in 2012, 2017 and 2019. A similar situation was observed in the tertiary sector, but growth peaks occurred in 2012 and 2016. In the secondary sector, the figure exceeded one in 2011–2013 and 2015–2017, significantly outpacing the rest of the sectors.

Table 1. Solow's residuals by sectors of the Ukrainian economy, 2002–2019

	Primary sector	Secondary sector	Tertiary sector
2002	1,72923E+13	6,90544E-10	6,03919E-20
2003	3,7278E-208	4,82316E+98	1,04276E+74
2004	4,8177E-21	1,78241E-15	2,52677E-46
2005	3,90733E-07	4,19423E-20	1,91138E-14
2006	0,01726532	1,16045E-20	6,97219E-23
2007	2,87263E-07	9,81763E-19	1,44055E-33
2008	1006,903288	8,2603E+119	1,46366E-75
2009	365387315,5	7163122,069	663462,0016
2010	1,50618E-06	1,3418E-06	0,057647247
2011	6,82909E-21	6,50829E+27	7,5708E-134
2012	190885,4326	3,20623E+18	4,67893E+28
2013	3,16379E-09	31759130492	0,047327008
2014	0,922109244	0,041478273	140,5518028
2015	8,0446E-10	4,77672E+58	0,00015026
2016	1,03265E-13	3,15433E+13	1,34073E+16
2017	35,6024382	4,30833E+24	3,01852E-36
2018	3,55247E-08	1,32771E-08	3,22783E-23
2019	191813,3023	2,24988E-08	0

*calculated on the basis of sources (SSSU; ILO; UNCTAD)

Thus, there is a need to determine the distribution of value added between the primary, secondary and tertiary sectors of the economy, which would contribute to the formation of an innovative model of development. Of course, market regulation mechanisms will be aimed at maximizing GVA, i.e. the target function of market optimization of the division of labor and capital between the three sectors will take the form of (4).

$$Y = Y^I + Y^{II} + Y^{III} \rightarrow \max; \quad (4)$$

Y^I – value added in the primary sector; Y^{II} – value added in the secondary sector; Y^{III} – value added in the tertiary sector.

In this case, the market mechanism of distribution of L and K will be based on the Cobb-Douglas functions for the primary, secondary and tertiary sectors of the economy (5).

$$\begin{cases} \ln(Y^I) = \ln(A^I) + \beta^I \cdot \ln(L^I) + \alpha^I \cdot \ln(K^I) \\ \ln(Y^{II}) = \ln(A^{II}) + \beta^{II} \cdot \ln(L^{II}) + \alpha^{II} \cdot \ln(K^{II}) \\ \ln(Y^{III}) = \ln(A^{III}) + \beta^{III} \cdot \ln(L^{III}) + \alpha^{III} \cdot \ln(K^{III}) \end{cases}; \quad (5)$$

L^I, L^{II}, L^{III} – employment in the primary, secondary and tertiary sectors of the economy; K^I, K^{II} and K^{III} – the value of fixed assets in the primary, secondary and tertiary sectors of the economy.

Given that at a certain point in time a certain amount of capital and human resources is available within the economy, the target function will have limitations (6).

$$\begin{cases} L^I + L^{II} + L^{III} \leq L \\ K^I + K^{II} + K^{III} \leq K \end{cases} \quad (6)$$

L – total employment; K – total fixed assets.

We convert Y^I, Y^{II} and Y^{III} in the objective function (4) into a logarithmic form. Given the fact that the exponent of the natural logarithm of the indicator is equal to the value of the indicator, the objective function will look like this (7).

$$Y = e^{\ln(Y^I)} + e^{\ln(Y^{II})} + e^{\ln(Y^{III})} \rightarrow \max; \quad (7)$$

Therefore, equation (7) with limitations (5) and (6) provides an algorithm for the distribution of factors K and L, as well as value added between the primary, secondary and tertiary sectors based on the action of market mechanisms. However, the effect of market mechanisms must be adjusted by government mechanisms to ensure long-term economic growth.

We see the feasibility of managing such parameters that ensure the formation of an innovative model of development. There is a choice between α, β and A. Although these parameters are determined by constants, they tend to change constantly, which is the property of the post-industrial

dynamic era. Even Hall R. in 1989 noted the inexpediency of perceiving Solow’s residual as a constant, because it covers price fluctuations (Hall, 1989).

On the one hand, it would be appropriate to take into account the dynamic relationship between the three parameters for the three sectors of the economy. Such a simulation would result in a system of nine equations with a definite time lag. On the other hand, building a model with so many parameters requires historical data over a fairly long period of time (over 30 years). Thus, to construct a VAR-model for three parameters with a time lag of two years requires empirical data for 18 periods (years or quarters). In view of the above, it is advisable to ensure the availability of the dynamic analysis procedure, i.e. to reduce the number of input parameters for analysis based on time series.

Solow's residual, despite all the controversy of scientists, contains an innovative component, so we consider it appropriate to take it into account in the process of modeling changes in the sectoral structure. The formation of the indicator, in our opinion, depends not only on its own output, but also on the consumption of goods and services of other sectors. Many scholars agree that the primary sector of the economy is the starting point for sustainable economic growth, as it forms the basis of the supply chain for the secondary sector, as well as an intermediate consumption of tertiary sector services (Timmer, 2014). Solow's residual in the primary sector depends on the level of equipment of agriculture and mining, i.e. the amount of capital spent by the sector on manufactured goods. The greater residual of the primary sector means the greater the ability to develop new technologies. Therefore primary sector needs goods of secondary sector and services of the tertiary sector with higher consumer value. This is a stimulating factor for the modernization of production to create high value products, which forms the demand for high value services of the tertiary sector.

At the same time, changes in Solow's residual in one sector of the economy will provide a gradual change in the relevant indicators for other sectors, i.e. not simultaneously, but over a period of time. Based on the above, it is advisable to determine the relationship between the Solow’s residuals in the primary, secondary and tertiary sectors of the economy of Ukraine based on vector autoregression model (VAR).

$$\left\{ \begin{array}{l} A_t^I = -933,8639 \cdot A_{t-1}^I - 0,169644 \cdot A_{t-2}^I + 0,000434 \cdot A_{t-3}^I \\ \quad + 4,4 \cdot 10^{-122} \cdot A_{t-1}^{II} + 4,1 \cdot 10^{-109} \cdot A_{t-2}^{II} + 7,5 \cdot 10^{-113} \cdot A_{t-3}^{II} \\ \quad + 3,81 \cdot 10^{-21} \cdot A_{t-1}^{III} - 7,19 \cdot 10^{-65} \cdot A_{t-2}^{III} - 3,11 \cdot 10^{-70} \cdot A_{t-3}^{III} + 32413 \\ A_t^{II} = -4 \cdot 10^{117} \cdot A_{t-1}^I - 7,3 \cdot 10^{113} \cdot A_{t-2}^I - 3,8 \cdot 10^{110} \cdot A_{t-3}^I \\ \quad + 4,7105 \cdot A_{t-1}^{II} + 1770393 \cdot A_{t-2}^{II} + 321,8272 \cdot A_{t-3}^{II} \quad ; \\ \quad + 1,63 \cdot 10^{94} \cdot A_{t-1}^{III} + 6,31 \cdot 10^{49} \cdot A_{t-2}^{III} - 1,33 \cdot 10^{45} \cdot A_{t-3}^{III} + 1,4 \cdot 10^{119} \\ A_t^{III} = 9,75 \cdot 10^{22} \cdot A_{t-1}^I + 2,10 \cdot 10^{19} \cdot A_{t-2}^I + 1,28 \cdot 10^{20} \cdot A_{t-3}^I \\ \quad - 1,14 \cdot 10^{-94} \cdot A_{t-1}^{II} - 4,31 \cdot 10^{-89} \cdot A_{t-2}^{II} - 9,27 \cdot 10^{93} \cdot A_{t-3}^{II} \\ \quad - 0,3975 \cdot A_{t-1}^{III} - 2,12 \cdot 10^{-41} \cdot A_{t-2}^{III} + 3,84 \cdot 10^{-50} \cdot A_{t-3}^{III} - 4 \cdot 10^{24} \end{array} \right. \quad (8)$$

$A_t^I, A_t^{II}, A_t^{III}$ – Solow residuals for primary, secondary and tertiary sectors.

The first and third equations in system (8) have 100% reliability, and the second – 10.88%.

Based on the variance decomposition, it was determined that currently the Solow residual in the secondary sector has the great impact on the formation of the A^I in the second period, on A^{II} and A^{III} in the first period, but for long run residual in primary sector has greatest impact on three sectors (Table 2).

Table 2. Variance decomposition of A^I, A^{II} and A^{III}

	Variance decomposition of A^I			Variance decomposition of A^{II}			Variance decomposition of A^{III}		
	A^I	A^{II}	A^{III}	A^I	A^{II}	A^{III}	A^I	A^{II}	A^{III}
1	100,0000	0,000000	0,000000	3,881849	96,11815	0,000000	3,899608	5,728188	90,37220
2	32,83540	67,16460	4,12E-06	99,99727	0,002706	2,47E-05	99,99725	0,002572	0,000181
3	99,99695	0,003026	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05
4	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05
5	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05
6	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05
7	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05
8	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05
9	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05
10	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05	99,99738	0,002595	2,47E-05

Modeling of innovative and structural transformations of Ukraine's economy is aimed at accelerating economic growth, and thus increasing the Solow's residuals. Therefore, it is important that the impact of A is not only significant but also positive. To do this, the IRF technique was used for the given variables (Table 3).

Table 3. Response of A^I, A^{II} and A^{III} to innovations in A^{II}

	Response of A ^I			Response of A ^{II}			Response of A ^{III}		
	A ^I	A ^{II}	A ^{III}	A ^I	A ^{II}	A ^{III}	A ^I	A ^{II}	A ^{III}
1	78162,18	0,000000	0,000000	-6,6E+118	3,3E+119	0,000000	1,98E+24	2,40E+24	9,53E+24
2	-1,02E+08	1,46E+08	36282,99	-3,1E+122	1,6E+120	1,6E+119	7,62E+27	-3,86E+25	-3,79E+24
3	-7,06E+10	3,60E+08	35057389	2,9E+125	-1,5E+123	-1,4E+122	-7,09E+30	3,61E+28	3,52E+27
4	6,56E+13	-3,34E+11	-3,26E+10	-2,7E+128	1,4E+126	1,3E+125	6,59E+33	-3,36E+31	-3,27E+30
5	-6,10E+16	3,11E+14	3,03E+13	2,5E+131	-1,3E+129	-1,2E+128	-6,12E+36	3,12E+34	3,04E+33
6	5,67E+19	-2,89E+17	-2,82E+16	-2,3E+134	1,2E+132	1,2E+131	5,69E+39	-2,90E+37	-2,83E+36
7	-5,27E+22	2,68E+20	2,62E+19	2,2E+137	-1,1E+135	-1,1E+134	-5,29E+42	2,70E+40	2,63E+39
8	4,90E+25	-2,50E+23	-2,43E+22	-2,0E+140	1,0E+138	1,0E+137	4,92E+45	-2,51E+43	-2,44E+42
9	-4,55E+28	2,32E+26	2,26E+25	1,9E+143	-9,6E+140	-9,3E+139	-4,57E+48	2,33E+46	2,27E+45
10	4,23E+31	-2,16E+29	-2,10E+28	-1,7E+146	8,9E+143	8,7E+142	4,25E+51	-2,17E+49	-2,11E+48

Calculations based on artificial intelligence show that innovations in the A^{II} in secondary sector have a positive effect on the formation of A^I in the first three periods, A^{II} in the first two periods and A^{III} in the first period. That is why government intervention should now focus on adjusting the process of forming Solow's residual in secondary sector.

Given that Solow's residual contains an innovative component, its increase involves the use of drivers of innovative development, which launch and intensify the processes of knowledge accumulation, innovation and their commercialization. We believe that this process involves increasing the intermediate consumption of services of sections of the economy that produce driving services for innovative development: education (P in ISIC rev.4), ICT (J in ISIC rev.4) and professional, scientific and technical activities (M and ISIC rev.4). Thus, in order to increase Solow's residual in the secondary sector of the Ukrainian economy, it is necessary to increase the share of its expenditures on innovative development driving services. The dynamics of the secondary sector consumption share of the innovative development driving services is shown in Fig. 2.

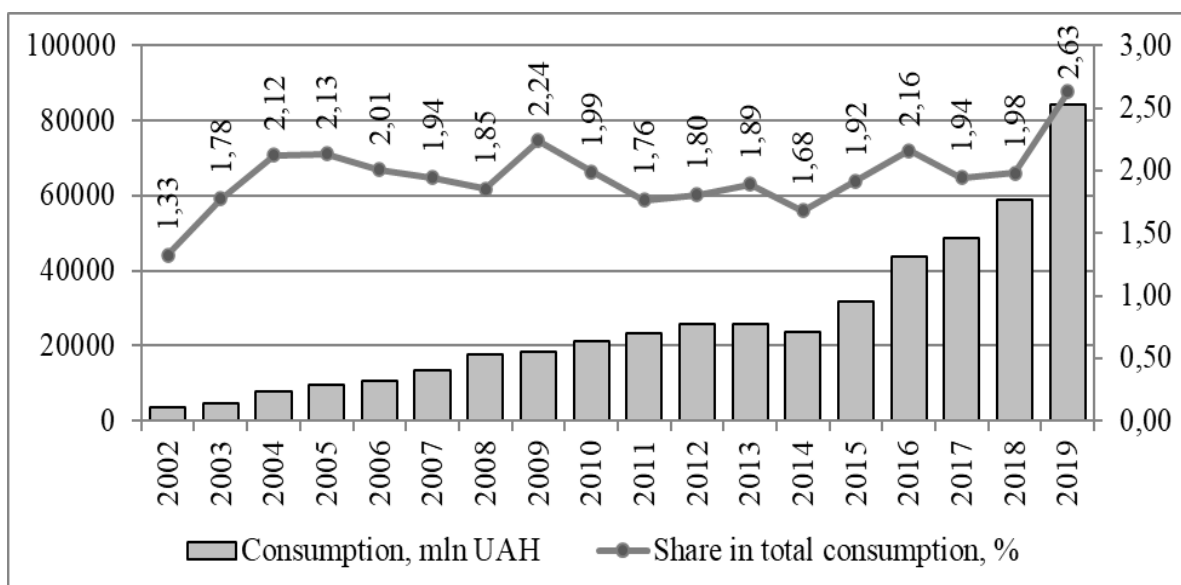


Fig. 2. Consumption of innovative development driving services by the secondary sector of Ukraine

Based on the data in Table 1 and Fig. 2 in the environment EViews it is established that the formation of A^{II} occurs on the basis of equality (9).

$$A_t^II = -2.8 \cdot 10^{120} - 0.307 \cdot A_{-1}^{II} - 0.196 \cdot A_{-2}^{II} - 0.369 \cdot A_{-3}^{II} - 0.196 \cdot A_{-4}^{II}, \tag{9}$$

$$+ 1.3 \cdot 10^{119} \cdot C_{-1}^{II} + 6.0 \cdot 10^{119} \cdot C_{-2}^{II} + 2.3 \cdot 10^{119} \cdot C_{-3}^{II} + 5.8 \cdot 10^{119}$$

C_t^{II} – secondary sector consumption share of the innovative development driving services in t period.

According to variance decomposition, consumption of education, ICT, professional, scientific and technical services by secondary sector has increasing the impact on A^{II} (from 0.779% in the second period to 25.63% in the 10th period). Similarly, IRF shows that innovations in C^{II} have a positive effect on the formation of A^{II} from the second period and have a long-term positive effect (Fig. 3).

Accumulated Response of A_II to Innovations using Cholesky (d.f. adjusted) Factors

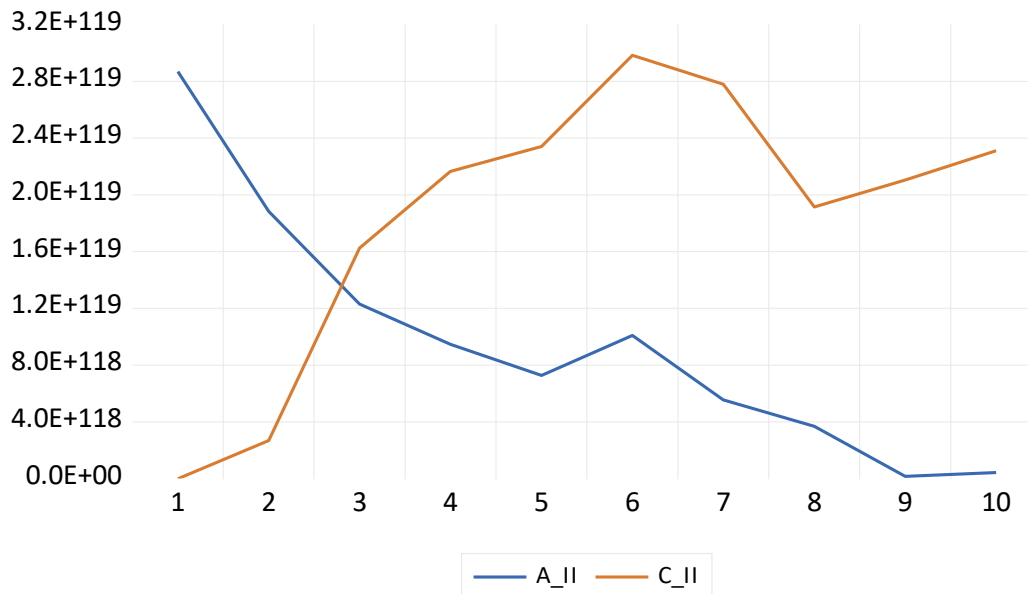


Fig. 3. Accumulated response of A^{II} to innovations of C^{II}

Therefore, the modeling of changes in the sectoral structure of the economy to form an innovative model of development should be based on the adjustment of market mechanisms for the distribution of resources between primary, secondary and tertiary sectors through the impact on the Solow’s residuals. In view of the above, we propose a conceptual model of structuring the national economy, which covers actions for the successive periods (Fig. 4).

The zero period is represented by the processes of data collection, calculation of indicators, determination of the relationship and interaction between the Solow’s residuals in the three sectors using artificial intelligence, identification of the target adjustment sector, determination of the relationship and interaction between the Solow’s residual in the target sector and its consumption share of services related to education, ICT, professional, scientific and technical activities, selection of measures to increase the share of consumption of these services.

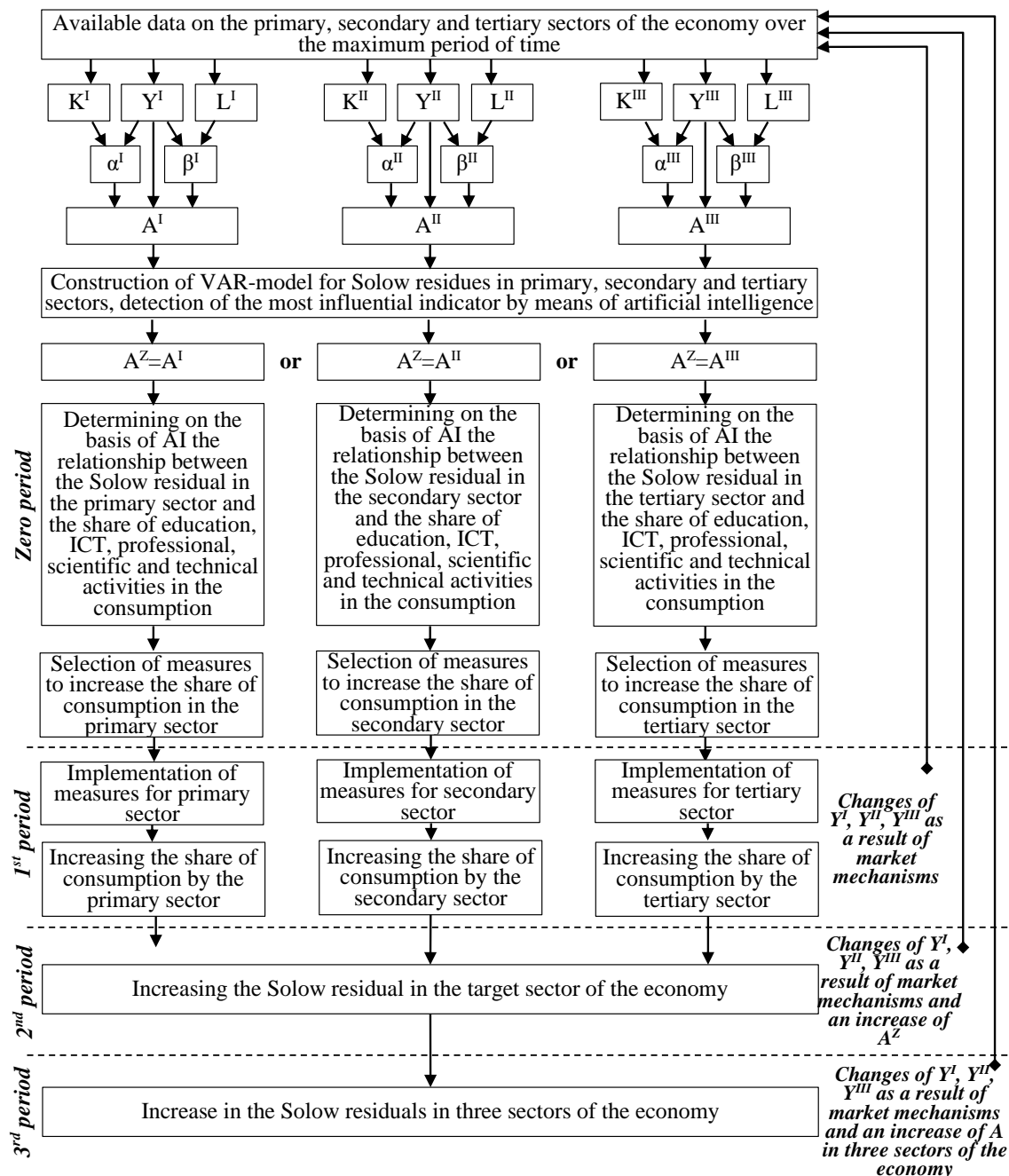


Fig. 4. Conceptual model of structuring the national economy

Within the first period, measures are being implemented to increase the consumption share of services related to education, ICT, professional, scientific and technical activities in the target sector of the economy. The effect of these measures in this period will be minimal and the structuring of the economy will be carried out mainly under the influence of market regulatory mechanisms. However, even minimal changes will provide additional data on the distribution of output, labor and capital, as well as changes in the residuals, which must be taken into account to adjust forecasts and measures.

In the second period, the Solow’s residual in target sector will change as a result of an increase in the share of its consumption, which falls on education, ICT, professional, scientific and technical activities. This will lead to certain changes in the process of structuring the economy based on market mechanisms. As in the previous period, the model will have access to new data that must be included in the calculations to adjust current measures and / or select new measures.

With the onset of the third period, all three residuals will change, that will be marked by a significant increase in the influence of public administration on market mechanisms.

Of course, this conceptual model reflects the cyclical process of change, as well as its dynamism, because the choice of measures and their adjustment is based on data updates, which must be taken into account when using artificial intelligence.

The proposed model of structuring the national economy is aimed at forming an innovative model of development, and therefore, as a result of its practical implementation, the following changes are expected: (1) transition from extensive to sustainable development; (2) transformation of the value chain from low costumer value to medium and high; (3) changing priorities in favor of the interaction of innovative economic activities with all sectors of the economy. The implementation of this model is possible under the condition of constant use of artificial intelligence to regularly identification of key points, the change of which allows to transform the system of the national economy gradually with minimal state intervention in market regulation mechanisms.

4. Discussion. As a result of the study it was substantiated that the transformation processes in the economy occur under the influence of market mechanisms. Ensuring the vector of structural transformations for the formation of an innovative model of development requires government intervention in change, which must be justified by the analysis of big data using artificial intelligence.

A proposal has been made to implement changes in Ukraine's economy by interfering in the process of forming the Solow's residuals in three sectors of the economy by increasing the share of intermediate consumption of education, ICT, professional, scientific and technical services in the sector of the economy and the period of time, that determined in the EViews environment.

On the one hand, D. Liu, R. Li, and J. Tan note that the Solow's residual affects only 30% of output formation, but scientists draw conclusions based on a one-sector model (Liu, 2012). On the other hand, the study of T. Ten Raa and V. Shestalova confirms the fact that the indicator reflects technical and efficiency change, which in turn is a source of innovative and structural transformation of the economy (Ten Raa, 2011).

The consideration of intermediate consumption as a factor in the Solow's residual formation is indicated only by Z. Lin and T. Feng, but by substituting capital for it (Lin, 2016). Y. Bai, J.V. Rios-Rull and K. Storesletten argue that the formation of Solow's residual is influenced by demand (Bai, 2012), but the results of our study do not contradict this conclusion, but rather complement it, because increasing consumption of driving development services can optimize the production process and also increase the consumer value of products, which will positively affect the formation of demand.

5. Conclusions. As a result of studying the dynamic characteristics of the sectoral structure of Ukraine's economy during 2002–2019, it was found that the tertiary sector produces the largest and the primary sector the smallest share of value added. However, the largest sectoral contribution to the growth rate of value added falls on the primary sector.

It is noted that market mechanisms of economic regulation are aimed at maximizing output through the optimal distribution of factors of production between the primary, secondary and tertiary sectors. It is substantiated that making changes in the sectoral structure of the economy is to adjust market regulation mechanisms with the help of government levers. The process of market distribution, in addition to the elasticity of output of labor and capital in each sector, is influenced by Solow's residual, the management of which should be directed to public administration.

With the help of artificial intelligence, a conceptual model of structuring the national economy has been developed, which allows to identify key points of the system (sector of the economy that needs to increase Solow's residual) and specific changes that need to be made in a specific period (increasing by target sector consumption share of innovative development driving services), which is aimed at forming an innovative model of development. It is substantiated that the production of innovative development driving services falls on the following sections of ISIC rev.4: J, M and P. According to the proposed model, ensuring innovative development involves not just increasing investment in these economic activities, but increasing the share of intermediate consumption. The implementation of the model will achieve the following changes in the national economy: transition from extensive to sustainable development, transformation of low consumer value chains into medium and high value chains, change of priorities in favor of interaction of innovative economic activities with all sectors of the economy.

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FACTORS ANALYSIS OF FAILURE IN ONLINE BUSINESS ON BUSINESS ADMINISTRATION STUDENTS

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ABSTRACT

The study aims to determine the factors that influenced the failure of online businesses run by Business Administration students from the class of 2017-2018, along with the most dominant element that caused the business to take a knock. The research was done using the descriptive qualitative method. The data collection process was in the form of in-depth observation and interviews with 12 sources who had failed to do business online. The data analysis technique used in this study is the Miles and Huberman model. The result shows that 14 factors caused the failure of online businesses run by Business Administration students from the class of 2017-2018, which are managerial incompetence, the lack of experience and skill, financial problems, business planning, wrong target market, business transition, inability to control stock, uncontrolled growth, location, marketing management, high product cost, poor management, consistency, and time management. The most dominant ones were business planning, managerial incompetence, and lack of experience and skill.

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Introduction. The development of online business in Indonesia can be said to be very rapid. Many business people use technology to support their business in the hope of making a considerable contribution to the business they run. Doing business online has been a well-known thing to do by people across the world. The increasing number of internet users in Indonesia has also opened up opportunities for people doing online business. According to the data from an online news outlet, *kompas.com*, internet users in Indonesia increased by 202,6 million people by the start of 2021, which means the number increased by 15,5% or 27 million more people compared to January 2020. The current population of Indonesia is 274,9 million people, meaning that internet penetration in Indonesia by early 2021 reached 73,7%.

Business online runners benefit significantly due to the low cost that online business requires. People running online businesses, for example, do not need to pay rental fees, and that means fewer operational costs. Online business is also very effective and efficient, as it is one of the reasons why offline business runners are trying their luck online. Still, not all online businesses can proliferate, and in reality, many people experience failure when running an online business.

One example is the failure experienced by students of the oldest university in Samarinda, East Kalimantan, Indonesia. These students are Business Administration students from 2017-2018, Faculty

of Social and Political Sciences of Mulawarman University. The following data recapitulation is of Business Administration students who had started a business online.

Table 1. The Number of Business Administration Students from the Year 2017-2018 Who Had Started a Business

No.	Class and Year	Number of Students	Students Who Had Started a Business
1.	Business Administration (A) 2017	43 Students	19 Students
2.	Business Administration (B) 2017	45 Students	17 Students
3.	Business Administration (A) 2018	52 Students	7 Students
4.	Business Administration (B) 2018	41 Students	9 Students
	Total	181 Students	52 Students

Source: Data Collection by Authors

Based on the first survey, we gathered that the number of Business Administration from the year of 2017-2018 who had started a business before is 52 out of 181 students, meaning the majority of the students never tried starting a business online. Out of the 52 students who had started a business, not all of them could develop nicely. Many said they experienced failure to the point that their business had to take a downfall.

From that phenomenon, the authors of this study were interested in observing what kind of factors contribute to the failure of managing online business experienced by Business Administration students from the year of 2017-2018, Faculty of Social and Political Sciences, including the most dominant element that caused its permanent closing. Generally, these students have received lessons about theories regarding business that can be implemented into their business plans, as one of the learning outcomes of Business Administration majors is to create students with an entrepreneurial mindset that can be of use to society. Thus, the failure to manage an online business needs to be anticipated to prevent such an event and to have more young entrepreneurs that grow from Business Administration.

Theory. According to Timothy (2010) in a book titled *Developing an Online Business*, an online business is a business run by making use of the internet as a medium to market a product or service. Sidabalok (2016) said online business is all activities done on the internet to sell and purchase. Mahmud (2018) stated that online business is an activity that can be done by individuals or communities and as a means of information exchange by using the internet. According to Dedik Kurniawan, quoting from the article written by Aisha (2020), online business is a transaction done via the internet or any available shopping platform.

Several factors can cause a business to fail. As stated in a study done by Ali and Kodrat (2017), seven factors contribute, including economy, financial, experience, strategy, accident, scam, et cetera. Wartika (2015) stated that eight factors influence failure in running a business: managerial competence, experience, financial, planning, location, supervision, transition, and behavior. In the study done by Arasti, Zandi, and Bahmani (2014) with the title, "Business failure factors in Iranian SMEs: Do successful and unsuccessful entrepreneurs have different viewpoints?", the result showed that the main factor of failure in managing a business is "inappropriate policy." A few respondents also mentioned that the other reasons are the lack of support toward the business, the instability of rules and regulations, the lack of guarantee and monitoring to obey the rules, and bureaucracy. According to Suparyanto (2012), what become weaknesses to a few small businesses are marketing management, natural resources management, and financial management. According to Sari (2018), a study showed that four factors caused Le Crème to permanently go out of business: lack of experience in managing a business, human resources, financial management, and the inability to organize management systems.

A study by Srihadiastuti (2018) stated that the factor that influences business failure most is startup capital, then experience in entrepreneurship, marketing management, business ownership, business plan, economy, knowledge in business, operational management, relationship with the supplier, business feasibility analysis, business transition, rivals, motivation to do entrepreneurship, human resources management, financial management, and relationship with customers. Fourqoniah and Aransyah (2020) classified the factors that contribute to business failure into five categories: financial problems, managerial incompetence, lack of a good business plan, lack of experience and expertise, wrong target market, and disadvantageous market condition. According to a study done by

Jannah (2015), the factors that make a business experience a downfall are the economy, management errors, and natural disasters.

Method. This study uses the descriptive qualitative research method. According to Sugiyono (2019), qualitative research is used to scientifically observe object conditions and analyze the phenomenon experienced by the research subject. Furthermore, this method was chosen because of the interest the authors of this journal have in observing and knowing what kind of problems arose that can cause the business run by students to fail.

A total of ten operational variables were implemented in this study, which includes: 1) managerial incompetence, 2) lack of experience and expertise, 3) financial problems, 4) business plan, 5) wrong target market, 6) business transition, 7) resources management, 8) uncontrollable growth, 9) location, 10) marketing management.

These operational variables were implemented according to the theories applied in this study: managerial incompetence theory, uncontrollable growth, location, resources management, and business transition based on Zimmerer and Scarborough (2009). The lack of experience and expertise theory, financial problems, business plan, wrong market target based on Fourqoniah and Aransyah (2020). The marketing management theory, according to Suparyanto (2012).

Table 2. Operational Variables of the Study

Variable	Conceptual	Operational
Managerial Incompetence	According to Zimmerer and Scarborough (2009), one of the causes of business failure is managerial incompetence in every aspect.	Unable to improve business management. Unable to make a good decision.
Lack of Experience and Expertise	According to Fourqoniah and Aransyah (2020), people with no expertise and experience will push the business out of its market.	No experience regarding the business. No specific skills.
Financial Problems	Financial problems such as startup capital, liquidity constraint, debt management will fail the business (Fourqoniah dan Aransyah, 2020).	Poor money management. Not enough startup capital. Afraid of borrowing money to start up.
Business Plan	According to Fourqoniah and Aransyah (2020), planning is the main character of business; failure might arise when inappropriate planning happens.	Unorganized planning. Absence of a business plan.
Wrong Market Target	According to Fourqoniah dan Aransyah (2020), a failure in business can happen when we target the wrong market due to the market's inability to accept the product or service provided by the businessmen.	No market researches. The target market does not align with the product or service.
Business Transition	According to Zimmerer and Scarborough (2009), business growth requires people to let go of daily activities, something many business people cannot do.	No product variant provided. Afraid to make product variant.
Resources Management	According to Zimmerer and Scarborough (2009), insufficient resources management can explain why entrepreneurship experiences failure.	Records for the stocks are not done well. Does not do daily records.
Uncontrollable Growth	Business owners desperately want business growth, yet not all can manage their development well (Zimmerer and Scarborough, 2009).	Inability to follow the market's demand.
Location	Wrong location decisions can affect the customers' willingness to buy the product, which is why people in a business must consider a good location to start a business (Zimmerer and Scarborough, 2009).	Unstrategic location.
Marketing Management	According to Suparyanto (2012), what become weaknesses to small businesses are marketing management, operational, human resources, and financial.	Unable to maximize the opportunity to promote a product. Rarely make interesting content.

The object of this study is the students of Business Administration of the Faculty of Social and Political Sciences, Mulawarman University, class of 2017-2018, who have experienced failure in managing an online business. There are two kinds of data used in this study, which are primary and secondary. The primary data was collected directly by doing in-depth interviews with the sources who are the students of Business Administration who had experienced a failure running an online business before. The secondary data was collected through different forms such as literary books, the internet, journals, and thesis.

The analysis technique went through four steps, with the first one being collecting data through observation and in-depth interviews with the sources. The second one is data reduction which was narrowed down carefully in detail. The third one is the presentation of data by displaying data. The last process is by verification or conclusion making, which looks for meaning from the data collected by looking for similarities, relationships, or differences, to conclude answers to the studied problems.

Result and Discussion. The result of this study was obtained through in-depth interviews with the sources that decided and given their consent to be informants. Based on the records from those interviews, the authors concluded that it would be reduced to only the necessary information to the study and chosen to be presented to conclude. An initial description of the characteristics of the informants in this study is summarized in the following table.

Table 3. Characteristics of The Sources

No.	Social Media of the Failed Businesses	Business	Location	How Long It Lasted
1.	Instagram: palingtahu.id	Food	Balikpapan	3 Month
2.	Instagram: dugemb_official	Food	Samarinda	12 Month
3.	Instagram: kurbang.smd	Transportation Service	Samarinda	7 Month
4.	Instagram: pisangnah.sepaku	Food	Penajam	1 Month
5.	Instagram: dapuroshin_id	Food	Tenggarong	4 Month
6.	Instagram: lm.parfum	Skincare	Samarinda	2 Month
7.	Instagram: dailystuffsmr	Fashion	Samarinda	2 Month
8.	Instagram: jajanpiscok	Food	Samarinda	1 Month
9.	Instagram: healthy skin.co	Skincare	Samarinda	1 Month
10.	Facebook: Alviyanur Muhammad	Property	Samarinda	8 Month
11.	Instagram: kalaparansmr	Food	Samarinda	8 Month
12.	Instagram: skotir.id	Beverage	Samarinda	2 Month

Based on the data that we have collected through in-depth interviews with our 12 sources, it can be seen from Table 3 that our ten sources said that failed businesses could scarcely make it through the 1st year, while our other two sources said that failed businesses could last for one year. Moreover, the results of our in-depth interviews with 12 sources also cited that having a mentor could reduce the possibility of failure of said business because they could indirectly discuss problems with the mentor and gain advice that could be useful in the future.

Regarding business ownership, 8 of our sources said the business was run by individuals, while the other four said that the business was a partnership or was run together with colleagues.

Based on the same data collected through in-depth interviews with 12 sources, researchers found several factors that could cause an online business' failure. The factor that causes the online business to fail such as managerial incompetence, lack of experience and expertise, financial problems, business planning, wrong market target, business transition, inventory control, uncontrollable growth, location, marketing management, high product price, lack of communication, inconsistency, and time management. Below are the conclusions that we have concluded from our 12 sources:

1. Managerial incompetence

Five of 12 sources stated that they have not been able to manage their time between owning a business and going into college, so their lack of time management impacted the business that they ran.

One of them also stated that they scarcely had the time to do promotional rounds for their business, resulting in customers thinking that their business was no longer running. So that when they had the time to do promotional rounds again, the customers were no longer interested in their business.

2. Lack of experience and expertise

Five of 12 sources stated that they did not have any experience and expertise before starting a business, such as never joining the community and starting a business for the first time. Two of them also stated they had joined a business community to gain new knowledge in the business world. However, according to them, it was also ineffective because they joined without intense interaction with said community's mentor.

3. Financial problems

Six of 12 sources stated that the capital used to build a business came from their savings. One of the sources said that capital was the biggest problem in building a business because they did not dare to borrow more than what they had; because of that, the income earned was not comparable to the capital they had spent. Two of them also stated that if there was a lack of capital funds, the solution was to borrow capital from their respective parents.

4. Business planning

Two of our 12 sources stated that they did not have any business plans before starting their business because they did not understand business planning sciences. Their business was only managed by themselves, so they did not think they had to make a plan. Meanwhile, our other sources said they had carried out essential business planning, such as looking for suppliers for raw materials. However, according to them, the planned plans were not thorough, so it impacted their business.

5. Wrong market target

Three of 12 sources stated that one of the factors that caused their business to fail was the wrong market target. Some have promoted their business using their social media accounts and their business' social media accounts. However, because the promotions were carried out without proper research, it caused the advertisements to reach the wrong market target.

6. Business transition

Two of 12 sources stated that one of the factors that caused their business to fail was not optimally introducing product variations. One of them said that they had proposed product variations to customers. However, because the suppliers also did not have various variations to choose from and were afraid to choose a new supplier, they worried that the product would also be different and lose its authentic taste and impact consumers.

7. Inventory control

Nine of 12 sources said they have recorded inventory stock control, but the result contradicts what has been recorded because of inconsistent stock recording.

8. Uncontrollable growth

Eight of our 12 sources stated that their business had once experienced growth, but it did not last long because they could not handle the demands when market stocks rose. So they decided to stop operating their business. 2 of our 12 sources said that the business that they ran has never experienced any growth. Several sources said that one of the obstacles in developing a business was that they still did not adequately promote products. Hence, they needed more guidance from a mentor to provide advice for the business they were running.

9. Location

Two of 12 sources stated that location was one of the factors that failed their business because their business location can be challenging to access, far from urban areas. So if there were customers who wanted to buy their products, they would reconsider because of the relatively high shipping costs.

10. Marketing management

Three of our 12 sources stated that to help their business flourish, they would ask for help to promote their business from their friends, but eventually, they realized that it did not help much in their business' marketing growth. Then one of our sources also said that they did not dare pay for endorsements from social media influencers, even though it is proven to make businesses more known to the broader community.

11. High product price

One of our sources stated that another factor that caused their business to fail was the price of too high products from suppliers. They could not increase the price of their products again if there

were a price increase from the packaging suppliers. They feared that their customers would be dissatisfied with the store's service if a huge price increase that will cause the customer to stop purchasing their products.

12. Lack of communication

One of our sources stated that another factor that caused their business to fail was the lack of optimal communication between them and their team, which led them to stop their business because it did not go well with the initial plan.

13. Inconsistency

Three of 12 sources stated that one of the other factors that caused their business to fail was the inconsistency in running a business. They believe in being inconsistent in promoting their products because sometimes they forget or are caught lazing around.

14. Time management

One of our sources stated that another factor that caused their business to fail was. They could not manage their time well because they had not been able to manage their time between lectures from school and handling a business, so sometimes the product that the customer wanted was not by the initial agreement, which disappointed the customer.

From the data that we have conducted through interviews with various sources, we have concluded that the results of the most dominant factors that caused online businesses to fail for students of the Mulawarman University's Business Administration Study Program, Faculty of Social and Political Sciences, namely business planning, managerial incompetence, and lack of experience:

1. Four of 12 sources stated that an immature and rushed business plan was the dominant factor that caused their business to fail. The other four of 12 sources also stated that they did not have a good business plan before running a said business, which affected the other factors. Sources also said that before starting a business, it is better to plan it as best as possible in advance to be more structured in the future.

2. Three of 12 sources stated that managerial incompetence was the dominant factor that caused their business to fail. The other 3 of 12 sources also stated that they had not been able to manage their business well between lectures and college assignments and businesses being run by themselves without any employees. Because of that, the business was not run optimally.

3. Two of 12 sources stated that lack of experience and expertise was the dominant factor that caused their business to fail. They did not have any expertise in promoting the product appropriately. It created an impact on their business. The lack of expertise, such as several business teams in the production process, results in delayed production from a specified time.

Conclusions. Based on the data from our research that has been compiled and explained by the problem, it can be concluded what factors are the cause of online business failures and the dominant factors that caused the business of Business Administration study program students for the 2017-2018 class to fail as follows: 1) Managerial incompetence; 2) Lack of experience and expertise; 3) Financial problems; 4) Business planning; 5) Wrong market target; 6) Business transition; 7) Inventory control; 8) Uncontrolled growth; 9) Location; 10) Marketing management; 11) High product price; 12) Lack of communication; 13) Inconsistency; 14) Time management. Out of the 14 factors that cause students' online business failures, the most dominant factors that cause online student businesses to fail are business planning, managerial incompetence, and lack of experience and expertise.

Based on the data of our research conducted through an in-depth interview process with various sources, suggestions can be made for students of the 2017-2018 Business Administration study program to anticipate failures that might occur in the Business Administration study program: 1) Administration students are expected to be able to carry out a matured business plan so the business can have a solid ground and well structured, as well as paying more serious attention in running the business; 2) Students can add insights related to the business world by joining business training in order to increase the entrepreneurial spirit; 3) For the Business Administration study program, we hope that it can develop a more intensive forum or place for business owners students, as well as to provide a unique business training for students.

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RESEARCH ON CONFIRMATION AND MEASUREMENT OF CORPORATE ENVIRONMENTAL COSTS-BASED ON GREEN ECONOMY

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ABSTRACT

Green economy can effectively solve the issue of environmental damage happened during economic development. Meanwhile, many countries have taken the development of green economy as an economic development mode, in which the protection of ecological and environmental, and the development of economic and social could be simultaneously realized. Since the deteriorating environmental situation has seriously affected the healthy development of human society, the environmental cost management should be incorporated into the enterprise cost management research as soon as possible. This paper mainly studies the theory of natural resources and environmental system in the enterprise cost management theory, discusses the enterprise environmental cost management, confirmation and measurement under low carbon economy, provides new ideas for improving the enterprise environmental cost theory and realizing the sustainable development of economy.

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Related theoretical research. Firstly, in terms of low-carbon economic theory, it is based on low energy consumption, low pollution, low emissions, with an ability to maximize carbon productivity, adapt to climate change, as far as possible slow the negative impact of climate change and along the path of sustainable development of economic form. And its core and goal is to innovate energy technology and system, to reduce the risk of climate warming, to promote the sustainable development of mankind [1, p.126-148]. Since the 1970s, the international community has been concerned about the development of low-carbon economy. The United Nations has adopted the United Nations Framework Convention on Climate Change (1992), the Kyoto Protocol (1997), the Delhi Declaration (2002), the Paris Agreement (2015), and held the 26th Conference of the Parties to the Convention in Glasgow, UK in November 2020, calling for emission reduction, tackling climate change and ensuring sustainable economic development [2]. Low-carbon economy is a new economic development model, which affects the whole cycle of the product production process of enterprises, and its essence is energy conservation and emission reduction. In the EU Climate and Energy Framework for 2030, the Commission proposed in September 2020 to raise the 2030 greenhouse gas emission reduction target, including emissions and removals, at least 55% compared to 1990 [3]. As one of the largest energy consumers, Chinese government also advocates the development of environmental protection industry, new energy industry, ecological economy and circular economy. Low carbon economy requires following the law of ecology to reduce the impact of economic activities on the natural environment to as small the extent as possible. The purpose of low carbon economy is to achieve sustainable economic, social and environmental development.

Secondly, it is the theory of sustainable development. Sustainable development reflects the reflection on the relationship between human own progress and natural environment, and is a product of the development of human society. The concept of sustainable development originally originated from ecology

was proposed in the 1980 by the International Alliance for Conservation of Nature in the World Outline of Conservation, and later added some new connotations to form a comprehensive concept in the fields of economic, social, cultural, technological, and natural environment. In 1987, at the WECD, on behalf of the members, the concept of "Sustainable development" was formally introduced in "Our Common Future" (Our Common Future) [4]. At the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil in June 1992, a series of documents such as Agenda 21 and the Framework Convention on Climate Change were adopted, which was agreed and recognized by the concept of sustainable development had international significance, meaning that the concept of sustainable development developed from theoretical exploration to the stage of global action [5].

Niu Wenjuan (2014) puts forward that the theoretical connotation of sustainable development is extracted from three essential elements, namely, the "power" of development, the "quality" of development, and the "fairness" of development. He emphasized that the sustainable development SD maximization can be achieved when the intersection of dynamics (DS), mass (QS), and fairness (ES) maximize [6, p.410-414]. The theoretical basis of cost management is the sustainable development theory, and also the theoretical basis of environmental cost accounting. While focusing on the state and goals of development, more attentions have been paid to the cultivation and sustainability of development potential for development, and emphasized the endurance and sustainability of development trends. Under the concept of sustainable development, environmental cost accounting is in the three-dimensional "economic-social-ecological" system, and its mission and position is inevitably different from the traditional cost accounting. Therefore, the traditional cost accounting should be revised to meet the needs of environmental cost accounting objectives.

Confirmation and measurement of enterprise environmental costs from the perspective of low-green economy. Cost is the same study as economics and accounting, but from different perspectives. Qian Wenjuan (2018) noted that the definition of cost in Cost Management is the resources consumed or abandoned to achieve a particular purpose. In economics, people study not only the costs incurred in the production process of enterprises, but also the costs incurred before and after the production process and the costs incurred between enterprises, between enterprises and society, and between internal organizations [7, p.182-183]. In this paper we want to discuss the cost management environmental cost as a technical tool to solve the economic problems in the economic development. The confirmation of enterprise environmental cost needs to combine the actual situation of the enterprise, to start from the environmental protection concept of low-carbon economy, to analyze the production and operation activities of the enterprise, as well as to confirm the environmental cost of the enterprise.

Cost accounting based on the green economy. Environmental costs are the cost of being responsible for the environment and being required to manage the impact of corporate activities on the environment. Enterprises with resource consumption as the main focus attach great importance to the reduction of environmental costs. In the environment of low carbon economy, the environmental requirements of energy enterprises become very high. In order to reduce the control cost of the environment, enterprises must use the various process production links of accounting enterprises to accurately control the investment of resources. Based on the perspective of low-carbon economy, accounting is not a change of accounting method, but a great change of accounting content. Here we take power companies as an example to list what should be included in environmental costs during production:

- 1) Depreciation expense of the equipment.
- 2) Equipment maintenance fee.
- 3) Treatment fee for waste pollutants.
- 4) Research and development costs on environmental protection.
- 5) Other environmental protection expenditures

In the process of confirmation and measurement of environmental costs, two main problems are needed to be solved. One is that the accounting subjects have to be standardized and unified. The other is that the environmental costs should be capitalized or cost-oriented. The recognition of environmental costs should first establish a unified measurement specification to facilitate management and comparability of data between enterprises. The environmental cost account is the profit and loss account of the current environmental cost and the comprehensive accounting system issued by the United Nations Statistics Agency (1993), defining the environmental cost as the loss due to the quantity consumption and quality of environmental resources [8]. The 15th meeting of the United Nations International Accounting

and Reporting Standards Intergovernmental Expert Working Group (ISAR) first proposed in the Position Announcement of Environmental Accounting and Reporting that the environmental that cost should be measured as the period cost and capitalization conditions should be capitalized [9]. Wang Yan and co-workers (2012) proposed that environmental costs flow economic interests into the enterprise through the following ways directly or indirectly, a) improving the ability of other assets owned by the enterprise, the production safety, and production efficiency. b) reducing or prevent pollution from future production and operation activities. c) protecting the environment [10, p.8-10].

Relevant recommendations. Enterprise pollution emission accounting system should be established as soon as possible. Overall, the confirmation of carbon emission costs and the determination of measurement are more complex. Carbon emissions costing require matching accounts to count these measurements. It is required to be included accurately and promptly in accounting statements. From the perspective of low-carbon economy, it will become very meaningful to build the enterprise carbon emission accounting system.

Conclusions. Under the promotion of low-carbon economy, enterprises should assume the corresponding environmental responsibilities. The internalization of external environmental costs is an inevitable trend, including establishment an environmental cost accounting system and gradually internalizing the external costs that should be borne by the enterprise. It can reduce the impact of large profit fluctuations on enterprises in the centralized external environmental costs in the future.

Including environmental costs into enterprise accounting costs can help enterprises to establish environmental awareness, so as to force enterprises to improve their production mode, optimize the industrial structure to ensure reduced energy consumption, and finally achieve the purpose of environmental protection. From the perspective of low-carbon economy, the development of enterprise environmental cost accounting work is facing profound challenges in the transformation period, especially by taking certain measures to optimize and adjust their own environmental cost accounting work. Taking the sustainable development as the goal can solve the problems existing in the environmental cost accounting of enterprises, implement the preventive management of enterprise environmental cost accounting, and promote the unity of enterprise economic and social benefits to a direct extent.

So, I think as the country vigorously advocates a green economy, government departments, enterprises, and the public must actively respond to the call of the state and clarify their rights, responsibilities and obligations. Government departments must vigorously support and supervise enterprises to prevent business activities that cause major environmental pollution. Once discovered It is absolutely serious to deal with rectification. For the sake of its own reputation and long-term development, enterprises must also consciously reduce pollution and emission reduction, and the public must also play a good role in supervision and contribute to the creation of a green environment.

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THE INFLUENCE OF THE DIGITAL ECONOMY ON THE DEVELOPMENT OF THE DOMESTIC ECONOMY

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ABSTRACT

The article examines the problems and prospects for the development of the digital economy in Ukraine.

The current trends of new technological solutions and opportunities are identified, because global informatization intensifies this process.

The effective use of digital economy tools, the means of which is to ensure information security and stability in the country, is described.

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Introduction. The study of problems and prospects for the development of the digital economy in Ukraine is quite relevant, because now there is a decisive transition from the raw materials economy to high-tech production.

Modern trends of new technological solutions and opportunities, global informatization intensify this process. At the same time, the digital economy focuses on international, European and regional cooperation in order to enter the European and world markets.

In addition, the effective use of digital economy tools is a means of ensuring information security and stability.

These factors cause considerable interest in the study of this area.

Research purpose. The main purpose of the research is to reveal the essence and features of the formation of the digital economy and its impact on the development of the domestic economy.

Research materials and methods. In this article uses general scientific methods of analysis and synthesis of action induction and deduction, the transition from abstract to concrete, as well as special methods of analysis: grouping, comparison, systematic and others.

Results. In the third wave of globalization, the digital economy plays an important role in the development of countries, the most important factor of which is information and knowledge, as well as ways to access them. The digital economy is not a separate industry, but a virtual environment that complements our reality.

Increasingly, the digital economy is intertwined with the traditional economy, making clear demarcations increasingly difficult. The main products of the digital economy are the same goods and

services of the traditional economy provided by computer equipment and digital systems such as the global Internet. This has its advantages, the main of which is to increase the availability of ordinary users to certain markets (goods or services), not just large companies, reduce transaction costs, increase efficiency and competitiveness [2]. At the same time, it should be noted that among scientists and practitioners there is no single approach to defining the concept of digital economy.

In the classical sense, the «digital economy» is an activity in which the key factors (means) of production are digital data and their use, which can significantly increase efficiency / productivity in various economic activities. The «digital economy» is also called the economy that uses digital technologies and services [3]. The terms «data economy», «internet economy», «new economy», or «web economy» are often used.

As for the digital skills of Ukrainians, domestic IT specialists are among the five best specialists in the field in the world. And Ukrainian IT companies are associated with the international space of innovation. However, digital skills are a person's ability to use information technology. Such skills apply not only to professionals in the field of information and computer technology, but also to citizens in general.

It is digital skills that should facilitate the use of technology in everyday life. Such skills include the ability to search, evaluate and process information, interaction and correct use of technologies for communication in the relevant online environment, as well as skills of creating and editing digital content [4].

The introduction of digital technologies is accompanied by certain challenges that society and the state must overcome for the successful implementation of the digital economy: short-term decline in productivity from the introduction of new technologies; reduction of the number of employees, in particular highly paid and low-skilled workers and increase of technological unemployment; temporary growth of unevenness in the distribution of income for the period of professional development of employees to the required level of qualification; significant changes in the regional structure of the location of productive forces, the necessary education and qualifications of staff, infrastructure; transformation of norms and rules (strengthening the protection of intellectual property rights, improving antitrust law, etc.), lifestyle [11].

The role of the state in the implementation of the digital economy is two fold. First, as a regulator that introduces and establishes norms, principles and bases of coexistence of elements of digital economy along with the existing realities in the state, controls and checks the methods of their use, carries out technological changes that strengthen digital relations between society and government. Second, the state can use the internet and information technology directly in providing its services in online commerce, e-government [9].

However, the peculiarity of Ukrainian digital development is that individual users and businesses are significantly ahead of the state and industry. Domestic small and medium-sized businesses are already working on the Internet in one way or another and mostly use digital methods to promote their services, while the state and large industry in Ukraine are far behind.

Within the framework of the «EU's Europe 2020 strategy», one of the important development initiatives has been the Digital Single Market Strategy (Digital Single Market Strategy). The program contains a list of 100 specific actions for the development of the digital single market, trust and security of users of online transactions, improving electronic skills, using information technology to solve social problems, stimulating research and innovation. In the context of Ukraine's European integration aspirations and the introduction of a number of reforms on the path to democratization and European progress, the development of elements of the digital economy can become an important mechanism for transforming and moving away from the old pro-Soviet system of governance and relations [7].

Institutional and legal registration of the development of the digital economy in Ukraine began in 2013, when the Cabinet of Ministers of Ukraine issued an order «On approval of the strategy for the development of the information society in Ukraine».

In June 2015, Ukraine joined the Declaration of the First EU Eastern Partnership Ministerial Meeting on the Digital Economy. The next step was to develop the conceptual framework of the «Digital Agenda of Ukraine – 2020», which defined the key tasks, priorities, initiatives and projects of «digitalization» of Ukraine for the next three years.

In 2017, the Law of Ukraine «On Electronic Trust Services» was adopted (in fact, it is a technical translation of the European Regulation on eIDAS regulation).

On January 17, 2018, the government approved the Concept of Development of the Digital Economy and Society of Ukraine for 2018 — 2020 and approved an action plan for its implementation [4].

The main purpose of the document was to implement the initiatives of the «Digital Agenda of Ukraine 2020» (digital strategy) to remove barriers to the digital transformation of Ukraine in the most promising areas. The strategy was based on stimulating the economy and attracting investment, overcoming digital inequality, deepening cooperation with the EU in the digital sphere and building the country's innovation infrastructure and digital transformation. The development of digital infrastructure as the basis of the digital economy, digitalization of the real sector through the creation of «digital workplace», «smart factories», etc., as well as basic areas of life, the development of digital literacy.

For the successful formation of the digital economy requires three effectively functioning components:		
➤ regulatory framework that would promote competition and market entry of enterprises, allowed enterprises to make full use of digital technologies for competition and innovation;	➤ kills needed by employees, businessmen, civil servants to use the opportunities of digital technologies;	➤ effective and accountable institutions that use the internet to empower citizens.

Fig. 1. qualitative components of the digital economy. Source: [13].

As of 2020, 119 electronic services are available to citizens and businesses in Ukraine. The «single window» of access to state electronic services is the Government portal [1]. Services that are already available online include social services, business services, construction services, security and court services, car owner services, transportation services, and more. In addition, two new portals for public control are already in place: for the use of international technical assistance and for state-owned enterprises. At the same time, according to the rating indicators for the effective implementation and development of digital economy methods in Ukraine, the state is not in the forefront. Thus, according to the Bloomberg Innovation Index [6] - a rating that reflects the key factors of innovative economic development, Ukraine in 2018 entered the top fifty innovative economies and took 46-th place, but in 2019 the level of introduction of elements of innovative economy dropped to 53 position.

We will try to identify the main problems and obstacles during the introduction and development of the digital economy in Ukraine. First, it is not a well-developed infrastructure (according to Speedtest.net, Ukraine's position in the world in terms of Internet connection quality is incredibly low: 114th place in the quality of mobile Internet and 45-th in the quality of broadband internet [12]). Secondly, it is low technological education, accessibility to the benefits and opportunities of the digital world for all citizens, territorial digital inequality (rural population, low-income people and older age groups are more limited in access to the Internet), a small share of innovation in digital economy (only 17% of Ukrainian industries use innovation, while in the EU this figure reaches 49% [5]).

Third, it is the obsolescence of technology in government organizations and structures (if Ukrainian private IT companies can afford the latest equipment, government agencies, small and medium-sized businesses, potential buyers of their goods and services in Ukraine, and ordinary Ukrainians are limited as in technology and finance).

Fourth, the low level of state support for the modernization of fixed assets into digital, the existence of most projects on paper and their lack of implementation in practice, weak progress in approaching the key achievements identified in the harmonization of digital markets by the document "20 expected achievements of the Eastern Partnership by 2020 lack of a coherent strategic approach to policy-making to harmonize digital markets with the EU [10].

In addition, obstacles to the development of the digital economy in Ukraine include the lack of standardization of entire digital systems and the use of the internet of Things, which could guarantee information security both at the individual level and at the level of information services provided by the state. However, the construction of digital systems, platforms and infrastructures to be used by citizens, businesses and the state cannot operate solely on national standards [8].

A number of obstacles to the development of the digital economy in Ukraine include the low level of security and trust of Internet users in the digital economy, high risk of information and cyber-attacks, imperfect antivirus equipment, and a relatively small share of investment in digital infrastructure.

This indicates that the actual implementation of solutions such as e-governance and e-economy is now more declarative and needs concrete reforms. However, the informatization of society can increase the investment attractiveness of the state and economic potential. In particular, increasing the number of services that can be provided online reduces the level of corruption in the state, raises the level of openness of services provided and the level of transparency of government agencies. The advantages of the digital economy include lower prices for goods, their availability and wide variety, saving time and human resources as labor and at the same time almost "infinity" of goods in electronic form.

Conclusions. Thus, today, the digital economy is an effective basis for the development of public administration, economy, business, social sphere and society as a whole.

The formation of the digital economy is also a matter of national security and independence of Ukraine, competition of domestic companies, the country's position on the world stage in the long run. Successful development of the digital economy in Ukraine requires an effective state policy to bridge the "digital divide" and stimulate the development of the digital economy.

The country cannot be successful in the development of the digital economy in the absence of the necessary regulatory framework, economic development strategy based on digital technologies.

But no less important is the formation of professional skills, basic ICT - literacy, preparation for a professional career, promoting lifelong learning.

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BENCHMARKING E-GOVERNMENT: CURRENT TRENDS AND DIGITAL BARRIERS TO DEVELOPMENT

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ABSTRACT

The basic principles and methodological foundations for measuring the readiness and ability of the national institutions to provide citizens and businesses with access to public services online are considered. On the occasion of the 20th anniversary of the study of the implementation of e-government tools in UN member states (UN E-Government Survey), current trends and transformations of the e-government model, the digital divide and digital barriers to further progress in the development of the digital economy and e-democracy are analyzed. The methodological basis of the study applied are techniques and methods of complex comparative analysis and logical generalization and the information base is formed by the results of the UN E-Government Survey and World Bank Governance Surveys.

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1. Introduction. The rapid progress of information and communication technologies (ICT) is embodied in all spheres of life of modern society. An irreversible trend in the world development is the innovative improvement of public administration, in particular, the introduction of the e-government model and its digital transformation to solve the multifaceted and complex problems that humanity faces on a daily basis.

The e-government information and communication system is not a supplement or analogue of traditional government, its main purpose is to create conditions for the optimal functioning of all branches and levels of government, to ensure quality standards for the provision of administrative and social services to citizens and businesses based on the active use of the ICT [1]. Traditionally, there are three e-government information sectors:

- G2G (Government-to-Government) involves sharing data and provides for online interaction of government bodies of various levels (central, regional, local) and various branches of government (executive, legislative, judicial). The creation of interdepartmental networks, corporate and state databases and registers, the introduction of electronic document flow between various government structures - all this optimizes the processes of collecting and processing information, contributing to an increase in the efficiency of the state apparatus.

- G2C (Government-to-Citizens) simplifies interaction between the state and society: on the one hand, the provision of administrative and social services to citizens (electronic personal

identification, employment, declaration, social security services, etc.), on the other, public involvement in the government decision-making process.

- G2B (Government-to-Business) contains business-specific transactions (business registration, issuance of licenses and permits, declaration, interaction with fiscal authorities, government procurement, etc.), as well as the provision of business-oriented services.

There is no single generally accepted model of e-government in the world, each country decides on the level and scope of its initiatives in the field of implementation of e-government in accordance with its own national priorities. The main goal of e-government is to improve the efficiency of the executive functions of the state, to make the government more transparent and accountable to citizens and businesses, to guarantee data confidentiality and cybersecurity.

2. International e-Government research experience. E-government as a modernized form of organization of public administration was launched in 2000 as the following powerful government web portals: eCitizen portal in Singapore, FirstGov in the US, and e-citizen, e-business, e-government in the UK. Since the introduction of e-government technologies, several systems of informatization of administrative processes have changed. The rapid spread of the Internet, the massive use of innovative communication tools and various information technologies, the powerful development of social networks made it necessary to introduce deeper digital transformations into the management sphere. Each new generation of the ICTs resulted in an increase in the complexity of e-government, an expansion of the range of public services offered, and an increase in their accessibility and inclusiveness. New electronic communication platforms have become an effective tool for involving citizens and businesses in the process of making government decisions, which is declared in the Global Goals as one of the elements of sustainable development (Goal 16.7 SDG) [2].

The Department of Economic and Social Affairs (UN DESA) has been tracking progress in the development of e-government in the UN member states since 2001. Every two years, a global report is published, which analyzes at the national level: public online service systems, the state of the telecommunications infrastructure and the availability of human resources capable of promoting and using the powerful capabilities of modern ICTs. The E-Government Development Index (EGDI) is used as a generalized assessment of the level of implementation by countries of digital technologies in order to improve the interaction of public authorities and society, according to which the corresponding ratings are compiled.

The evolution of the search for and adaptation of the best e-government practices is reproduced by the topic of the UN E-Government Surveys [3]. The most iconic ones among them are: Benchmarking E-government: A Global Perspective (2001); From E-Government to E-Inclusion (2005); From E-Government to Connected Governance (2008); E-Government for the Future We Want (2014); E-Government in Support of Sustainable Development (2016); Gearing E-Government to support transformation towards sustainable and resilient societies (2018); Digital Government in the Decade of Action for Sustainable Development (With addendum on COVID-19 Response) (2020). The latest UN E-Government Survey summarizes the results of the 20-year period of transformation of public administration in the direction of its digitalization. The global COVID-19 pandemic has reinvigorated the role of e-government in both traditional digital service delivery and new innovative crisis management efforts, becoming an essential element of communication (networking, e-health, online learning, and telecommuting) [4].

The introduction of modern digital technologies (artificial intelligence, cloud technologies, as well as blockchain technologies, data analysis and the Internet of things) into the sphere of public administration contributed to the formation of an effective e-governance system and accelerated the pace of digital transformation. Technological, organizational, and strategic aspects of digitization of public administration in countries worldwide, innovative programs and best practices of e-government are actively debated in such international scientific journals as *Electronic Government*, an *International Journal* (EGIJ); *International Journal of Electronic Government Research* (IJEGR); *International Journal of Public Administration in the Digital Age* (IJPADA); *Transforming Government: People, Process, and Policy* (TGPPP) etc.

Topics in the journals also cover e-readiness and e-business models, introduction and dissemination of local e-government, e-democracy and e-voting, digital divide/social isolation, personal data protection, information- and cybersecurity. One cannot ignore the fundamental review [5], in which the authors analyzed more than 130 publications devoted to research on costs, opportunities, priorities and risks affecting the implementation of electronic government.

The purpose of the article is to summarize the international experience in assessing the development of e-government, to carry out a comparative analysis of the readiness and ability of governments to provide services online, to identify global trends, patterns, and contradictions in the evolution of public administration under modern conditions of digital transformations.

3. Research Methods. The E-Government Development Index (EGDI) is a key benchmarking tool for the progress achieved in the digitalization of public administration. The index aggregates 12 basic indicators, which, from the point of view of international experts, embody the country's ability to participate in the digitalization of public services and are aimed at improving the efficiency of management and the quality of life of people [6]. The basic indicators are grouped into three sub-indices: Telecommunications Infrastructure Index (TII) based on data from the International Telecommunication Union (ITU), Human Capital Index (HCI) based on UNESCO information, and Online Services Index (OSI), which is based on expert estimates from an independent survey of official government portals and websites and is being carried out by UN DESA at the stage of preparing the next ranking. Aggregation of indicators of different dimensions and different measurement scales presupposes their preliminary standardization. Within each of the above-mentioned sub-indices, the basic indicators are standardized according to the z-score procedure:

$$z_{ij} = \frac{x_{ij} - \mu_i}{\sigma_i},$$

where z_{ij} and x_{ij} are standardized and the real values of the i -th indicator in the j -th country;

μ_i and σ_i are the means and standard deviations of the i -th indicator for the sample of countries.

Algebraically, EGDI is calculated as the arithmetic mean of the named sub-indices:

$$\text{EGDI} = 1/3 (\text{TII} + \text{HCI} + \text{OSI})$$

The TII sub-index assesses the state of the telecommunications infrastructure development and is determined as average of z-scores of the following four indicators (per 100 inhabitants): Internet users, mobile subscribers, fixed broadband subscribers, and active mobile broadband subscribers. In 2020, an upper limit of 120% was introduced for all indicators.

The HCI sub-index indicates how high the level of education of citizens is and whether they are ready to promote and effectively use the latest ICTs. Algebraically, the HCI is determined as the sum of the z-scores of four indicators: adult literacy (%), gross school enrollment ratio (upper bound of 100%), average duration of school completion for adults and expected duration of schooling (years).

The OSI sub-index measures the completeness of the provision of services through the web interface, the availability of online services and content, their adaptation for mobile applications, and the like. There are four stages of development of online services: emerging information services, enhanced information services; transactional services; connected services (in %). The total number of points scored by each country is standardized according to the z-score procedure in the same way as the indicators of other sub-indices.

The standardized values of each i -th sub-index of the j -th country Z_{ij} are converted into a single rating scale from 0 to 1 using the minimax criterion [4, Annexes]. Since all basic indicators are stimulants, the conversion is carried out according to the formula:

$$G_{ij} = \left(\frac{Z_{ij} - Z_{i,\min}}{Z_{i,\max} - Z_{i,\min}} \right),$$

where G_{ij} is the rating of the i -th sub-index of the j -th country;

Z_{ij} is the standardized value of the i -th sub-index of the j -th country (for TII - average level; for HCI - the total value of human capital; for OSI - the total number of points);

$(Z_{i,\max} - Z_{i,\min})$ is the range of standardized values of the i -th sub-index in the sample of countries covered by the study.

Based on EGDI, countries are classified according to the level of e-government development: VH (very high, $\text{EGDI} > 0.75$); H (high, $0.50 \leq \text{EGDI} \leq 0.75$); M (medium, $0.25 \leq \text{EGDI} < 0.50$); and L (low, $\text{EGDI} < 0.25$). In 2020, the EGDI ratings were supplemented with grade classes - now each group is divided into four equal intervals (quartiles), which provides a more detailed cluster analysis.

The opportunities for interaction and partnership between citizens and government are expanding with the improvement of the e-government model. To compare the willingness of countries to involve civil society and the business sector in decision-making processes, the Electronic Participation Index (EPI) is defined, which is based on the indicators of the OSI sub-index and is

practically an appendix to the EGDI with an identical division into groups. Both indices demonstrate the effectiveness of the national e-government not in absolute terms, but in relation to each other, which gives rise to each country to identify strengths, weaknesses, opportunities, and threats in public administration, and then formulate its strategy for digital transformation of the government [7], [8].

4. Results. The analysis of the UN E-Government Survey data indicates a global trend of steady development of e-government. From year to year, the number of countries with a high level of EGDI is growing and almost all countries, regardless of their geographic location and characteristics of the economic structure, are expanding the scope of using the latest ICTs to provide public online services and deepening the dialogue between the government and society. The structural shifts in the e-government development in 2016-2020 on a planetary scale are illustrated in Fig. 1.

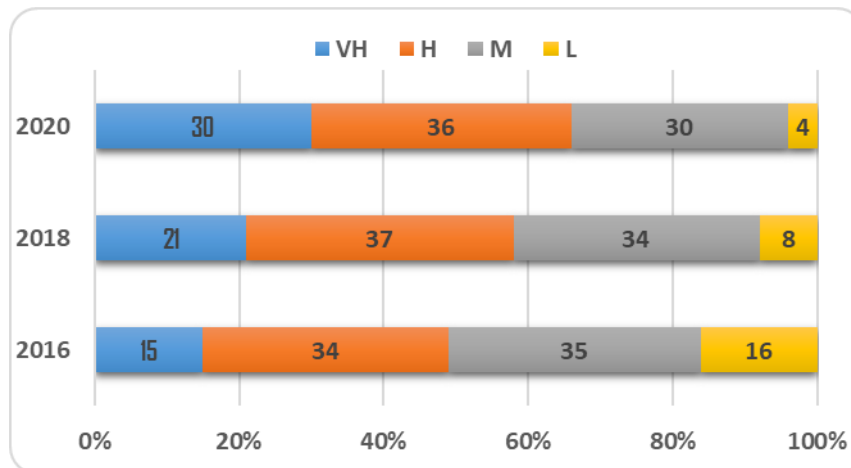


Fig. 1. The global structural shifts in the e-government development in 2016-2020.

The share of countries with the highest (VH) level of e-government development increased from 15 to 30%, but the share of countries with the lowest (L) level decreased from 16 to 4%. According to the E-Government Survey 2020, more than 2/3 of the countries received an EGDI score > 0.50, including 59 countries in the range [0.75 ÷ 1.0] (of which 14 countries were in the highest VH group); and only 8 countries remained in the L group with an EGDI score < 0.25. The average EGDI level increased from 0.49 in 2016 to 0.60 in 2020. The main drivers of e-government development over this period were: increased investment in ICT infrastructure and transformation of public services into convenient online services.

Figure 2 shows the relationship between the level of a country's economic development (by Gross National Income (GNI) per capita) and the e-government development: in countries with higher incomes, the EGDI value is significantly higher than in countries with lower incomes. At the same time, the dynamics of progress in the e-government development is demonstrated by countries in all income groups.

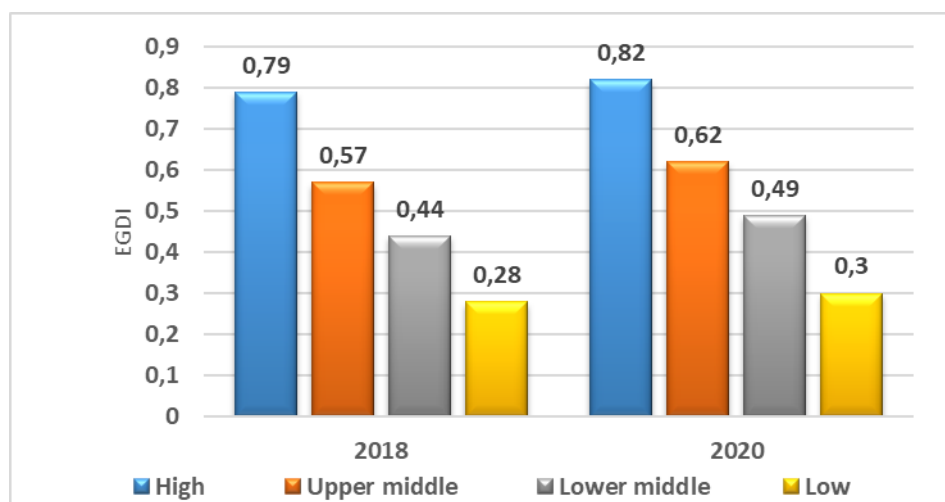


Fig. 2. Change in EGDI in groups of countries with different incomes.

All regions of the world are making progress in the development of e-government, which confirms the growth of regional values of EGDI in 2020 compared to 2018 (Table 1). The growth of EGDI values across regions is almost the same, therefore, despite certain successes in the development of e-government, regional imbalances and digital inequality persist. The oscillation coefficients, calculated for each region as the ratio of the range of variation to the mean, range from 0.41 in Europe to 1.51 in Africa. Therefore, Europe with a high EGDI value and a low level of its variation is the leader in the development of e-government. At the regional level, all 43 European countries are in the high or very high EGDI group, and eight of them are in the VH group.

Table 1. EGDI regional levels and oscillation coefficients in 2018 and 2020

Region	EGDI level		Oscillation coefficient	
	2018	2020	2018	2020
Africa	0.34	0.39	1.77	1.51
Americas	0.59	0.63	0.97	1.04
Asia	0.58	0.64	1.18	1.01
Europe	0.77	0.82	0.82	0.41
Oceania	0.46	0.51	1.82	1.29
World	0.55	0.60	1.56	1.48

One of the key aspects of public administration influencing the development of society is the involvement of citizens in the processes of formation and decision-making through information and communication channels of interaction: e-government portals and other state websites related to the provision of information to citizens, social networks, mobile platforms and devices. The most common forms of communication between government and society are e-consultations and discussion forums, moderation of thematic subgroups, submission of petitions and appeals, e-voting. Electronic innovations in the world, of course, affect the transformation of forms of communicative interaction and contribute to their fairly rapid spread from developed regions to less developed ones. However, due to legal traditions, economic and cultural differences, the level of development of e-government and forms of e-participation vary greatly by country [4], [8].

To measure the activity of communications between the government and society, the E-Participation Index (EPI) is used, which, by analogy with the EGDI, takes values from 0 to 1. According to the UN E-Government Survey 2020, a third of countries have reached the highest level (EPI>0.75); at the same time, one of five countries, due to a lack of resources for the development and implementation of ICTs, had extremely limited opportunities for e-participation and mobile management (EPI<0.25). On average, countries provided 14 of the 20 online services, which accessibility was assessed in the survey. Almost 90% of the countries ensured the development and operation of a single state portal, taking into account the principle of a “one-stop-shop”. The number of countries that provide sectoral information has increased, especially the websites of government departments responsible for education, health, labor relations, social protection of the population, environmental protection, and justice. More than 3/4 of public online services are adapted for mobile devices [4].

At the same time, it should be noted that the E-Government Survey surveys essentially record information on the “supply” of e-participation, and the “demand” for e-participation remains outside these surveys. Meanwhile, numerous opinion polls in various countries, in particular the Gallup International poll, show a low level of trust in government agencies, which reduces the effectiveness of communicative interaction between government and society [8], [9].

According to the E-Government Survey 2020, 14 countries were recognized as leading in the development of e-government and e-participation (VH group), 8 of them are European. The leading countries have begun the full-scale introduction of new generation electronic government technologies - digital government, are implementing projects for the digital transformation of public administration systems, and expanding the range of online services. Unlike e-governance, digital governance provides for an integrated approach that prioritizes improving the efficiency and effectiveness of governance and its focus on achieving the Global Sustainable Development Goals [10].

To identify the advantages or vulnerabilities of digital government versus e-government, a comparative analysis is carried out using the Worldwide Governance Indicators (WGI), namely: Government Effectiveness (GE) and Control of Corruption (CC). The GE indicator is considered as a comprehensive assessment of the quality of public services, the competence of civil servants, the level of

independence of the civil service from political pressure and the level of trust in government policies; the CC indicator reflects progress in anti-corruption [11]. The measure of both WGI indicators is Percentile Ranks, which take values from 0 to 100 (higher values correspond to better results) [12].

The object of the study is 17 European countries combined in two clusters: the first cluster is represented by 8 leading countries in the development of e-government (Denmark, Estonia, Finland, Sweden, UK, Netherlands, Spain, Norway), the second - 9 countries of Eastern Europe, of which six countries are members of the European Union (Bulgaria, Hungary, Romania, Slovakia, Czech Republic, Poland) and three countries are members of the Eastern Partnership (Belarus, Moldova, Ukraine). The information base was formed according to the results of the E-Government Survey 2020 and the World Bank Governance Surveys.

The correlation coefficients in table 2 indicate the presence of a significant relationship between the level of e-government development, Government Effectiveness (GE) and Control of Corruption (CC) in all countries (the supra-diagonal coefficients of correlation measure the strength of the relationship in the cluster of leading countries, below diagonal ones - in the cluster of Eastern European countries).

Table 2. The relationship of e-government development between government effectiveness and control of corruption

Indicators	EGDI	GE	CC
EGDI	1	0.535	0.668
GE	0.672	1	0.923
CC	0.879	0.827	1

The advantages of digital government over e-government in terms of management efficiency, government transparency and control over corruption are also evidenced by the inter-cluster deviations of the average values of all three indicators. The significance of these deviations is confirmed with a high degree of probability by the *t-test* (Table 3).

Table 3. Deviations of average values of indicators EGDI, GE and CC by clusters

Cluster	# of countries	EGDI	GE	CC
I	8	0.93	93.09	93.33
II	9	0.78	58.17	52.67
Deviation	x	0.15	34.92	40.66
<i>t-test</i>	x	7.41	5.37	6.50

Thus, digital transformation contributes to the efficiency of public administration, government transparency, reduce corruption, the involvement of civil society and the business sector in the decision-making processes. Digital transformation brings e-government to a new, higher level, creates a qualitatively new dialogue between the state and society and is gaining more and more popularity in the world [13], [14]. However, in a large part of the countries, the implementation of a digital governance system faces a number of objective and systemic digital barriers. These are the lack of modern means of communication due to limited resources, poverty and insufficient digital literacy of the population, disability, a low level of trust in government institutions and many other obstacles. All of them are combined into one global problem of digital (information) inequality - the Digital divide.

The digital divide is a complex and multidimensional issue that reflects and simultaneously exacerbates existing social, cultural and economic inequalities. Along with the growing role played by modern technologies in public life, the social inequality is deepening between individual strata and groups of people who, for one reason or another, are limited in access to modern technologies, knowledge, information, and those who do not have such restrictions [15]. The intellectual gap between information and technologically advanced and undeveloped countries and entire regions is widening. For digitalization to work for the benefit of people, it is necessary to create equal digital opportunity, ubiquitous digital literacy and robust digital security. According to the UN Secretary General, without reducing digital inequality, the world will not be able to achieve the Sustainable Development Goals [16].

A new round of technological advances in the digitalization of management, along with the emerging progressive opportunities, creates new challenges and threats of a technological nature: unauthorized access to information that is protected by the state (state, commercial, banking secrets, personal data), cyber aggression and cybercrime. Digital transformation requires governments to adopt common privacy and data protection standards and laws, and implement effective cybersecurity mechanisms. However, no country is able to guarantee the protection of the vital interests of the state,

society and the individual, relying solely on its own forces. Cyber threats are cross-border by their nature, therefore, it is possible to prevent and counteract all kinds of attacks in cyberspace and information and communication systems only through coordinated international cooperation in the field of cybersecurity.

5. Conclusions. The transformation of the public administration system in the direction of digitalization has become a global trend. The basic component of public administration - e-government - plays a key role in establishing information communications between various branches of government, citizens, and business, in ensuring quality standards for the provision of administrative services. In the context of the 20th anniversary of the UN E-Government Survey, the stages of formation and development of e-government are revealed, global trends of its modernization are identified, and the strengths and weaknesses of national initiatives to provide administrative services and involve civil society and business structures in government decision-making processes are outlined. Emphasis is placed on intensifying the role of the e-government during the COVID-19 pandemic.

The implementation of digital transformation projects of the government in economically developed countries contributes to an increase in the efficiency of public administration, transparency of government, and a decrease in corruption. In the context of achieving the Sustainable Development Goals, the concept of digital governance puts people, their rights and freedom in the first place, embodying the principle of “state for people”. At the same time, many countries around the world face fundamental challenges related to ICT development, security, digital infrastructure, and digital inequality. Addressing these issues requires concerted efforts and international partnership.

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УСЕРЕДНЕНІ ПОКАЗНИКИ ВАРТОСТІ ЕКСПЛУАТАЦІЇ ДОРОЖНІХ МАШИН ТА МЕХАНІЗМІВ. ПРОБЛЕМИ ТЕХНІЧНОГО ОСНАЩЕННЯ ДЕРЖАВНИХ ДОРОЖНІХ ПІДПРИЄМСТВ

Бібік Юлія Миколаївна, завідувач відділу економічних досліджень та визначення вартості дорожніх робіт Державного підприємства «Державний дорожній науково-дослідний інститут імені М.П. Шульгіна» (ДП «ДерждорНДІ»), м. Київ, Україна, ORCID ID: <https://orcid.org/0000-0002-7197-8909>

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ABSTRACT

Can hardly be overestimated the importance of the road construction industry for the economic development of any country. According to the Kyiv School of Economics (KSE) the implementation of the infrastructure program "Great Construction", a large share of which correspond to projects in the road sector, in the long-term effects will increase GDP in the next 5 years by 2,2% [1]. In this context it is necessary to effectively use financial resources intended for rehabilitation of the transport and operational characteristics of Ukrainian road network to accomplish this it is extremely important to objectively determine the cost of road works on the early stages of the investment process, which can be achieved by using the relevant and authentic data on the cost of all components.

The operating cost of road construction equipment is one of the most significant factors affecting the cost of work and increasing the profitability of enterprises. For reliable determination of the operating cost of road construction equipment at the stage of preparation of investor budget documentation it is necessary to use Average operating cost of road machinery and mechanisms recommended by Ukravtodor (hereinafter – UPVEM). The UPVEM provide the average actual operating operation of road equipment. The objectivity of calculations is ensured by an up-to-date regulatory framework, systematic updating of the labor cost and cost of material resources and obtaining information on the actual costs of contractors.

When calculating the pricing documentation the cost of road machines and mechanisms is calculated on the basis of the Average operating cost of road machinery and mechanisms. The Average operating cost are calculated by averaging the cost component data received from road market participants. Therethrough, the enterprises that have actual costs which exceeding the Average operating cost losing a competitive advantage and receive a deterioration in the economic efficiency of their activities due to overspending on the operation of machines.

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Вступ. Однією із найбільших складових у вартості дорожніх робіт (майже 30 %) є вартість експлуатації машин і механізмів, яка на стадії складання інвесторської кошторисної документації визначається на підставі Усереднених показників вартості експлуатації машин і механізмів. Усереднені показники вартості експлуатації дорожніх машин та механізмів застосовуються при складанні інвесторської кошторисної документації з обов'язковим уточненням при формуванні договірних цін та при проведенні взаєморозрахунків за обсяги виконаних робіт підприємствами дорожнього господарства. У зазначеному документі відображені середні арифметичні значення витрат на експлуатацію машин, що систематично отримуються від підрядних підприємств. В ході усереднення показників виявляються певні залежності, які в подальшому можуть впливати на розвиток підприємств.

Аналіз останніх досліджень та публікацій. Питаннями оптимізації основних фондів підприємств, аналізу фізичного і морального зносу машин і механізмів займалися Іванов С.В., Захарченко Н.В., Дятлова Н.В. [9]. Науковцями розроблено та запропоновано методику визначення оптимального періоду оновлення, при порівнянні машин і механізмів з різними термінами експлуатації. Визначенням строків експлуатації дорожніх машин і механізмів та особливості нарахування амортизаційних відрахувань займалися Безуглий А.О., Гресько І.Л. [10].

Мета дослідження. Мета статті полягає у висвітленні методичних основ розрахунку однієї із складових прямих витрат вартості дорожніх робіт – вартості експлуатації дорожніх машин та механізмів на етапі складання інвесторської кошторисної документації, дослідженні та оцінці впливу зношеності парку дорожньої техніки державних дорожніх підприємств на вартість експлуатації машин і механізмів, а також виявлення можливих проблем, що впливають на ведення фінансово-господарської діяльності підприємств та, як результат, їх місця на дорожньому ринку.

Матеріали і методи дослідження. При написанні статті було використано теоретичний метод наукових досліджень, охарактеризовано підхід до розрахунку усереднених показників вартості експлуатації дорожніх машин та механізмів. Також використано метод аналізу та статистичний метод в частині дослідження фактичних витрат на ремонт і технічне обслуговування, а також кількісного і якісного складу парку дорожньої техніки в розрізі років.

Результати дослідження. Згідно з діючим порядком ціноутворення, а саме: Національним стандартом України – ДСТУ Б Д.1.1-1:2013 «Правила визначення вартості будівництва» [2]; рядом настанов, які його доповнюють; а також на підставі положень галузевих нормативних документів - СОУ 42.1-37641918-050:2018 «Автомобільні дороги. Правила визначення вартості робіт з капітального ремонту» [3] та СОУ 42.1-37641918-085:2018 «Автомобільні дороги. Правила визначення вартості робіт з поточного ремонту та експлуатаційного утримання» [4] основою для розрахунку вартості дорожньо-будівельних робіт слугують кошторисні норми. Кошторисні норми відображають сукупну потребу в ресурсах (витрати труда, часу експлуатації машин і механізмів та витрат матеріалів) для виконання визначеного обсягу певного виду робіт. Головна функція кошторисних норм - визначення нормативної кількості ресурсів, мінімально необхідних і достатніх для виконання відповідного виду робіт, як основи для подальшого переходу до вартісних показників. Тобто, кошторисна норма визначає прямі витрати у загальній вартості робіт, що складаються із заробітної плати (основної та додаткової) робітників, вартості дорожньо-будівельних матеріалів та вартості експлуатації дорожніх машин та механізмів (рис. 1).

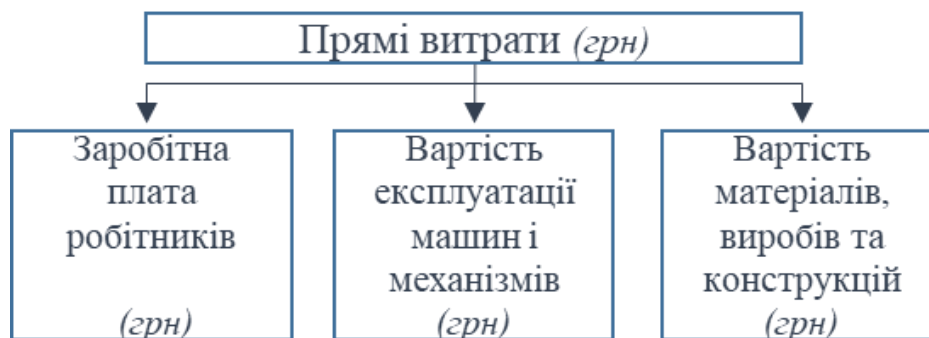


Рис. 1. Склад прямих витрат. Джерело: [5]

У структурі вартості прямих витрат дорожніх робіт найбільшу частку займають витрати на матеріали, а також на експлуатацію машин і механізмів. Зокрема, згідно із рисунком 2 питома вага вартості експлуатації дорожніх машин і механізмів у структурі прямих витрат вартості дорожніх робіт (експлуатаційного утримання) складає майже 30 %, а у загальній вартості майже 20 % (рис. 3), що є другою найбільш значною статтею витрат після вартості матеріалів.

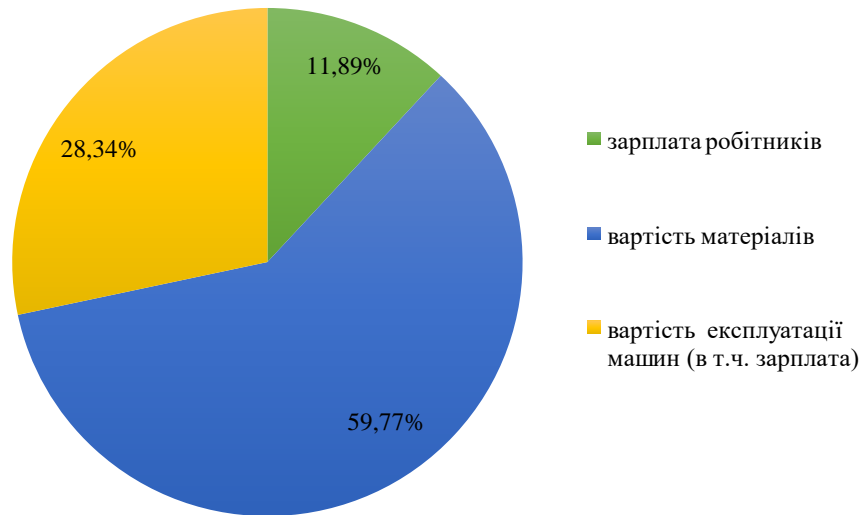


Рис. 2. Структура прямих витрат робіт з експлуатаційного утримання автомобільних доріг.
Джерело: побудовано автором за розрахованими кошторисами

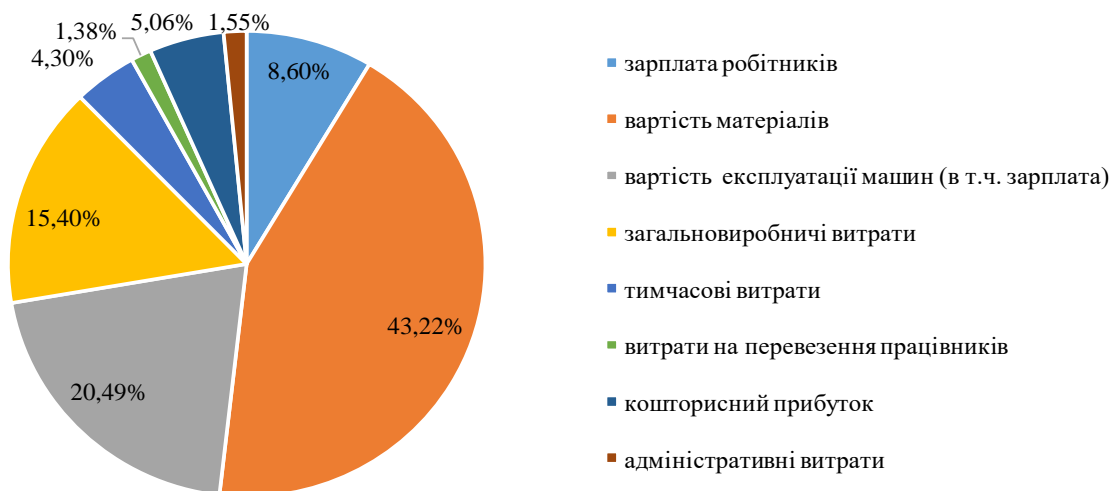


Рис. 3. Структура загальної вартості робіт з експлуатаційного утримання автомобільних доріг. Джерело: побудовано автором за розрахованими кошторисами

Вартість експлуатації дорожніх машин та механізмів у прямих витратах розраховується виходячи з нормативного часу їх роботи, передбаченого проектною документацією обсягу дорожніх робіт, і вартості експлуатації однієї машино-години їх роботи в поточних цінах [14]. При виконанні робіт з ремонтів та експлуатаційного утримання автомобільних доріг загального користування вартість експлуатації дорожніх машин і механізмів при складанні інвесторської кошторисної документації визначається в межах Усереднених показників вартості експлуатації дорожніх машин і механізмів рекомендованих Укравтодором. Структуру вартості однієї машино-години експлуатації дорожніх машин і механізмів наведено на рисунку 4.

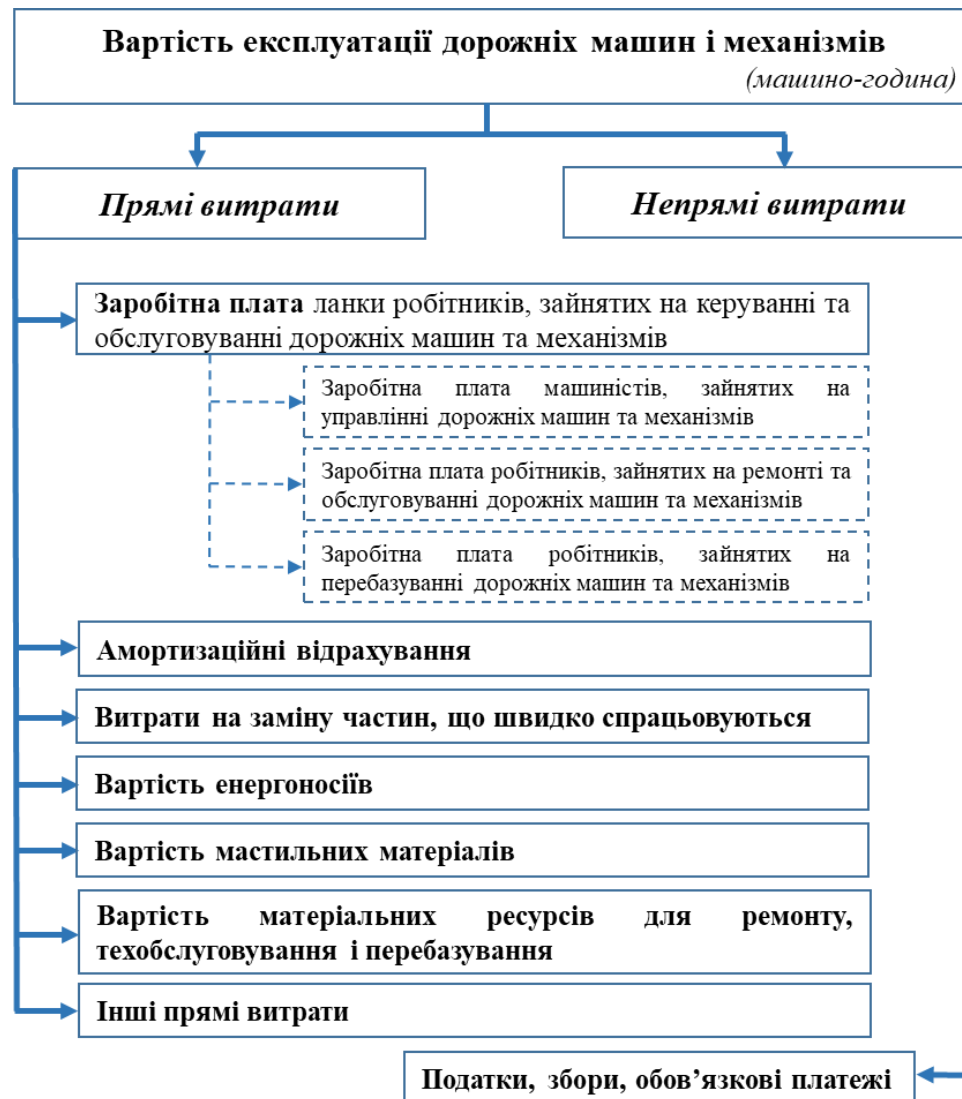


Рис. 4. Структура вартості експлуатації дорожніх машин і механізмів. Джерело: [5]

Усереднені показники вартості експлуатації дорожніх машин та механізмів (рис. 5), рекомендовані Укравтодором, і використовуються для визначення вартості експлуатації дорожніх машин та механізмів при складанні інвесторської кошторисної документації [6]. Усереднення полягає в тому, що при розрахунку враховується середній рівень заробітної плати, усереднені величини амортизаційних відрахувань для всього парку дорожніх машин і механізмів, усереднені витрати на ремонт і технічне обслуговування, усереднені витрати на перебазування, усереднені ціни на паливно-мастильні матеріали тощо. Такий підхід забезпечує достовірність визначення розміру коштів на експлуатацію дорожніх машин і механізмів на стадії проектування (складання інвесторської кошторисної документації). Достовірність та об'єктивність проведених розрахунків забезпечується ще й систематичним наданням підрядними підприємствами свої фактичних даних щодо балансової вартості придбаної дорожньої техніки та деяких складових вартості експлуатації всієї техніки, що експлуатується.

Усереднені показники вартості експлуатації дорожніх машин та механізмів (станом на 01.12.2020 року)																	
Шифр машин та механізмів	Найменування машин та механізмів	Вартість експлуатації 1 машгод	Заробітна плата машиністів	Амортизаційні відрахування	Частини, що швидко спрацьовуються	Бензин	Дизельне паливо	Електроенергія	Мастильні матеріали	Гідралічна рідина	Суми часу та моторного палива (під час паливо)	Мазут	Газ (вода)	Всього ТО	У тому числі заробітна плата ТО	Всього перебудування	У тому числі зарплата перебудування
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
200-0001.4	Автомобіль бортовий Mercedes Benz Sprinter 311 CDI, вантажопідйомність до 1,0 т	230,95	60,40	12,85	0,58	-	99,12	-	35,16	-	-	-	-	22,84	13,29	-	-
200-0001.5	Автомобіль бортовий Mercedes-Benz Vario 814 D, вантажопідйомність до 4,0 т	246,68	63,87	15,91	1,05	-	105,38	-	37,97	-	-	-	-	22,50	14,05	-	-
200-0002.1	Автомобіль бортовий Mercedes Benz Atego 815, вантажопідйомність до 5,0 т	310,87	63,87	16,78	1,05	-	151,43	-	53,44	1,80	-	-	-	22,50	14,05	-	-
200-0002.2	Шіткове обладнання на базі автомобіля ГАЗ 3309 (у складі комплексу машин для влаштування дорожньої розмітки)	436,73	70,35	38,19	4,91	-	244,54	-	45,17	9,67	-	-	-	23,90	18,99	-	-
200-0003.3	Автомобіль бортовий MAN 19.364 (з гідробортом), вантажопідйомність до 10,0 т	379,80	63,87	11,20	2,10	-	204,75	-	71,72	3,59	-	-	-	22,57	18,52	-	-
200-0003.4	Автомобіль бортовий MAN 18.280 М з автогідроциментаєм, вантажопідйомність	496,91	63,87	34,39	2,10	-	252,55	-	88,60	34,11	-	-	-	21,29	17,24	-	-
200-0009.1	Напівпричіп Vario-26, вантажопідйомність 26,0 т	50,34	-	3,62	3,46	-	-	-	30,94	-	-	-	-	12,32	3,67	-	-

Рис. 5. Складові вартості експлуатації 1 машино-години. Джерело: витяг з Усереднених показників вартості експлуатації дорожніх машин та механізмів [6]

Розрахунок вартості експлуатації машино-години здійснюється на підставі ресурсних кошторисних норм експлуатації машин та механізмів (РКНЕМ), що наведені у відомчих збірниках СОУ 42.1-37641918-034:2018 «Дорожні машини та механізми. Ресурсні кошторисні норми експлуатації будівельних машин та механізмів» [7], СОУ 42.1-37641918-082:2018 «Дорожні машини та механізми. Ресурсні кошторисні норми експлуатації машин та механізмів для експлуатаційного утримання» [8] і відповідних поточних цін на них з додаванням амортизаційних відрахувань; витрат на заміну частин, що швидко спрацьовуються; вартості матеріальних ресурсів на ремонт і технічне обслуговування та перебудування машин; інших витрат, пов'язаних з експлуатацією і утриманням дорожніх машин та механізмів, що враховуються в складі прямих витрат.

Калькулювання амортизаційних відрахувань; витрат на заміну частин, що швидко спрацьовуються; вартості матеріальних ресурсів на ремонт і технічне обслуговування та перебудування дорожніх машин та інших витрат здійснюється шляхом усереднення даних, отриманих від усіх організацій, які виконують роботи на автомобільних дорогах загального користування. Таким чином отримується середньозважений показник розміру зазначених витрат по дорожньому господарству.

Як свідчить структура УВПЕМ найбільш вагомими показниками, які впливають на вартість 1 машино-години експлуатації, є витрати на паливно-мастильні матеріали, заробітна плата та амортизаційні відрахування (рис. 6).



Рис. 6. Структура усередненої вартості 1 маш. год експлуатації машин і механізмів Джерело: побудовано автором на підставі Усереднених показників вартості експлуатації дорожніх машин та механізмів [6]

При цьому, як показав аналіз отриманих від підприємних організацій даних, різниця між найбільшими і найменшими показниками для схожих машин є доволі суттєвою. Так питома вага

витрат на ремонт і технічне обслуговування у загальній вартості експлуатації 1 машино-години, за даними з Усереднених показників вартості експлуатації дорожніх машин та механізмів, складає від 1 % до 20 %. Така велика розбіжність між значеннями може бути пов'язаною із оптимізацією основних фондів та тим, що на різних підприємствах машини мають різний строк експлуатації.

З урахуванням напрацювань дослідників, які займалися питаннями оптимізації основних фондів підприємств, аналізу фізичного та морального зносу машин і механізмів, було здійснено аналіз отриманих від підрядників даних, зокрема зведену інформацію від АТ «ДАК «Автомобільні дороги України» щодо дати придбання; початкової балансової вартості; витрат на ремонт та технічне обслуговування; витрат на частини, що швидко спрацьовуються по дочірніх підприємствах компанії; було проаналізовано стан парку дорожньої техніки.

Таблиця 1. Стан парку основних дорожніх машин в організаціях АТ «ДАК «Автомобільні дороги України» станом на 2020 рік

Дорожні машини	Загальна кількість, шт.	Кількість машин із закінченим нормативним строком експлуатації, шт.	Питома вага машин із закінченим нормативним строком експлуатації в загальній кількості машин, %
Навантажувач	50	50	100
Екскатор	8	7	87,5
Автогрейдер	78	71	91
Трактор	51	48	94
Коток	12	10	83
Самоскид	17	16	94

Якщо машина має закінчений нормативний строк експлуатації, то згідно із СОУ 42.1-37641918-064:2019 «Дорожні машини та механізми. Строки експлуатації та норми амортизації» [11] для такої машини виникає доцільність її оновлення (купівлі нової на заміну зношеної), оскільки витрати на ремонт та технічне обслуговування перевищують залишкову балансову вартість машини (рис 7).

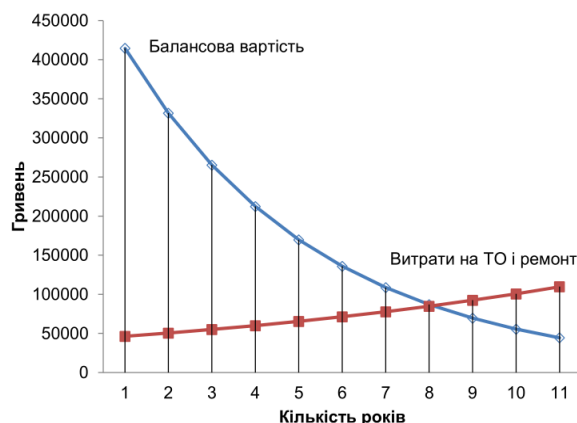


Рис. 7. Графічне визначення строку експлуатації машин на підставі економічної доцільності їх експлуатації. Джерело: [11]

Згідно із отриманими даними на підприємствах, що підпорядковуються АТ «ДАК «Автомобільні дороги України» з кожним роком зростає відсоток машин із закінченим строком експлуатації. Також, при аналізі фактичних даних було визначено, що на підприємствах наявна дорожня техніка, яка неодноразово відслужила нормативні строки експлуатації (згідно з термінами амортизації). Це суттєво знижує їх виробіток та збільшує потребу у ремонті і оновленні дорожньої техніки (графік 1), а також збільшує витрати на паливно-мастильні матеріали.

Машини і механізми, які експлуатуються більше 8 років, в залежності від пробігу і терміну експлуатації матимуть підвищену витрату паливно-мастильних матеріалів (щонайменше на 7-9 % згідно із [12]).

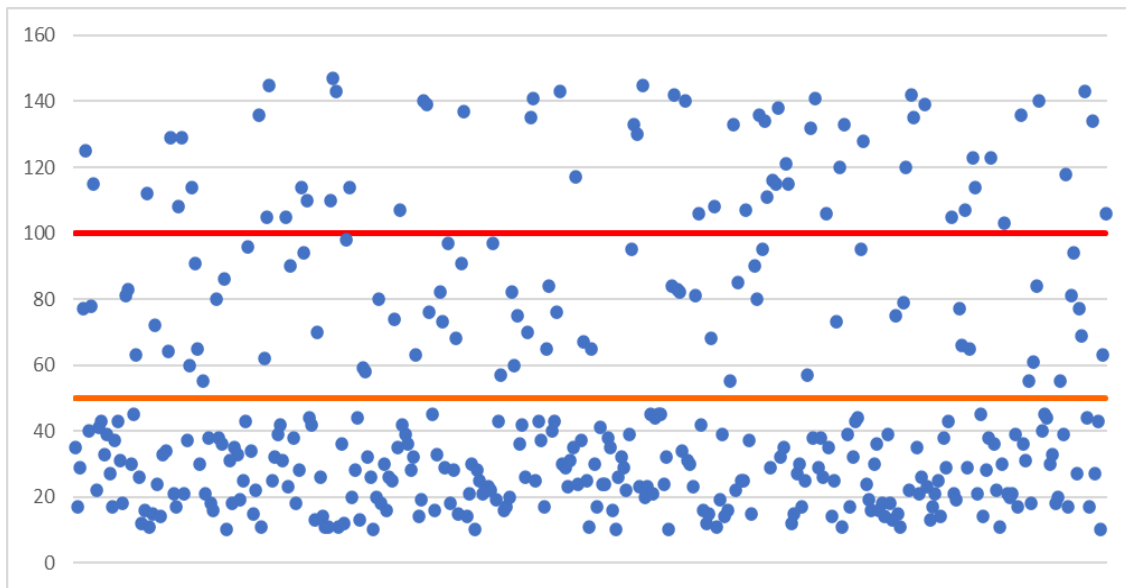


Рис. 8. Кількість дорожніх машин в розрізі витрачених коштів на ремонт і ТО за останні 4 роки. Джерело: побудовано автором на підставі Усереднених показників вартості експлуатації дорожніх машин та механізмів [6]

Дані, наведені на рис.8 мають наступні значення:

- 1) 64 дорожні машини мають сумарні витрати на ремонті і ТО, які за останні 3 роки складають від 50 % до 100 % первісної балансової вартості машин і механізмів (становить 17,80 % від загального парку машин);
- 2) 69 дорожніх машин мають сумарні витрати на ремонті і ТО, які за останні 3 роки складають від 100 і більше % первісної балансової вартості машин і механізмів (становить 16,55 % від загального парку машин);
- 3) 255 дорожніх машин мають сумарні витрати на ремонті і ТО, які за останні 3 роки некритичні.

Таким чином фактичні витрати на експлуатацію великої кількості машин на підприємствах АТ «ДАК «Автомобільні дороги України» суттєво перевищуватимуть визначені на стадії складання інвесторської кошторисної документації показники, вартість яких порахована на підставі УПВЕМ.

З урахуванням вищезазначеного очевидно, що існує значна потреба в оптимізації цих основних фондів, зокрема шляхом придбання нових дорожніх машин і механізмів. Вона обумовлена не розвитком і ростом обсягу робіт, які виконують філії облавтодорів в областях, а необхідністю заміни машин і механізмів, подальша експлуатація яких стає нерентабельною з точки зору витрат на їх утримання і ремонт, оскільки на більш ніж третину дорожніх машин було витрачено на ремонт і технічне обслуговування більше, ніж їх первісна балансова вартість лише за останні три роки. Можливим вирішенням такої проблеми могло б бути систематичне оновлення техніки для формування оптимального складу та продуктивності парку дорожньої техніки. Але, здійснивши аналіз динаміки оновлення парку дорожньої техніки філій за останні 10 років, та який наведено в таблиці 2, стає очевидною наступна проблема, а саме аномально низький рівень придбання нової техніки, що становить 14 % за 10 років.

Таблиця 2. Динаміка оновлення парку дорожньої техніки

Роки	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Кількість придбанної нової дорожньої техніки	27	7	1	1	0	2	2	6	1	1
	Всього									48

Дорожнім підприємствам варто брати в розрахунок те, що в процесі експлуатації дорожніх машини та механізмів настає момент, коли їх подальше використання стає

економічно не вигідним (рис. 7). Якщо дорожнє підприємство не проводить періодичної заміни машин і механізмів, то його конкурентоспроможність падає. Політику заміни можна уявити як набір рішень, що приймаються в кінці кожного року про те замінювати або не замінювати наявні засоби механізації. На практиці час заміни машини швидше залежить від економічних умов, ніж припадає на момент її повного фізичного зносу. Згодом вартість однієї машино-години експлуатації зростає, а продуктивність падає. У якийсь момент часу прибуток, який одержується від експлуатації машини, не покриває витрати на її утримання та експлуатацію (рис.1). Для динамічного і ефективного розвитку дорожнього підприємства необхідно систематично оновлювати машинний парк. В умовах ринкової економіки, коли головною метою діяльності будь-якого суб'єкта ринку є отримання прибутку, закон конкуренції змушує підприємців замінювати застарілі машини і механізми [13].

Перспективи подальшого дослідження. В роботі висвітлено теоретичні аспекти розрахунку усереднених показників вартості експлуатації дорожніх машин та механізмів як однієї з ключових складових вартості дорожніх робіт, та окреслено їх важливість. Проведене дослідження дозволило оцінити фактичні дані щодо стану дорожньої техніки та визначити можливі проблеми.

Згідно із аналізом, проведеним в ході розроблення Усереднених показників вартості експлуатації було виявлено значний знос машин і механізмів підприємств АТ «ДАК «Автомобільні дороги України» (переважна частина дорожньої техніки із закінченим терміном експлуатації згідно з термінами амортизації), що суттєво знижує їх виробіток та підвищує потребу в ремонті та оновленні дорожньої техніки. Така ситуація не надає жодних можливостей для конкурентного розвитку підприємств та потребує подальшого аналізу та пошуку стратегій оптимізації парку дорожніх машин і механізмів та забезпечення їх ефективного використання, зокрема шляхом його термінового оновлення.

Висновки. Система ціноутворення в дорожньому господарстві дозволяє об'єктивно визначити вартість дорожніх робіт на всіх етапах інвестиційного процесу. Від того наскільки точно буде визначена вартість дорожніх робіт на етапі складання інвесторської кошторисної документації залежить ефективність виділеного для дорожньої галузі фінансування. Для цього нормативно-кошторисна база містить достатньо нормативних документів, які регламентують визначення розміру всіх складових вартості. Однією із головних складових є вартість експлуатації машин і механізмів, яка на стадії інвесторської кошторисної документації визначається на підставі Усереднених показників вартості експлуатації дорожніх машин та механізмів, які актуалізуються двічі на рік відповідно до змін цін на матеріально-технічні й трудові ресурси, а також розраховуються на нові машини та механізми.

Для розрахунку Усереднених показників вартості експлуатації дорожніх машин та механізмів систематично збираються та усереднюються дані з підрядних підприємств щодо їх фактичних витрат. В ході розрахунку цих показників було виявлено значний знос машин і механізмів підприємств АТ «ДАК «Автомобільні дороги України» (переважна частина дорожньої техніки із закінченим терміном експлуатації згідно з термінами амортизації), що суттєво знижує їх виробіток та підвищує потребу в ремонті та оновленні дорожньої техніки. Така ситуація суттєво зменшує технічну та фінансову привабливість підприємства та зменшує можливість отримання прибутку на конкурентному ринку дорожніх робіт, а потребує аналізу та пошуку стратегій оптимізації парку дорожніх машин і механізмів та забезпечення їх ефективного використання, зокрема шляхом його термінового оновлення.

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ON THE FINANCIAL ASSESSMENT OF THE NKR ELECTRICITY SYSTEM

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ABSTRACT

The article aims to calculate the separate elements of the financial strategy of the NKR energy system and to carry out a factor analysis. Using the Kaufmann-Calibardi method, the coefficients of flexibility of electricity consumption by GDP were estimated, showing the causes of the shadow economy in the Artsakh Republic depending on the volume of electricity. Based on the annual statistics of electricity consumption and real GDP in the period of 2000-2019, the years were emphasized, as a result of which the fact that it is a calculated value of 1 substantiates the fact that the higher the electricity consumption, the higher the GDP should be, but obtained the results are not equal to 1 (greater than or less than 1), so the size of the shadow was calculated in those years.

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Structural changes in the electricity and gas markets, as well as the emergence of innovative technologies, contribute to the fact that traditional approaches to strategy development no longer meet expectations. At the same time, the strategy of the energy companies should include new systemic approaches, such as technology equipment companies already having a competitive advantage in the energy market as they supply state-of-the-art utility equipment (industrial equipment sensors or Nest programmable thermostats). In the case of new software products, these companies are in an advantageous position to offer new products based on expert knowledge and cannot be duplicated by energy companies.

International availability, financial stability, economies of scale and experience with mass consumers allow these companies to gain market share in the new energy economy.

Consequently, energy companies carefully study each stage of the strategy in order to maintain a stable position in the market and further expand the policy: these are the competitive position, the emergence of new competitors of energy companies, opportunities and obstacles to entering traditional or new markets, etc. This means that the strategy of energy companies is radically transformed into the goals of applying new approaches and tools.

Therefore, the task was set in the work to calculate individual elements of the financial strategy of the NKR energy system and to conduct a factor analysis.

According to Table 1, in 2019, compared with 2000, the volume of production, consumption and export of electricity increased by 436.2 million kWh, 238.6 million kWh and 4.6 million kWh, and the volume of imports and losses of electricity decreased, respectively by 102.3 million kWh and 25.4 million kWh. And in 2019, compared to last year (compared to 2018), the volume of production, consumption and losses of electricity increased by 90.7 million kWh, 22.2 million kWh and 1.7 million kWh, due to the decrease in export and import volumes by 42.1 million kWh and 19.8 million kWh.

Table 1. In 2000-2019, analysis of indicators of electricity production, electricity consumption, electricity exports and electricity imports, electricity losses and electricity tariffs in the NKR¹

Year	Electricity production (million kWh)	Electricity imports (million kWh)	Electricity exports (million kWh)	Electricity consumption (million kWh)	Electricity losses (million kWh)	Electricity tariff (AMD)
2000	43.1	117.4	5.5	155	68.8	14
2001	51.4	122.2	12.5	151.1	61	14.1
2002	108.6	72	33.3	147.3	54.5	14
2003	130.6	68.9	44	155.5	48.4	14
2004	137	77.3	44.6	169.7	46.6	14
2005	112.1	115.7	17.7	210.1	65.9	14
2006	69.1	154	3.4	219.7	61.1	16.8
2007	90.4	145.2	10.1	225.5	53.3	20
2008	97.1	132.7	5.7	224.1	45.2	20
2009	119.2	134.8	25.5	228.5	42.6	23.3
2010	177.6	96.3	41	232.7	39.5	25
2011	121.9	153.2	15.7	259.4	44.5	25
2012	164.5	118	18.8	263.7	46.2	25
2013	193.2	87.2	11	269.4	42.3	25
2014	224.5	78.1	14.4	288.2	45.3	25
2015	221.3	87.7	16.2	292.8	47.5	25
2016	296.5	31.6	29	299.1	45.9	25
2017	327.8	50.8	27.5	351.1	56.8	25
2018	388.6	34.9	52.2	371.4	41.7	25
2019	479.3	15.1	10.1	393.6	43.4	25

According to the data of Table 1 from 2000-2005, the average electricity tariff was 14 drams, in 2006, compared with 2005, the tariff increased by 2.8 drams, however, since 2007, an increase in the average electricity tariff was registered, in particular, in 2019, compared with 2008, the average electricity tariff increased by 5 drams and amounted to 25 drams.

In addition, the work highlighted and compared the prices for the export and import of electricity, as well as the exchange rate (compared to 1 US dollar) (see table 2). Thus, in 2019, as compared to 2000, the exchange rate in the NKR (compared to 1 US dollar) decreased by 59.07 drams, the volume of electricity exports increased by 4.6 million kWh, and import volumes decreased by 102.3 million kWh. However, in 2019, compared to 2018, the exchange rate (compared to 1 US dollar) decreased by 2.54 drams, and the volume of electricity export-import decreased by 42.1 million kWh and 19.8 million kWh.

¹ NSS of AR – yearbooks 2000-2006, 2006-2009թթ., 2009-2014, 2019,2020, pages 118, 175, 171-172, 203-204,212-213, http://stat-nkr.am/files/yearbooks/2000_2006/15.pdf, http://stat-nkr.am/files/yearbooks/2003_2009/19_Prom_161-181.pdf, http://stat-nkr.am/files/yearbooks/2008-2014/19_Prommet_159-160.pdf, http://stat-nkr.am/files/yearbooks/2019/14_Prommet_189-205.pdf, <http://stat-nkr.am/files/publications/2020/Taregirq/14%20ardyunaberutyun.pdf>.

NSS of AR – yearbooks 2000-2006, 2002-2008,2008-2014,2020, pages 276, 276, 276.,313, http://stat-nkr.am/files/yearbooks/2002_2008/21_Gner.pdf, http://stat-nkr.am/files/yearbooks/2008-2014/28_Gner_270-281+.pdf, http://statnkr.am/files/publications/2020/Taregirq/20%20gner_ev_sakagner.pdf.

Table 2. 2000-2019 electricity export, import and exchange rate of electricity (compared to 1 US dollar) in the NKR¹

Year	Rate (compared to 1 US dollar)	Electricity imports (million kWh)	Electricity exports (million kWh)
2000	539.52	117.4	5.5
2001	555.08	122.2	12.5
2002	573.35	72	33.3
2003	578.76	68.9	44
2004	533.45	77.3	44.6
2005	457.69	115.7	17.7
2006	416.04	154	3.4
2007	342.08	145.2	10.1
2008	305.97	132.7	5.7
2009	363.28	134.8	25.5
2010	373.66	96.3	41
2011	372.50	153.2	15.7
2012	401.76	118	18.8
2013	409.63	87.2	11
2014	415.92	78.1	14.4
2015	477.92	87.7	16.2
2016	480.49	31.6	29
2017	482.72	50.8	27.5
2018	482.99	34.9	52.2
2019	480.45	15.1	10.1

The picture was different in the NKR in 2000-2019; in particular, according to the results of a comparative analysis of exports, imports and the exchange rate of electricity (1 Rub. compared to dram), in 2019, compared with 2000, the exchange rate (1 Rub. compared to dram) decreased by 11.62 drams, as a result of which the volume of electricity exports increased by 4.6 million kWh, and the volume of imports decreased by 102.3 million kWh. In addition, in 2019, compared to last year (2018), the exchange rate (1 Rub. compared to dram) decreased by 0.3 drams, and the volume of exports and imports of electricity decreased by 42.1 million kWh and 19.8 million kWh (see table 3).

¹ NSS of AR – yearbooks 2000-2006,2006-2009,2009-2014,2019,2020. pages 118,175,171-172,203-204,212-213, http://stat-nkr.am/files/yearbooks/2000_2006/15.pdf, http://stat-nkr.am/files/yearbooks/2003_2009/19_Prom_161-181.pdf, http://stat-nkr.am/files/yearbooks/2008-2014/19_Prommet_159-160.pdf, http://stat-nkr.am/files/yearbooks/2019/14_Prommet_189-205.pdf, <http://stat-nkr.am/files/publications/2020/Taregirq/14%20ardyunaberutyun.pdf>. The Central Bank of the NKR – “Archive of exchange rates”, 2000-2019, <https://www.cba.am/am/SitePages/statexternalsector.aspx>

Table 3. 2000-2019 electricity export, import and exchange rate of electricity (1 Rub. compared to dram) in the NKR¹

Year	Exchange rate (1 Rub. compared to dram)	Electricity import (million kWh)	Electricity export (million kWh)
2000	19.05	117.4	5.5
2001	18.97	122.2	12.5
2002	18.24	72	33.3
2003	18.83	68.9	44
2004	18.52	77.3	44.6
2005	16.19	115.7	17.7
2006	15.29	154	3.4
2007	13.37	145.2	10.1
2008	12.35	132.7	5.7
2009	11.5	134.8	25.5
2010	12.32	96.3	41
2011	12.7	153.2	15.7
2012	12.94	118	18.8
2013	12.88	87.2	11
2014	10.98	78.1	14.4
2015	7.89	87.7	16.2
2016	7.19	31.6	29
2017	8.28	50.8	27.5
2018	7.73	34.9	52.2
2019	7.43	15.1	10.1

In order to identify the relationship between the volume of industrial production, electricity production, electricity consumption, export and import of electricity in the real sector of the NKR economy, the following indicators were considered and evaluated (Table 4).

¹ NSS of AR – yearbooks 2000-2006, 2006-2009, 2009-2014, 2019, 2020. pages 118,175,171-172,203-204,212-213, http://stat-nkr.am/files/yearbooks/2000_2006/15.pdf, http://stat-nkr.am/files/yearbooks/2003_2009/19_Prom_161-181.pdf, http://stat-nkr.am/files/yearbooks/2008-2014/19_Prommet_159-160.pdf, http://stat-nkr.am/files/yearbooks/2019/14_Prommet_189-205.pdf, <http://stat-nkr.am/files/publications/2020/Taregirq/14%20ardyunaberutyun.pdf>. The Central Bank of the Republic of Artsakh – “Archive of exchange rates”, 2000-2019., <https://www.cba.am/am/SitePages/statexternalsector.aspx>

Table 4. 2000-2019 volume of industrial production, electricity production, electricity consumption, electricity export and electricity import in NKR¹

Year	Volume of industrial production (million drams)	Electricity production (million kWh)	Electricity consumption (million kWh)	Electricity export (million kWh)	Electricity import (million kWh)
2000	4854.6	43.1	155	5.5	117.4
2001	5903.8	51.4	151.1	12.5	122.2
2002	8082.6	108.6	147.3	33.3	72
2003	11125.4	130.6	155.5	44	68.9
2004	18579.1	137	169.7	44.6	77.3
2005	17773	112.1	210.1	17.7	115.7
2006	24203.6	69.1	219.7	3.4	154
2007	22437.4	90.4	225.5	10.1	145.2
2008	25345.5	97.1	224.1	5.7	132.7
2009	34092.3	119.2	228.5	25.5	134.8
2010	42991.8	177.6	232.7	41	96.3
2011	45822.5	121.9	259.4	15.7	153.2
2012	40871.7	164.5	263.7	18.8	118
2013	44339.4	193.2	269.4	11	87.2
2014	52046.8	224.5	288.2	14.4	78.1
2015	53541.3	221.3	292.8	16.2	87.7
2016	58999.5	296.5	299.1	29	31.6
2017	97490.3	327.8	351.1	27.5	50.8
2018	125006.1	388.6	371.4	52.2	34.9
2019	164856.2	479.3	393.6	10.1	15.1

As a result, the impact of electricity generation, consumption, export and import on industrial output was assessed. On these grounds, a regression equation was developed calculated for individual indicators characterizing the industry of the AR:

$$Y = a_0 + a_1 EA + a_2 ES + a_3 EX + a_4 IM + \varepsilon_t, \quad (1)$$

where

Y is the value of the volume of industrial output (million dram),

EA is the production of electricity (million kWh),

ES is electricity consumption (million kWh),

EX is electricity export (million kWh),

IM is electricity import (million kWh),

a_0, a_1, a_2, a_3, a_4 are independent coefficients of variable flexibility,

ε_t is the value of the random error.

For the calculation, the annual official statistical data of the volume of industrial production, electricity production, electricity consumption, electricity export, electricity import indices for 2000-2019 were considered.

¹ NSS of AR – yearbooks 2000-2006, 2006-2009, 2009-2014, 2019, 2020. pages 118, 175, 171-172, 203-204, 212-213, http://stat-nkr.am/files/yearbooks/2000_2006/15.pdf, http://stat-nkr.am/files/yearbooks/2003_2009/19_Prom_161-181.pdf, http://stat-nkr.am/files/yearbooks/2008-2014/19_Prommet_159-160.pdf, http://stat-nkr.am/files/yearbooks/2019/14_Prommet_189-205.pdf, <http://stat-nkr.am/files/publications/2020/Taregirq/14%20ardyunaberutyun.pdf>. NSS of AR, <http://stat-nkr.am/hy/component/content/article/763-2017-11-02-13-10-04>

(1) in the economic model, the statistical series are 19, which means that the values obtained are almost close to reality. It was evaluated by the method of smaller squares using the Eviews 9 computer program¹, according to which the corresponding regression and correlation analysis was carried out.

It should be noted that before estimating the model, it is necessary to equalize the data, therefore, the data have been logarithmized (see Table 5) for this purpose to avoid obtaining a false multifactorial linear regression.

Table 5. Logarithm values of the 2000-2019 volume of industrial production, electricity production, electricity consumption, electricity export and electricity import in the NKR²

Year	Electricity production (million kWh)	Electricity import (million kWh)	Electricity export (million kWh)	Electricity consumption (million kWh)	Electricity losses (million kWh)	Electricity rate (AMD)
2000	43.1	117.4	5.5	155	68.8	14
2001	51.4	122.2	12.5	151.1	61	14.1
2002	108.6	72	33.3	147.3	54.5	14
2003	130.6	68.9	44	155.5	48.4	14
2004	137	77.3	44.6	169.7	46.6	14
2005	112.1	115.7	17.7	210.1	65.9	14
2006	69.1	154	3.4	219.7	61.1	16.8
2007	90.4	145.2	10.1	225.5	53.3	20
2008	97.1	132.7	5.7	224.1	45.2	20
2009	119.2	134.8	25.5	228.5	42.6	23.3
2010	177.6	96.3	41	232.7	39.5	25
2011	121.9	153.2	15.7	259.4	44.5	25
2012	164.5	118	18.8	263.7	46.2	25
2013	193.2	87.2	11	269.4	42.3	25
2014	224.5	78.1	14.4	288.2	45.3	25
2015	221.3	87.7	16.2	292.8	47.5	25
2016	296.5	31.6	29	299.1	45.9	25
2017	327.8	50.8	27.5	351.1	56.8	25
2018	388.6	34.9	52.2	371.4	41.7	25
2019	479.3	15.1	10.1	393.6	43.4	25

A correlation analysis was carried out in the work, according to which the degree of accuracy of the selected factors and the indicator of industrial production was revealed. Moreover, both significant positive and negative correlations were found between the observed factors (Table 6).

Thus, the analyses justify that there is a significant positive correlation between the following factors:

- A change in one percentage point of electricity production leads to an increase of 0.89 percentage points in industrial output;
- A change in one percentage point of electricity consumption leads to an increase of 0.96 percentage points in industrial output;
- A change in one percentage point of electricity exports leads to an increase of 0.19 percentage points in industrial output.

In addition, a significant negative correlation was received from the observed indicators, in particular:

- between electricity import and industrial products: 0.57;
- between electricity import and electricity production: 0.79;
- between electricity import and electricity consumption: 0.54.

¹ Eviews is the Windows version for the Micro TSP package, which, in fact, is a guide to econometric methods, <http://www.eviews.com/>.

² Calculated by the author based on the statistic data of NSS of AR.

Consequently, the results of the carried out correlation analysis confirm that there is a significant relationship between the factors under consideration and the volume of industrial production.

Table 6. Correlation values between the selected factors¹

	Y	EA	ES	EX	IM
Y	1.000000				
EA	0.894969	1.000000			
ES	0.969550	0.839493	1.000000		
EX	0.192062	0.473196	0.048146	1.000000	
IM	-0.571728	-0.794858	-0.546834	-0.364008	1.000000

The results obtained as a result of the regression model evaluation are shown in Table 7, where the coefficients of independent variables are $a_0, a_1, a_2, a_3, a_4, a_5$. And the t – statistic and $\text{Prob}(t)^2$ show that the estimated coefficients in the model are statistically significant at the significance level of 1% $|t| > t_{\text{crit}}$ for all estimated coefficients ($|-4.25| > 1.75, |2.13| > 1.75, |4.74| > 1.75, |1.76| > 1.75$)³:

F statistic and $\text{Prob}(F)$ indicate that the equation is statistically significant at the significance level of 1% ($F > F_{\text{crit}}$, $F = 122.6$ and $F_{\text{crit}} = 3.287$). The hypothesis $H_0: \beta_1 = \beta_2 = \dots = \beta_{p-1} = 0$ was rejected in the model at the significance level of 1%⁴.

From the results of Table 7, it can be concluded that there is a significant relationship between the factors under consideration and the volume of industrial production. The adjusted coefficient of determination is 0.96, that is, 96% of the variation of the dependent (the size of industrial production) variable is explained by the variables included in the regression model, and the remaining 4% by random errors⁵.

Table 7. Model evaluation results⁶

Sample: 2000 2019				
Included observations: 20				
Y=C(1)+C(2)*EA+C(3)*ES+C(4)*EX+C(5)*IM				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-5.946567	1.396932	-4.256876	0.0007
C(2)	0.656349	0.307686	2.133182	0.0498
C(3)	2.177136	0.458784	4.745453	0.0003
C(4)	0.009068	0.104260	0.086971	0.9318
C(5)	0.244973	0.139532	1.755676	0.0995
R-squared	0.970316	Mean dependent var		10.32398
Adjusted R-squared	0.962401	S.D. dependent var		0.954783
S.E. of regression	0.185138	Akaike info criterion		-0.323117
Sum squared resid	0.514139	Schwarz criterion		-0.074184
Log likelihood	8.231173	Hannan-Quinn criter.		-0.274523
F-statistic	122.5823	Durbin-Watson stat		1.582076
Prob(F-statistic)	0.000000			

¹ Calculated by the author.

² Елисеєва И. И. Эконометрика, М., 2009, с. 25-28.

³ Магнус Я. Р., Катышев П. К., Пересецкий А. А., Эконометрика. Начальный курс: Издательство "ДЕЛО" Москва, 2004, с. 67,

⁴ In case of $n=20, p=4, \alpha=0.05$ significance level in the model $v=0.95, k_1=3, k_2=16$, the searched critical value of a random value with a Fisher distribution $F_{\text{crit}} = 3.24$.

⁵ Магнус Я. Р., Катышев П. К., Пересецкий А. А., Эконометрика. Начальный курс: Издательство "ДЕЛО" Москва, 2004, с. 67.

⁶ Calculated by the author.

Thus, (1) the calculated values of the econometric model are reflected in the model (2):

$$Y = -5.946567 + 0.656349EA + 2.177136ES - 0.009068EX + 0.244973IM + \varepsilon_t \quad (2)$$

Thus, as a result of the application of the econometric model and mathematical tools in the work, the model (2) was calculated, and its economic values were justified:

1. A one percentage point change in electricity production (EA) leads to an increase in industrial output (Y) by 0.65 percentage points.
2. A change in one percentage point of electricity consumption (ES) leads to an increase in the volume of industrial output (Y) by 2.17 percentage points.
3. A change of one percentage point of electricity exports (EX) reduces the volume of industrial output (Y) by 0.01 points.
4. A change in one percentage point of electricity imports leads to an increase in the volume of industrial products (Y) by 0.24 percentage points.

Summing up, it should be noted that:

1. changes in the volume of production, consumption, export and import of electricity are caused by electricity tariffs;
2. the change in the exchange rate for a certain period has increased the export of electricity conditioned by the exchange rate, but has reduced the import of electricity conditioned by the exchange rate, and for a certain period the opposite. As a result, the downward trend in exports was caused by fluctuations in exchange rates in AMD/dollar, as well as in AMD/ruble;
3. electricity production, electricity consumption and electricity imports have a positive impact on the volume of industrial output, while only electricity exports have a negative impact, due to the fact that the sectors of the NKR economy are not involved on the entire scale.

In addition, the work assessed the scale of the shadow economy of the NKR by the method of electricity consumption (Kaufmann-Calibardi method of electricity consumption), for which the assertion that the dynamics of electricity consumption in this country corresponds to the dynamics of overall economic activity was accepted. Consequently, over the years, differences in the rates of change in electricity consumption and real GDP volumes show the size of the shadow economy. After studying the changes in the presented indicators, Kaufmann and Calibardi suggested the following equation:

$$\varepsilon_t = \frac{e_0}{gdp_0} = \frac{e_1}{gdp_1} = \dots = \frac{e_n}{gdp_n} \approx 1 \quad (3)^1$$

where

- ε_t is the elasticity of electricity consumption in the t^{th} by GDP,
- e_0 is the change (increase or decrease) in the overall level of electricity consumption compared to last year,
- gdp is the change in GDP compared to last year.

Based on the Kaufmann-Calibardi method, the coefficients of flexibility of electricity consumption by GDP were estimated in the work, showing the causes of the shadow occurrence in the Republic of Artsakh depending on the volume of electricity. Accordingly, the annual statistics of electricity consumption and real GDP for 2000-2019 were reviewed, and the results of the calculation are presented in Table 8.

¹ Schneider Friedrich, Buehn Andreas, "Shadow Economy: Estimation Methods, Problems, Results and Open questions", published by De Gruyter Open, February 28, 2017, p. 10

Table 8. Indicators characterizing the size of the shadow economy in the AR in terms of electricity consumption and real GDP growth rates (according to the Kaufmann-Calibardi method)¹

Year	Electricity consumption growth rate (%)	Real GDP growth rate (%)	Elasticity of electricity consumption by GDP (%)
2001 compared to 2000	-0.19	106.7	-0.002
2002 compared to 2001	-0.18	102.5	-0.002
2003 compared to 2002	0.4	111.3	0.004
2004 compared to 2003	0.7	120.2	0.006
2005 compared to 2004	2.01	118.2	0.02
2006 compared to 2005	0.47	114.1	0.004
2007 compared to 2006	0.28	110.1	0.003
2008 compared to 2007	-0.07	108.8	-0.001
2009 compared to 2008	0.22	114.3	0.002
2010 compared to 2009	0.21	113.1	0.002
2011 compared to 2010	1.33	105.5	0.013
2012 compared to 2011	0.21	109.1	0.002
2013 compared to 2012	0.28	109.9	0.003
2014 compared to 2013	0.93	109.3	0.01
2015 compared to 2014	0.23	108.9	0.002
2016 compared to 2015	0.31	109.1	0.003
2017 compared to 2016	2.58	109.2	0.024
2018 compared to 2017	1.01	115.6	0.009
2019 compared to 2018	1.1	111.9	0.01

According to which, the elasticity of electricity consumption according to the calculation of GDP were:

- 2001 compared to 2000: $-0.002 < 1$,
- 2002 compared to 2001: $-0.002 < 1$,
- 2003 compared to 2002: $0.004 < 1$,
- 2004 compared to 2003: $0.006 < 1$,
- 2005 compared to 2004: $0.02 < 1$,
- 2006 compared to 2005: $0.004 < 1$,
- 2007 compared to 2006: $0.003 < 1$,
- 2008 compared to 2007: $-0.001 < 1$,
- 2009 compared to 2008: $0.002 < 1$,
- 2010 compared to 2009: $0.002 < 1$,
- 2011 compared to 2010: $0.0135 < 1$,
- 2012 compared to 2011: $0.002 < 1$,
- 2013 compared to 2012: $0.003 < 1$,
- 2014 compared to 2013: $0.01 < 1$,
- 2015 compared to 2014: $0.002 < 1$,
- 2016 compared to 2015: $0.003 < 1$,
- 2017 compared to 2016: $0.024 < 1$,
- 2018 compared to 2017: $0.009 < 1$,
- 2019 compared to 2018: $0.01 < 1$.

¹ Calculations were made by the author.

As a result, it should be noted that if the results obtained are equal to 1, this is due to the fact that the more electricity consumption increases, the more GDP should increase, but the results obtained are not equal to 1 (they are bigger or less than 1), therefore, there is a shadow in those years.

Table 9. Rates of electricity consumption, real GDP and production volume growth rates in the AR (%)¹

Year	Electricity consumption growth rate (%)	Real GDP growth rate (%)	Elasticity of electricity consumption by GDP (%)
2001 compared to 2000	-0.19	106.7	19.26
2002 compared to 2001	-0.18	102.5	111.3
2003 compared to 2002	0.4	111.3	20.26
2004 compared to 2003	0.7	120.2	4.901
2005 compared to 2004	2.01	118.2	-18.17
2006 compared to 2005	0.47	114.1	-38.36
2007 compared to 2006	0.28	110.1	30.83
2008 compared to 2007	-0.07	108.8	7.412
2009 compared to 2008	0.22	114.3	22.76
2010 compared to 2009	0.21	113.1	48.99
2011 compared to 2010	1.33	105.5	-31.36
2012 compared to 2011	0.21	109.1	34.95
2013 compared to 2012	0.28	109.9	17.45
2014 compared to 2013	0.93	109.3	16.20
2015 compared to 2014	0.23	108.9	-1.425
2016 compared to 2015	0.31	109.1	33.98
2017 compared to 2016	2.58	109.2	10.56
2018 compared to 2017	1.01	115.6	18.55
2019 compared to 2018	1.1	111.9	23.34

According to Table 9, in 2001, compared with 2000, the growth rates of electricity consumption, production and real GDP amounted to -0.19%, 19.26% and 106.7%, but in 2005 compared to 2004 amounted to 2.01%, 118.2% and -18.17%. The picture was different in 2017 compared to 2016, as the real growth rates of production, electricity consumption and GDP increased to 2.58%, 109.2% and 10.56%. Therefore, it should be noted that in the period under review, the existence of a shadow economy was revealed as a result of changes in electricity consumption, production volume and real GDP growth rates.

Thus, based on the factors determining the changes in the volume of electricity consumption, the size of the shadow economy was revealed according to the Kaufmann-Calibardi method. According to which, the fact that the coefficients of electricity consumption elasticity (in terms of real GDP) in the Artsakh Republic are higher or lower is explained by the existence of a shadow economy. In particular, comparing with the production volumes, it was grounded that the economic preconditions for production in the AR are uncompetitive, which leads to the formation of informal incomes, informal employment, and in terms of electricity consumption, it brings to the emergence of a gap with respect to the real GDP growth, which in its turn is explained by the existence of a shadow economy. Accordingly, it is proposed to implement infrastructure reforms aimed at reviewing electricity tariffs, creating alternative energy, reducing the shadow economy in that field, which can further increase the income of the population and improve living standards.

¹ Figure 6 is compiled by the author on the basis of statistical data of the NSS AR website.

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