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ECONOMY

THE IMPACT OF BANKING NETWORK SERVICES THROUGH PROFITABILITY ON INDONESIA BANKING COMPANIES

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ABSTRACT

The banking sector has embraced the use of technology to serve its clients faster and also to do more with less. Emerging technologies have changed the banking industry from paper and branch based banks to digitized and networked banking services. ATM machines and the number of switching networks is among the technologies used in the banking industry. The aim of this study is to analyze the influence of network switching and number of ATM machine through non-interest income to profitability. The paper proposes to examine whether the number of ATM machines of the bank affect the fee-based income, whether the amount of ATM switching network membership of the bank affects the bank's fee-based income, and whether the fee-based income affects the performance of the bank. The study was conducted in banking companies belonging to members of the switching principal network appointed by Bank Indonesia and switching network companies in Indonesia. The data used for this research is represented by financial statements from Indonesian commercial banks that have gone public, data from banking magazines and data available from each bank's page available for open access. The number of samples from this study is represented by 30 commercial banks that are listed in IDX. The results of this study show that the number of ATM machines has no significant effect on Fee Based Income. At the same time, the number of switching networks has a significant effect toward Fee Based Income, and the Fee Based Income has no significant effect on the bank's return on investment.

Keywords: ATM, switching network, fee based income, profitability.

Sectorul bancar a acceptat utilizarea tehnologiei pentru a servi clienții săi mai repede și, de asemenea, pentru a face mai multe acțiuni cu mai puține resurse. Tehnologiile emergente au schimbat industria bancară de la bănci cu lucru pe hârtie și sucursale bancare, la servicii bancare digitalizate și în rețea. Bancomatele și numărul de rețele de comutare reprezintă una dintre tehnologiile utilizate în industria bancară. Scopul acestui studiu este de a analiza influența comutării rețelei și numărul de bancomate prin venituri fără dobândă până la profitabilitate. Lucrarea își propune să examineze dacă numărul de bancomate ale băncii afectează venitul pe bază de comisioane, dacă valoarea calității de membru al rețelei de comutare bancară afectează venitul pe bază de comisioane al băncii și dacă venitul pe bază de comisioane afectează performanța băncii. Studiul a fost realizat pe companii bancare aparținând membrilor rețelei principale de comutare numite de Bank Indonesia și companiilor de rețele de comutare din Indonezia. Datele utilizate pentru această cercetare sunt reprezentate de situațiile financiare ale băncilor comerciale indoneziene care au devenit publice, datele din revistele bancare și datele disponibile de pe pagina fiecărei bănci în acces deschis. Eșantionarea acestui studiu este reprezentată de 30 de bănci comerciale care sunt listate în IDX. Rezultatele acestui studiu arată că numărul de bancomate nu are niciun efect semnificativ asupra veniturilor bazate pe taxe. În același

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timp, numărul de rețele de comutare are un efect semnificativ asupra veniturilor bazate pe taxe, iar Veniturile bazate pe taxe nu au un efect semnificativ asupra rentabilității investiției bancare.

Cuvinte-cheie: *bancomat, rețea de comutare, venituri bazate pe taxe, profitabilitate.*

Банковский сектор стал использовать технологии, чтобы быстрее обслуживать клиентов, а также делать больше с меньшими затратами. Новые технологии изменили банковскую отрасль от банков, основанных на бумажном документообороте и филиалах, до банков с цифровыми и сетевыми услугами. Банкоматы и количество коммутационных сетей являются одной из технологий, используемых в банковской сфере. Целью данного исследования является анализ влияния коммутации сети и количества банкоматов через непроцентный доход на прибыльность. В статье предлагается изучить, влияет ли количество банкоматов банка на комиссионный доход, влияет ли сумма участия банка в коммутационной сети банкоматов на комиссионный доход банка и влияет ли комиссионный доход на результаты деятельности банка. Исследование проводилось в банковских компаниях, принадлежащих членам основной коммутационной сети, назначенной Банком Индонезии, и коммутационных сетевых компаниях Индонезии. Данные, использованные для данного исследования, представлены финансовыми отчетами индонезийских коммерческих банков, которые стали общедоступными, данными из банковских журналов и данными, доступными на страницах каждого банка в открытом доступе. Выборка исследования представлена 30 коммерческими банками, которые перечислены в IDX. Результаты исследования показывают, что количество банкоматов не оказывает значительного влияния на комиссионный доход. В то же время, количество коммутируемых сетей оказывает существенное влияние на комиссионный доход, а комиссионный доход не оказывает значительного влияния на рентабельность инвестиций банка.

Ключевые слова: *банкоматы, коммутационная сеть, комиссионный доход, прибыльность.*

INTRODUCTION

Indonesia is a hugely significant market for financial services, not only in south-east Asia, but on the global stage, too. Home to more than 261 million people, it is the world's fourth most populous country and also the largest island nation on the planet, comprising more than 13,000 islands. From a financial services perspective, Indonesia has huge potential, but also some very real challenges to overcome, most notably financial inclusion. As the national government pursues initiatives to address this problem over the coming years, ATM deployment could prove a vital part of the mission.

Indonesia is the largest ATM market in south-east Asia, with the number of machines spread across the country passing the 100,000 mark in 2018, according to Retail Banking Research (RBR). It is a heavily cash-based society, meaning there is ongoing demand for ATM services. This is particularly relevant in light of the fact that, even though there are more than 35,000 bank branches in Indonesia and financial institutions (FIs) are expanding their physical networks into underserved areas, an increasing number of services are moving into digital channels. As a result, banks are seeking to maximize efficiency in their branches through strategies such as self-service automation. From a financial inclusion perspective, innovation in the ATM channel could have an important part to play in expanding service availability throughout the country. The development of the 'bank in a box' concept means it's now possible for banks to use ATMs to provide a range of services in areas where it might be impractical or financially infeasible to open a branch.

In the emergence of using ATMs, an ATM network company or a so-called switching company that will handle the connection and needs required in the implementation of using card as a payment instrument will also automatically appear. The company is working with banks in Indonesia. So far, an ATM interconnection company is mainly (fundamentally) hereinafter referred to in Indonesia as the switching company. The research features 3 switching companies that have operated and already hold a licence from Bank Indonesia PT. Artajasa Pembayaran Elektronis which manages the ATM Bersama network, PT. Rintis Sejahtera which manages the Prima ATM network, and PT. Daya Network Lest which manages the Alto ATM network. But in 2017 a new principal switching was present company which is also PT. It is the Telkomsigma or Himbara – ATM Link, which has operated an ATM network of state-owned banks, namely Bank BRI, Bank Mandiri, BNI and Ban BTN for approximately seven years. Himbara

Link was formed in order to realize the plan of Bank Indonesia to develop interconnection and interoperability of payment systems in Indonesia. In accordance with the Press Release of Bank Indonesia on 2018, a press release on "Developing Interconnection and Interoperability of Payment System with the National Payment Gateway (NPG)" while at the same time signing a Memorandum of Understanding conducted by four banks and three national principal switching companies (Bank Indonesia, 2016).

This research generally aimed at analyzing the effect of Bank Indonesia regulation on NPG creation on bank earnings and performance. In this study, NPG represented many network switchings owned by a bank. The study was conducted in banking companies belonging to members of the switching principal network appointed by Bank Indonesia and switching network companies in Indonesia. In detail the problems to be studied in this research were to first examine whether the number of ATM machines of the bank affect the fee-based income, secondly whether the amount of ATM switching network membership of the bank affects the bank's fee-based income, and the third whether the fee-based income affects the performance of the bank. The hypothesis of this study is three-fold. First, the number of ATM machines affect the bank's fee-based income. Second, the amount of switching network membership used affects the bank's fee-based income. Third, the bank's fee-based income affects the performance of the bank.

LITERATURE REVIEW

The Bank is a financial intermediary institution generally established with the authority to accept deposits of money, lend money, and issue promissory notes or banknotes (Hoggson, 1926). In their development, banks need information technology. Information Systems Technology proves that it continuously plays an important role in building an organization and its existence. Therefore, it is necessary to align the strategic model between business strategy and information system/technology strategy to ultimately improve organizational performance. Alignment of strategies for companies to achieve targets supported by information systems in their business processes will provide accurate information for management (Hamzah, 2007).

The plastic card is basically a card issued by a particular bank or company and that can be used as a means of payment for the transaction of goods or services, guaranteeing the validity of checks issued, and for withdrawing cash (Siamat, 2005). The use of the term „credit card” actually causes confusion because the term is often meant also for other types of cards that are not always related to credit card functions. Therefore, the specific term used is a plastic card (plastic card) (Siamat, 2005).

All transactions conducted and using information technology in banking will require a special information technology for banking called Core Banking. Core Banking is the heart of a Bank. Core banking stores data of customers and their accounts and all transactions since the customer opened an account at the bank until it closes (www.teknologibank.com 2016). Core Banking is generally associated with retail banking. The main core banking function is to serve customers for funding, lending and deposit money. Another function of core banking is recording all transactions that occur in the customer's account either in the form of savings, loans, or payment transactions. Access to core banking can be done through many channels such as Teller (Branch), ATM, Internet Banking, Mobile Banking and others (www.teknologibank.com, 2016).

In addition to core banking, a vital technological element owned by the bank is ATM Switching. The ATM Switching solution is known by different names. Although in the international world this solution is called EFT Switching (Electronic Fund Transfer Switch), in Indonesia it is better known as ATM Switching. This naming is actually not appropriate because this solution is also used to drive POS/EDC (Electronic Data Capture). It is worth noting that the term ATM Switching refers to software used to drive physical channels (such as ATM and EDC), perform authorization and transaction routing, and electronic data exchange. ATM Switch solutions are used to serve as a link between the bank's physical channels (such as branch, POS/EDC, ATM, Internet Banking and Mobile Banking) with the Core Banking system. The solution also handles connections to third parties such as Local National Switch (Artajasa/ATM Bersama, ALTO, Link, Rintis/Prima), International Switch (Visa, MasterCard, Amex), Payment Provider (PLN, Telkom, Airline) (www.teknologibank.com, 2016).

RESULTS OF OWN RESEARCH AND DISCUSSIONS

Fee Based Income. Fee based income is the income obtained from transactions provided in other bank services (Kasmir, 2012). This definition explains that apart from collecting and distributing funds, banks also carry out other supporting service activities. These support services are provided to facilitate

activities to collect and distribute funds that generate fee based income from the proceeds of providing bank services. Fee based income is the income other than operating income that is not shared with other parties. Some examples of banking services that generate fee-based income are transfers, collections, letters of credit, safe deposit boxes, credit cards, payment points for deposit accounts, bank guarantees, foreign exchange trading, commercial paper and traveler's checks.

Return On Asset (ROA). According to Fahmi (2013) ROA is one of the four ratios which measures the company's performance in terms of profitability. ROA measures the extent to which the company's ability to generate profits from assets used in the company. ROA is used as a measure of management effectiveness in managing its investment. ROA can be calculated by dividing earning after tax by total assets.

Network Switching and the number of ATMs are bank assets that play a role in the company's main operations. Automated Teller Machines contribute to the banking sector's effectiveness. The tremendous growth and development of technological advancement has been the driving force of the market (Jagede, 2014). Another study regarding the relationship between electronic banking and bank performance is the one conducted by Margaretha (2015), which examines the differences in the performance of banks that use electronic banking and banks that do not use electronic banking. In fact, the result shows that banks that use electronic banking have a higher Return on Assets. In relation to this research, those instruments which can be classified as pertaining to electronic banking are internet banking, mobile banking, phone banking, EDC, ATM, SMS banking, videobanking (Abadi, 2015).

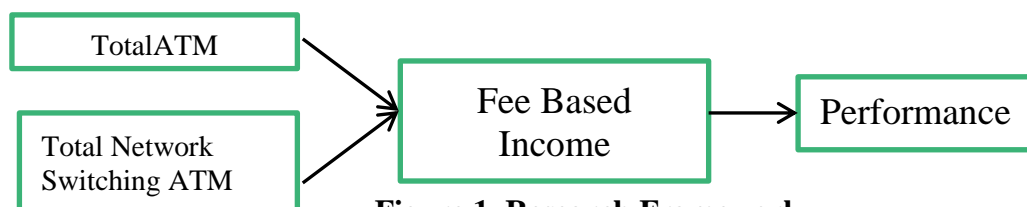


Figure 1. Research Framework

Source: Developed by the authors.

1. Research Method
Research Variable

Based on the issues to be discussed, then the specified variables are as follows:

Table 1

Definition of Operational Variables

Variable name	Variable type	Definition
ATM (X ₁)	Independen Variable	The "atm" variable is the number of atm machines used by each company. The "atm" variable is measured in equipment (machine) unis. Source obtained from Infobank magazine January 2019 edition.
Netwok Switching (X ₂)	Independen Variable	The variable "switching" is the number of bank switching networks, which banks use to perform bank operational activities through electronic means. The variable "switching" is measured in membership count. Source: obtained from Infobank magazine January 2019 and website every bank.
Non Interest (Y ₁)	Dependen Variable	The "non-interest" variable is the nominal value with the rupiah unit representing the amount of the bank's income earned from non-interest income, including the fee from the transaction for using the ATM. Sources are obtained from the bank's quarterly financial statements as of December 2018 from 30 selected banks.
Profitability (Y ₂)	Dependen Variable	The variable "ROA" represents the Return of Asset ratio that describes the ability of the banking company in generating return on the management of the company's assets. Data from this ratio is derived from the quarterly financial statements of banks as of December 2018 from 30 selected banks, the unit of "ROA" variables used in this provider is expressed in percentage, which is calculated manually. The reason for choosing ROA ratio to represent bank performance is because of the profitability ratios used to measure the effectiveness of a company in generating profits by using its total assets. And ATM machines and switching networks are included in fixed assets and bank inventories.

Source: Developed by the authors based.

Data Sample

The data used in this research is from the financial statements, publications of banking companies and from magazines. The method of data retrieval is by downloading quarterly financial reports per December 2018 from each bank that becomes the object, and retrieving data that has been published in the January 2019 infobank magazine (Infobank, 2019). The banking company has an ATM machine over 200 units of machinery that is still operating and can be used by all customers. This research uses 30 banking companies as sample.

2.Data and Analysis

Structural Model Test

Based on the normality evaluation shows that the data is feasible to be used in the structural model feasibility test on the influence of network switching and ATM through fee based income to profitability which the result of structural model test is shown in Table 2 as below:

Table 2

Structural model test			
Good of Fit (GOF) Index	Cut-off Value	Model	Good Fit
Chi-square (χ^2)		0,157	good fit
Df (Degree Freedom)	Positive	2	good fit
P (probabilitas)	>0,05	0,924	good fit
RMSEA	0	0,000	good fit
GFI	>0,9	0,997	good fit

Source: Developed by the authors.

From the overall calculation on the measurement Overall Model Fit and Good of Fit, it can be concluded that the model study made on the whole has qualified measuring and Fit.

After testing the structural model, the next test is the SEM (Structural Equation Modeling) testing. Here are the results and output Path Diagram of the Standardized Estimates section of the research model.

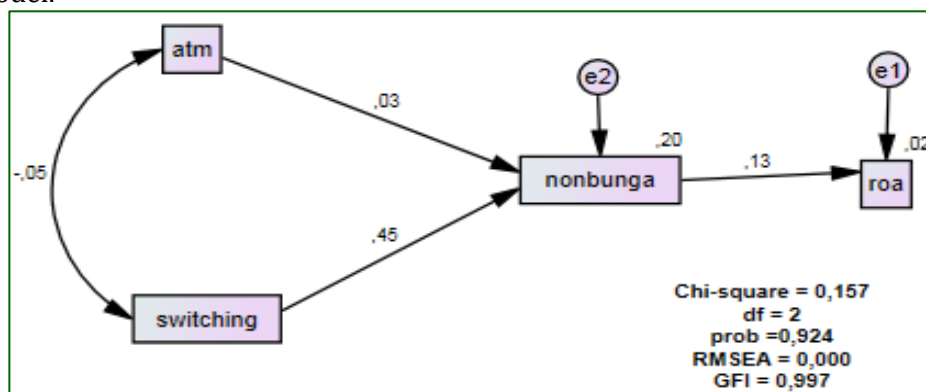


Figure 2. Path Diagram Output

Source: Developed by the authors.

Then, after testing Data Normality and Good of Fit, the next test is Structural Model Test. It's to test the relationship between constructs. The test is aims to see a significant and close relationship between independent and dependent variables. Here is the result.

Table 2

Result of Hypothesis Test

Hypothesis	Path	P	Result of Probability	Estimate
H1	atm → fee based	0,867	Rejected	0,028
H2	switching → fee based	0,006	Accepted	0,453
H3	fee based → roa	0,477	Rejected	0,131

Source: Developed by the authors based.

From the table above, it can be concluded that, the first hypothesis on the test results is the result that H_1 hypothesis is rejected. Respectively, there is no relationship/influence between variable "atm" with variable "fee based", with probability is 0,867 above 0,05 and number of closeness 0,028 under 0,5. And then the second hypothesis on the test results is that H_2 is accepted. This means that there is a relationship between the "switching" variable and the "fee based" variable in which the probability is 0.006 below 0.05 and the closeness is 0.453 below 0.5. and the last hypothesis, show H_3 is also rejected. This means that there is no relationship between the "fee based" variable with the "ROA" variable in which the number of probability is 0.477 above 0.05 and the closeness is 0.131 below 0.5.

According to the results of this test, it can be concluded that the number of ATM machines used by a bank to support bank operations to facilitate transactions done by customers does not guarantee an increase in bank non-interest income. The number of ATM machines does not contribute to an increase in non-interest income at banking companies. This can be due to the fact that there are many other means that can be used for transactions, for example EDC machines, Internet Banking, Mobile Banking, and others. Customers are thought to prefer banking transactions using online facilities rather than ATMs. This research is in line with the research of Jagede (2014) which states that although ATM is the driving force of fee-based income, it is the number of transactions that directly contributes to the amount of fee-based income.

CONCLUSION AND RECOMMENDATIONS

Based on test results and analysis results the conclusion of the research is, *First*, the number of ATM machines not affect to the bank's fee based income. *Second*, the amount of switching network membership used affects the bank's fee-based income. Then *third*, the bank's fee based income also does not affect to the performance of the bank. This research has answered the formulation of the problems that have been enunciated before. Further research can be directed to deep dive into the switching network factor, which is the aspect that shapes a bank's fee-based income, and also examines the size of a bank's assets which of course will affect the size of the switching network that it owns.

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GOVERNMENT SPENDING ON TOURISM APPROACHED THROUGH THE PRISM OF CONSOLIDATING THE RIGHT TO REST AND LEISURE

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ABSTRACT

Every person's right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay, as well as the right to freedom of movement without restriction, except as provided by law, determine the opportunity and necessity of the harmonious development of domestic and international tourism. The harmonious development of domestic and international tourism depends on the quality of public policies designed to stimulate the growth of this sector, especially the public expenditure policy. This paper aims to analyse the impact of tourism regarding the respect for the right to rest, the effectiveness of public policies applied in the field of tourism, especially the public expenditure policy aimed to stimulate tourism, to formulate solutions for the development of the tourism sector in the Republic of Moldova by strengthening the right to rest. The Human Development Index (HDI) is considered an aggregated indicator with the capacity to more or less consistently quantify the level of respect for economic, social and cultural rights. Based on the simple regression method, the relationship between HDI as a dependent variable and Travel and Tourism Sector Competitiveness Index (TTCI) as an independent variable is tested. The presented analysis suggests the conclusion that the quality of respect for the right to rest, materialized, including through tourism, is a factor with a major positive impact on the HDI. An important place in the paper is occupied by the generalization of the EU countries experience in the field of public policies designed to stimulate tourism development approached through the prism of respecting the right to rest and leisure.

Keywords: human development index, human rights, the right to rest and leisure, public expenditure, tourism, travel and tourism competitiveness index.

Dreptul fiecăruia la odihnă și timp liber, inclusiv dreptul la o restricție rezonabilă a orelor de muncă și la concediile periodice plătite, precum și dreptul de a circula liber fără restricții, cu excepția celor prevăzute de lege, determină oportunitatea și necesitatea dezvoltării armonioase a turismului intern și internațional. Dezvoltarea armonioasă a turismului intern și internațional depinde de calitatea politicilor publice destinate să stimuleze creșterea acestui sector, în special a politicii privind cheltuielile publice. Prezenta lucrare urmărește să analizeze impactul turismului asupra respectării dreptului la odihnă și recreație, eficiența politicilor publice aplicate în domeniul turismului, în special a politicii în domeniul cheltuielilor publice destinate stimulării turismului, să formuleze soluții de dezvoltare a sectorului turismului din Republica Moldova în scopul consolidării respectării dreptului la odihnă și recreație. În calitate de indicator agregat care are capacitatea să cuantifice, mai mult sau mai puțin amplu, nivelul de respectare a drepturilor economice, sociale și culturale este considerat Indicele Dezvoltării Umane (IDU). În baza metodei regresiei simple este testată relația dintre IDU, în calitate de variabilă dependentă, și Indicele competitivității sectorului călătoriilor și turismului în calitate de variabilă independentă. Analiza prezentată în lucrare sugerează concluzia conform căreia calitatea respectării dreptului la odihnă, materializat, inclusiv prin practicarea turismului, constituie un factor cu impact pozitiv major asupra IDU. Un loc important în lucrare îl ocupă generalizarea experienței țărilor din UE și Parteneriatului Estic în domeniul politicilor publice destinate stimulării dezvoltării turismului abordate prin prisma respectării dreptului la odihnă și recreație.

Cuvinte-cheie: cheltuieli publice, dreptul la odihnă și timp liber, drepturile omului, indicele competitivității sectorului călătoriilor și turismului, indicele dezvoltării umane, turism.

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Право каждого человека на отдых и досуг, включая разумное ограничение рабочего времени и периодические оплачиваемые отпуска, а также право на свободу передвижения без ограничений, за исключением случаев, предусмотренных законом, определяют возможность и необходимость гармоничного развития внутреннего и международного туризма. Гармоничное развитие внутреннего и международного туризма зависит от качества государственной политики, направленной на стимулирование роста этого сектора, особенно политики в области государственных расходов. Данное исследование направлено на анализ влияния туризма на соблюдение права на отдых и досуг; эффективности государственной политики в сфере туризма, в частности политики государственных расходов, направленной на стимулирование туризма; а также на формулирование предложений для развития туристического сектора в Молдове с целью усиления соблюдения права на отдых и досуг. Индекс человеческого развития (ИЧР) рассматривается в качестве совокупного показателя, способного в большей или меньшей степени отражать уровень соблюдения экономических, социальных и культурных прав. На основе метода простой регрессии проверяется взаимосвязь между ИЧР, как зависимой переменной, и Индексом конкурентоспособности сектора путешествий и туризма, как независимой переменной. Анализ, представленный в статье, позволяет сделать вывод о том, что качество соблюдения права на отдых и досуг, материализованное, в том числе посредством уровнем развития туристической отрасли, является фактором, оказывающим значительное положительное влияние на ИЧР. Важное место в статье занимает обобщение опыта стран ЕС и Восточного партнерства в области государственной политики, направленной на стимулирование развития туризма, рассматриваемые через призму соблюдения права на отдых и досуг.

Ключевые слова: государственные расходы, индекс конкурентоспособности путешествий и туризма, индекс человеческого развития, право на отдых и досуг, права человека, туризм.

INTRODUCTION

The right to rest and leisure is a right enshrined in the *International Covenant on Economic, Social and Cultural Rights*, connected to the right to work. Moreover, the right to rest and leisure is included in the *Universal Declaration of Human Rights*.

The right to rest and leisure is of fundamental importance for many other rights, including political and civil rights. There is an opinion based on a long-term perspective that leisure time is not a waste of inactive time or a simple absence and recovery from work, being rather necessary for a dignified life, as defined by human rights policies. The right to rest has been linked to a long series of empirical studies on the improvement of the well-being of people globally.

Every person's right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay, as well as the right to freedom of movement without restriction, except if provided by law, shall determine the appropriateness and necessity of the harmonious development of domestic and international tourism.

The harmonious development of domestic and international tourism depends on the quality of public policies designed to stimulate the growth of this sector. In this respect, the fundamental tool through which the promotion of public policies in the field of tourism is achieved is by means of public finances, in particular public expenditures and the quality of their management.

Based on these observations and statements, this paper aims to analyse the impact of tourism on respect for the right to rest and leisure, the effectiveness of public policies applied in the field of tourism, especially public expenditure policy to stimulate tourism, to formulate solutions for the development of the tourism sector in the Republic of Moldova in order to strengthen the respect for the right to rest and leisure.

LITERATURE REVIEW

A right is a morally and/or legally justified request to have or do something. Human rights are the norms that aspire to protect all people everywhere from serious political, legal and social abuses (Stanford University, 2019). In an alternate acceptance, human rights are those rights to which all human beings are considered to be entitled only on the basis of their humanity (Donnelly, 2003).

The classification provided by the French lawyer of Czech origin *Karel Vašák* (Vašák, 1977), proposing the concept of three generations of rights, is probably the most practical, frequently used and comprehensive classification of human rights. According to this group, there are three major types of human rights norms: civil and political; socio-economic and collective development. The first two, representing potential claims of individuals to the state, are widely accepted rules identified in international treaties and conventions. The third type, expressing potential demands of peoples and groups towards the state, is the most debated, lacking legal and political recognition.

Considering this classification, *Sumner B. Twiss* specifies two additional subtypes for each of the above types (Twiss, 2004), namely:

- political and civil rights, including two subtypes: rules on physical and civil security (e.g. without torture, slavery, inhuman treatment, arbitrary arrest and detention; equality under the law) and rules on civil and political freedoms or powers (e.g. freedom of thought, conscience and religion, freedom of assembly and voluntary association);
- human socio-economic rights similarly comprising two subtypes: rules on the provision of goods that meet social needs (e.g. nutrition, shelter, health care, education) and rules on the supply of goods that meet economic needs (e.g. fair work and wages, an adequate standard of living, a social security network);
- collective rights also encompass two subtypes: the self-determination of peoples (e.g. their political status and economic, social and cultural development) and certain special rights of ethnic and religious minorities (e.g. the right to their own culture, language, the right to manifest one's religion).

The Universal Declaration of Human Rights, adopted by the United Nations General Assembly in 1948, is the first UN document on human rights that includes civil and political rights, as well as economic, social and cultural rights.

In 1966, the General Assembly adopted two major separate human rights documents: the *International Covenant on Civil and Political Rights* (ICCPR) and the *International Covenant on Economic, Social and Cultural Rights* (ICESCR). The two separate documents were drawn up as a result of Western pressure. Western countries emphasized the alleged difference in the nature of both categories of rights: civil and political rights could be implemented immediately, while most economic, social and cultural rights could only be implemented progressively. In the *Vienna Declaration and Programme of Action*, adopted by consensus at the World Conference on Human Rights in Vienna in 1993, the principle of all human rights being of equal importance has, however, been emphasized.

The *Proclamation of Teheran*, adopted in 1968 by the International Conference on Human Rights, gave priority to economic, social and cultural rights: "Because human rights and fundamental freedoms are indivisible, the full realization of civil and political rights without the effective exercise of economic, social and cultural rights is impossible. Making sustainable progress in implementing human rights depends on sound and efficient national and international economic and social development policies." (UN, 1968).

There are opinions according to which while human rights should all be placed on the same footing, their implementation should have a well-defined and shared order. In so doing, explicated shared priorities allow states to have a more concrete and attainable implementation plan, serving as both guidance for the states and parameters for the human rights supervisory bodies. Accordingly, this approach might be specifically applicable in case of developing and transitioning states (Quintavalla, Heine, 2019).

The ICESCR includes the right of every person to work; the right to social security, including social insurance; the right of every person to a standard of living adequate for himself and his family; the right to enjoy the best physical and mental health he can attain; the right to education; the right to participate in cultural life; the right to benefit from scientific progress and its applications in the category of economic, social and cultural rights. At the same time, several rights contained in this international treaty define the right to work. Thus, the right to work includes: the right that any person has to obtain the possibility to earn a living through a freely chosen or accepted work; the right of every person to the enjoyment of fair and favourable conditions of work

and to ensure the following: a fair wage and equal remuneration for work of equal value without distinction; a decent existence for the employee and family; work safety and hygiene; equal opportunity for all to be promoted in their workplace to an appropriate higher category, taking into account only the duration of the services performed and the skills; rest, free time, rational limitation of working hours and paid periodic leave, as well as the remuneration of holidays; the right of every person to the favouring and protection of economic interests, the right to form trade unions, together with other persons and to join a trade union of his choice; the right to strike. Therefore, the *right to rest and leisure* is a right highlighted in the *ICESCR*, related to the right to work. Moreover, the right to rest and leisure is also included in the *Universal Declaration of Human Rights* (Article 24: "Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay"). This right is considered one of the primary (but not only) workers' rights constructed to meet challenges posed by the industrial revolution, the resulting new global economy and the First World War (Richards, Carbonetti, 2012).

The right to rest and leisure is of fundamental importance for many other rights, including political and civil rights. Awareness of the leisure-related human rights universality could assist leisure studies to become a more globally connected field of research (Veal, 2015).

There is an opinion based on a long-term perspective that leisure time is not a waste of inactive time or a simple absence and recovery from work, being necessary, rather, for a dignified life, as defined for human rights. The right to rest has been linked to a long series of empirical studies on the global improvement of the population's well-being.

It is relevant to mention that in this context, well-being includes both aspects that define eudaimonic happiness, a concept that means, according to modern psychology, the individual's ability to fully update his personal potential, and those that explain hedonic well-being (happiness and/or subjective satisfaction) having the possibility to be achieved through respect for economic, social and cultural rights.

Moreover, the positive effect of leisure time on cognitive and behavioural ability related to general mechanisms of psychological adaptation, including constructive recovery from negative life events, free expression and creative ability, providing the necessary environment for human development and self-actualization, happiness, the general satisfaction of life has been demonstrated.

The field of recreational therapy called free time "the correct purpose, from a moral point of view, of recreational therapy" and invoked its primordially as a human right.

DATA SOURCES AND USED METHODS

Considering the theoretical-scientific point of view, the research was carried out in the context of the complex and systemic approach of contemporary economic and social concepts. An important role in the paper is offered to the generalization of the experience of EU and Eastern Partnership countries in the field of public policies designed to stimulate the development of tourism approached through the prism of respecting the right to rest and leisure.

The research is based on established approaches in the field of human rights, in particular economic, social and cultural rights, with a basic focus on the right to rest and leisure. The relationship between tourism and rest periods is being considered.

The complexity of the studied social, economic and financial phenomena required the use of *statistical methods*, namely the *simple regression method*. At the same time, the *comparative analysis* was also used.

Applying the simple regression method, the *HDI* was selected as a dependent variable. *HDI* is a statistic composite index that measures key dimensions of human development: **a long and healthy life** (measured by *life expectancy*); **access to education** (measured by *expected years of schooling* of children at school-entry age and *mean years of schooling* of the adult population); **and a decent standard of living** (measured by *Gross National Income per capita* adjusted for the price level of the country). The *HDI* is considered an aggregate performance indicator that has the capacity to quantify, more or less consistently, the level of respect for economic, social and cultural rights. Tourism is representing one of the ways to achieve the right to rest and, through it – a premise for updating and developing people's personal potential, has the strength to contribute to increasing the value of *HDI*.

The *TTCI* was identified as an independent variable. The *TTCI* compares the competitiveness of the travel and tourism sector in 140 economies. The index is developed under the World Economic Forum's Aviation, Travel and Tourism Industry Program. The results of the index measurement are reflected in the *Report on the competitiveness of the travel and tourism sector*. The *TTCI* consists of 4 sub-indexes, 14 pillars and 90 individual indicators. The value of *TTCI* and its components can vary from 1 to 7 (best level). *TTCI* is considered one of the synthetic indicators that characterizes the development of the tourism sector and is examined with reference to the Republic of Moldova in the paper.

The application of the simple regression method aims to identify the existence of dependence between IDU and *TTCI*, in order to ultimately formulate the conclusion on the impact of public spending policy aimed at stimulating tourism on the level of respect for economic, social and cultural rights, in particular on the right to rest and recreation.

RESULTS OF OWN RESEARCH AND DISCUSSIONS

Every person's right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay, and the right to freedom of movement without restriction (LEGIS 1948), except as provided by law determines the opportunity and necessity for harmonious development of domestic and international tourism.

The relationship between tourism and rest periods can be explained based on Figure 1.

Depending on the category of the rest period, the arrangements for the use of leisure time and the corresponding activities are established. It is therefore noticed that the daily free time is used for self-training, fun activities and meetings. Free time on weekends will be used for tourism, sports activities, watching shows, etc. The annual rest leave is especially intended for tourism, balneary treatments, cultural purposes, etc. (Ioncica, 2003).

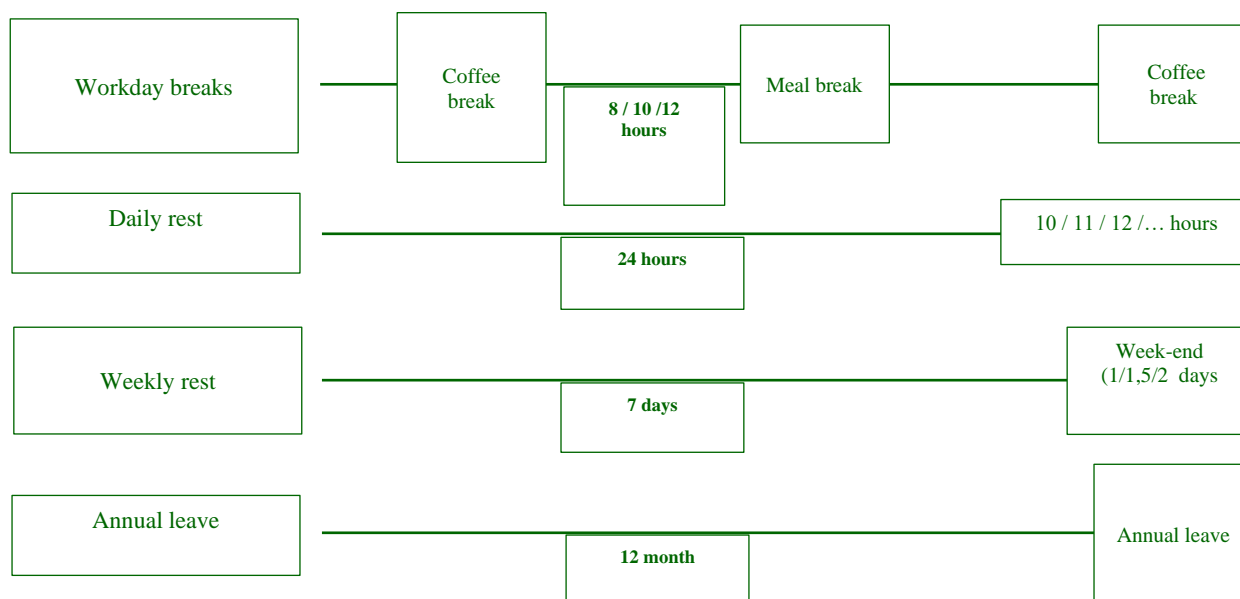


Figure 1. Rest periods

Source: (ILO, 2015).

From the above mentioned, tourism is among the ways to achieve the right to rest and, thereby – a premise for updating and developing the people's personal potential, tourism has also the power to contribute to increasing the value of the HDI. In this sense, Figure 2, based on a number of 138 countries, highlights this interdependence by representing the HDI reliance on the quality of tourism development measured using the *TTCI*. This index summarizes the set of factors and policies, including public expenditure policies, that enable the sustainable development of the travel and tourism sector, reflecting the role and quality of active leisure.

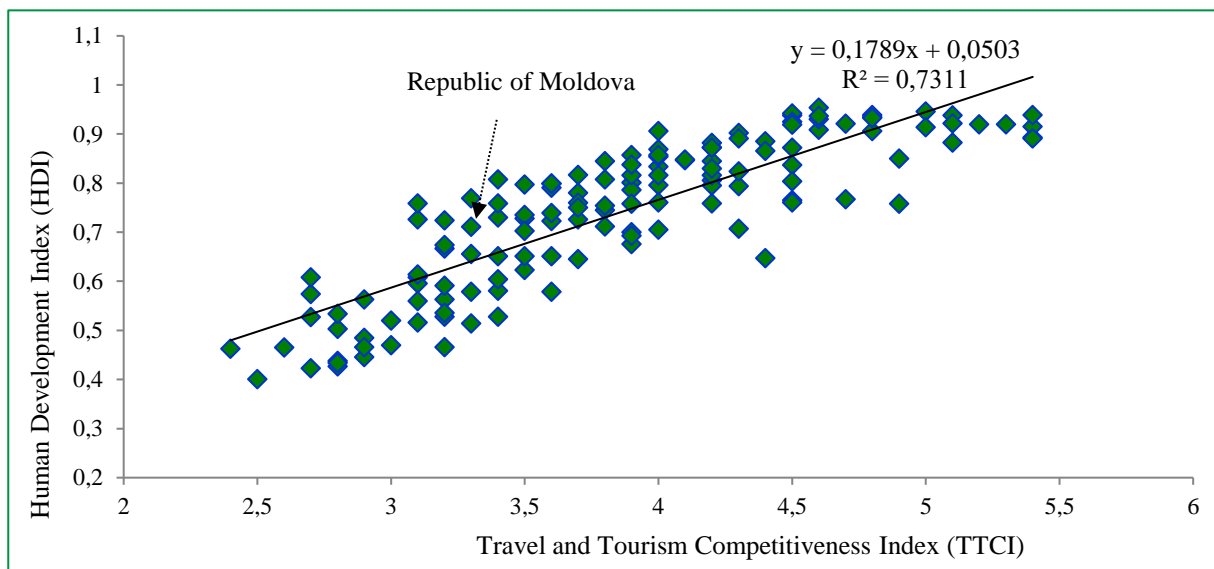


Figure 2. Human Development Index and Tourism Competitiveness Index Relationship (2019)

Source: Developed by the author based on (UNDP, 2019; WEFORUM, 2019).

As may be observed in figure 2, the *TTCI* strongly and positively influences the *HDI*. This finding suggests the conclusion that the quality of respect for the right to rest, materialized, including through tourism, is a factor with a major positive impact on *HDI*.

The harmonious development of domestic and international tourism depends on the quality of public policies designed to stimulate the growth of this sector. In this respect, the basic instrument through which the promotion of public policies in the field of tourism is achieved is public finances, in particular public expenditures and the quality of their management.

Next, the development of the tourism sector in the Republic of Moldova is evaluated in terms of the quality of public expenditure management for this field.

As follows in figure 3, in the case of the Republic of Moldova, the 3.3 *TTCI* score determines the rank of the country on the 103rd position (out of the 144 countries evaluated in the Report on the competitiveness of the travel and tourism sector). Thus, the Republic of Moldova is less competitive in terms of tourism compared to the vast majority of former socialist countries. In this respect, the most successful are Croatia (ranking 27), Slovenia (36), Russia (39) and Poland (42).

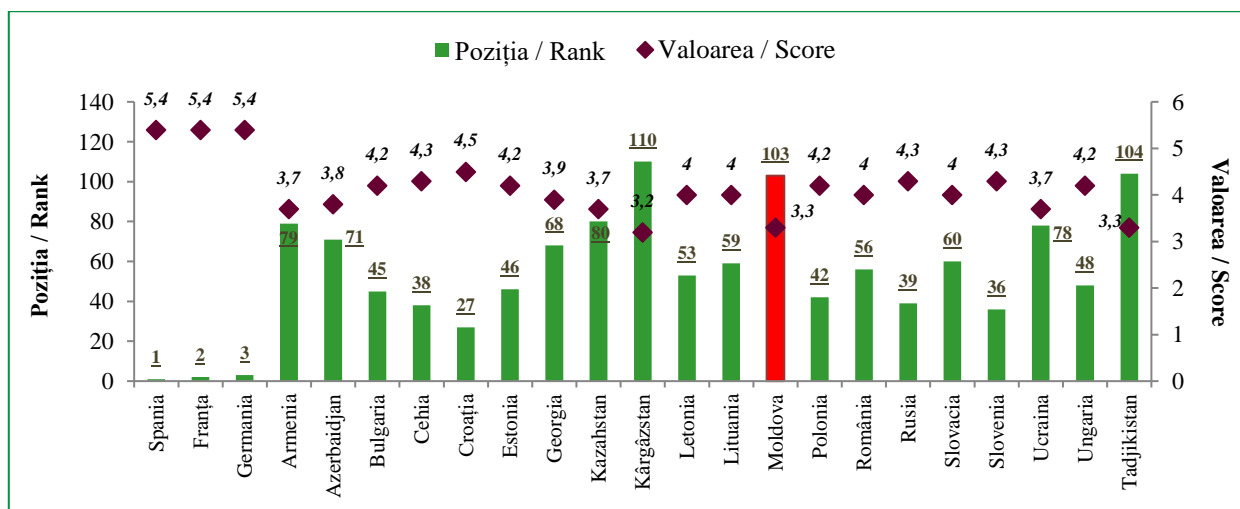


Figure 3. Tourism Competitiveness Index 2019: Overall Rankings and Scores

Source: Developed by the author based on (WEFORUM, 2019).

The causes that explain the unsatisfactory level of the *TTCI* in the situation of the Republic of Moldova are derived from the state of the component elements of this indicator. In this regard, referring to the *TTCI* pillars, the most unfavourable situation is in the case of the following parameters: "Cultural resources and business travel" (the Republic of Moldova registers the score 1.2, the maximum possible score being 7), "Natural resources" (1.7), 'Air transport infrastructure' (2.1), 'Land and port infrastructure' (2.6), 'Tourist services infrastructure' (2.9).

The underdevelopment of the tourism sector conditions the modest contribution of this sector to the formation of the gross domestic product of the Republic of Moldova (Figure 4). Thus, compared to some former socialist countries, the Republic of Moldova has the lowest share of tourism in GDP.

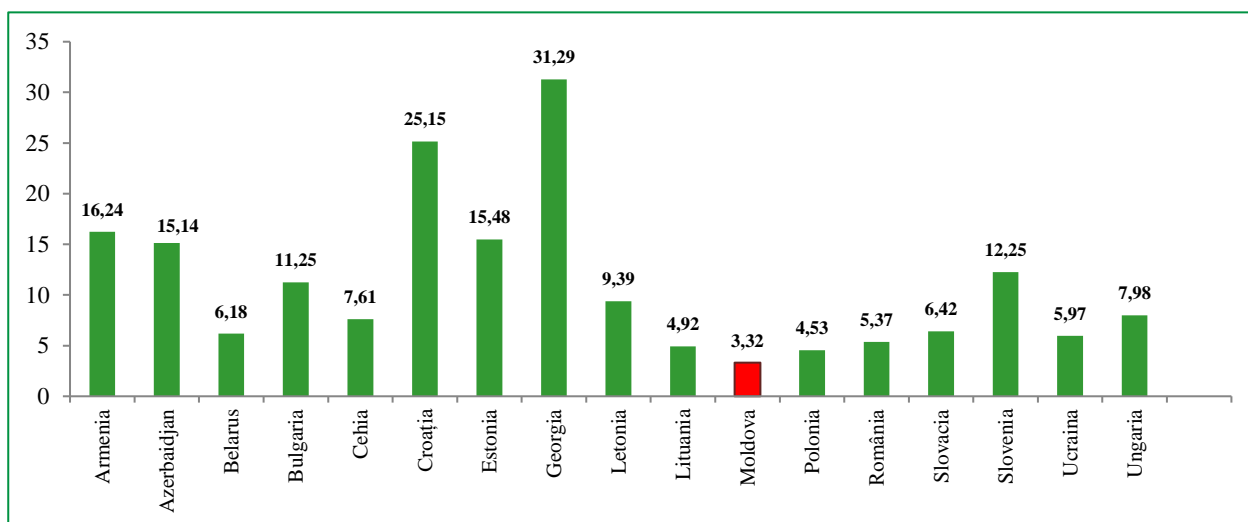


Figure 4. Travel and Tourism contribution to GDP, 2018 (%)

Source: Developed by the author based on (WORLD BANK, 2019).

The contribution of tourism to employment being, at the same time, a consequence, but also a substantive condition of the level of development of this sector, that registers, in the case of the Republic of Moldova, the lowest score among the countries included in the analysis represented in figure 5.

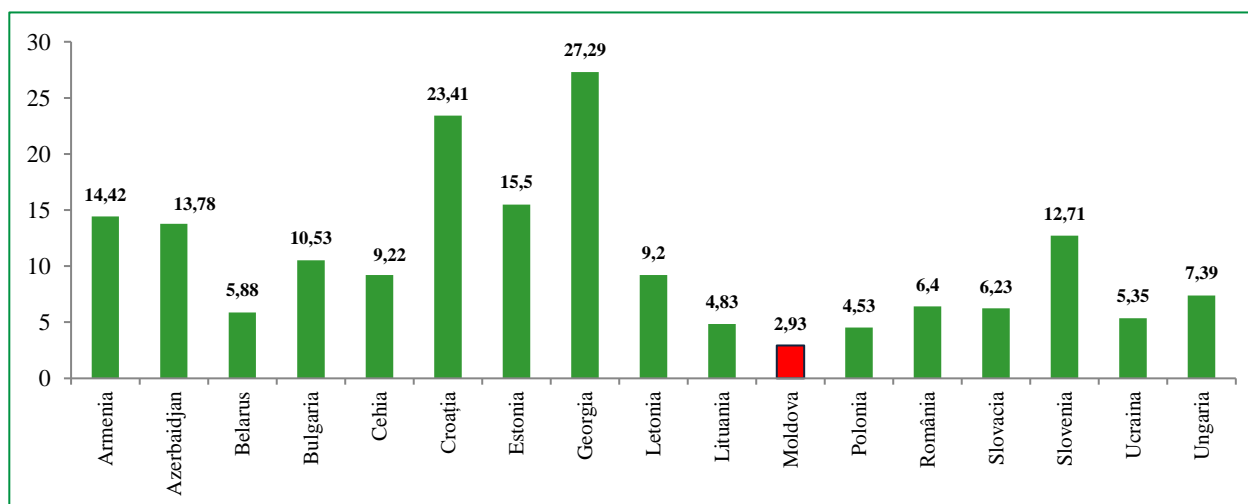


Figure 5. Travel and Tourism contribution to employment, 2018 (% of total employment)

Source: Developed by the author based on (WORLD BANK, 2019).

The Travel and Tourism (TT) Policy sub-index and stimulatory conditions, which are among the four components of the *TTCI*, include specific policies or strategic issues that most directly

influence the TT industry. In turn, this sub-index is based on 4 pillars: TT prioritization, international openness, price competitiveness and environmental sustainability. The efficiency of public finance policies, including those related to public expenditure is reflected by the pillar – the prioritization of TT. This pillar estimates the extent to which the government gives priority to the TT sector, influencing the competitiveness of the TT. By clearly stating that the sector is of primary concern, the government can channel funds to essential development projects and coordinate the players and resources required to develop the sector. Signalling the stability of government policy can affect the sector's ability to continue to attract private investment. The government can also play an important role in attracting tourists directly through national marketing campaigns. This pillar includes measures in respect of government spending, the effectiveness of marketing campaigns and country branding, as well as the completeness and actuality of providing TT data to international organizations, as this establishes the importance a country attaches to its TT sector.

Figure 6 indicates the position of the Republic of Moldova compared to the group of countries included in the analysis. Regarding the quality of travel and tourism policies estimated in the Report on Tourism Competitiveness (2019 edition), the Republic of Moldova, gaining a score of 3,7 thus occupying the position 117, stays well behind both EU and some of Eastern Partnership countries (*Armenia, Azerbaijan, Georgia, Ukraine*). Among EU countries most successful in this regard there are Malta and Cyprus. Among the Eastern Partnership countries, Georgia is the best positioned (28th), suggesting that it promotes the most appropriate government policy to increase the competitiveness of the TT sector compared to the other countries in this bloc of countries.

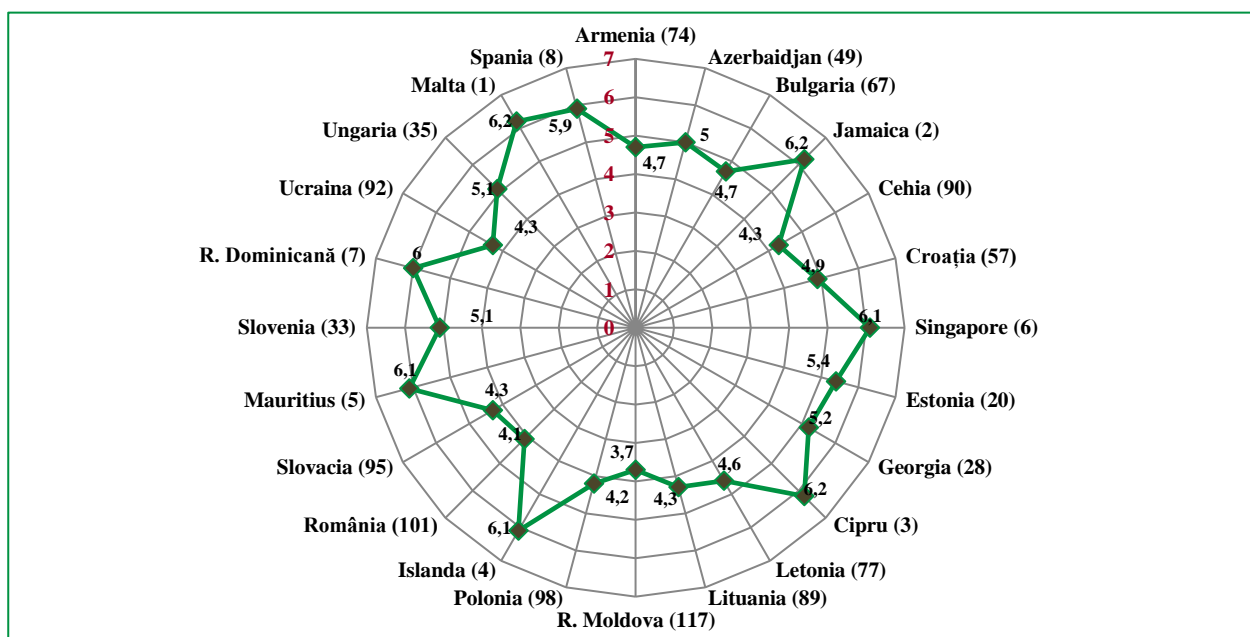


Figure 6. Prioritization of Travel & Tourism: sub-index score (1 - worst; 7 - best) and country rank (in brackets)

Source: Developed by the author based on (WEFORUM, 2019).

Public spending policy is one of the most important components of government travel and tourism policy.

From figure 7 it turns out that the Republic of Moldova, registering a share of tourism expenditures of 3.3% from total public expenditures, occupies position 67 in the total of 140 countries evaluated in the Report on the competitiveness of tourism (2019 edition). This value is thus comparable to that recorded by Bulgaria, Azerbaijan, Latvia, Lithuania, Georgia. The highest values are recorded by the Seychelles, the Dominican Republic and Jamaica.

In the budgetary classification, tourism is comprised in the functional subgroup 0473, the following categories of expenditures being covered from the sources of the national public budget:

- administration of services in the field of tourism, promotion and development of tourism, ensuring the connection with transport services, hotels and restaurants and with other fields that benefit from the result of tourism development;
- management of tourist offices in the country and from abroad, organization of tourism marketing/advertising campaigns, production and dissemination of literature to promote tourism.

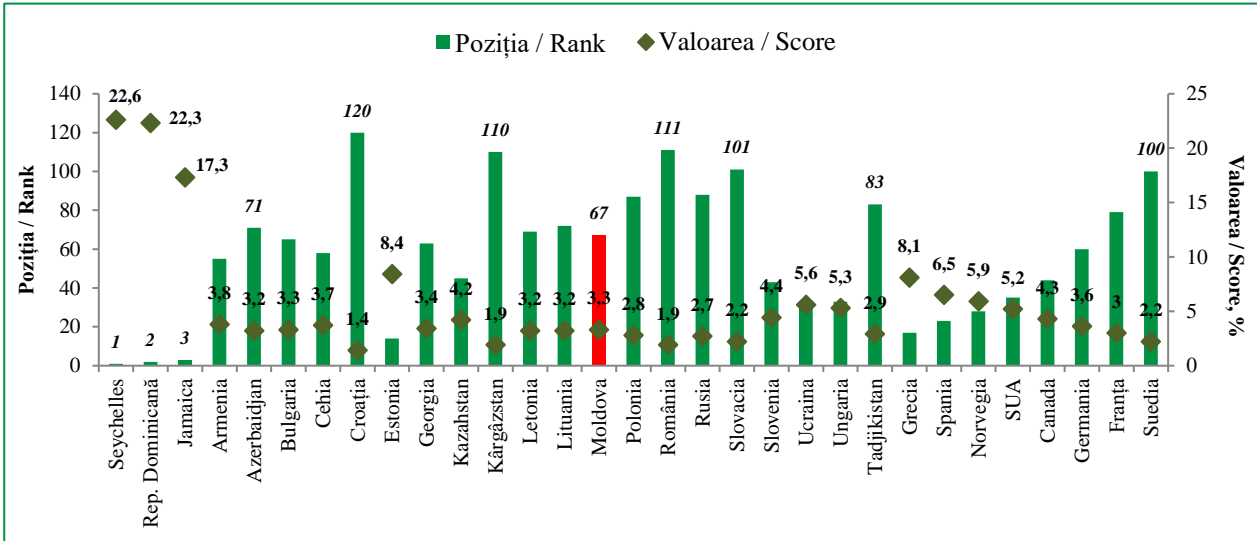


Figure 7. Government spending on Travel and Tourism service (% of total government budget)

Source: Developed by the author based on (WEFORUM, 2019).

The data contained in figure 7 contrasted with those of figure 4 generates the conclusion about the inefficiency of public spending on tourism. Considering a comparable level of public spending on tourism in GDP with Bulgaria, Azerbaijan, Latvia, Lithuania and Georgia, the Republic of Moldova has a contribution of this sector in GDP well below the contribution of the tourism sector in the countries concerned.

Also of interest is the dynamics of public expenditures for tourism in the Republic of Moldova. Thus, figure 8 shows a fluctuating evolution of the ratio between public spending on tourism and GDP. After the decline in public funding of this sector in the 2011-2014 period, during the 2015-2018 time segment there is a very modest increase in public funding.

The conclusion that requires to be formulated based on figure 8 is that, although, according to Law no. 352 of 24.11.2006 on the organization and development of tourism in the Republic of Moldova, tourism is qualified as a priority area of the national economy, the public financing policy of this sector is inconsistent and does not induce stability and sustainability.

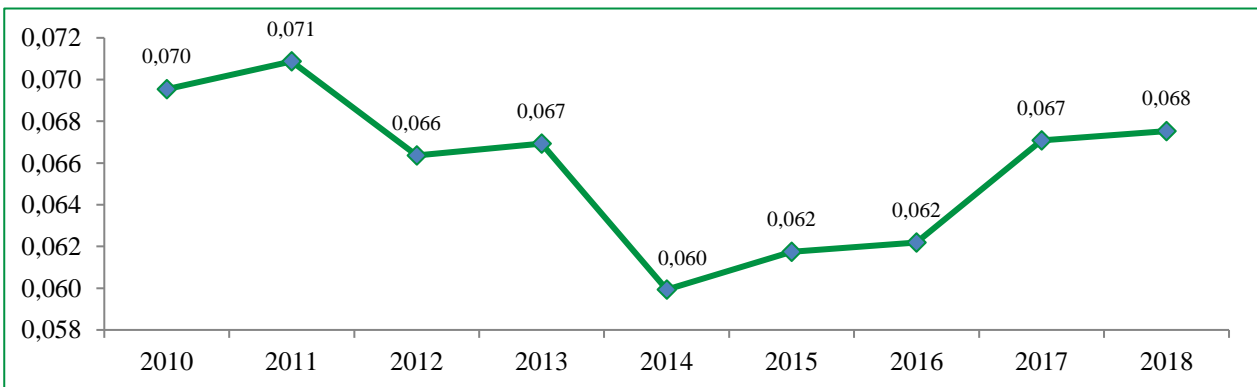


Figure 8. Government spending on Travel and Tourism service (% of GDP)

Source: Developed by the author based on (WORLD BANK, 2019).

A consequence of this public policy is the dynamic development of imports on the market of tourist services of the Republic of Moldova. However, this cannot be said about the export of tourist services. According to the data presented in table 1A of the Annexes, the outbound tourism exceeded in 2019 by the number of tourists-days the inbound tourism more than 33 times. The inefficiency of public policy in the field of tourism is observed even more strongly from the analysis of the dynamics of domestic tourism: when it does not stagnate, it faces obvious regresses (in 2016, 2017 and 2019 domestic tourism). This is mainly explained by the "price to quality" ratio, which is not in favour of the domestic tourism industry.

At the same time, from the point of view of the right to rest and leisure, domestic tourism is of particular importance. Thus, domestic tourism is a suitable solution for rest and leisure during weekends. Simultaneously, domestic tourism must be an affordable solution for people with incomes below the average level.

The effectiveness with which public expenditures for tourism development are being carried out can be approached in terms of two dimensions: allocative efficiency and technical efficiency.

Taking into account the pronounced limited public financial resources available to the National Public Budget of the Republic of Moldova, allocative efficiency is of particular importance. Allocative efficiency is determined by the capacity of the public authority responsible for tourism development in the Republic of Moldova (Tourism Agency/Investment Agency) to establish priorities in tourism development, to distribute resources according to the identified priorities and effectiveness of programs and to redirect resources from achieved objectives to setting new ones, or from less productive activities to those with higher productivity.

In its turn, technical or operational efficiency in the using of available budgetary resources for tourism development refers to the ability of the Tourism Agency/Investment Agency to implement programs in the field and to provide services at the lowest cost.

Until 2018, the central administrative authority responsible for promoting public policy in the field of tourism in the Republic of Moldova was the Tourism Agency. In 2018, it was reorganized by merging with the Investment Agency of the Republic of Moldova, the latter having the mission to contribute to the economic growth by increasing the level of foreign investment, increasing the volume of exports and developing the tourism industry. At the same time, the frequent change of governments in the Republic of Moldova with the application of various approaches each time on the reform of the central public administration have affected, among other things, the efficiency of spending public money for the development of the tourism branch.

The shortcomings in the management of public expenditures aimed for tourism with an impact on the allocative efficiency are pointed out further:

Inadequate prioritization of the directions of tourism development in conditions of very limited financial resources. The tourism sector in the Republic of Moldova faces a number of pronounced impediments. These include a lack of adequate skills in the tourism workforce, relatively underdeveloped land, river and air transport networks, and declining price competitiveness. Although the "Tourism 2020" Tourism Development Strategy has largely identified these shortcomings, formulating an extensive list of actions to overcome them, the problems mentioned above have not been addressed, remaining current and ongoing. Consequently, at a level comparable to public expenditure on tourism in GDP with Bulgaria, Azerbaijan, Latvia, Lithuania și Georgia, the Republic of Moldova has a contribution of this sector to GDP well below the contribution to the tourism sector in those countries.

The Government fails in applying an integrated approach to tourism development in the Republic of Moldova based on the efficient exploration of interdependencies, synergies and trade-offs between the tourism industry and other related sectors and activities. As a result, significant benefits and savings in financial resources are being missed.

In the strategic documents that establish the direction of long-term tourism sector development in the Republic of Moldova, tourism is not treated as a solution for strengthening the right to rest and leisure.

In turn, the technical efficiency of public expenditures for tourism sector development has been severely affected by numerous management gaps, which have been identified and published several times in the Reports by the Court of Accounts of the Republic of Moldova.

Thus, although it appears as an action to be implemented in the "Tourism 2020" Strategy, so far the management of the national brand portfolio is not ensured in good conditions. In fact, according to the Court of Accounts of Moldova, it is not even recorded in the accounting records. Consequently, due to the fact that the necessary activities regarding the monitoring and control over the legality of the use of brands by third party users are not carried out, the Republic of Moldova faces potential failed revenues and financial losses related to the reckless use of tourist brands.

So far, the tourist heritage register has not been established, which creates premises for missing economic opportunities/benefits and disadvantages the development of the tourism sector.

At the same time, the technical efficiency at the level of the central authority responsible for tourism sector development is compromised by an internal control system that is not properly organized, the existence of distorted information in the accounting and financial statements, compromising the inventory of assets and liabilities, the existence of expenses illegally supported.

In compliance with the shortcomings outlined above, the following solutions could, in our opinion, improve the efficiency of public expenditure management for tourism:

It is of strong necessity to conduct research in the field of tourism in order to identify common interests or synergies between the Investment Agency, responsible for the development of tourism sector in the Republic of Moldova and other related public authorities. This task could include the conducting of a cross-sectoral policy mapping exercise that would systematically assess the interdependencies between multiple policy sectors, actors and organizations directly or indirectly interested in tourism sector development.

The implementation of institutional arrangements to establish and harness policy synergies to the full extent for the development of tourism sector. In this regard, it is necessary to improve the collaboration between different ministries and government agencies, the exchange of knowledge and the awareness and common understanding of the benefits and disadvantages of policy synergies. This could involve the creation of communication forums and cross-sectoral discussions.

The integration of the right to rest and leisure in the strategic documents that regulate the perspective development of the tourism sector. In this context it is necessary to address issues related to the impact of tourism on the quality of life in the Republic of Moldova, the inclusion and accessibility of disadvantaged categories of the population to the tourism products and services. At the same time, the integration of human rights in the public budget process and the efficient management of public expenditures in order to strengthen ESCR is a solution for consolidating the right to rest and leisure, the latter being strongly connected to the level of tourism sector development.

Improving financial management and its components (asset and liability management, public revenue and expenditure management, internal control systems development, etc.) within the Investment Agency.

CONCLUSIONS

Research carried out in this article brings out the following conclusions:

Everyone's right to rest and leisure emphasizes the opportunity and necessity for the harmonious development of domestic and international tourism depends on the quality of public policies designed to stimulate the growth of this sector. The basic tool for promoting public policies in the field of tourism is public finances, especially public expenditure and the quality of public finance management.

The level of respect for the ESCR measured by the HDI is strongly associated with the level of development of the tourism sector assessed using the TTCI. Therefore, tourism being one of the ways to achieve the right to rest and leisure and, by means of it – a premise for updating and developing people's personal potential, has the power to contribute to increasing the value of HDI.

The following shortcomings affect the sound management of public spending on tourism development: inadequate prioritization of the directions of tourism development in conditions of very limited financial resources; Government's failure in applying an integrated approach to tourism development based on the efficient exploration of interdependencies, synergies and trade-offs between the tourism industry and other related sectors and activities; in the strategic documents that establish the direction of long-term tourism sector development tourism is not treated as a solution for strengthening the right to rest and leisure; reduced technical efficiency of public spending on

tourism due to inadequate financial management within the Tourism Agency/Investment Agency.

The efficiency of public spending on tourism can be improved by applying the following solutions: conducting a research in the field of tourism to identify common interests or synergies between the Investment Agency, responsible for the development of tourism sector in the Republic of Moldova and other related public authorities; implementation of institutional arrangements for establishing and harnessing on policy synergies to the full for the development of tourism sector; integration to the right to rest and leisure in the strategic documents that regulate the perspective development of the tourism sector; integration of human rights in the public budget process and public expenditures management in order to strengthen the right to rest and leisure, the latter being strongly connected to the level of tourism sector development; improving financial management within the Investment Agency.

Annex

Table 1A. Tourist activity of travel agencies and tour operators in the Republic of Moldova

	2015		2016		2017		2018		2019	
	tourists and excursions	tourists-days	tourists and excursions	tourists-days	tourists and excursions	tourists-days	tourists and excursions	tourists-days	tourists and excursions	tourists-days
Total	242559	1688546	234217	1558192	284953	2046642	323468	2130052	376625	2408548
Inbound tourism¹, total	15514	44472	15668	46920	17497	55523	19276	58204	19848	60993
of which, for the purpose of:										
- rest, leisure and recreation	10097	22527	11454	28010	13706	35505	15835	40827	16928	43874
- business	4196	13123	3062	9438	3002	10392	2857	9781	2358	9967
- treatment	488	6609	606	7828	789	9626	584	7596	562	7152
- other purposes	733	2213	546	1644						
Outbound tourism², total	189790	1338534	177252	1229335	229349	1713716	264055	1752066	310649	2035895
of which, for the purpose of:										
- rest, leisure and recreation	188131	1326079	175364	1215872	226854	1698702	261262	1733236	305173	1989610
- business	676	3381	863	3118	1417	4084	1390	5417	1989	8140
- treatment	816	8193	1024	10335	1078	10930	1403	13413	3487	38145
- other purposes	167	881	1	30						
Domestic tourism³	37255	305540	41297	281917	38107	277403	40137	319782	46128	311660

Source: Developed by the author based on [BNS RM Activitatea agențiilor de turism].

Note:

¹ Receiving foreign citizens in the country

² Travelling of Moldovan residents abroad

³ Travelling of Moldovan residents inside the country, for tourism purposes

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POTENTIAL EFFECTS OF FINANCE 4.0 ON THE EMPLOYMENT IN EAST AFRICA

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ABSTRACT

Two of the five fastest-growing economies in the world were in the East African region in 2019. The region's share within the economic growth of Africa rose from less than 20% in 2018 to more than 32% in 2019. Despite the difficulties in 2020 the eastern part of Africa seems to be keeping its status as the continent's fastest-growing region. Digitalization and the connected structural transformation is one of the main drivers of growth in the services sector worldwide. In this study we analyze the status and movements of industry 4.0 and Finance 4.0 developments and their effects on the employment in the East African region. We found three main approaches based on the literature sources on Africa's future industrial development ways. In case of finance 4.0, countries like Uganda or Kenya reached considerable results in financial inclusion; thus, East African economies and societies now have an improved access to international financial markets. Another significant development is East Africa's status as global leader in mobile money services, increasing broad access to financial services. With the help of digital solutions, entrepreneurs and businesses can reconsider their business models which can be more competitive, sustainable, and better connected to other sectors of the economy. In this paper we investigated the macro- and micro-level effects of the digitalization on the employment and identified the possible scenarios. Our conclusion is that with affordable and stable finance 4.0 solutions and a strong institutional framework, East African enterprises can reduce poverty, increase employment and stimulate inclusive growth.

Keywords: finance 4.0, East-Africa, employment, financial inclusion, industry 4.0, mobile money.

Două dintre cele cinci economii cu cea mai rapidă creștere din lume s-au aflat în regiunea Africii de Est în 2019. Cota regiunii în creșterea economică a Africii a crescut de la mai puțin de 20% în 2018 la peste 32% în 2019. În ciuda dificultăților din 2020 partea de est a Africii pare să-și păstreze statutul de regiune cu cea mai rapidă creștere a continentului. Digitalizarea și transformarea structurală conectată este unul dintre principalii factori de creștere în sectorul serviciilor la nivel mondial. În acest studiu analizăm situația și mișcările dezvoltărilor industriei 4.0 și Finanțelor 4.0 și efectele acestora asupra ocupării forței de muncă în regiunea Africii de Est. Au fost identificate trei abordări principale bazate pe surse de literatură privind viitoarele căi de dezvoltare industrială ale Africii. În cazul finanțării 4.0, țările ca Uganda sau Kenya au atins rezultate considerabile în ceea ce privește incluziunea financiară; astfel, economiile și societățile din Africa de Est au acum un acces îmbunătățit la piețele financiare internaționale. O altă evoluție semnificativă este statutul Africii de Est ca lider global în servicii de bani mobili, sporind accesul larg la servicii financiare. Cu ajutorul soluțiilor digitale, antreprenorii și întreprinderile își pot reconsidera modelele de afaceri care pot fi mai competitive, durabile și mai bine conectate la alte sectoare ale economiei. În această lucrare am investigat efectele la nivel macro și micro

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ale digitalizării asupra ocupării forței de muncă și am identificat scenariile posibile. Concluzia noastră este: cu soluții de finanțare 4.0 accesibile și stabile și un cadru instituțional puternic, întreprinderile din Africa de Est pot reduce sărăcia, pot crește ocuparea forței de muncă și pot stimula o creștere favorabilă incluziunii.

Cuvinte-cheie: finanțe 4.0, Africa de Est, ocuparea forței de muncă, incluziune financiară, industrie 4.0, bani mobili.

Две из пяти самых быстрорастущих экономик мира находились в регионе Восточной Африки в 2019 году. Доля региона в экономическом росте Африки выросла с менее, чем на 20% в 2018 году до более, чем 32% в 2019 году. Несмотря на трудности в 2020 году, восточная часть Африки, сохраняет свой статус самого быстрорастущего региона континента. Цифровизация и связанная структурная трансформация являются одними из основных драйверов роста в секторе услуг во всем мире. В этом исследовании мы анализируем состояние и динамику развития Индустрии 4.0 и Финансов 4.0, а также их влияние на занятость в регионе Восточной Африки. Мы нашли три основных подхода на основе литературных источников о будущих путях промышленного развития Африки. В случае «Финансы 4.0» такие страны, как Уганда или Кения, достигли значительных результатов в финансовой доступности; таким образом, экономика и общества Восточной Африки теперь имеют улучшенный доступ к международным финансовым рынкам. Еще одно важное событие – это статус Восточной Африки как мирового лидера в сфере услуг мобильных денег, что расширило широкий доступ к финансовым услугам. С помощью цифровых решений предприниматели и предприятия могут пересмотреть свои бизнес-модели, которые могут стать более конкурентоспособными, устойчивыми и лучше связанными с другими секторами экономики. В этой статье мы исследовали макро- и микроуровневое влияние цифровизации на занятость и определили возможные сценарии. Мы пришли к выводу, что с помощью доступных и стабильных финансовых решений 4.0 и прочной институциональной базы восточноафриканские предприятия могут сократить бедность, увеличить занятость и стимулировать инклюзивный рост.

Ключевые слова: финансы 4.0, Восточная Африка, занятость, финансовая доступность, промышленность 4.0, мобильные деньги.

INTRODUCTION

In 2019, two of the five fastest-growing economies in the world were in the East African region (Ethiopia and Rwanda). Based on the analysis of the prestigious Brookings Institute, this region's share within the economic growth of Africa rose from less than 20% in 2018 to more than 32% in 2019 [23]. Even though the year 2020 seems to be a kind of disaster in terms of economic performance, the African Development Bank (AfDB) forecasts that the eastern part of Africa is keeping its status as the continent's fastest-growing region [2]. According to the AfDB, agriculture's contribution to the region's gross domestic product decreased from 33.4% in the early 2000s to 28.3% in 2018. Instead, the vibrant and fast-growing services sector performed more than half (53.8%) of the East Africa's GDP. This shift in the economies generates new and restructured employment opportunities. According to the Africa Prosperity Report by Legatum Institute [26], the number of employment opportunities in East Africa's services sector increased to more than double between 2000 and 2020.

Digitalization and the connected structural transformation is one of the main drivers of growth in the services sector worldwide. The World Bank estimates that connecting every African business, individual and government to digital technologies in the frame of the Single Digital Market by 2030 can boost growth by up to 2% per year and reduce poverty by 1% per year [44].

LITERATURE REVIEW

Current status of Industry 4.0 in East Africa

We can identify three main approaches in the literature on Africa's future industrial development ways. Technological revolution plays a crucial role in each of these concepts: 1) the technological change is too fast and complex for African countries to benefit from it promptly; at least

15 years needed for completing the necessary investments and developing the appropriate business ecosystems in the continent [6]; 2) technological revolution is changing the nature and base of manufacturing and services, making services sector the focal point for structural adjustments [32]; 3) the new and emerging technological developments encourage and upgrade the African manufacturing with the help of high-tech start-up firms [29].

The industry 4.0 implementation in East Africa is based mainly on transcontinental efforts [3]. In Africa, the commitment to industry 4.0 can be identified on the different program initiatives launched recently: "Smart Africa", "One Africa Network" and "EU-AU Digital Task force". Smart Africa program focusing on whole Africa, was initiated by the East African Community (EAC) in 2013. Industry 4.0 demands upgraded employee skills and competencies, including ICT knowledge, inter-, trans-, and multidisciplinary competencies, and special personal qualities. Moreover, in addition of industry 4.0 digitalization base, knowledge and skills in ICT sector are necessary as these are the ground for the digital transformation. However, the poor ICT infrastructural environment in East African countries is therefore one of the major challenges which are making barriers for governments to adopt the industry 4.0 in a rapid way [28]. So, ICT adoption among the EAC countries (Rwanda, Kenya, Uganda, Tanzania, Burundi, and South Sudan) was realized parallel with industry 4.0.

In 2012, the East African Community (EAC), covering Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda, announced its 2012-2032 Industrialisation Policy. The strategy is targeting to establish a market-driven, competitive and balanced industrial sector which relies on the advantages of East Africa [11].

Kenya is one of the few countries in Africa that achieved the lower middle-income status already [40]. In the business terminology of the new digital economy Kenya is called Africa's "Silicon Savannah" [24]. The reason for this analogy is the presence of a very strong and well-focused ICT policy with its flagship program Vision 2030. Moreover, the advanced technology in the mobile money system such as M-Pesa is a real pioneer in this field. The M-Pesa (means mobile money) revolution has created Kenya's digital space and positioned the country ahead of other developing countries regarding the implementation, use and development of digital technology [35]. M-Pesa is a mobile payment platform introduced and started in 2007 as a cooperation of Safaricom, Commercial Bank of Africa, and commercial banks in Kenya [31]. Another remarkable milestone in the Kenyan digital industry was the successful development of a virtual money savings platform called "M-Shwari" which has been spread out in the whole East African region, with "M-Pawa" in Tanzania and "Mokash" in Uganda and Rwanda. Within the Kenyan ICT policy framework, a Government Digital Payments Taskforce was launched, the eCitizen. In spite of the strong and committed ICT policy of Kenya, the implementation strategy and details of the industry 4.0 is not clear yet.

Rwanda is one of the three African countries (besides Morocco and South Africa) that started to develop industry 4.0 strategy alongside its ICT policies and created technology centres [12]. The Rwandese government established the "Centre for the Internet of Things" in partnership with Inmarsat, the global mobile satellite communications provider [41]. The initiative's focus is on helping the learning capabilities and skills of students, developing IoT prototypes and to conducting academic research in prospective IoT solutions. In addition, it tries to speed up the implementation of the IoT and smart city results. The country's first ICT policy framework was the SMART Rwanda Master Plan 2015-2020; some initiatives have been generated and realized by both the government and private sector. The major ICT innovative initiatives of Uganda are: Rwanda's ICT Hub Strategy 2024, Digital Ambassadors Program, IREMO platform, Kigali Innovation City. The clever ICT policy has significantly contributed to the integration of Rwanda's cultural and creative industry to the global economic systems [22]. The new "Made in Rwanda" policy is an all-inclusive strategic plan targeting the stimulation of competitiveness by improving the domestic market by the value chain development. These initiatives serve the main goal to develop Rwanda into an upper middle-income country by 2035 and higher income country by 2050 [29]. This new policy has the capacity to push and promote industry 4.0 adoption and implementation in the country.

Uganda developed its strategic plan "Vision 2040" where the main focus is on industrialization. Despite of the clear and set macro vision, the country's national industrial policy still does not prioritize manufacturing, meaning the manufacturing sector remains less competitive with mainly

focusing on agriculture related processing and low-value manufacturing [13]. The government of Uganda seems to be committed for developing a digital vision for the country and elaborated the Digital Uganda Vision (DUV) program. The DUV is a comprehensive framework that is driven by from the Vision 2040 macro vision and provides a complete set of ICT policies [17]. This policy package is directed by the Ministry of ICT which was established specifically for supporting the growth and deployment of the ICT sector in Uganda. For ICT ministry staff special knowledge is provided on industry 4.0 technologies including as blockchain technologies, artificial intelligence, big data and cloud computing. Furthermore, the Blockchain Association of Uganda as non-governmental organization has been founded and the government related Nakawa Innovation ICT Hub has been established [34]. These developments demonstrate Uganda's commitment to the development of industry 4.0 related fields, however, there is still much to be done by Uganda to catch up with the mainstream.

Tanzania is doing serious efforts for improving its industrial sector's productivity and competitiveness. These steps are coordinated by the 5th Phase of the Government Plan under in the frame of Vision 2025 strategic program [1]. Tanzania has a well-established ICT policy; however, concrete steps are still missing [36]. The potential positive impacts of ICT in Tanzanian context are predominantly in industrial agriculture and company business processes (Mwantinwa, 2019). Tanzania hosts the joint initiative of East African Community and the German Federal Ministry for Economic Cooperation and Development (BMZ), the Centre of Excellence for ICT in East Africa (CENIT@EA) which has been launched in 2019. The main aim of this Centre is to provide industry 4.0 relevant skills, capabilities, and knowledge for supporting the digital transformation. This initiative is essential for setting up well-based digital skills needed for the Tanzanian economy and society, therefore providing an appropriate environment and frame for industry 4.0 implementation.

Burundi and South Sudan. Due to the unstable political environment, these two East African countries have failed to take any steps towards developing their economy and society with the toolset of industry 4.0 [43], the development visions of these two countries are mainly focusing on peace and stability.

Table 1

Strategic vision of the EAC member states

Member state	Time frame	Strategic vision
Uganda	Vision 2040	Transform Ugandan society from peasant to a modern prosperous country
Kenya	Vision 2030	Globally competitive and prosperous Kenya with a high quality of life
Rwanda	Vision 2020 Vision 2050	Become a middle-income country by 2020 High standard of living
Tanzania	Vision 2025	High quality of life anchored on peace, stability, unity, and good governance; rule of law, resilient economy, and competitiveness
South Sudan	Vision 2040	Realizing freedom, equality, justice, peace, and prosperity for all
Burundi	Vision 2025	Sustainable peace and stability and achievement of global development commitments in line, Millennium Development Goals
EAC	Vision 2050	Attain a prosperous, competitive, secure and politically united East Africa

Source: [7].

It is obvious from the above status reports that all the EAC members have a strong ICT policy initiative except Burundi and South Sudan. Kenya and Rwanda are the most advanced. Table 2 demonstrates that the focus of ICT initiatives is mainly on governance and services rather than industry and agriculture. Concerning industry 4.0 initiatives, countries in East Africa perform a quite low level of readiness, with exception of Rwanda.

Table 2

Initiatives in the EAC launched within the ICT policies

Country	Initiatives	Year	Funding
Uganda	ICT4Agriculture	2017	-
	E-government (eTAX, mTrac, e-water)	-	Public
	Mobile money platform (MTN, Airtel)	2009	Public-private
	M-Pesa	2007	Private
	M-Shwari, M-Pawa, and Mokasa	2012	Private
Kenya	Government Digital Payments Taskforce (eCitizen) or e-government	-	Public
	PRIMR (Primary Math and Reading)	2011	Public-private
	ICT4D or e-government agency	-	Public
Tanzania	E-transparency	2009	Public
	E-government strategy 2013	2013	Public
	IREMBO e-government platform, one-stop e-government	2015	Public-private
	Digital Ambassadors Program (DAP)	2019	Public
	Kigali Innovation City (KIC)	2016	Public
Rwanda	Rwanda's ICT Hub Strategy 2024	2019	Public
	Tap&Go Smartcard	2015	Public-private
	Smart city Rwanda	2019	Public

Source: [39] [7].

Fintech in East Africa

Innovations in financial sector, often referred to as "FinTech", is transforming the global financial sector drastically. Since 2010, more than 50 billion USD has been invested in around 2,500 companies worldwide. This is meaning, FinTech revolution forces us to rethink the ways how we store, save, invest, lend, mobilize, spend, send and protect money [37].

FinTech is the key to supporting and accelerating significant improvements in financial system development experienced in the East African region over the last two decades. Liberalization in financial sector, monetary policy frameworks and instruments reforms, and developments in the institutional environment provided a considerable expansion of banking and financial activities and outputs. Some countries like Uganda or Kenya achieved significant progress in financial deepening and inclusion; as a result, this region now has an increased access to international financial markets. The arrival of pan-African banks resulted in a more intensive use of payment system tools such as debit and credit cards, but more remarkably, we can experience a robust growth in mobile payments in many East African countries – on a much different basis. However, financial systems and frameworks in East Africa still cope with several barriers and financial inclusion remains a problem, limiting the opportunities for further improvements in sustainable growth, employment, and poverty eradication [4].

FinTech is a major driver affecting the financial industry architecture in East Africa. New technologies were and are developed and implemented in East Africa with the potential to change the competitive circumstances in the financial sector. FinTech provokes traditional banking methods and creates efficiency advantages unfolding the financial services value chain. Nowadays, FinTech is evolving as a technological gamechanger in East Africa, upgrading financial inclusion and acting as a facilitator for innovation in other economic branches, e.g. agriculture and infrastructure [8].

East Africa achieved the status of the global leader in mobile money services, stimulating broad access to basic and advanced financial services. While-East Africa left behind the world in access to finance, several countries in the region are now forerunners globally. East Africa is the leader in mobile money implementation and use. With appropriate and for costumers attractive pricing strategy, advanced regulation frameworks, and a technically reliable network, Kenya is the most successful country in terms of the use of mobile money solutions [4].

The technological background for the FinTech products and services are well developed. The products and services developed in the field of FinTech rely on global technological innovations. These include the following innovations (based on [20]):

- Mobile access and the internet link consumers to each other (person-to-person transactions).
- Big data and artificial intelligence provide the availability and analysis of databases having billions of observations of transactions and attributes; these can be used to improve design and personalize financial products and services.
- Distributed ledger technology (DLT) means a type of networking of independent computers to record, share, and synchronize transactions instead of having a centralized database.
- Cryptography improves the safety of electronic transactions and is the basis for smart contracts based on cryptocurrencies.

Mobile money developments in Sub-Saharan Africa

Within Africa, the East African region is the absolutely forerunner and leader in mobile money development and usage. While the use of mobile money in sub-Saharan Africa is a real success story, there is a wide range of differences among the countries (Figure 1). East Africa did it well and created an infrastructure that built on the real demand for mobile financial services in sub-Saharan Africa. They realized that the limitations in terms of financial inclusion and lack of traditional banking retail units can be solved only via mobile money systems.

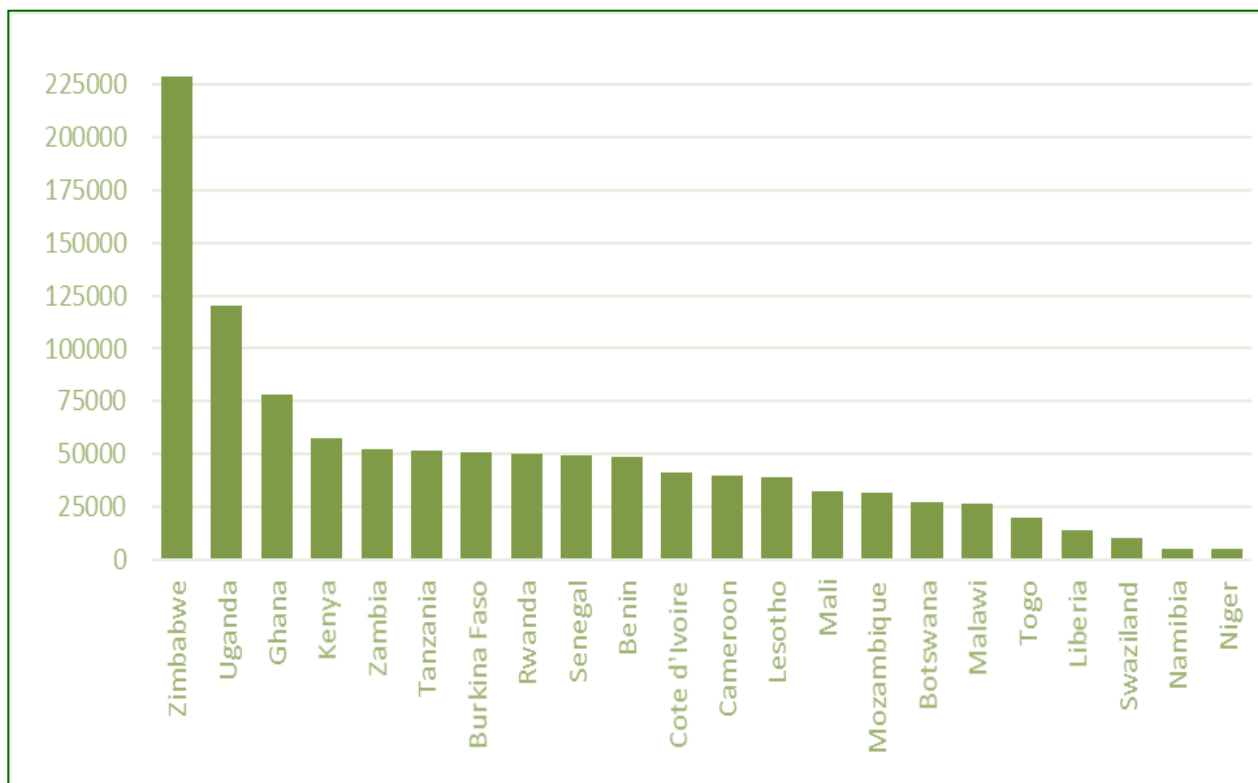


Figure 1. Mobile money developments in Sub-Saharan Africa (mobile money transactions per 100.000 adults, 2019)

Source: [21].

The countries in East Africa chose a telecom sector led regulatory scheme. In this solution, the telecommunication service provider cooperates with the financial regulatory body to develop the platform for mobile payments. This telecom-led model seems to be more successful in attracting clients than the bank-oriented model that is used by other sub-Saharan Africa countries. For regional distribution of alternative finance in Sub-Saharan Africa see Figure 2.

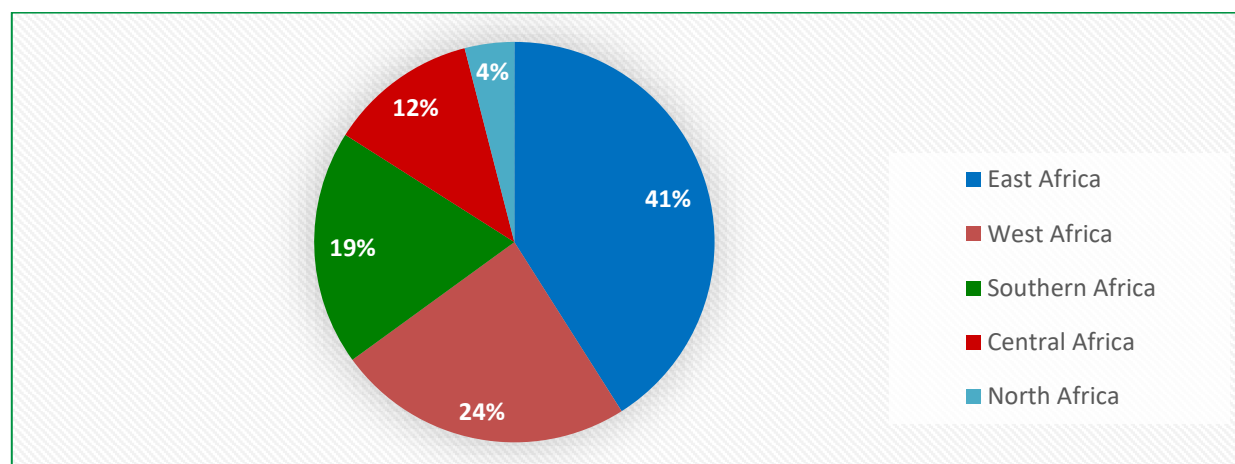


Figure 2. Regional distribution of alternative finance in Sub-Saharan Africa

Source: [5].

East African countries decided to select a single telecom provider that owns a dominant market share, which assured the initial critical volume of required to put mobile money over the niche level (for mobile money providers see Table 3). So, instead of being a provider of a unique and exotic service with a small market share mobile money was getting the banking industry standard. In Kenya, mobile network operator Safaricom has a market share of around 70 percent; Vodacom in Tanzania has a share of around 50 percent. In Uganda, MTN Uganda and Airtel Uganda have almost the same market share (46 and 44 percent). This large market share makes it possible for most mobile money clients to use a single platform without having compatibility problems, From the other hand, this high market concentration raises competition law and consumer protection concerns.

Table 3

Mobile payment systems deployed in the EAC

Service provider	Burundi	Kenya	Rwanda	S. Sudan	Tanzania	Uganda
Africell Money						X
Airtel Money		X	X			X
BK mVISA			X			
Dau-Pesa					X	
EcoKash	X					
EzeeMoney						X
ezyPersa					X	
Leo Manoti	X					
M-PESA		X				
mHose			X			
M-Sente						X
mCash						X
Micropay						X
MobiCash	X	X	X			
MTN Mob'Money			X			X
Orange Money		X				
PAYG Platform		X				
Tangaza Pesa		X				
Tigo Cash			X			
Tigo Pesa					X	
Vodacom M-pesa					X	

Source: [19].

East African countries, especially in the East African Community, have national identification systems; these simplify and accelerate faster mobile payment adoption rates and allow more secure transactions.

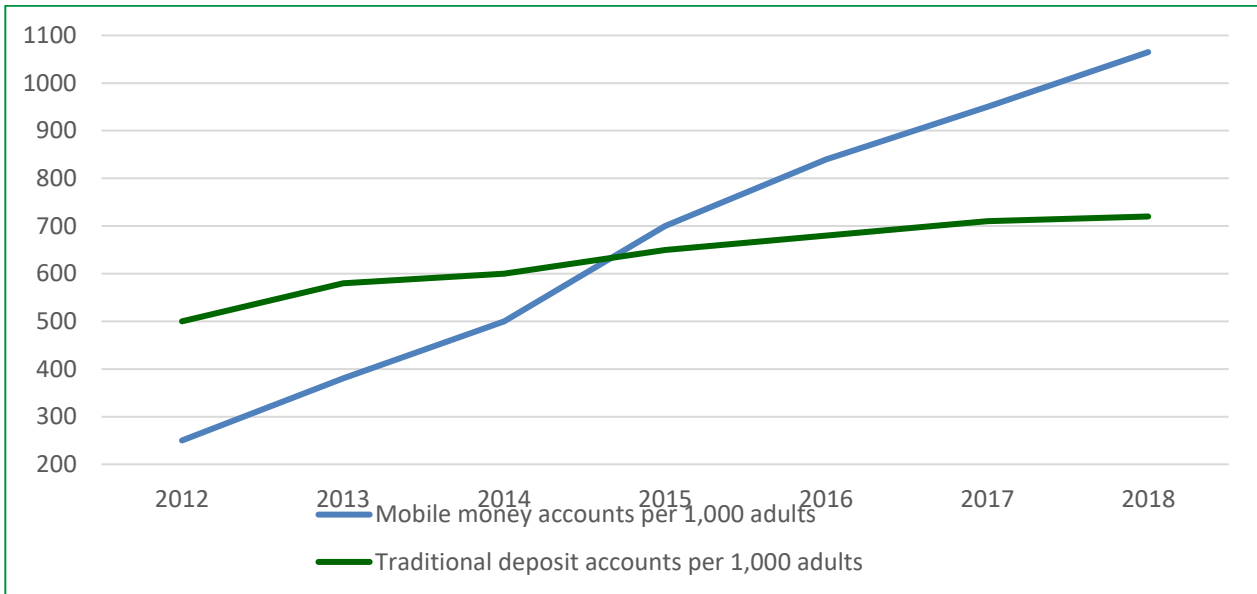


Figure 3. Mobile Money versus traditional banking

Source: [10].

Until recently, in East African economies, cash was dominant. In the region the credit cards and bank accounts penetration were low, traditional banking was limited. The mobile money revolution, initiated by the pioneer M-PESA and nowadays offered by several operators in the East African region, has transformed this situation dramatically and makes the ground for a new wave of financial inclusion that has now spread beyond the region and globally (Figure 3).

In the East African countries, there are significantly more mobile money accounts users than account holders with traditional banking institutions. The exceptions are South Sudan, where mobile money is not yet licensed, and Rwanda (Figure 4).

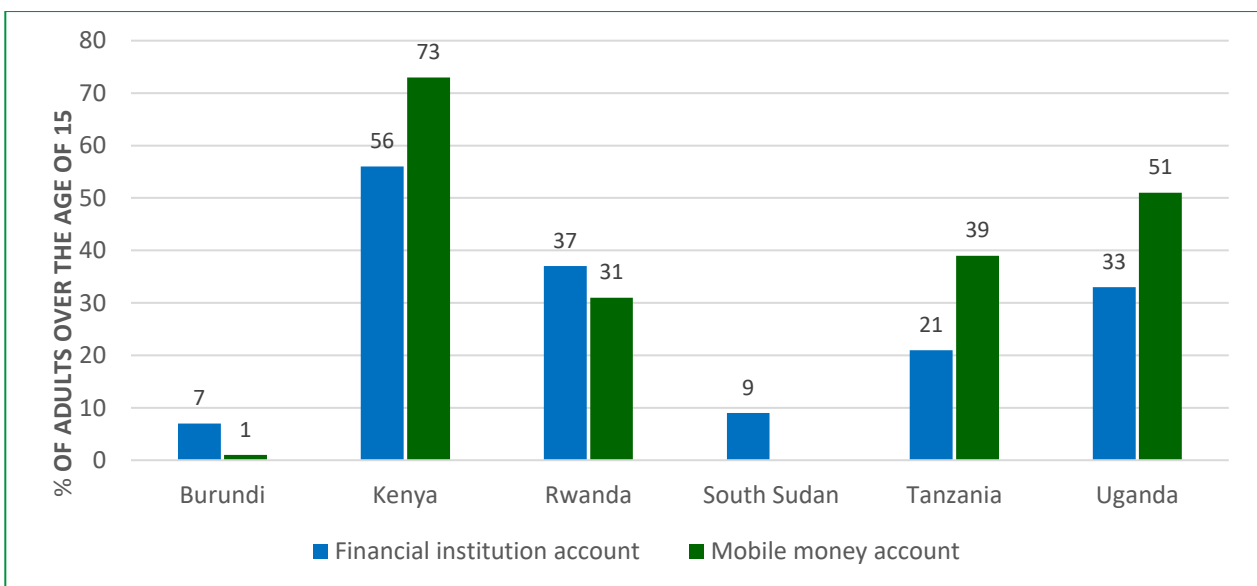


Figure 4. Penetration of financial institution accounts versus mobile money accounts

Source: [10].

Nonetheless, digital payments' popularity rises rapidly in some countries: the use of digital payments among Ugandan adults is 55 percent and 79 percent in Kenya, however, remains limited in Burundi [10]. Moreover, there are several obstacles regarding international payments, including network interoperability and high transaction fees; this is a serious barrier for developing regional online services and the growth of e-commerce.

METHODOLOGY

Due to the lack of validated statistical sources and survey on this topic in the East African region, our research attempts to present the effects of the seemingly unstoppable expansion of finance 4.0 on employment in East Africa relying primarily on secondary data sources and a comparative analysis of the literature published in the topic. Using scenario analysis, we present these potential consequences at the micro and macro levels, as well as in terms of efficiency.

RESULTS AND DISCUSSION

Impact of industry 4.0 on finance sector

Finance 4.0, a subcategory of Industry 4.0 can support the grow of the emerging and developing economies by over 6%, which takes about \$3.7 trillion by 2025 [27]. More than 37% of the foreign direct investment flowing to the developing countries was technology-intensive investment.

The fourth industrial revolution spread out to all industries with a rather positive impact. The financial services sector is also one of the sectors that is benefiting the power of industry 4.0 significantly. Banking, insurance, mortgage, forex, stocks, and many other financial sectors are booming due to the positive impetus of digital innovation and financial process automation.

According to [33], mobile based devices and tools are the new standard for banking activities. The developing regions like Africa are becoming the major driver of mobile banking in the world.

The blockchain technology based new crypto finance system will transform the financial sector in the near future. Taking these in consideration, we can summarize the impact of industry 4.0 on financial services as follows [38]:

- Global financial transactions have become much faster
- Financial service charges were getting much cheaper
- Significant decrease of financial institutes' operational costs
- 0-24 easy access to financial services
- Easy handling of upgraded financial systems and surfaces
- Expanded use of robotics and artificial intelligence
- A new era of marketing: more effective, more efficient, more targeted and tailored
- Effective and advanced customer service through bots at very low cost
- Reduced risks due to data-driven assessments
- More advanced business intelligence
- Greater user service experience
- Diminished opportunities for leakages in funds and projects
- More transparency and increased trust
- No chance for human errors in financial activities
- Rise of new business domains, e.g. FinTech, payment gateways
- Enhanced financial inclusion of the poor and disadvantaged people
- More effective use of available assets and money
- More efficient trading of stocks and forex
- Lowered number of scams and burglary
- Increased customer satisfaction
- Smart contracts powered by blockchain technology

Effects of finance 4.0 on the employment in East Africa

Digitalization's main benefit for economic growth is promoting inclusive finance and allowing the by banks not covered groups to join formal financial systems through electronic payments platforms and savings and credit supply technological platforms. Moreover, with the help of digital solutions, entrepreneurs and businesses can reconsider their business models which can be more competitive, sustainable, and better connected to other sectors of the economy in this way. The fintech has impacts beyond the financial sector and affects the real sector and households, initiating

changes in business models across market segments. A good example for it Kenya, where blockchain made the efficient verification of property records and transactions possible, and also enabled expanded access to credit in some previously informal sectors of the economy [16].

Based on finance 4.0 technologies, there are very good opportunities for job creation in Africa. Mobile technologies and services generated 9 percent of GDP in sub-Saharan Africa and supported almost 2,05 million jobs (of which 650.000 formal jobs and 1,4 million in the informal spheres) in 2019. The GSM Association forecasts that by 2023, mobile's contribution will reach almost \$185 billion, 9.1 percent of GDP [19]. Given the informal sector is estimated to contribute 55 percent of sub-Saharan Africa's GDP [2] these tools can occur significant changes. Increased financial inclusion contributes to greater capital accumulation and investment, so a vast potential for employment creation.

Since creating jobs for the increasing youth population is an urgent priority in East African countries, governments are hesitating to support technologies that endanger current jobs. Some of the upcoming technologies will replace low-skilled workers with higher-skilled workers and constraining the involvement in the industry 4.0 to economies missing relevant skills [30]. Therefore, East African governments should invest in education and reskilling programs to ensure that the new technology support and not replaces labor.

Employment in the context of finance 4.0

Macro level effects

If we investigate the effects of the technological jump in the finance sector on the macro-level, we can expect that improved financial inclusion through mobile payments supports a more intensive capital growth and investment, which is a very good base for employment expanding. Digital technologies generate substantial spillovers on local demand for services; it is projected that one additional technology job creates around five new jobs in the local sectors [14]. Since the larger part of the employment in developing countries is in micro, small, and medium enterprises, these firms are often supported by the governments or donor organizations for growth and job creation. Usually these interventions consist of provision of finance services, providing credit access, entrepreneurship training, business support services and wage subsidies [18]. Digitization could be a platform for the success of these interventions.

From a macro-financial approach, digitization can manage the typical problems of information asymmetry in the financial sector and in the labor market. Digital financial services provide useful database of individuals' financial transactions that financial institutions use to verify the creditability of their customers. Virtual savings account and virtual credit supply platforms, among others M-Kesho, M-Pesa, M-Shwari, Mobicash and Tangaza in Kenya facilitated the utilization of transactions and savings data as the base for micro credit pricing and evaluate credit risks. Information symmetry reduces the risk premium payments and pre-checking costs of credit transactions by the financial institutions. In this way, credit information sharing can help to promote access to affordable credit. This has improved access to credit by small entrepreneurs supporting them to keep or develop their companies so generating employment opportunities in the East African region.

Micro level effects

Based on the overview of evolution of financial services in East Africa we can draw some conclusions regarding the effects and mechanisms of the different development stages. The vibrant and technology-based financial activities boosted the number of clients and service providers and so more opportunities for employment. In the first stage (launch of electronic payments) there was a need for different new jobs at different levels (certain categories of agents). The developing network of agents reinforced the robust expansion in mobile devices based financial services (mobile money).

Garcia-Murillo and Velez-Ospina [15] argue that empowerment inspired by digitalization, including the greater and easier access to information and resources can help reduce the role of informal sector. In an economy with huge unemployment, digitization provides an easy opportunity for self-employment. This improves the informal market operations and increases labor absorption, but not in a formal way.

Productivity

The most important impact of digitization in the labor market is that it increases labor

productivity [42]. Digitization improves total productivity by enhancing job matching hence the allocation of labor and skills to the most suitable opportunities in the market [9] and alleviates employees of monotonous repetitive working so they are able focus on more productive jobs. Digital platforms are able to reduce to costs of information search and improves chances for people who have problems in finding a job. In Kenya, some evidence from literature demonstrate a growth in labor productivity in the past decade [25] when the digital transformation was getting more significant.

In the financial sector, agency banking, that is based on the mobile phone-based financial services agents' network, has also created job opportunities across the region, overriding the likely job losses resulting from online banking. We expect that potential for digitization and net employment creation will show some positive results.

Unemployment

Wider and deeper access to information and sources can support diminish the informal sectors in the East African economies; in economies characterized by huge unemployment rate, digitization provides an easy solution for self-employment. This could improve the informal market operations and increases workforce absorption.

CONCLUSIONS

East African region remains one of the fastest-growing regions in the world, however high unemployment and high poverty rate is still a problem to be solved. The region shows a high level of entrepreneurial activity compared to other parts of Africa. With a well-focused policy support framework and a advantageous economic environment, including the spread of new industry and finance 4.0, the region could manage the problems of unemployment poverty.

With affordable and stable finance 4.0 solutions and a strong institutional framework, East African enterprises can reduce poverty, increase employment and promote inclusive growth by providing practical solutions through value-added products and services, enhancing GDP growth in this way.

Our expectation is that industry 4.0 and IoT initiatives will empower small (including rural) business owners in Africa, whereby the data based software and analytical solutions will be available on their smart devices; this will have an effect of better cooperation among stakeholders along the whole value chain. Moreover, connectivity will support their daily business through acceptance of digital payment methods and getting more information on their customers so they will be able to develop tailor-made marketing strategies based on the collected data. This will result in a much better-established business. Furthermore, small business runners will have better chances to apply for bank loans, as they have unquestionable, reliable data of their business processes and cash flow accounting.

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**STRENGTHENING THE COMPETENCES OF FUTURE SPECIALISTS
IN ACCORDANCE WITH THE DEVELOPMENT TRENDS OF CROP PRODUCTION**

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ABSTRACT

Under the current conditions, marked by a flexible and turbulent environment, balancing the demand and supply of the labor market is one of the basic factors for sustainable development. In this context, identifying the most effective tools to adapt the supply of professional education to the needs of the sectors is an important step towards achieving the goals of sustainable development. Even if considerable efforts as well as relevant methodological tools are required, the process of harmonizing the requirements of the sectors and the content of professional education programs is particularly important and represents a decisive factor in achieving the sustainable development goals. The main purpose of this investigation was to highlight the essence and application aspects of the sectoral approach in anticipation of the necessary competences, as well as to operate with this tool in order to identify trends and problems related to crop production in the Republic of Moldova and to make changes necessary for improving the curricula. In order to achieve the proposed goal, the following methods were used: synthesis of methodological recommendations and good practices for applying the sectoral approach in anticipating competences; economic-statistical analysis; systematic approach; classification method; structural-logical method; generalization; deduction; drawing conclusions and reasoning, including using the objectives tree technique. The research resulted in explaining the essence and particularities of sectoral approach in terms of advantages and disadvantages, analysis of the agricultural production sector, especially crop production in the Republic of Moldova and formulating recommendations for improving agricultural study programs.

Keywords: *agriculture, competences, crop production, education, labor market, sectoral approach.*

În condițiile actuale de dezvoltare a societății, în virtutea mediului extrem de flexibil și turbulent, echilibrarea cererii și ofertei pieței muncii reprezintă unul din factorii de bază ai dezvoltării durabile. În acest context, identificarea celor mai eficiente instrumente de adaptare a ofertei educației profesionale la necesitățile sectoarelor reprezintă un pas important în direcția atingerii obiectivelor dezvoltării durabile. Chiar dacă se impun eforturi considerabile și se solicită instrumente metodologice relevante, procesul de armonizare a cerințelor sectoarelor și conținutului programelor de educație profesională este deosebit de important și reprezintă un factor decisiv al atingerii obiectivelor dezvoltării durabile. Scopul de bază al prezentei investigații a constat în elucidarea esenței și aspectelor aplicative ale abordării sectoriale în anticiparea competențelor necesare, precum și operarea cu acest instrument pentru a identifica tendințele și problemele aferente producției vegetale în Republica Moldova și a proiecta unele intervenții curriculare în raport cu deficiențele constatate. În vederea atingerii scopului propus, s-au utilizat metodele: sinteza recomandărilor metodologice și bunelor practici de aplicare a abordării sectoriale în anticiparea competențelor; analiza economico-statistică; abordarea sistemică; metoda clasificării; metoda structural-

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logică; generalizarea; deducția; formularea de concluzii și raționamente, inclusiv și prin utilizarea tehnicii arborelui obiectivelor. Cercetarea s-a soldat cu explicarea esenței și particularităților de aplicare a metodelor și tehnicilor de abordare sectorială prin prisma avantajelor și dezavantajelor, analiza sectorului producției agricole și, distinct, a producției vegetale în Republica Moldova și formularea recomandărilor de perfecționare a programelor de studii cu profil agrar.

Cuvinte-cheie: *agricultură, abordare sectorială, competențe, educație, producție vegetală, piața muncii.*

В современных условиях развития общества, в силу чрезвычайно гибкой и турбулентной среды, балансирование спроса и предложения на рынке труда является одним из основных факторов устойчивого развития. В этом контексте, выявление наиболее эффективных инструментов для адаптации системы профессионального образования к потребностям секторов является важным шагом на пути к достижению целей устойчивого развития. Даже если требуются значительные усилия и соответствующие методологические инструменты, процесс согласования требований секторов и содержания программ профессионального образования особенно важен и является решающим фактором на пути достижения целей устойчивого развития. Основная цель данного исследования заключается в изложении сути и практических аспектов секторального подхода в проектировании необходимых навыков, а также в применении данного инструмента для выявления тенденций и проблем в развитии растениеводства в Республике Молдова и разработки предложений по улучшению соответствующих учебных программ. Для достижения поставленной цели, использовались следующие методы: синтез и обобщение методических рекомендаций и передовой практики применения секторального подхода; экономико-статистический анализ; системный подход; метод классификации; структурно-логический метод; дедукция, формулировка обоснований и выводов, в том числе с использованием техники дерева целей. В результате исследования были разъяснены сущность и особенности применения методов и приемов секторального подхода с точки зрения преимуществ и недостатков, проведен анализ сектора сельскохозяйственного производства и, в отдельности, растениеводства в Республике Молдова, а также сформулированы рекомендации по совершенствованию программ сельскохозяйственного профессионального образования.

Ключевые слова: *навыки, образование, растениеводство, рынок труда, секторальный подход, сельское хозяйство.*

INTRODUCTION

The economic and social prosperity of each state, as a primary strategic objective, must be examined under the influence of all determinants. Among them, while some are manifested by direct and quantifiable impact, others, including the quality of trained specialists, face the difficulty of measuring the exerted influences. However, this does not diminish the significance of the efforts needed to increase this impact, thus creating conditions to achieve the expected development goals.

Education, along with lifelong learning, are recognized today as pillars of the development process by virtue of their multiple effects: promoting the interests of individuals, businesses, and, implicitly, of the economy and society; reducing the vulnerability of young people on the labor market; eradicating poverty; increasing social inclusion; facilitating economic growth, etc. [ILO. Skills for trade and economic diversification; ILO, 2004; ILO, 2010. A Skilled Workforce for Strong, Sustainable and Balanced Growth; Savelieva and Prodan, 2018]. The extent to which the professional education system, in its turn, will be able to generate the above-mentioned effects depends on its ability to meet current and future requirements of the sectors for which the final products are intended (qualified human resources). In other words, the best possible balance of the demand for skilled labor and the supply of the professional education system is required, which, in its turn, must meet the following requirements: relevance, efficient organization and management, high quality results [ILO, 2010. Upskilling out of the Downturn]. Compliance with these requirements in relation to the educational offer is particularly important, taking into account that demand patterns are constantly and similarly changing in most countries under the influence of demographic factors, globalization, international competition and technological change [Cedefop, 2016]. Thus, it is obvious that the modernization of

the educational system represents an urgent necessity in response to the challenges and needs of the economy diversification, the transition to new technological structures, the expansion of a competitive presence on the external markets, the increased competitiveness of the economically active population and business entities etc. [Bogush, 2017:103].

LITERATURE REVIEW

Under the current conditions, because of the increasing flexibility of the business and living environment, governments are called upon to strengthen competence development systems to ensure that the skills and qualifications offered can bridge the gap that may exist between the world of education and training on the one hand, and the world of work on the other hand [ILO. Skills for trade and economic diversification; ILO, 2010. A Skilled Workforce for Strong, Sustainable and Balanced Growth]. Although it has been in use for decades, the term „competence” has gained a greater interest in educational research, psychology and neighboring disciplines in the last few years, generated by the globalization of the labor and educational markets. Thus, since the end of the 1980s, the implementation of new governmental intervention strategies in the educational systems has led to a stronger focus on “outputs” and “outcomes” at all educational levels, from elementary, up to vocational and adult education. The outcomes – or the value added to them – are used as criteria of the educational systems` productivity, as well as of the related educational institutions` quality and of the learning achievement of the individuals [Klieme et al., 2008:3].

Among different existing definitions, those that are based on the functional approach may be highlighted and, consequently, may be used for a large-scale assessment of the educational outcome. So, according to Weinert (1999) *“the concept of competence refers to an individually or interindividually available collection of prerequisites for successful action in meaningful task domains”*. Based on the previous approach, Klieme and Leutner came with a working definition, as *„context-specific cognitive dispositions that are acquired by learning and needed to successfully cope with certain situations or tasks in specific domains”* [Klieme et al., 2008:9]. In a more concise but consistent manner the competences are defined by the International Labour Organization as *“knowledge, skills and know-how applied and mastered in a specific context”* [ILO, 2004]). It can be observed that the term „competence”, according to the definition given by the International Labour Organization, is larger, than the term “skills”, the latter representing a component of “competence”. However, many documents and studies refer to the term skills in a broader meaning: knowledge, abilities, know-how.

The analysis of the demand and supply of competences in order to balance them can be done in various ways, among which the sectoral approach is getting a growing relevance. The term "sector" in this context is used to define specific areas of economic activity. The sectoral approach is defined as *„one which aims at changing skills needs from the perspective of a particular sector”* [Wilson et al., 2016:13]. It operates from a forward-looking perspective, and provides information about sector`s development and growth opportunities based on its global competitive position and market development and, on this basis, anticipates the skills that the sector most needs to strengthen for future success [ILO, 2016]. Currently, the sectoral approach in anticipating competences is a significant and effective tool, widely accepted and promoted internationally. The history of implementing the sectoral approach begins at the end of the last century. Initially, some countries, such as France, began to make labor forecasts (a long time ago) based on indicative economic planning. Most other countries have been making such forecasts since the 1970s and 1980s. Later the sectoral studies became part of that process. For example, Portuguese studies began in the late 1990s. The United Kingdom imposes itself by setting up Sector Skills Councils in 2002, and the EU began publishing the results of sectoral studies in 2008 (Wilson et al., 2016:28). The experience of wide implementation of sectoral studies has been widely taken over by the countries in transition, having obtained remarkable results in the Czech Republic, Romania, Estonia [Wilson et al., 2016:30-31]. The particularly high significance of sectoral studies is evidenced by their persistence in most attempts to predict the future of the labor market [ILO Skills for trade and economic diversification; Gregg and Nayef, 2015; Breuer, 2012], representing a dimension of macroeconomic models for skill anticipation. For most countries, the sector is in the centre of systems providing education and training, especially vocational education. Germany, for example, has managed to establish strong links between

employers and providers of education and training [Wilson et al., 2016:28].

The sectoral approach to competence forecasting is based on a series of tools and techniques, which are set out in Figure 1.

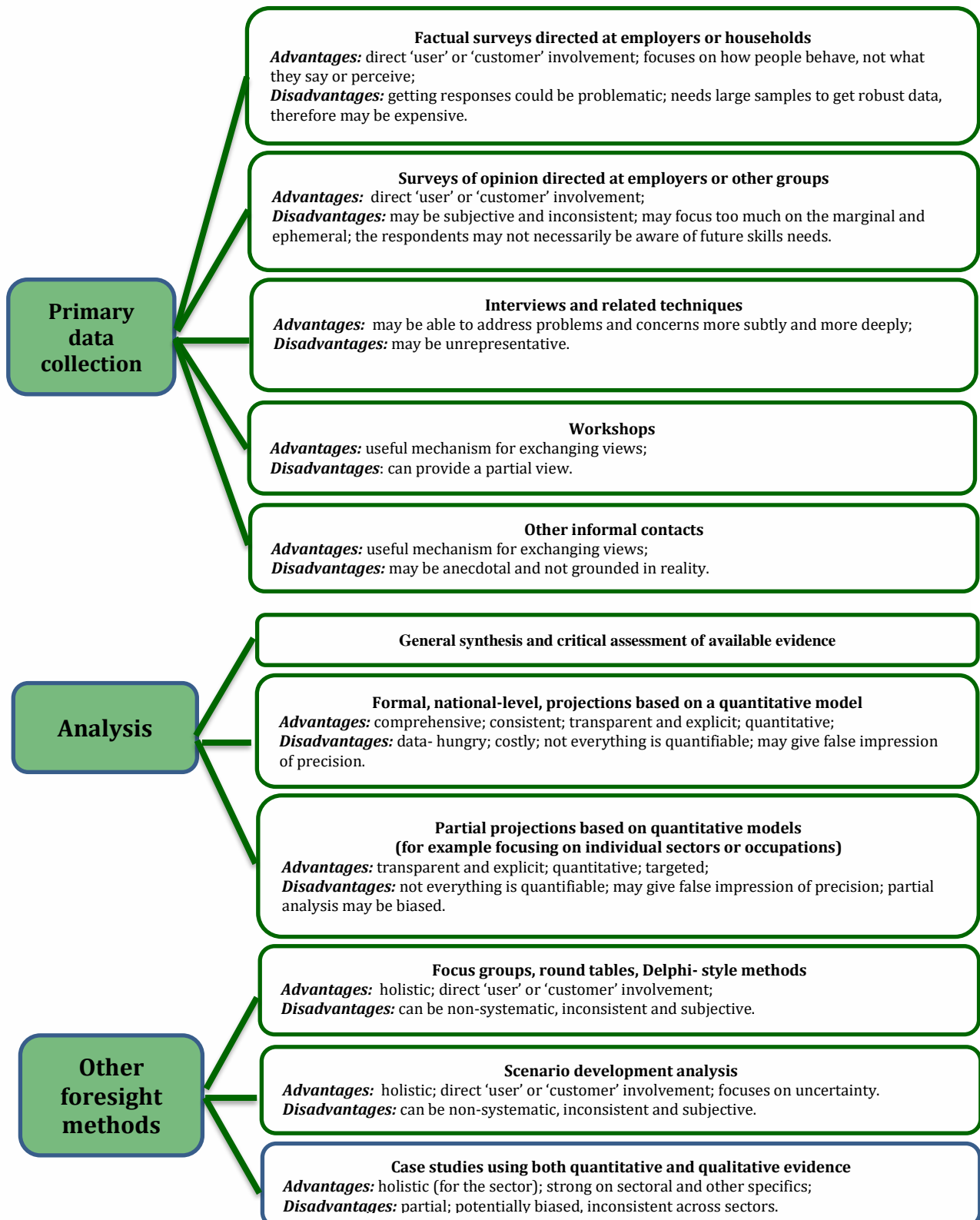


Figure 1. Tools and techniques used in competence anticipation

Source: Developed by the authors based on [Wilson et al., 2016: 26-27].

The effectiveness of the competence anticipation process depends on the extent to which the optimal combination of different tools will be made, each of which has, in addition to advantages, some limitations, as shown in Figure 1. The main factors determining the content and methodology of the sectoral approach and, respectively, the possible choices regarding the tools and techniques to be applied, are set out in Figure 2.

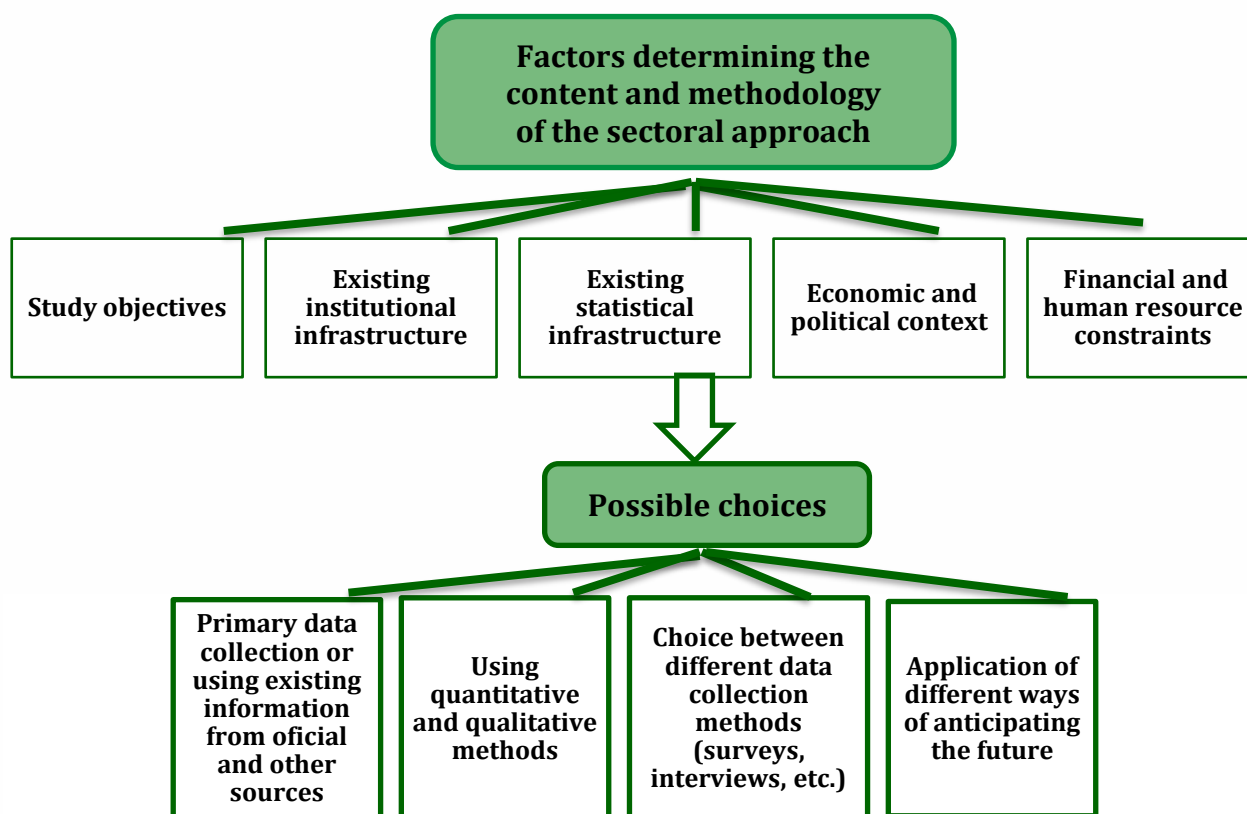


Figure 2. Factors determining the content and methodology of the sectoral approach in anticipating competencies

Source: Developed by the authors based on [Wilson et al., 2016:13].

Another important landmark of the sectoral analysis as a tool for anticipating competences is the active and productive involvement of stakeholders, including: employers and their representatives; employees and their representatives; the state; professional education and training providers; potential labor market participants (students, their parents, career guidance services) [Wilson et al., 2016:13-14].

In addition to the tools and techniques applied, other important factors for the success of the sectoral analysis are highlighted, namely: commitment and support from beneficiaries, their active involvement (especially of the employers); representativeness of enterprises of various sizes (small, medium and large); availability of financial and human resources; skills and expertise in implementation; relevant data availability [ILO. Skills for trade and economic diversification; ILO, 2004; Wilson et al., 2016:14].

RESEARCH METHODOLOGY AND RESOURCES

The present investigation was carried out by following several consecutive steps:

1. Synthesis study of the conceptual approaches of the sectoral analysis and of the good practices in applying the sectoral analysis in the competence anticipation;
2. Assessment of general trends in the evolution of agricultural production and, distinctly, of crop production in the Republic of Moldova;
3. Identification of factors that reduce crop production efficiency;

4. Identification of the competences to be improved within the professional education programs with agricultural profile in the context of issues related to crop production;

5. Prediction of the medium and long-term effects of proposed interventions.

The assumed tasks were performed by using the following methods: investigating different resources regarding the sectoral approach in competence anticipation; analysis of the crop production in terms of quantitative and qualitative indicators; identification of problems related to crop production efficiency and, implicitly, to agricultural production in general; deducing the directions of intervention in professional education programs with agricultural profile and forecasting their effects in the medium and long term by using the objectives tree technique; formulation of reasoning and final recommendations on the necessary interventions in the programs.

The sources of information were: a series of strategic documents, scientific and analytical publications on the researched subject, statistical data available on the official website of the National Bureau of Statistics of the Republic of Moldova.

The present investigation was carried out within the scientific project "Predictive approaches to increasing the quality of skills in agricultural higher education based on the partnership with the business environment", no. 20.80009.0807.41.

RESEARCH RESULTS AND DISCUSSIONS

The need to focus efforts on improving the quality of the specialists for the agricultural sector is justified both by the recognized significance of the sector for the economic and social development of the Republic of Moldova, and by the absence of visible positive trends in its performance evolution. Moreover, climate change, economic crises (example: the current crisis caused by the Covid pandemic) amplify the pressures on agricultural balances and education budgets.

At the current stage the agricultural professional education system in the Republic of Moldova consists of educational institutions of three levels: secondary technical vocational education, postsecondary technical vocational education and higher education. The productivity of the respective system can be evaluated by a series of indicators, the most relevant being the number and the quality of specialists trained for the national economy. With reference to the basic quantitative aspect of agricultural education performance, there exists the problem of continuous reduction of the number of students (Figure 3) and, as a result, of the reduction of the number of graduates (Figure 4). Thus, as shown in figure 4, there is a visible descendent trend in the number of graduates from postsecondary technical vocational education institutions and from higher education institutions in the „Agricultural sciences” field. With reference to the graduates from secondary technical vocational education institutions, we find out an insignificant increase in 2019. However, with the reduction of the number of students in the investigated field, it is obvious that in the future the number of graduates will drop.

We have a positive situation only with reference to the field of "Veterinary Medicine" higher education, where growth trends are manifested in both the number of students and graduates.

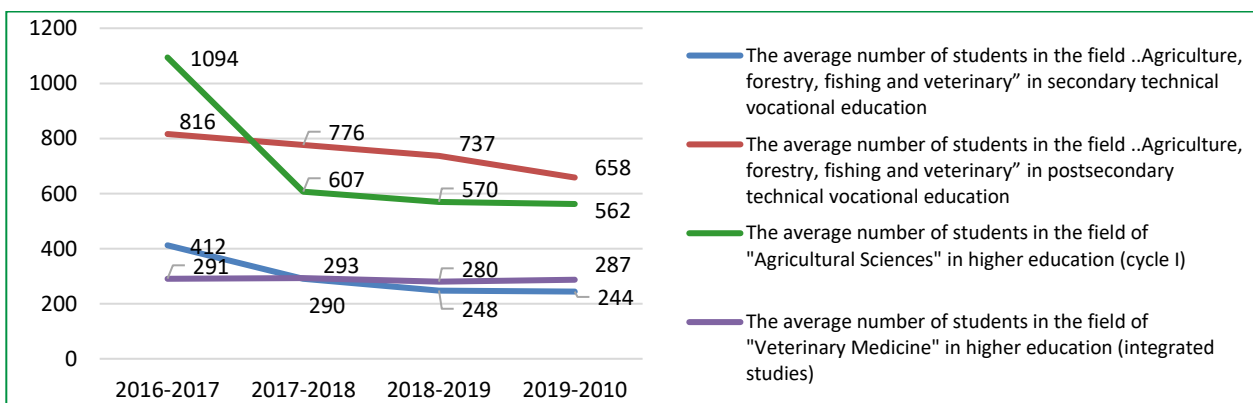


Figure 3. The average number of agricultural program students in the Republic of Moldova in the 2016-2010 period, pers.

Source: Developed by the authors based on [NBSRM. Education and science].

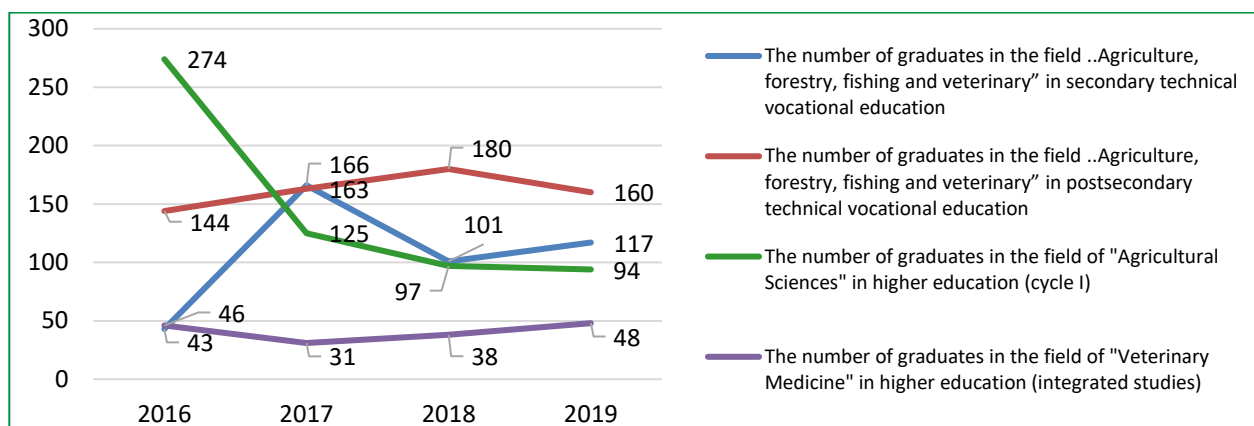


Figure 4. The number of agricultural program graduates in the Republic of Moldova in the 2016-2019 period, pers.

Source: Developed by the authors based on on [NBSRM. Education and science].

Descending trends in the number of graduates, along with the low level of employment according to their qualification, lead to a shortage of skilled labor in the sector [Prisacaru et al., 2019; Buciuceanu-Vrabie and Gagauz, 2017]. The quantitative insufficiency of qualified personnel in the agricultural production sector is not the only problem related to the transfer of professional education performance in the real sector, another important problem being unsatisfactory competencies. At the same time, it would be erroneous to say that the issue of connecting the competences offered by professional education institutions with agricultural profile in the Republic of Moldova is new, being widely addressed at different levels [National Strategy for Agricultural and Rural Development, 2014-2020; The concept regarding the restructuring of the research, innovation, education and rural extension system in the agri-food field]. However, the persistence of this problem, as evidenced by the low satisfaction of employers with the quality of professional education [Prisacaru et al., 2019] denotes the reduced effectiveness of the efforts made up to the current stage. Based on the latest reasoning, there is a clear need for better clarification of the necessary interventions in the study programs, an important step in this regard being to clarify the existing problems in the evolution of the sector and to identify the necessary curricular interventions.

The sector evolution analysis, based on quantitative and qualitative indicators, is one of the recommended methods of the sectoral approach which, having a number of disadvantages as shown in Figure 1, has also a series of benefits by highlighting the drivers of change in the sector – new trends in technology, trends in international business and the context in which the sector operates (Wilson et al., 2016:26). Without diminishing the significance of other tools that need to be operated and that should complement the sector analysis, we must recognize that the evaluation of the sectoral indicators trends is an indispensable component of competence anticipation process. Already at the stage of examining the quantitative and qualitative trends found out in the sector evolution, and of problems and factors determining them, a series of directions of intervention in professional education programs can be designed, thus making an essential contribution to the quality of those programs.

Harnessing the trends in the sector evolution as a tool to rationalize professional education offer is possible by understanding the interdependence between economic indicators and the factors of different nature conditioning them. On the basis of detailed examination of the factors, the areas where professional education institutions can improve the competences of the future managers and specialists can be identified.

The data on the evolution of agricultural production in the Republic of Moldova show the absence of increasing trends of the sector performance, a first sign being the negative tendency of the contribution of agriculture, forestry and fishing in GDP (Figure 5). Thus, we find out that, if in 2014 the sector's contribution in GDP was 12.2%, it continuously decreased later, being only 10.3% in 2018. In the absence of available statistical data for the last two years (2019 and 2020), due to the

drought faced by the Republic of Moldova in 2020 and the economic crisis caused by the pandemic, it is obvious that we can not expect an improvement of the situation, but rather the opposite.

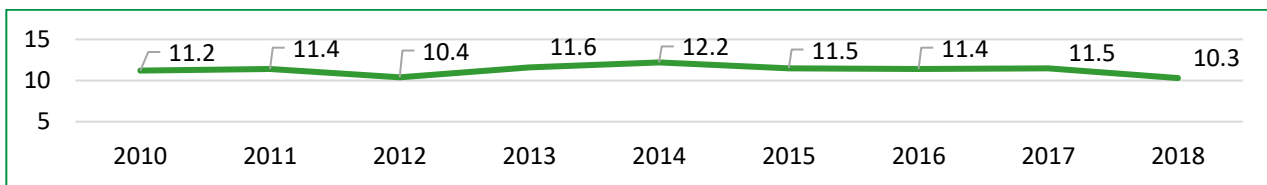


Figure 5. The contribution of agriculture, forestry and fishing in the GDP of the Republic of Moldova in the 2010-2018 period, %

Source: Developed by the authors based on [NBSRM. National accounts].

Another significant aspect that reveals the prosperity of any sector is the evolution of the gross added value generated per employed person (Figure 6). Examining the evolution of the indicator over a period of eight years, we note a very slow rise, and the level of only 46.6 thousand lei reached in 2018.

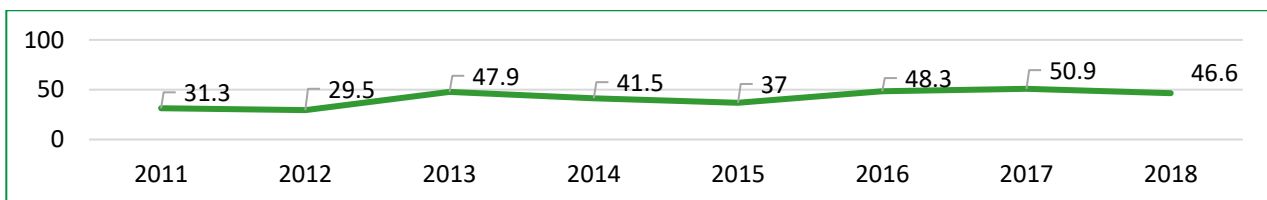


Figure 6. Gross value added per person employed in agriculture, forestry and fishing in the Republic of Moldova in the 2011-2018 period, thousand lei (comparable prices)

Source: Developed by the authors based on [NBSRM. National accounts. Gross domestic product; NBSRM. Labour force].

One of the important criteria for a sector performance is its contribution to exports. As we note in Figure 7, the share of agricultural products in total exports has fluctuating trends, registering its significant reduction in 2018, while the share of imported agricultural products had slow, but steady growth trends.

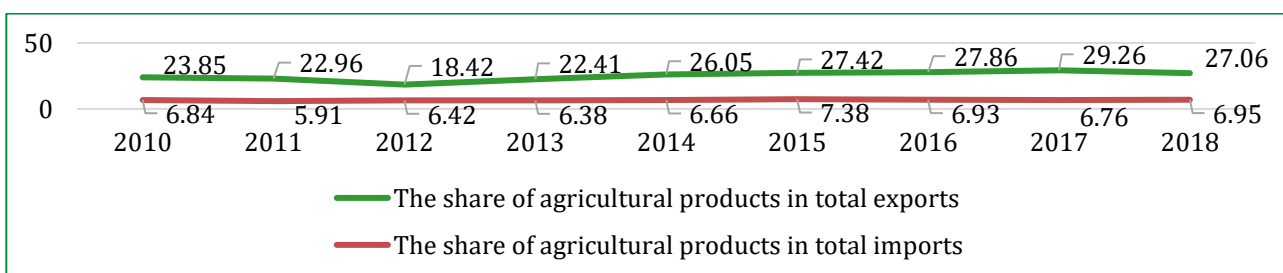


Figure 7. Comparative analysis of the share of agricultural products in total imports and exports of the Republic of Moldova in the 2010-2018 period, %

Source: Developed by the authors based on [NBSRM. External trade].

Crop production is a branch that the economy of the Republic of Moldova relies on, especially as a result of the decline in the livestock production generated by the privatization process. The first step in the analysis of the crop production evolution consists in the estimation of its production potential, an important element of which are the agricultural areas of various categories. In this context, the trends in perennial plantations areas as well as those cultivated with vegetables have a special significance, fruit and vegetables representing high value crops, on which a greater stake is placed (Tables 1 and 2).

Table 1

Evolution of perennial plantation areas in the Republic of Moldova in the 2010-2018 period

Indicators	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total fruit, berries and nuts plantations, thousand ha	116	119	120	122	122	136	135	138	140
<i>incl. in agricultural enterprises of all types</i>	53.9	54.5	55.8	56.7	64.2	63.8	61.5	64.1	65.8
Share of fruit, berry and nut plantations of the agricultural enterprises in the total area of respective plantations, %	46.47	45.80	46.50	46.48	52.62	46.91	45.56	46.45	47.00
Total area of vineyards, thousand ha	145	140	141	137	140	135	135	130	133
<i>incl. in agricultural enterprises of all types</i>	36.8	35.1	34.3	32.1	31.9	30.5	30.4	30.5	30.9
Share of vineyard of the agricultural enterprises in the total area of vineyards,%	25.38	25.07	24.33	23.43	22.79	22.59	22.52	23.46	23.23

Source: Developed by the authors based on [NBSRM. Agriculture. Crop production].

According to the data in Table 1, the plantations of fruit trees, nuts and berries increased continuously in the analyzed period (2010-2018), reaching the level of 140 thousand ha in 2018. Thus there is an absolute increase of the respective areas of 24 thousand ha equivalent to a growth rate of 120.7%. Areas managed by agricultural enterprises had the same trend, the growth rate being 122.1%. Total vineyard area decreased by 8.28%, including those managed by enterprises – by 16%. Regarding the share of area with perennial crops managed by enterprises in the total areas, we can see that in the analyzed period it did not vary substantially.

Table 2

Evolution of the areas cultivated with vegetables in the Republic of Moldova in the period 2010-2018

Indicators	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total areas cultivated with vegetables, thousand ha	77	73	65	66	63	57	59	57	53
<i>incl. in agricultural enterprises of all types</i>	15.2	12.8	10.6	9.4	9.8	7.4	8.2	6.9	6.5
Share of areas cultivated with vegetables of the enterprises in the total area,%	19.74	17.53	16.31	14.24	15.56	12.98	13.90	12.11	12.26

Source: Developed by the authors based on [NBSRM. Agriculture. Crop production].

According to the data in Table 2, the areas cultivated with vegetables decreased continuously during the researched period, the level reached in 2018 being by 24 thousand ha below the level of 2010, which means a reduction by 31.16%. At the same time, we notice an even more substantial reduction, by over 57%, in the vegetable areas of agricultural enterprises. Due to the potential value of vegetables, along with other special meanings (e.g. as a food product, as raw material for the processing industry, etc.), the stated trends can certainly be considered an alarm signal for decision makers on the strategic direction of the sector.

By generalizing the data on the evolution of agricultural areas, we can positively appreciate the increase of the areas of perennial plantations in the investigated period. At the same time, based on the economic significance of perennial crops, we can deduce that the growth rate of areas of only 120.7% in a period of nine years is insufficient. The reduction of areas cultivated with vegetables is another problem of the sector with a negative impact on its performance.

In order to highlight the economic results of the crop production, we will initially elucidate the trends in the evolution of the global crop production (Figure 8) and the crop production index (Figure 9).

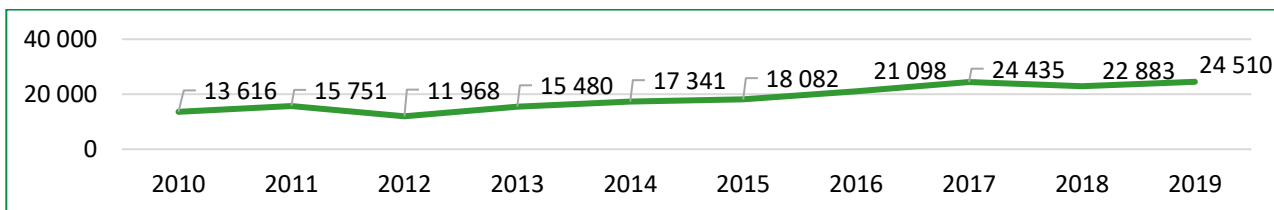


Figure 8. Evolution of the global crop production in the Republic of Moldova in the 2010-2019 period, million lei

Source: Developed by the authors based on [NBSRM. Agriculture. Crop production].

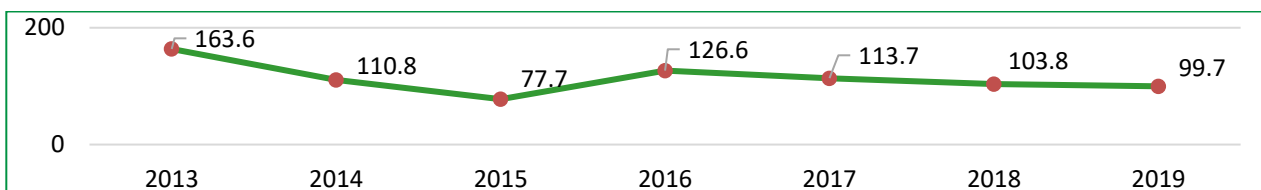


Figure 9. Evolution of the crop production index in the Republic of Moldova in the 2013-2019 period, %

Source: Developed by the authors based on [NBSRM. Agriculture. Crop production].

According to the data presented in Figure 8, we notice the increasing trends in the crop production value. Thus, despite the reduction of the indicator in 2012 and 2018 compared to previous years, the level reached in 2019 is higher than that recorded in 2010, the total growth rate (for nine years) being 180%. However, the indicators set out in Figure 8 cannot serve as indisputable evidence of the increase in crop production performance under the following circumstances:

- the crop production index, as we notice from figure 9, did not have continuous growth tendencies, being ascertained even its continuous reduction starting with the year 2016;
- global crop production is an indicator that expresses the result, but not the economic efficiency of the brunch.

In order to deepen the study, we will use the "crop yields" indicator which provides a more accurate picture of the quality of the production factors' management (Table 3).

Table 3

Crop yields in the Republic of Moldova in the period 2010-2019, quintals/ha

Indicators	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cereal and legume crops	22.3	25.4	14.3	30.8	34.0	25.1	35.0	39.2	37.9
Sugar beet	326.6	240.1	191.4	358.6	501.6	255.5	329.0	381.8	386.5
Tobacco	17.6	15.3	13.1	15.4	17.4	16.2	13.9	18.3	19.5
Sunflower	15.4	15.7	10.3	20.5	18.4	15.5	19.8	21.8	22.3
Soy	18.7	13.4	8.0	16.7	21.5	7.2	11.8	14.4	22.2
Potatoes	130.9	152.3	105.9	157.7	184.3	114.7	139.5	149.7	142.6
Field vegetables	67.1	88.5	73.6	88.8	105.1	115.2	138.1	142.2	130.4
Pumpkin food crops	46.5	50.4	38.4	59.7	35.5	52.2	54.3	69.4	103.8
Roots for fodder	275.9	264.4	204.1	273.2	404.0	272.9	143.4	41.5	35.6
Corn for silage, green mass and hay	152.8	148.7	48.6	171.4	177.1	97.7	190.5	193.7	270.2
Seed fruits	42.3	56.6	60.6	81.8	92.9	67.6	89.7	119.9	171.0
Stone fruits	27.1	18.4	19.8	37.2	41.2	49.9	51.9	48.4	65.6
Nuts	1.7	2.2	0.9	3.9	3.5	3.7	3.5	3.8	5.4
Berries	8.7	8.6	10.8	10.5	17.0	11.0	14.5	19.5	27.8
Grapes	23.1	44.8	40.5	62.1	51.3	53.3	62.3	79.0	86.0

Source: Developed by the authors based on [NBSRM. Agriculture. Crop production].

Note: Data reflects the situation in agricultural enterprises.

The data in Table 3 show an increase in the crop yields, with the exception of fodder roots. At the same time, we note that none of the crops shows a stable trend of increasing yields, with fluctuations being identified in its evolution. The modest results in the evolution of crop production are also confirmed by the efficiency indicators of the agricultural enterprises (Table 4).

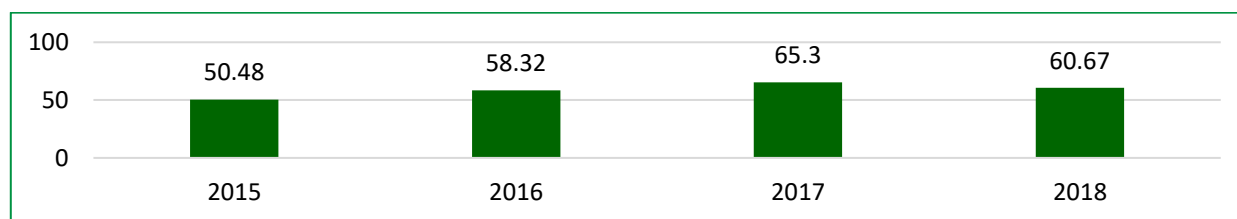
Table 4

**Evolution of financial results of agricultural enterprises in the Republic of Moldova
in the period 2015-2018**

Indicators	2015	2016	2017	2018
Number of profitable enterprises, units	1530	1935	2431	2479
Financial result of profitable enterprises, million lei	1148.94	1731.69	2720.43	2136.42
Number of unprofitable enterprises, units	1377	1254	1163	1431
Financial result of unprofitable enterprises, million lei	-1039.81	-451.7	-274.93	-525.25
Total financial result before tax, million lei	109.13	1279.99	2445.50	1611.16

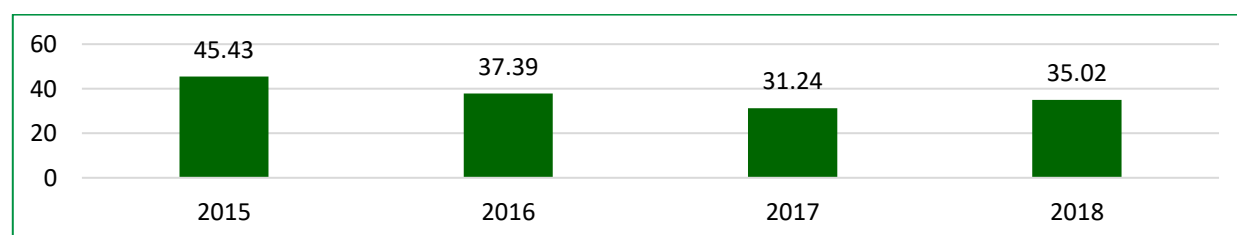
Source: Developed by the authors based on [NBSRM. Entrepreneurship].

The data in Table 4 show the increase in the number of enterprises that operated profitably during the analyzed period, but also the continued existence of an impressive number of unprofitable enterprises. Through a more detailed investigation (Figure 10) we can see that in 2018 the share of profitable enterprises was 60.67%. Even if, compared to the level of 2015, in 2018 the share of profitable enterprises increased by 10.19 pp, there are no stable trends in their share. At the same time, during the analyzed period a significant part of enterprises operated with losses, as we note in Figure 11. In the evolution of the total financial result, as well as, distinctly, of the profit obtained by the profitable enterprises and the losses of other category of enterprises, we also note the absence of stable improvement trends.



**Figure 10. Evolution of the share of profitable agricultural enterprises
in the period 2015-2018, %**

Source: Developed by the authors based on [NBSRM. Entrepreneurship].



**Figure 11. Evolution of the share of unprofitable agricultural enterprises
in the period 2015-2018, %**

Source: Developed by the authors based on [NBSRM. Entrepreneurship].

By examining the "average profit per employee" indicator (Figure 12) we can see the same trends as in the total financial results of agricultural enterprises: while there is a steady increase in the indicator in the 2015-2017 period, 2018 was marked by its substantial reduction (by 33.8%).

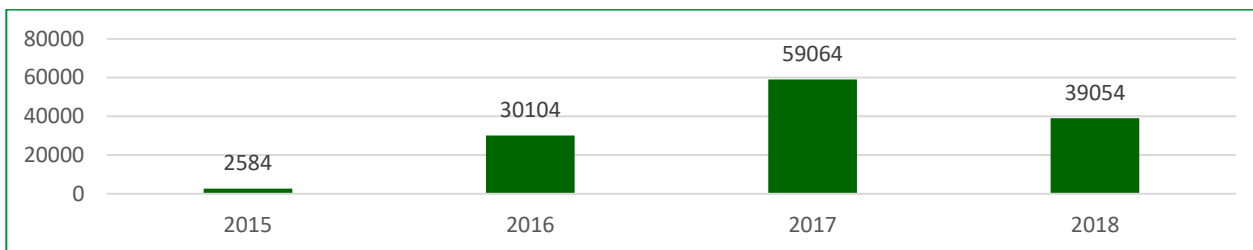


Figure 12. Evolution of the average profit per employee in agricultural enterprises in the 2015-2018 period, lei

Source: Developed by the authors based on [NBSRM. Entrepreneurship].

By generalizing the presented above, we deduce the modest performance of agricultural production in general and of the crop production in particular, as well as the absence of visible positive trends in their evolution. The synthesis of some analytical studies on the subject reveals a series of factors conditioning the low profitability of crop production (Table 5).

Table 5

Factors conditioning the low profitability of crop production in the Republic of Moldova

Groups of factors according to their nature	The factors` content
Technological factors	<ul style="list-style-type: none"> • The dominant position of low value crops (cereals, oilseeds, sugar beet); • Low level of application of modern agricultural technologies (drought-resistant varieties, hail protection tools, etc.); • Insufficient irrigation capacity.
Managerial factors	<ul style="list-style-type: none"> • Dual and fragmented structure of agricultural enterprises; • Poorly developed risk management tools; • Lack of knowledge in product promotion.
Economic and financial factors	<ul style="list-style-type: none"> • Relatively high local production costs; • Much lower productivity of agricultural crops compared to the EU countries; • Limited share of investments in agriculture; • Limited share of foreign capital in long-term active investments; • High interest rates on bank loans and the short period of time for which loans are offered; • Lack of conditions and of infrastructure for storing products; • Lack of the necessary resources to carry out at least partial processing of production.
Factors regarding the state mechanisms for managing the sector	<ul style="list-style-type: none"> • Long and expensive procedures for registering varieties; • Instability of legislation, which increases business costs and creates difficulties in making forecasts for longer periods of time; • Instability of the country's policy in the field of international cooperation.
Market factors	<ul style="list-style-type: none"> • Monopoly on the local market by large companies that do not allow producers to market their products at advantageous prices; • Difficulties in penetrating new markets; • High competition in foreign markets; • Underdevelopment of the land market.
Natural factors	<ul style="list-style-type: none"> • Unfavorable weather conditions.

Source: Developed by the authors based on [National Strategy for Agricultural and Rural Development, 2014-2020; Lupusor et al 2017; Stihl and Zatic, 2016].

Through the synthetic evaluation of the data presented in Table 5 we can conclude that the crop production efficiency can be increased through a system of complex and varied measures of technological, economic-financial, organizational, managerial, legislative-normative nature, etc.,

which, in their turn, require active and effective involvement of several actors and an optimal synergy of their efforts. Last but not least, we must mention the multitude of "cause-effect" relationships between various factors analyzed. For example, high production costs (economic factor) generate difficulties in penetrating products into markets, including external ones (market factor). On the other hand, the deficiencies in the application of advanced technologies (as a technological factor) are determined both by insufficient knowledge of advanced technologies (managerial factor) and by insufficient financial resources as a result of limited self-financing possibilities and difficulties in attracting external resources (financial factors). Based on the above mentioned, we also deduce the multiple effects of the same possible measures and, therefore, the special significance of those measures for the prosperity of the analyzed branch. Among them, we will emphasize in particular the better quality of agricultural education and training. In this context, based on the previously presented problems related to crop production, and using the objectives tree technique, we will schematically represent the recommendations for improving agricultural education programs and the expected medium and long term results (Figure 13).

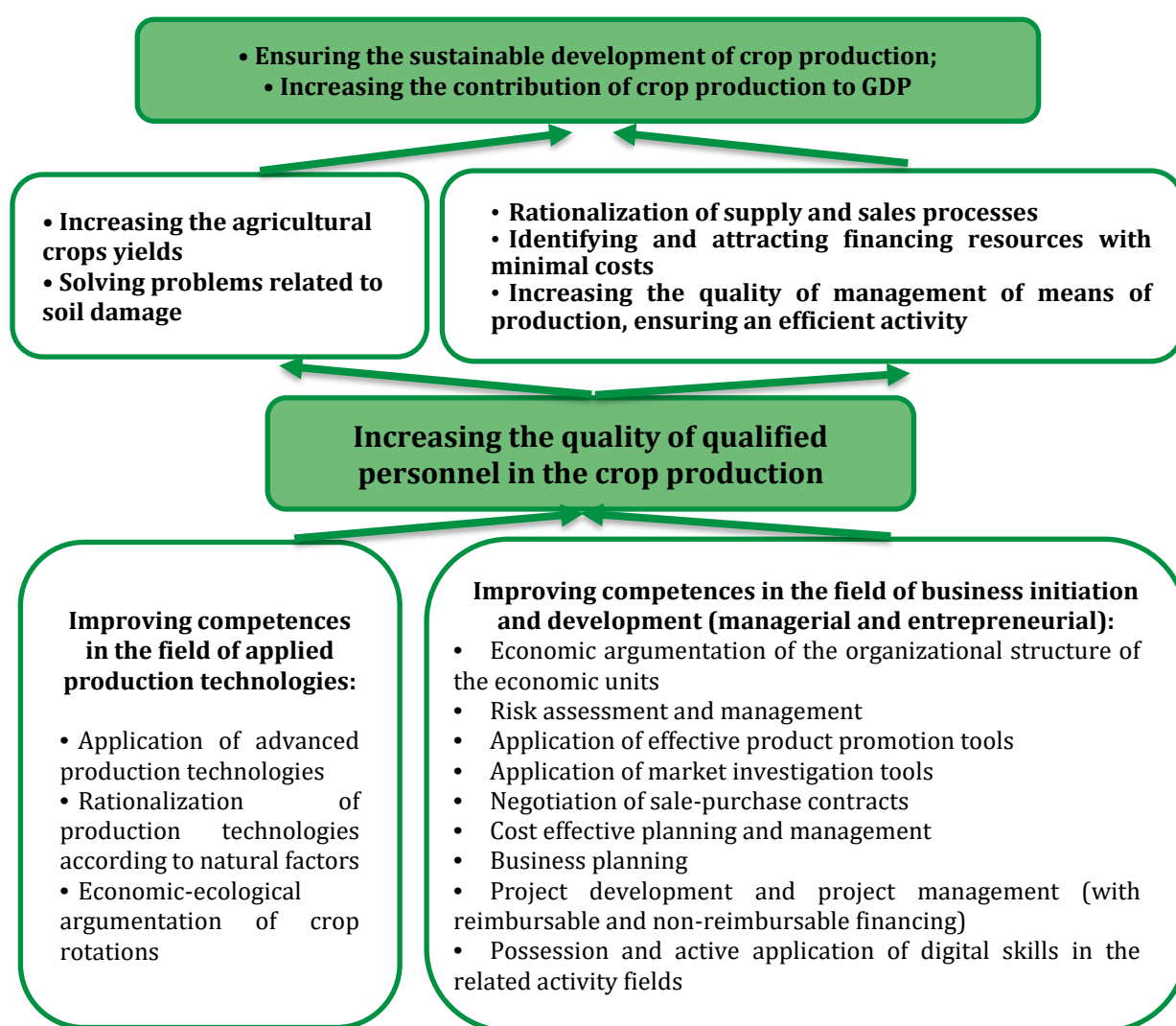


Figure 13. The tree of agricultural education objectives regarding the improvement of competences in the field of crop production

Source: Developed by the authors.

As shown in Figure 13, based on the problems that appeared in the evolution of the crop production, a number of objectives can be identified, and namely: objectives aimed at applying

production technologies and objectives related to improving managerial and entrepreneurial competences. The effects of improving the related study programs are systematized in medium term effects (increasing crop yields, increasing soil fertility, streamlining supply and sales processes; identifying and attracting financing resources with minimal costs; increasing the quality of production management, ensuring efficient activity), and leading to the long-term effect (ensuring the sustainable development of the branch and increasing its contribution to GDP).

It should be noted that much of the competences needed to be improved in agricultural professional education programs in the Republic of Moldova are analogous to international concerns in this regard under the following circumstances: the sector will increasingly face both threats and opportunities because of climate changes. Thus, the agriculture is seen as the sector providing benefits and services over and above the production of commodities (UK Commission for Employment and Skills, 2012). But at the same time, advanced skills will be required, especially in the application of technologies adapted to environmental regulations. The skills of efficient business management are also widely addressed, thus creating premises for business continuity.

CONCLUSIONS

The data obtained as a result of the analysis of crop production in the Republic of Moldova as a tool of sectoral approach to anticipating competences, shows the existence of a wide range of problems that hinder the development and, respectively, the competitiveness of the branch. Solving the problems related to the agricultural production efficiency in general and to the crop production efficiency in particular, requires a series of measures of economic, managerial, normative and legislative nature, etc., as well as the involvement of a wide list of actors representing various fields and levels. Among them, agricultural education institutions are meant to contribute by providing better competences to future managers and specialists, so as to overcome or at least to diminish a number of problems in the sector.

Based on the problems appeared in the development of crop production, we can identify the following competences, on which greater emphasis must be placed in the process of professional education:

I. In the field of applied production technologies:

- Application of advanced production technologies;
- Rationalization of production technologies according to natural factors;
- Economic-ecological argumentation of crop rotations.

I. In the field of business initiation and development:

- Economic argumentation of the organizational structure of the economic units;
- Risk assessment and management;
- Application of effective product promotion tools;
- Application of market investigation tools;
- Negotiation of sale-purchase contracts;
- Cost effective planning and management;
- Business planning;
- Project development and project management (with reimbursable and non-reimbursable financing);
- Possession and active application of digital skills in the related activity fields.

Improving the competencies mentioned above is an important step in increasing the quality of the professional education process.

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**DEVELOPMENT OF MOBILE MARKETING IT PROJECTS:
OPPORTUNITIES FOR MOLDOVA AND UKRAINE**

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ABSTRACT

This article describes the main problematic issues and modern approaches to managing and developing mobile marketing IT projects. In this study, the authors set the goal of the study - to analyze the features of IT project management in mobile marketing, to systematize the development models of modern web projects and to study the possibilities of using flexible applied methodologies that formalize the development and modification of web applications based on the use of effective methods for managing IT projects in mobile marketing. To achieve this research goal, the authors used theoretical and conceptual analysis, studied existent empirical databases for the mobile application market in the Republic of Moldova and Ukraine. The authors highlighted the critical problems of using agile methodologies in IT projects of mobile marketing. A comparative analysis of the feature's applicability of IT project management methodologies and problems of their using in mobile marketing applications are presented. The logical and structural diagram of the stages of the Mobile App Design Timeline is proposed, which contributes to increasing the effectiveness of the implementation of information technology projects in general. To assess the applicability of the flexible methodologies of Kanban and Scrum, an IT project of mobile marketing was simulated. The significance of the results obtained is predetermined by the fact that they could form a theoretical base for improving the effectiveness of marketing activity under conditions of the informatization of society through the building a self-organizing team and use of agile methodologies in mobile marketing IT projects.

Keywords: mobile marketing, mobile marketing IT project, flexible IT project management methodologies, MVP – minimum viable product.

Articolul descrie principalele provocări și abordări moderne pentru gestionarea și dezvoltarea de marketing mobil a proiectelor IT. În acest studiu, autorii au stabilit obiectivul studiului – să analizeze caracteristicile managementului proiectelor IT în marketingul mobil, să sistematizeze modelele de dezvoltare ale proiectelor web moderne și să studieze posibilitățile de utilizare a metodologiilor aplicate flexibile care să formalizeze dezvoltarea și modificarea de aplicații web bazate pe utilizarea unor metode eficiente pentru gestionarea proiectelor IT în marketingul mobil. Pentru a atinge acest obiectiv de cercetare, autorii au folosit analize teoretice și conceptuale, au studiat baze de date empirice existente pentru piața aplicațiilor mobile din Republica Moldova și Ucraina. Autorii au evidențiat problemele critice ale utilizării metodologiilor agile în proiectele IT de marketing mobil. Este prezentată analiza comparativă a metodologiilor de gestionare a proiectelor IT și a constrângerilor de utilizare a acestora în aplicațiile de marketing mobil. Se propune diagrama logică și structurală a etapelor Programului de proiectare a aplicațiilor mobile, care contribuie la creșterea eficacității implementării proiectelor de

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tehnologii informaționale în general. Pentru a evalua aplicabilitatea metodologiilor flexibile ale Kanban și Scrum, a fost modelat un proiect de marketing mobil IT. Semnificația rezultatelor obținute este predeterminată de faptul că acestea ar putea forma o bază teoretică pentru îmbunătățirea eficacității activității de marketing în condițiile informatizării societății prin construirea unei echipe de auto-organizare și utilizarea metodologiilor agile în proiecte IT de marketing mobil.

Cuvinte-cheie: marketing mobil, marketing IT proiect IT, metodologii flexibile de gestionare a proiectelor IT, MVP – produs viabil minim.

В данной статье описаны основные проблемные вопросы и современные подходы к управлению и развитию мобильного маркетинга IT-проектов. Цель исследования – проанализировать особенности управления IT-проектами мобильного маркетинга, систематизировать модели развития современных веб-проектов и изучить возможности использования гибких прикладных методологий, формализующих процессы разработки и модификации веб-приложений на основе применения эффективных методов управления IT-проектами мобильного маркетинга. Для достижения цели исследования авторы использовали теоретический и концептуальный анализ, изучили существующие эмпирические базы данных рынка мобильных приложений в Республике Молдова и Украины. Авторами были выделены критические проблемы использования гибких методологий в IT-проектах мобильного маркетинга. Проведенный сравнительный анализ применимости данной методологии управления IT-проектами и проблем их использования в приложениях для мобильного маркетинга, позволил авторам предложить логическую структурную схему этапов разработки мобильных приложений, применение которой способствует повышению эффективности реализации проектов в сфере информационных технологий в целом. Для оценки применимости гибких методологий Kanban и Scrum авторами был смоделирован IT-проект мобильного маркетинга. Значимость полученных результатов определяется тем, что они могут стать теоретической базой для повышения эффективности маркетинговой деятельности в условиях информатизации общества за счет построения самоорганизующейся команды и использования гибких методологий в IT-проектах мобильного маркетинга.

Ключевые слова: мобильный маркетинг, мобильный маркетинг, IT-проект, гибкие методологии управления IT-проектами, MVP – минимально жизнеспособный продукт.

INTRODUCTION

Statement of the problem in general form and its connection with important scientific or practical tasks. The use of certain marketing concepts in enterprises is mainly due to the characteristics and trends of the market. In the process of market transformation, the marketing approach to it is changing.

One of the global modern trends in digital marketing is the steady growth of mobile traffic, which is associated with both an increase in the number of mobile users, mobile Internet connections, mobile communications, and an increase in the speed of data transmission on mobile networks. The average annual growth rate of mobile traffic over the next five years will amount to 60-70%. Mobile devices will generate more than 90 percent of traffic in 2020. In 2019, over two-thirds of Ukrainians and Moldovans are connected to the Internet, most of them using mobile devices to access the Internet (Douglas, 2019).

Today, mobile marketing is the preferred method of digital marketing – a set of promotions, events and campaigns carried out through mobile devices via SMS (Short Message Service) to promote goods and services (Danilenko, 2014:174).

With the transition to the mobile marketing model, the processes of adapting and modifying the new functionality of web applications are accelerated, which requires the use of effective and adequate technologies for managing mobile marketing IT projects (creation of web applications for use with mobile devices). Reducing the timing of such projects, increasing the requirements of usability and the need for dynamic improvement of the quality assurance functionality requires formalizing the processes of web application development and modification based on the application of effective methods of managing mobile marketing IT projects.

SCIENTIFIC APPROACH AND LITERATURE REVIEW

According to the classic definition of the American Marketing Association: "Marketing – a function of the organization, which includes a set of processes for creating, promoting and the supply of consumer values through the management of customer relations, as a result of which the organization bears risks and benefits". Research on digital transformation of marketing; places of digital marketing in modern conditions of social development; features of digital marketing as a modern tool of communication management with consumers; components and tools of digital marketing are dedicated to the work of many domestic and foreign scientists: Oklander M. (2017), Oklander T., Yashkina O., Pedko I. (2018), Danilenko M. (2014), Gritsenko S. (2017), Ruban V. (2017), Shafalyuk O. (2017), Kwilinski A., Trushkina N. (2017), Kotler F. (2018), Kaplan A. (2012), Jeffrey M. (2018), Lengard I. (2017).

The analysis of the essence, prospects, methods, features and tendencies of the development of mobile marketing in the world and in Ukraine was carried out in the works of Mazurenko V.P., Matviienko N. (2011), Marchuk O. (2018), Romanenko O. (2015), Yatsyuk D. (2015). The issue of IT-project management at the theoretical level is considered in the works of Bourque P., Fairley R.E (2014), Fatrell R., Donald Schafer F., Larman K., Cohn M., Cobb G. (2016), developed plenty of standard methodologies for process manufacturing software: ISO9001, ISO12207, ISO15504, CMM (Capability Maturity Model), MSF (Microsoft Solution Framework), RUP (Rational Unified Process), SCRUM, XP (eXtremal Programming), Crystal Clear, ASD (Adaptive Software Development), Agile (2018:68).

Author Bhalla (2011) proved that the marketing strategy should focus on strengthening the interaction between seller and consumer. However, the researchers did not identify areas for monetization of the proposed solutions.

Authors Iliashenco, Ivanova (2015) emphasized the importance of operational transactional interaction in real time. They have systematized the main methods and tools of digital marketing, the specifics of their application. But digital marketing tools are rapidly being upgraded and the results of such research need to be developed. The research study of Oklander, Oklander, Yashkina (2018) contains an analysis of current trends in marketing research in the Internet environment.

However, it seems that the study is not complete because no strategic solutions are proposed. In particular, in the field of mobile marketing, which is progressing most rapidly among other areas of digital marketing. Authors Oklander, Oklander, Yashkina (2017) systematized the classic tools of digital marketing and general aspects of the application of digital technologies. This does not show the trends that have given rise to innovative digital technologies.

Analysis of the literature on the comparison of technological innovations of digital marketing in terms of improving their effectiveness shows that, firstly, the research is fragmentary and does not show the system of their latest most effective tools, does not show their strengths and weaknesses. Secondly, although the issue of mobile marketing is being reprinted in research, not enough attention is paid to the strategies of its monetization. Third, in the presence of multivariate models of affiliate marketing development, their systematization and characteristics of each model are not proposed.

Thus, to develop effective marketing strategies in the digital economy there is a need to improve the theoretical foundations for the use of innovative digital marketing tools, develop recommendations for effective strategies for their monetization and the formation of affiliate marketing models.

Highlighting the previously unresolved parts of the general problem to which the article is devoted. However, all attempts of formalization have failed, uniqueness of mobile marketing IT projects highlights the issue of choice of methods, practices and rules of lowering project risks.

Formulation of the purpose of the article (statement of the problem). The purpose of this study is to analyze the features of a mobile marketing IT project management, systematize the development models of modern web projects, highlight critical problems of using flexible methodologies in mobile marketing IT projects, and develop recommendations for overcoming them.

DATA SOURCES AND METHODS USED

Mobile applications are one of the most successful and promising marketing channels to date. According to Gartner, more than 10 billion mobile devices are registered in the world in 2019, including 1.7 billion machine-to-machine (M2M) connections. The number of mobile users has grown

from 4.3 billion in 2012 to 5.3 billion in 2019. The current annual growth rate is 2.4%. The average mobile data rate has increased more than 7-fold since 2012 (Gartner Special Report, 2020).

The highest Internet speed in the world is in South Korea with 95.1 mbps, and within a year this figure grew by 120%. In 2019, this country was the first in the world to launch 5G high-speed Internet. In second place by speed we have Qatar (69.1 mbps), third place – Norway (68 mbps). The average speed of mobile Internet across the world is 29.5 mbps. Global mobile traffic in 2019 increased by 30.6% compared to 2017, and in the desktop segment it dipped by 3.3%. 70% of searches come from mobile devices, up to 30% of visitors go to sites and leave orders from mobile devices, the average user spends at least 87 hours on performing Internet search activities (Digital Marketing by the Numbers, 2020).

The country with the highest prevalence of smartphones was South Korea – 94% of adults use smartphones and 6% use phones. On second place there is Israel with a smartphone prevalence of 83%, in third place is Australia with 82%. The United States is in eighth place with 77% (Jomer 2020).

Smartphone sales in the EU and app downloads have increased exponentially over the past years and already over half of Internet access is via mobile devices – and it's still growing. Moreover, most mobile Internet usage is through apps rather than web browsers [11]. The increasing adoption of smartphones and tablets is driving the growing demand for mobile applications. European spending on mobile applications (including user spending and advertising), totaled €6.1 billion in 2013 and by 2018 it grew to €18.7 billion – so a more than 3-fold increase in just 5 years' time (EU Export Explorer on IT Services, 2016).

Android is the leading operating system for mobile devices in Europe. Other mobile operating systems include Apple's iOS (running only on iPads, iPhones and the Apple Watch) and Windows (unlike Google and Apple, Microsoft has only one OS for desktop computers, laptops, tablets and phones). Demand for cross-platform mobile applications is growing (GEN2 Standard, 2016).

The market for mobile applications is changing rapidly. New technological trends are emerging continuously, offering new opportunities for mobile applications. As a result of all these developments big data environments are growing fast and are becoming more complex and dynamic, which results in poor usability and reduced control over applications. There is thus an increasing demand for mobile applications that analyze data that is available to companies, or that makes collection and use of this data possible.

European companies prefer to outsource services to providers within the same country (onshoring). When outsourcing to foreign service providers, nearshore locations are preferred to offshore locations, due to their proximity, language and cultural similarities and little or no time difference. Popular nearshore destinations are, for example, Bulgaria, Poland, Lithuania and Romania. This may be an opportunity for Ukrainian and Moldovan IT Service providers (GEN2 Standard, 2016).

The Government of the Republic of Moldova approved a Strategy for the Development of the Information Technology and Ecosystem Industry for Digital Innovation for 2018-2023. The development of these documents was the base for the growth of IT technologies: the volume of IT services exports in 2011-2016 increased by an average of 10.6% per annum in Moldova, amounting to \$79.2 million in 2016, and the share of such services in the total services exports increased from 5.6% in 2011 to 8.9% in 2016 (IT Sector Strategic Roadmap for Moldova, 2020).

Western Europe, with a share of 45% of the total volume, dominates the sales markets in the structure of the Moldovan export of IT services, followed by America (USA, Canada) with a 21% share and Central and Eastern Europe with a share of 18%. According to the type of services provided in the ICT sector, 70% of Moldovan companies' exports are IT services, followed by R & D services/engineering services with a 15% share and BPO (Business Process Outsourcing) services with a 10% share. In turn, 70% of the IT services exports relate to application development and testing, while setting up and supporting applications generates about 14% of these services.

At the same time, it should be noted that large volumes of export of IT services are not reflected in the official external balance sheet, since the work is carried out by freelancers working individually in international companies. Moldova was featured in the Bloomberg Innovation Index and made it into the Top 10 Global Innovation Index (GII) economies in mobile App development (Table 1). Apps represent global commerce in completely digital goods, therefore provide insight into how

innovation, production, and trade of digitized products and services are evolving in an increasingly globalized digital economy (GII, 2020).

Table 1

Top 10 GII economics in mobile creation

Countries	%	Place
Cyprus	100.00	1
Finland	66.11	2
Lithuania	63.35	3
Israel	59.41	4
Estonia	52.44	5
Sweden	50.17	6
Denmark	49.65	7
Korea, Republic of	48.88	8
Moldova, Republic of	45.90	9
Hong Kong (China)	44.50	10

Source: [GII 2020].

Out of 70% of IT services application development and testing services amounted to 69% of the share, while application customization and support to 14% (Figure 1). IT services export are focused on web and mobility app development and include focus on languages such as NET, Enterprise Java, C, C++, C#, PHP, Sitecore CMS, iOS, Oracle DB and Cisco networks.

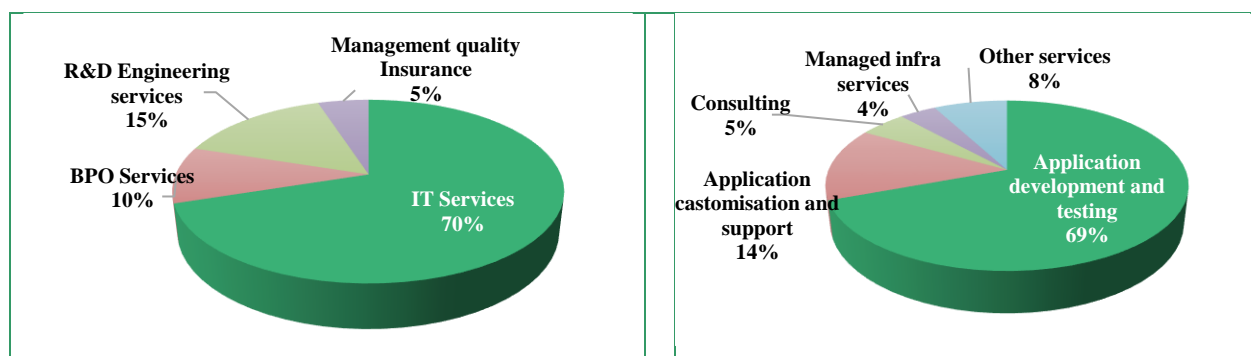


Figure 1. IT services export

Source: [IT Sector Strategic Roadmap for Moldova 2020].

Moldova has a relatively high level of Internet penetration. In 2012, Moldova was significantly behind in this indicator and held only the 37th place in Europe. But in recent years, the country has shown accelerated growth. In 2016, the number of people over 6 years of age using the Internet was 71%, compared with 63% in 2015. In 2017, the number of mobile telephony service users who used 4G mobile Internet via smartphones increased by 45.8%. The volume of traffic generated by mobile Internet users via smartphones in 2018 increased by 64.2%. As a result of such dynamics, the penetration rate of mobile Internet access services per 100 residents in 2019 increased by 14.3 percentage points and amounted to 82.7%.

Similar global trends are observed in Ukraine. The use of the second and third screens is growing, people are using several mobile devices at the same time. In 2019, the number of Ukrainians in the network amounted to almost 23 million, or 71% of the population, against 63% of the population in 2018. 66% of Ukrainian Internet users use mobile devices. 76.2% of mobile Internet users access the network via Android, 22.5% through Apple devices (Digital report, 2019).

Increasing importance of mobile traffic requires a change in approach to the development of modern web-projects with a focus on improving usability based on the principles of ergonomics and customer-centricity. The issue of web application development, adapted for use with mobile devices, is critical in digital marketing. Mobile versions have a number of features that must be considered to ensure high usability. Ergonomics means fitness for use, availability of conditions and pre-conditions

for easy, enjoyable, non-burdening use. There are several usability models: responsive web design, adaptive design, Mobile First, Mobile Only (Table 2).

Table 2

Models of development of modern web-projects

Type	Characteristics	Advantages	Limitations
Responsive web design	The site is readable on various monitors, does not require zooming or scaling, there is no need for horizontal scrolling.	The need to develop only one version of the design that will automatically adapt to the screen size of the device.	Excessive overload of web page traffic (by downloading CSS styles and JavaScript files); difficulties with image adaptation.
Adaptive design	The content is automatically adapted to the screen of the device used by the user. First, the developer creates content for PC users, and only then "trims" for the smartphone.	Wide versatility. Suitable for almost any category of websites.	Difficulty in adapting an existing site; significant requirements for the choice of server solutions
Mobile-first	Development of web-based solutions for mobile users, with further adjustments to those solely for workplace users.	Laconic design, Minimal functionality. The connection speed of the network is taken into account.	Requires more detailed work on the prototyping and development phase of the site concept, given the need to reduce the amount of content. Design is limited, scripts are truncated, background images are missing, images are minimized.
Mobile Only.	mobile users only receive content that is prepared for their screen and device solution.	reducing page load time on mobile devices by reducing the number of resource downloads requests.	There are risks associated with browser incompatibilities, differences in operating systems (OS) of user devices, restrictions on the mobile version only.

Source: Developed by the authors.

Improper model selection causes the site to lose a large share of the market. To provide the most user-friendly interface and navigation, an adequate choice of technology is required at the stage of designing the structure of the web-resource and program code. When choosing a technology, consider the limitations of content minimalism requirements, the complexity of the project, the type of device screens, mono- or multi-variant versions of web-projects, the type of operating system that will be applied.

Mobile marketing IT project management methodologies can be divided into traditional and flexible (iterative). Traditional – based on fairly strict planning of the project before launch and minimal interventions after. With this approach, each subsequent phase begins after the completion of the previous one. The traditional approach correlates with the classic project management standard from PMI – PMBOK (PMBOK, 2018).

Agile Agencies are more effective in a rapidly changing business environment. Agile methodologies encourage change at all stages. This makes them more competitive in current realities. The use of flexible methodologies in the management of IT projects for mobile marketing increases the manageability of the project and allows you to get an effective return on investment; provide structure flexibility.

Agile methodologies are based on adaptive development, focusing on people and their interaction, rather than on processes and tools. They are characterized by flexibility, iterativeness, adaptability. Conducive to breaking into small manageable work packages.

An iterative and incremental approach to project and product management, focused on the dynamic formation of requirements and ensuring their implementation as a result of constant interaction within self-organizing working groups consisting of specialists of various profiles. A working product is more important than comprehensive documentation; cooperation with the

customer is more important than agreement on the terms of the contract; readiness for change is more important than following the original plan. Suitable for open end projects.

The share of Agile projects in the total array is steadily increasing (from 9% in 2010 to 25% in 2019), while traditional approaches are losing popularity, which is particularly noticeable in application development (COBB, 2016:115). Among the methods based on the ideas of Agile, the most popular are Scrum and Kanban.

Kanban (Toyota, 1953) a development management method that implements the principle on time and contributes to an even distribution of workload between employees. The product increment is passed forward from stage to stage, and at the end, an element ready for delivery is obtained. Accurate calculation of the load on the team, the correct placement of constraints and focus on continuous improvement. The main task of Kanban is to reduce the amount of “work currently in progress”. In Kanban, estimates of the deadlines for the task are optional or none at all. Kanban is a tool for visualizing the process and limiting the execution of the simultaneous number of tasks, but it alone is not enough for a successful project. Suitable for fairly cohesive teams with good communication.

Scrum is the most structured of the Agile family, combines the elements of the classical process and the ideas of a flexible approach to project management. Scrum is a set of principles on which the development process is built, which allows to provide a product to a customer in hard-fixed and short-term iterations, called sprints. The scrum methodology is aimed at interacting with the customer, and despite the fact that the development team decides what tasks it will perform during one iteration, there is a leader (scrum master) in this methodology who monitors the process. Using this methodology makes it possible to identify and eliminate deviations from the desired result at earlier stages of software product development.

Table 3 shows a comparative analysis of the features and areas of applicability of flexible methodologies for managing mobile marketing IT projects.

Table 3

Analysis of the application of IT project management methods in the company

Method	Features	Usage in projects
Micro-management	Problems regarding involving the team in the development process; internal security threat (project, information, staff).	The number of people in the project does not exceed 10. Leadership lacks delegation skills or is reluctant to delegate.
Kanban boards	Just in time (JIT) principle. Helps to identify bottlenecks in the project. A visual solution that involves prioritizing. Panoramic view of the project. Provides business opportunity to be reactive to customer needs. It's hard to combine testing and development in one team.	Task-oriented. High volume of tasks. The requirements are constantly changing. Many tasks may be out of date and get “demoted”.
Scrum	Aims for interaction with the customer. More communications. The beginning of the sprint is accompanied by planning: analysis and evaluation of tasks. Weekly mandatory stand-ups. After the sprint, a retrospective is held. As a result, all communications (meetings, workshop, sprint retrospective, etc.) take about 30% of the time.	Team-oriented. Projects with flexible workflow algorithm, uncertainties, variable requirements, inability to determine the time limits of tasks in advance. Quick launch of the project with the most priority functions.

Source: Developed by the authors.

When using flexible methodologies in mobile marketing IT projects, it is necessary to take into account a number of critical problems associated with determining the target market, designing, prototyping, organizing teamwork, and choosing the MVP functionality (minimum viable product). Underestimating the importance of these issues leads to the fact that only 29 out of 100 IT mobile marketing projects reach the stage of successful implementation (Chaikovska, Chaykovskyy, 2018:68).

Figure 1 shows the logical and structural diagram of the Mobile App Design Timeline stages, which helps to increase the effectiveness of the project.

1. Building an autonomous, self-organizing team in practice. Such a team may not be considered completely independent; leadership is still being implemented: goals are set from the outside, and the team itself is formed by management. However, the team independently determines the path by which the goal will be achieved.

2. Decide what functionality will be the MVP (minimum viable product), how to think of architecture for future expansion, what technologies to choose, and, in addition, determine the time and cost of the project. In order to optimize this process, it is recommended to carry out the design. Designing requires applications with unique, deliberately new functionalities that integrate many features and systems that provide ambiguity for possible solutions.

3. Ignoring the principles of building interfaces for Android and requirements for iOS, laying the wrong structure of screens. Application of non-native elements. This makes the app unintelligible to the user and increases the development time. The lack of clarity of the scripts in the TK and their detailing in the design, the difficulty of integrating the mobile application with CRM systems and ERP.

4. Conducting A/B-testing of the apps and the retrospective of the IT project. In practice, it often turns out that carrying out a retrospective at the end is difficult: the team does not have enough time, many problems are already solved during the iteration.

Table 4

Effectiveness of Scrum and Kanban

Model	Duration (days)		Deviation (%)	Cost (\$)	
	Base	Factual		Estimate	Factual
Kanban	40	46	15%	13400 \$	15410 \$
Scrum	40	35	-12,5%	13400 \$	11725 \$

Source: Developed by the authors using COBB G (2016).

To evaluate the applicability of Kanban and Scrum, a mobile marketing IT project was modeled. Despite the fact that the baseline duration of a project modeled using the Scrum methodology is the same as the duration of a project implemented using Kanban, the variance in both the duration and cost of a project modeled using the Scrum methodology is much less than in Kanban with an obvious gain in product quality.

Table 5

Comparison of Scrum and Kanban by criteria

Criteria	Scrum	Kanban
Evaluation of terms	+	-
Long-term planning	+	-
Roles	+	-
Changes after scheduling	-	+
Technical task	+	-
Quick reaction	-	+
Narrow specialization in the team	+	-
Daily meetings	+	+
The division of tasks into several stages	+	-

Source: Developed by the authors using COBB G (2016).

The basis of flexible IT project management methodologies is a retrospective. However, there are various approaches to conducting a retrospective, to choosing a model and an algorithm for its implementation. According to the cascade model, a retrospective should be carried out in the late stages of an IT project. An alternative approach recommended in benchmarking is the continuous retrospective of an IT project. The main feature of this approach is the departure from a phased model to a spiral one, with daily milestones ("stand-up" assemblies) (Chaikovska, 57).

Continuous retrospective is implemented by the following activities: visualization of the problem, development of a business process model for its implementation, analysis of alternative options for its operational resolution.

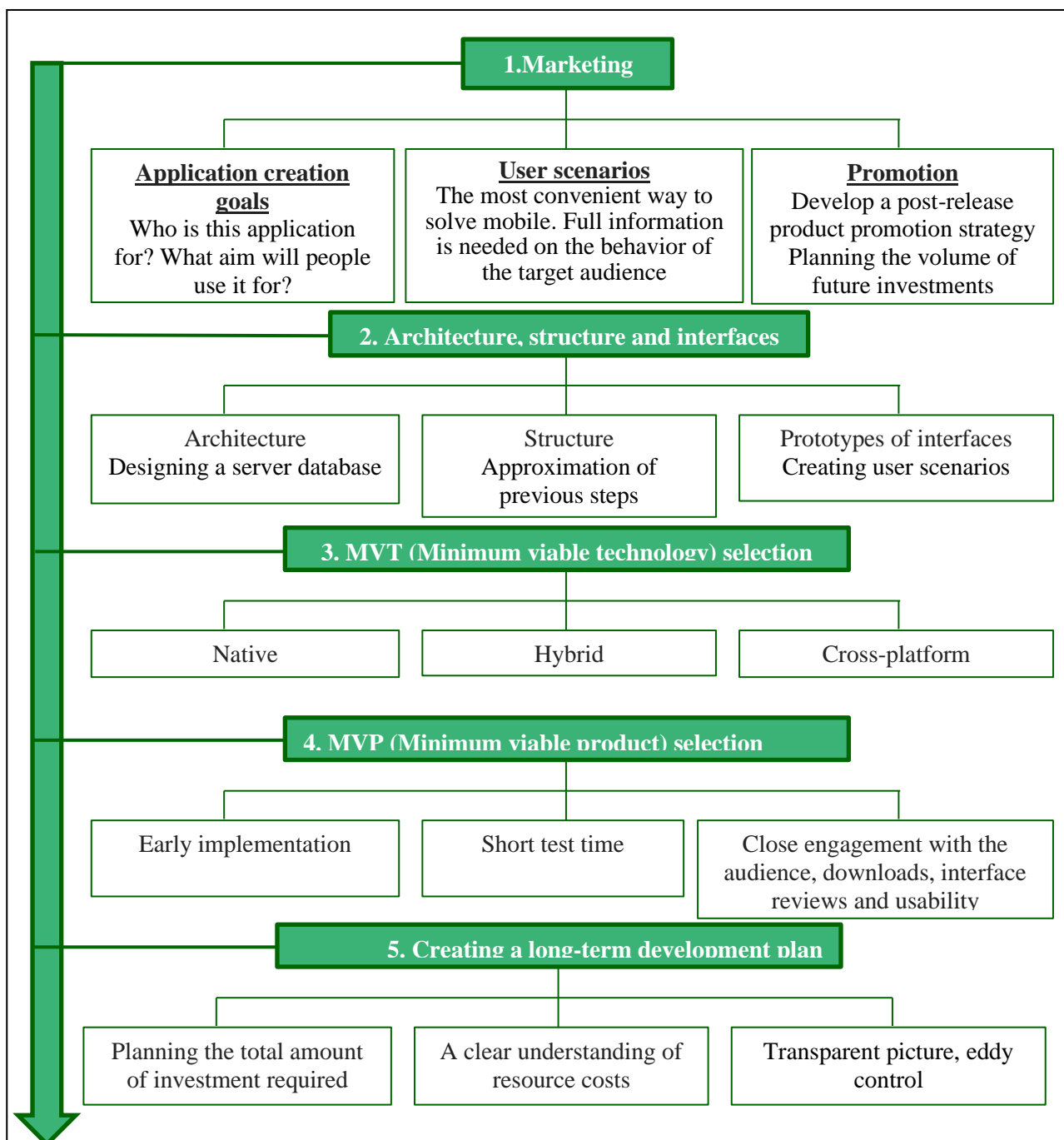


Figure 2. Mobile App Design Timeline

Source: [Chaikovska, 2017].

CONCLUSIONS AND PROSPECTS FOR FURTHER DEVELOPMENTS

Mobile marketing is constantly evolving. In a world where people read their correspondence, socialize and search for different information through mobile devices, businesses need new marketing strategies and tools, new approaches to managing. Applying these flexible approaches will encourage customers using mobile services to visit the site. It will contribute to creating applications that provide unique usability content, and among other things, digital presence.

One of the main tasks that directly affect the effectiveness of software development is choosing a model for the development process. There is no single optimum choice. The model may vary depending on the scale, novelty and criticality of the project, distribution of participants, customer requirements. Today, the traditional approach to managing IT projects is having considerable difficulties when project

requirements can change at almost any stage, as it is necessary to respond to the rapidly changing environment.

These are exactly the challenges inherent to mobile marketing IT projects. Flexible methodologies have their own challenges. It is important to perceive them as “challenges” and not advantages or disadvantages. Micromanagement and Kanban are good for small business website projects that don't take much time to plan. Scrum is suitable for a large project (3 months in duration) that has full specification and requirements before development begins.

In this case, the team can easily draw up a detailed development plan and split the whole process into a sprint. Implementing Scrum and switching to flexible methodologies takes time and effort. A flexible team goes through the stages of formation, conflict, normalization, and cooperation. Productive work is only possible at the last stage, at which point the manager needs to help and support the team.

The transition to flexible methodologies involves a dramatic change in the tasks and methods of executives' work. The leadership style of the manager should focus on delegation, virtually all authority is transferred to the team, and the task of the manager is to teach them to act independently, organize and support the work process.

The underlying complexity of using flexible methodologies is that it is not just a change in the work process, it is also a change of mindset: working together to achieve a goal that determines the direction of further research. These recommendations will have a practical approach for IT companies of the Republic of Moldova and Ukraine.

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**THE EFFECTS OF CORPORATE GOVERNANCE
ON THE PROFITABILITY OF COMPANIES IN THE FIELD OF PUBLIC
WATER SUPPLY SERVICES IN THE REPUBLIC OF MOLDOVA**

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ABSTRACT

In the Republic of Moldova, in the field of public water supply services, corporate governance, from a conceptual and regulatory point of view, began to develop only in the early 2010s. The selected topic is current because corporate governance is at the early stage in this field, but, at the same time, its evolution for 10 years needs to be analyzed. This process must be monitorized to identify the most important successes or deficiencies in order to develop a set of good practices. The purpose of the research is to identify the relationship between degree of development of corporate governance and the profitability of companies in the field as well as shaping the corporate governance model. Research methods used refer to the observation of corporate and economic processes, interview, investigation, comparing, analysis of corporate legislative and regulatory documents in the field, induction, explanation and interpretation of the main indicators of corporate management. The relevant research results are: identifying the fact that there is no clear dependence between the application of corporate management and increasing the profitability of water companies; at the same time, it has been identified that the participation of employees of water companies in the company boards contributes to better profitability. The corporate governance model was configured, with the identification of deficiencies in the process of regionalization of services. Corporate governance, in the analyzed field, must be subjected of the process of continuous improvement in particular by evaluating the activity of the company's board.

Keywords. *Joint stock company, corporate governance, company board, profitability, executive body, stakeholders.*

În Republica Moldova, în domeniul serviciilor publice de alimentare cu apă, guvernanta corporativă, din punct de vedere conceptual și reglementar, a început a se defini abia la începutul anilor 2010. Tema selectata este actuală deoarece guvernanta corporativă în domeniul selectat este la început de cale, dar în același timp evoluția ei timp de 10 ani necesită a fi analizată pentru identificarea celor mai importante succese sau deficiențe, cu scopul de a elabora un set de bune practici. Scopul cercetării este de a identifica relația dintre gradul de dezvoltare a guvernantei corporative și rentabilitatea companiilor din domeniu precum și conturarea modelului de administrare corporativă. Metodele de cercetare utilizate se referă la observația proceselor corporative și economice, interviu cu actorii implicați, ancheta, comparația, analiza documentelor legislative și de reglementare corporativă din domeniu, inducția, explicarea și interpretarea principalelor indicatori ai managementului corporativ. Rezultatele relevante ale cercetării se rezuma la identificarea faptului că nu există o dependență clară dintre aplicarea managementului corporativ și creșterea profitabilității companiilor de apă; în același timp s-a identificat faptul că participarea în consiliile societății a angajaților companiilor de apă contribuie la o rentabilitate mai bună, s-a configurat modelul de administrare corporativă, cu identificarea deficiențelor în proces de regionalizare a serviciilor. Guvernanta corporativă, în domeniul analizat, trebuie supusă unui proces de îmbunătățire continuă, în special prin evaluarea activității consiliului societății.

Cuvinte-cheie: *societatea pe acțiuni, guvernanta corporativă, consiliul societății, profitabilitate, organul executiv, părțile interesate.*

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В Республике Молдова, в сфере услуг общественного водоснабжения, корпоративное управление с концептуальной и нормативной точки зрения появилось только в начале 2010-х годов. Выбранная тема актуальна, потому что корпоративное управление находится в начале пути в этой сфере, но в то же время необходимо проанализировать эволюцию за 10 лет. Нужно осуществлять мониторинг этого процесса, чтобы определить наиболее важные успехи или недостатки для разработки набора хороших практик. Цель исследования - выявить взаимосвязь между степенью развития корпоративного управления и прибыльностью компаний в данной сфере, а также формирование модели корпоративного управления. Используемые методы исследования включают наблюдение за корпоративными и экономическими процессами, интервью, опрос, сравнение, анализ корпоративных законодательных и нормативных документов в этой области, индукция, объяснение и интерпретация основных показателей корпоративного управления. Результаты исследования сводятся к: выявлению того факта, что нет четкой зависимости между применением корпоративного управления и повышением прибыльности водохозяйственных компаний; В то же время было установлено, что участие сотрудников компаний водоснабжения в советах директоров компаний способствует повышению прибыльности. Была идентифицирована модель корпоративного администрирования с выявлением недостатков в процессе регионализации услуг. Корпоративное управление в анализируемой области должно подвергаться процессу постоянного совершенствования, в частности путем оценки деятельности совета директоров компании.

Ключевые слова. Акционерное общество, корпоративное управление, правление компании, рентабельность, исполнительный орган, заинтересованные стороны.

INTRODUCTION

Corporate governance is a concept that has been increasing concerned public water supply companies lately. Corporate management provides a greater degree of guarantee that an effective control system is implemented at the company level, thus ensuring that the company is managed in the interests of consumers, local government – owners and other stakeholders.

The concept of "corporate governance" is defined by the Organization for Economic Development and Cooperation as **the system of administration and control of companies, totality of a company's relations with its shareholders, or, in the extended sense, with its partners** (creditors, suppliers, customers, employees and administrative authorities). It involves a *complex system* of rights, obligations, attributions and control measures established in order to protect shareholders and investors, they are viewed as a community, and to ensure the liability of administrators and managers towards shareholders [Iovu, 2019:3].

Corporate governance of water companies divides the rights and responsibilities between the various participants in the management of public water supply services and specifies the rules and procedures for making the right decisions for the entity, so as to ensure the right of access to quality services in accordance with the legislation in force and to manage the system at the level of costs, which fall within the limits of the degree of affordability of the tariff. The main objectives of corporate governance within water companies are to create an effective system. to ensure the safety of the infrastructure that was transmitted in management of the water company by the shareholders and its efficient operation complying with regulations and technical requirements in force, including those for environmental protection.

The evolution of the economic and financial results of the water companies in dependence of the corporate governance must be seen in the context of the tendencies of the field of economic activity at national level.

Thus, the evolution in the Republic of Moldova of the Gross Domestic Product for economic activity *E Water distribution; sanitation, waste management, decontamination activities*, recorded an increase from 1225527 thousand MDL in 2010 to 3303739 thousand MDL in 2018, or an increase of 2.7 times increase in 8 years. (Figure 1) The most remarkable growth was recorded in 2011 compared to 2010 with 48.4%, followed by a period of slow growth 2012-2016, while in 2017 and 2018 the growth becomes more pronounced by 12.4-12.2% per year.

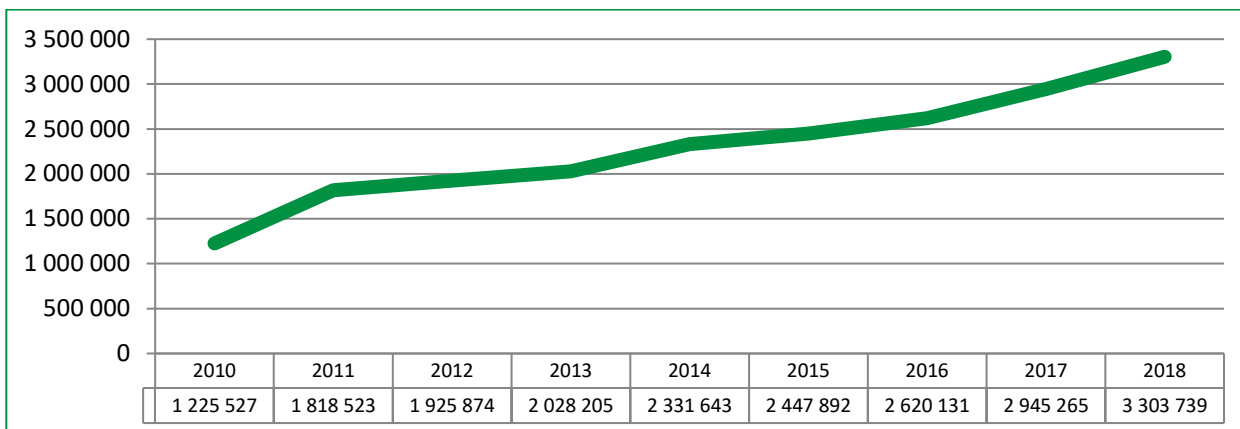


Figure 1. Gross Domestic Product for economic activity: E Water distribution; sanitation, waste management, decontamination activities, thousand MDL

Source: Developed by the author based on [statistica.gov.md].

The contribution of this economic activity to the formation of the Gross Domestic Product, at national level, varied from 0.8% in 2010 to 1.1% in 2018.

Corporate governance for public water supply companies is a new issue, that has been developing slowly lately. The implementation, of corporate governance principles, was recommended to companies in the field by external financing partners. The most remarkable project for this purpose was "The Program for Development of Water Supply and Sewerage Companies", which is the first project with a regionalization component of water supply and sewerage services in the Republic of Moldova. The project, with a worth of 30mil. Euro, was financed by: the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB) and the Neighborhood Investment Fund (NIF).

The general objective of the Project was to promote a reform of water companies by creating sustainable models of operators who will provide services at acceptable standards. The purpose of the Project was to reform the water supply and sewerage services on the territory of the Republic of Moldova and, in particular, to improve and increase the efficiency of water supply services. The mentioned purpose was to be achieved by building and renovating water supply and sewerage systems in 6 regions of the Republic of Moldova, two from each development area of the country: South – Leova and Ceadâr-Lunga; Center – Orhei and Hincesti; North – Florești and Soroca. The beneficiary localities have assumed a series of commitments, including the reorganization of water companies into joint stock companies and the application of corporate governance [Decision of the Court of Accounts no. 29, 22.07.2016:4].

Table 1

Water companies with the form of organization – joint stock companies and the date of reorganization

No	Name	The date on which the company was reorganized into JSC	Note
1	J.S.C. "Apa Canal Chișinău"	1997	EBRD funded project
2	J.S.C. „Apă- Canal Leova”	March 11, 2011	"The Program for Development of Water Supply and Sewerage Companies", funded by EBRD, EIB and NIF
3	J.S.C. „Regia Apă- Canal Soroca”	April 03, 2012	
4	J.S.C. „Regia Apă- Canal Orhei”	July 06, 2012	
5	J.S.C. „Apă-Termo” Ceadâr-Lunga	November 24, 2010	
6	J.S.C. "Operator Regional Apa-Canal" Hincesti	May 19, 2011	
7	J.S.C. „Servicii Comunale Florești”	May 02, 2001	
8	J.S.C. "Apa Canal Cahul"	April 14, 2017	Modernization of Local Public Services in the RM, GIZ project

Source: Developed by the author based on [Hotariria Curtii de Conturi nr. 29, 22.07.2016:20].

Of all the 8 joint stock companies, only JSC "Servicii Comunale Floresti" was reorganized without this fact being recommended by a financed institution. The shares of these joint stock companies are wholly owned by the local municipal councils.

Out of 40 water supply companies, in urban areas in the Republic of Moldova, only 8 are joint stock companies, the other companies most often have the municipal enterprise form of organization. [AMAC, 2019:8].

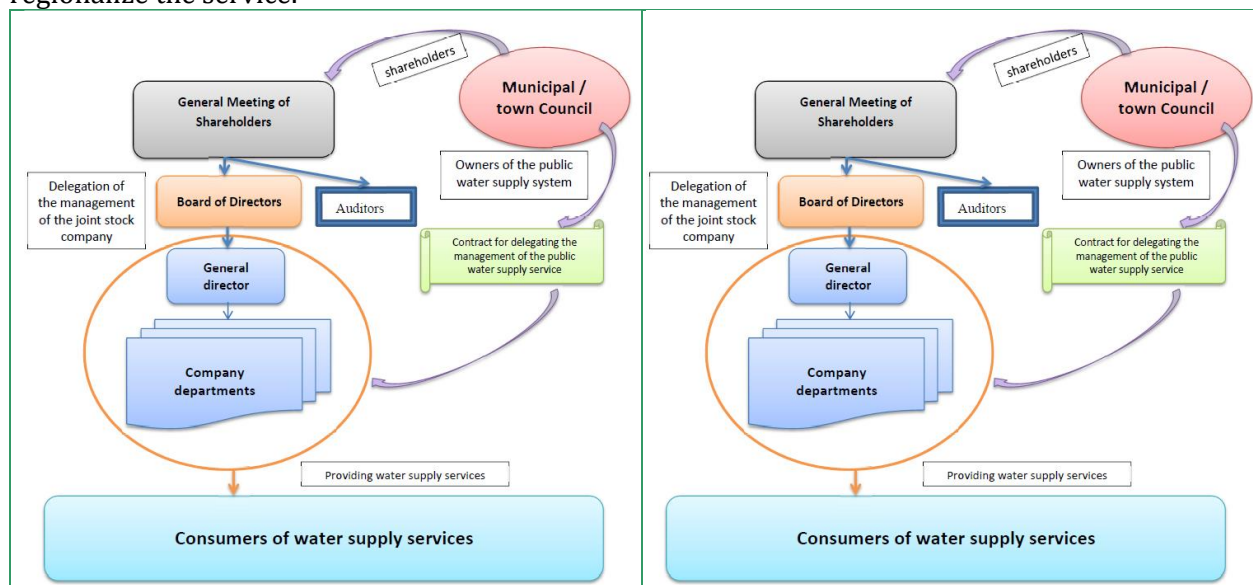
This 8 joint stock companies play an important role in the field of public water supply services because they have a turnover that in 2018 was 0.41% of the national gross domestic product and 50.9% of the gross domestic product for economic activity. *E Water distribution; sanitation, waste management, decontamination activities*. The service area, with water supply services of these joint stock companies, covers a population of 1.1 million people, which is 40.9% of the country's population [statistica.gov.md; AMAC, 2019:14].

1. The corporate governance model in the public water supply services sector

Joint stock companies in the field of public water supply services are owned by local public administration, represented by local councils and they can have only an entirely public capital. The corporate governance model of water companies is shown in Figure 2a.

The purpose of reorganizing municipal enterprises into joint stock companies was also the regionalization of water supply services, meaning namely the extension of the service management area of the joint stock company.

Thus, they manage the water supply service in several localities apart from the company's official place of residence. For example, the water company in the town of Florești manages the service in the largest number of localities-27, and the water company from the town of Ceadir-Lunga manages the service only in the city, although it has been transformed into a joint stock company in order to regionalize the service.



2a. Management of the services only in the company's town of residence

2b. Management of the services and in the neighboring rural localities

Figure 2. Corporate governance model of the companies in the field of public water supply services

Source: Developed by the author.

The basic elements of the corporate governance model of water companies in the Republic of Moldova are:

1. **The shareholders/general meeting of the shareholders** of the joint stock companies in the field of public water supply services are the town/municipal Councils. The new share issues can be offered for subscription only to local authorities from the Republic of Moldova. For all 8 joint stock companies, the decision of the General Meeting of Shareholders is considered the decision taken by

the Town Council. Within the analyzed joint stock companies, except for JSC "Apa-Canal Chisinau", in most cases, the general meetings of shareholders do not follow the legal procedures of announcement and held, because they take place in the form of meetings of local councils.

2. The company's Board of Directors is elected by the General Meeting of Shareholders and in most cases is composed of local council members. The number of members of the company's board varies from 3 in the case of JSC "Operator Regional Apa-Canal" Hincești to 9 in the case of JSC "Apa Canal Chișinău".

Of the 8 joint stock companies 5, or 63% have 5 members on the board of directors of the company. The analysis of the company's board structure identified that most members are local councilmen. There are situations when a representative of the water company is included in the company's board, for example the case of JSC "Apa Canal Chișinău", JSC „Apa-Termo” Ceadîr-Lunga, JSC „Apa- Canal Leova” and JSC “Apa Canal Cahul”.

Table 2

Composition of the Company's Board of Directors

No	Name	Number of members on the company's board	Structure	Chairman
1	JSC "Apa Canal Chisinau"	9	=5 members delegated by the Local Public Administration =4 members delegated by the company	No data
2	JSC „Apa- Canal Leova"	5	=Mayor =Vice mayor = 1 member delegated by the Local Public Administration =2 members delegated by the company	Mayor
3	JSC „Regia Apa- Canal Soroca"	5	=5 Councillors	Councillor
4	JSC „Regia Apa- Canal Orhei"	5	=5 Councillors	Councillor
5	JSC „Apă-Termo” Ceadîr-Lunga	5	=2 members delegated by the Bashkan's (Governor's) office =1 member delegated by the District Council =1 member delegated by the Local Public Administration = 1 member delegated by the company	Head of the Economic Department of Bașcanat
6	JSC "Operator Regional Apa-Canal" Hincesti	3	= 2 member delegated by the Local Public Administration =1 member delegated by the company	Councillor
7	JSC „Servicii Comunale Floresti"	5	= 5 Councillors	Councillor
8	JSC "Apa Canal Cahul"	7	= 5 Councillors = Chief Accountant of the Town Hall = 1 member delegated by the company	Councillor

Source: Developed by the author based on [<http://ceadir-lunga.apacanal.md>; <http://floresti.apacanal.md>, <http://hincesti.apacanal.md>; <http://leova.apacanal.md>; <http://www.apacanalcahul.md>; <http://www.racorhei.md>; <https://acc.mdceadir-lunga.apacanal.md>]

The mandate term of the Company's Board of Directors is 4 years. The selection of the members of the company's board is made by the local councils – the shareholders without the participation of independent experts in the field. The requirements for candidates are vague. A mandate contract is not signed with the company's board, so the board's liability for improper management of the company is not established. The remuneration of the members of the company's board is not related to the fulfillment of performance indicators in the management of the entity.

According to the “best practices” of corporate governance in developed economies, the Board of Directors appoints the chairman from among persons who are not part of the company's

management. For all analyzed companies, the positions of chairman of the Board of Directors and that of executive director are held by different persons. The implementation of a Code of Ethics is absolutely necessary, according to the "best practices" of governance in developed economies. In the Republic of Moldova, the analyzed joint stock companies do not present information on the existence of a Code of Ethics [Feleaga, 2011:7].

3. The company's Board of Directors delegates the management of the company to the company's executive bodies.

The 7 joint stock companies out of 8, with the exception of JSC "Apa-Canal Chisinau" are managed by a director. In the Articles of Association of a Company of JSC "Apa-Canal Chisinau", it is provided that the executive bodies are the *Management Committee* and the *General Director*. They act on behalf of the company for the current production and investment management, in accordance with current legislation, decisions of General Shareholders' Meetings, Board of Directors, the Regulation on the activity of the executive bodies of the JSC "Apa-Canal Chisinau" etc. [Statutul SA "Apa-Canal Chişinau", 6].

The **Audit Committee** exercises the control of the economic and financial activity of the company. The Audit Committee is obliged to supervise the management of the company, to verify if the financial statements and registers are legally prepared, and whether the evaluation of the patrimonial elements was done according to the rules established for preparing and presenting the financial statements. [Statutul SA "Apa-Canal Chisinau", 16].

In order to be considered effective, corporate governance must provide for appropriate control mechanisms, which will intervene in critical situations and protect the interests of all actors involved. During the research, the presentation of the audit reports on the company's website was analyzed. Only JSC "Apa Canal Chisinau" presented the audit report for 2018 and complied with the information dissemination requirements. JSC „Apa- Canal Leova” presented the audit report for 2016. The other joint stock companies did not present the audit reports on their websites. JSC "Servicii Comunale Floresti" published a news item regarding the audit, but the report was not published. Only JSC "Apa Canal Chisinau" complies with the established information dissemination requirements.

4. The contract for delegating the management of public water supply services. The administrative-territorial units, through the local public administration authorities, delegate the management of their water supply services to the water company through a management delegation contract.

The delegation contract sets out the specific obligations and rights of each party with regard to the investment programs and the achievement of pre-established levels of performance of services. Thus, the water company is responsible for the administration, operation, maintenance, improvement, renewal and extension, where appropriate, of all fixed assets subject to the contract. The most important risk assumed by the company are failure of payment by service customers, according contractual provisions.

Ownership of public assets and the supply of services at affordable costs are the responsibilities of the local public administration. Public assets remain in public ownership and must be taken over by their owner (administrative-territorial units) upon termination of contract. The delegation contract is a long-term commitment [Haskoning Romania, 2008:8-10].

5. Analysis of the evolution of profitability indicators depending on corporate governance issues of joint stock companies in the public water supply services sector

A primary goal of corporate management is to increase the performance of water companies. The instruments of systemic evaluation of the economic efficiency of the corporate governance are in the development phase. Traditional methods to evaluate the economic efficiency of management for water companies are not applicable, because water companies operate under a natural monopoly, the number of customers is limited by the area of service, shareholders can become only territorial administrative units, setting tariffs for services is limited by the ability to pay of the household customers, company assets, mostly have a high degree of wear and require significant maintenance costs, etc. Therefore, scientific research dedicated to solving this difficult problem is highly topical. It is important to point out that joint stock companies in the field of water, appeared not as a result of the evolution of individual business, but as a result of the reorganization of municipal enterprises, which leaves its mark on the efficiency of economic activity of these companies.

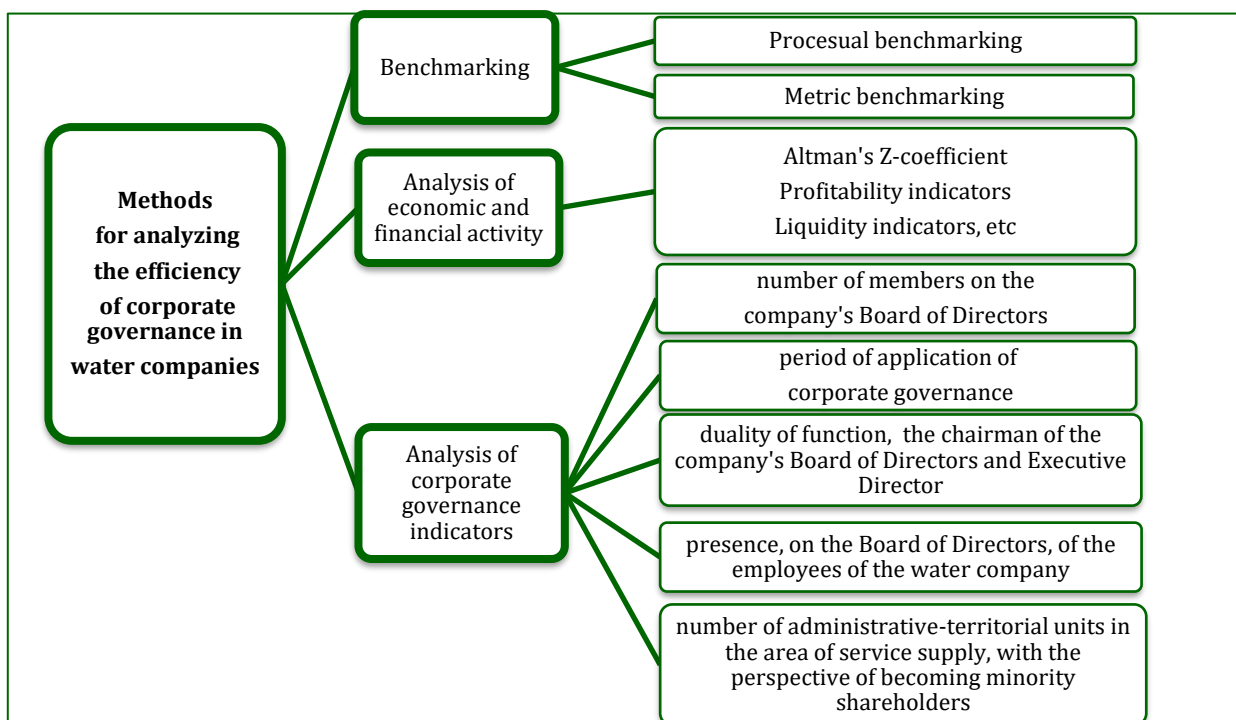


Figure 3. Methods for analyzing the efficiency of corporate governance of joint stock companies in the field of public water supply services

Source: Developed by the author based on [Bocanete, 2013:114].

The analysis of the efficiency of corporate governance of water companies can be done through several methods, the most important of which are presented in Figure 3. From the multitude of approaches, the author selected, by prioritization, a limited number of indicators specific to corporate governance and economic analysis. The summary of the indicators specific to corporate governance analyzed in the previous subchapter is presented in Table 3.

Table 3

The indicators specific to corporate governance of water companies

Name	Number of members on the company's Board of Directors	Period of application of corporate governance, years	Duality of function, the chairman of the company's Board of Directors and Executive Director	The diversity of the company's Board of Directors 1-Uniform, 5-Diverse	Presence, on the Board of Directors, of the employees of the water company, persons	The shareholding structure, Concentrated or Dispersed	Number of administrative-territorial units in the area of service supply, with the perspective of becoming minority shareholders
JSC "Apa Canal Chişinău"	9	23	no data	4	4	Concentrated	24
JSC „Apă- Canal Leova"	5	9	not the same person	4	2	Concentrated	2
JSC „Regia Apă- Canal Soroca"	5	8	not the same person	1	0	Concentrated	4
JSC „Regia Apă- Canal Orhei"	5	8	not the same person	1	0	Concentrated	5
JSC „Apă-Termo" Ceadr-Lunga	5	10	not the same person	5	1	Concentrated	0
JSC "Operator Regional Apa-Canal" Hînceşti	3	9	not the same person	4	1	Concentrated	4
JSC „Servicii Comunale Floreşti"	5	19	not the same person	1	0	Concentrated	27
JSC "Apa Canal Cahul"	7	3	not the same person	4	1	Concentrated	8

Source: Developed by the author based on [<http://ceadir-lunga.apacanal.md>; <http://floresti.apacanal.md>, <http://hincesti.apacanal.md>; <http://leova.apacanal.md>; <http://www.apacanalcahul.md>; <http://www.racorhei.md>; <https://acc.mdceadir-lunga.apacanal.md>]

Another indicator, that reflects the efficiency of corporate governance, refers to the economic and financial activity namely at the evolution of the profitability of water companies. The analysis of the dynamics has the year preceding the reorganization of the municipal enterprise into a joint stock company as a reference point. The subsequent period represents the period of corporate governance of water companies. Considering that after the reorganization of the companies, between 3 to 23 years have passed, it is opportune to analyze the evolution of profitability indicators. Because JSC "Apa Canal Chisinau" with 23 years, JSC „Servicii Comunale Floresti" with 19 years and JSC "Apa Canal Cahul" with 3 years of corporate governance are examples of extremes, these companies were excluded from the analysis due to the fact that they are not representative for the present study.

A key indicator in any economic analysis is *turnover*. This is considered a fundamental indicator of the volume of a company's activity and, obviously, it is always taken into account when evaluating an entity.

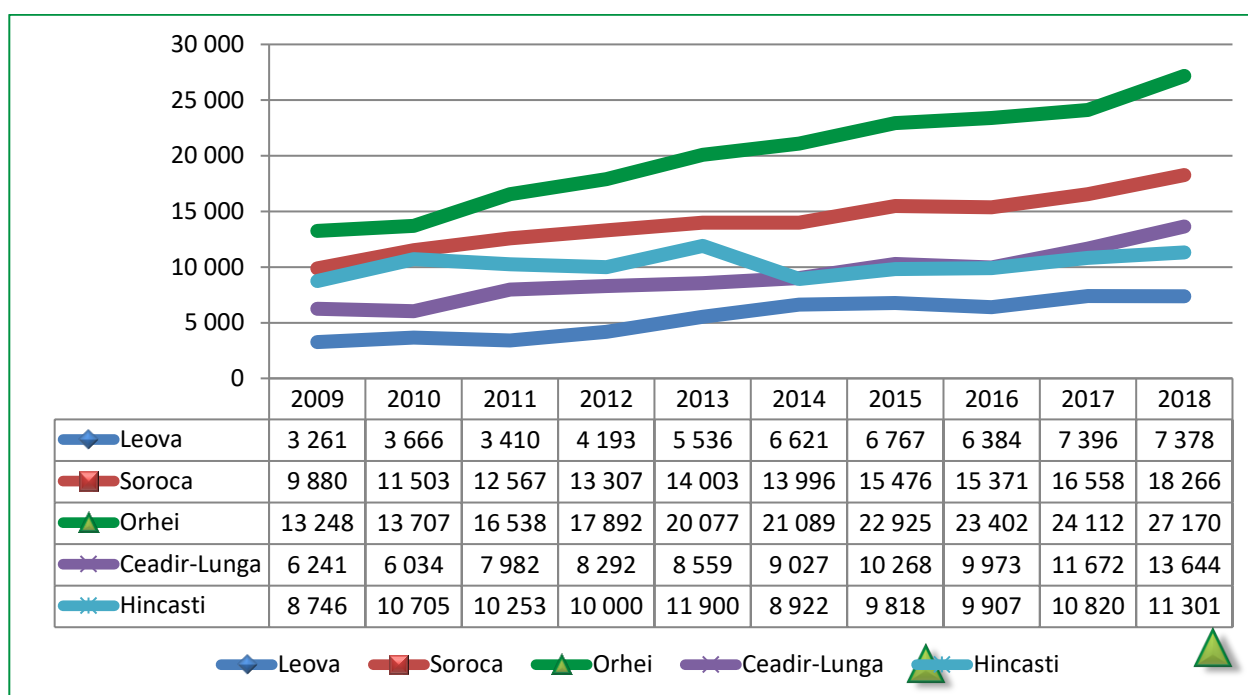


Figure 4. Evolution of turnover after the reorganization of water companies, thousand MDL

Source: Developed by the author based on [AMAC, 2019; AMAC, 2018; AMAC 2017; AMAC, 2012; AMAC, 2011; AMAC, 2010].

The turnover of the companies had an increasing trend during the analyzed period, with one exception for JSC "Operator Regional Apa-Canal" Hincești in 2014 compared to 2013. The most accentuated growth was noticed at JSC „Regia Apa-Canal Orhei", Figure 4.

JSC "Apa-Canal Leova" was reorganized into a joint stock company in 2011, from this year the company applied corporate governance. In the 2012-2018 period, the turnover tended to grow slowly, from 4.2 million MDL in 2012 to 7.4 million MDL in 2018, or by 76.2% in 6 years. In 2012, 2013 and 2014 the growth rate of turnover is higher compared to the growth rate of Gross Domestic Product for the field of activity of which the company is part.

JSC „Regia Apa- Canal Soroca" was reorganized into a joint stock company in 2012. The 2013-2018 period is characterized by the increase of the value of the indicator from 14.0 million MDL in 2013 to 18.3 million MDL in 2018, or by 30.7% in 5 years. In 2012, 2013 and 2015, the growth rate of turnover is equal compared to the growth rate of Gross Domestic Product for the field of activity of which the company is part. For the rest of the years, the growth rate is slower.

JSC „Regia Apa- Canal Orhei" started to apply corporate governance in 2012. Starting with 2013, turnover had an increasing trend. In 2018, an indicator value was 27.2 million MDL, an increase

compared to 2013 with 36% in 5 years. In 2012, 2013, 2015 and 2018 the growth rate of turnover is higher compared to the growth rate of the Gross Domestic Product for the field of activity of which the company is part.

JSC „Apa-Termo” Ceadir-Lunga was reorganized in 2010. Starting with 2011 the indicator evolved positively, with some oscillations such as those in 2016. In 2018 the turnover was 13.6 million MDL, or a 70.4% increase compared to 2011. In 2015, 2017 and 2018, the growth rate of turnover is higher compared to the growth rate of Gross Domestic Product for the field of activity of which the company is part.

JSC "Operator Regional Apa-Canal" Hincești was reorganized in 2011. The turnover of 11.3 million MDL was in 2018, with 13% more compared to 2012. In 2014 and 2016 the growth rate of turnover is higher compared to the growth rate of Gross Domestic Product for the field of activity of which the company is part.

Analyzing the average growth rate of turnover per year, it was identified that the best results were obtained by JSC „Apă-Canal Leova” with a value of turnover increase per year of 12.6%, and the weakest results were obtained by JSC "Operator Regional Apă-Canal" Hincești with a value of 2.1% per year. For the other 3 companies the value of the indicator varies from 6% to 10%. The results obtained by JSC " Apa-Canal Leova" can also be explained by the fact that this is the smallest company out of the 5, if we take into account the number of customers and the area of service supply.

The evolution of the *profit/loss before tax* indicator of the 5 water companies, JSC " Apa-Canal Leova", JSC "Regia Apa -Canal Soroca", JSC „Regia Apă-Canal Orhei”, JSC „Apa-Termo” Ceadir-Lunga and JSC "Operator Regional Apă -Canal" Hincești is presented in figure 5.

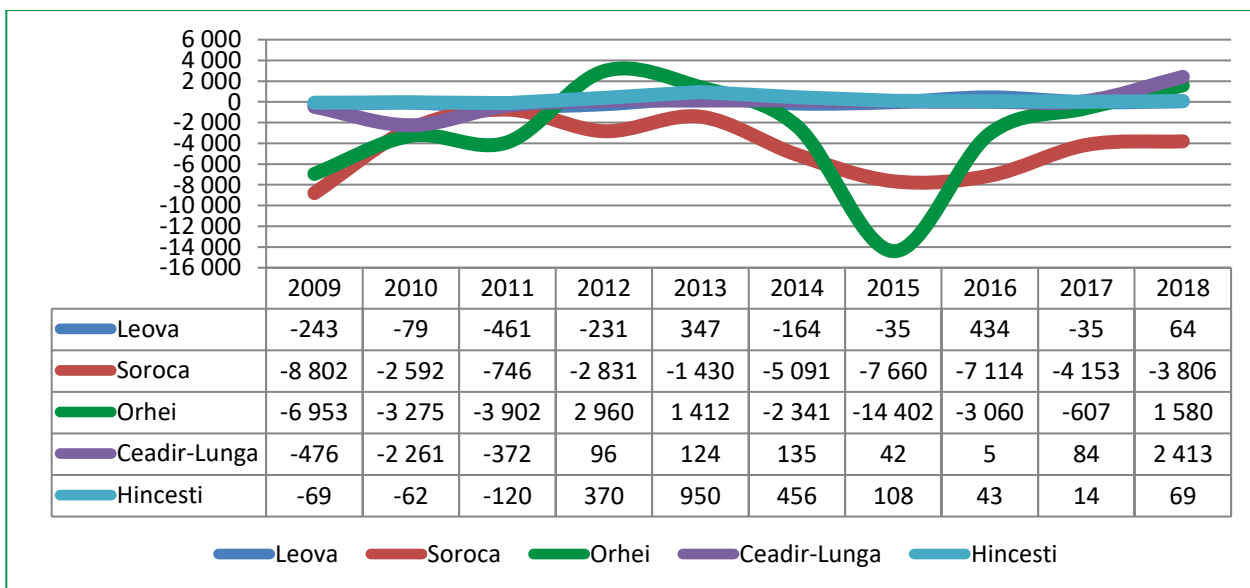


Figure 5. Evolution of profit/loss before tax indicators after the reorganization of water companies, thousand MDL

Source: Developed by the author based on [AMAC, 2019; AMAC, 2018; AMAC 2017; AMAC, 2012; AMAC, 2011; AMAC, 2010].

In most cases, companies recorded losses during the analyzed period, with some exceptions such as 2013, in which 4 out of 5 companies recorded a profit. In the period 2009-2011 all companies recorded losses. Because companies have different sizes, number of customers and areas of operation, a comparative analysis of the indicator between them is not representative, the analysis will focus more on the trend of the indicator for each company and compare the growth rate.

JSC "Apa-Canal Leova" was reorganized into a joint stock company in 2011, the year in which the company recorded the lowest value of the loss indicator. In the period 2012-2018, the value of the indicator registered a slow, oscillating, growth trend, with the maximum value of the profit 434.1 thousand MDL obtained in 2016.

JSC „Regia Apa- Canal Soroca” was reorganized in the joint stock company in 2012, year in which it recorded a loss of 2831.2 thousand MDL. In the following years of corporate governance of the company, losses were persisted.

JSC „Regia Apa- Canal Orhei” started to apply corporate governance in 2012, year in which it obtained a maximum profit, for the analyzed period. In 2013 and 2018 there was profit, and in the period 2014-2017 there were losses, with a tendency to reduce losses in 2015.

JSC "Apa-Termo" Ceadir-Lunga was reorganized in 2010, a year in which it obtained a record value of losses. Starting with 2011, the indicator evolved positively, in 2018 the profit value was 2413.3 thousand MDL.

JSC "Operator Regional Apa-Canal" Hîncești being reorganized in 2011, recorded only profits in the analyzed period, the values of the indicator are ranging from 13.8 thousand MDL in 2017 to 949.7 thousand MDL in 2013. In the period, 2009-2011, the company recorded losses.

A general feature of the evolution of profit/loss before tax is the fact that compared to the years before the reorganization, in 2018 four of the five companies recorded a profit. A negative aspect in this regard is the fact that this positive result was influenced by the financial activity of the company and not by the operational one.

Taking into account the negative results related to the profitability of companies, it is appropriate to analyze the risk of bankruptcy. One of the best-known quantitative models for predicting bankruptcy was proposed by the economist Altman. It allows to divide the companies into bankruptcy and non-bankruptcy categories.

The Altman indicator is a function of several indicators that characterize the economic potential of the company and the results of its activity in the past period. In general, the solvency indicator (Z- score) could be calculated as follows:

$$Z=1,2 X1+1,4 X2+3,3X3+0,6 X4+ X5$$

Where:

X1 – working capital/total assets

X2 – retained earnings/total assets

X3 – earnings before interest and tax/total assets

X4 – market value of equity/total liabilities

X5 – sales/total assets

A score below 1.8 means it's likely the company is headed for bankruptcy, while companies with scores above 3 are not likely to go bankrupt [Bocanete, 2013:115].

Table 4

Analysis of the company's financial situation based on the Altman model, Z score

Name	2016	2017	2018
JSC „Apă- Canal Leova”	0.43	0.14	0.16
JSC „Regia Apă- Canal Soroca”	0.05	0.16	0.17
JSC „Regia Apă- Canal Orhei”	0.14	0.24	0.31
JSC „Apă-Termo” Ceadir-Lunga	0.31	0.36	0.36
JSC "Operator Regional Apa-Canal" Hincesti	0.16	0.18	0.20

Source: Developed by the author based on [AMAC, 2019; AMAC, 2018; AMAC, 2017; AMAC, 2012; AMAC, 2011; AMAC, 2010].

The analysis of the financial situation of water companies based on the Altman model identified that all 5 companies have a Z score less than 1.8, respectively they are unconditionally insolvent. Table 4. These results have the following aspects as influencing factors: the approved tariffs for the services do not cover the costs, the loans from international financing institutions, the low payment capacity of the customers, etc. A positive issue in the evolution of the Z score of the Altman model is that, excepting JSC "Apa-Canal Leova", the other four companies had results with a tendency to improve.

Water companies compared to private companies are not effectively influenced by the risk of bankruptcy, because these companies operate under natural monopoly conditions and provide vital services in their operation area and have a crucial role in water protection. For these reasons, a

precarious economic situation of water companies will lead to subsidizing the activity and not to bankruptcy.

In order to identify the link between corporate governance and the profitability of water companies, the performance of the 5 companies was analyzed in detail, by calculating the profitability indicators, presented in Table 5.

Table 5

Profitability indicators used in the study

Name of the indicator	Calculation formula	Unit of measurement
Profitability from sales revenue calculated on the basis of profit from operational activity, %	$(\text{Profit from operational activity} / \text{Sales revenue}) * 100\%$	%
Profitability from sales revenue calculated on the basis of net profit (net loss), %	$(\text{Net profit (net loss)} / \text{Sales revenue}) * 100\%$	%

Source: Developed by the author based on [AMAC, 2019:40].

The reference year was considered the year before reorganization of the company, and the values of the indicator were analyzed for the previous 3 years, 2016-2018.

Table 6

Profitability indicators for JSC „Apa-Canal Leova”

Name of indicators	2010	...	2016	2017	2018
Sales revenue, thousand MDL	3665.8		6383.8	7396.3	7377.7
Profit/ loss from operational activity, thousand MDL	-79.0		-202.6	-1873.2	-2354.9
Net profit (net loss), thousand MDL	-79.0		369.6	-35.3	64.2
Profitability from sales revenue calculated on the basis of profit from operational activity, %	-2.2		-3.2	-25.3	-31.9
Profitability from sales revenue calculated on the basis of net profit (net loss), %	-2.2		5.8	-0.5	0.9

Source: Developed by the author based on [AMAC, 2019; AMAC, 2018; AMAC, 2017; AMAC, 2012; AMAC, 2011].

JSC „Apa-Canal Leova” was reorganized into a joint stock company in 2011. During 2016-2018, sales revenue had a slow growth. The indicator that was recorded in 2018 increased 2-fold compared to 2010. Factors that contributed to this process were: the increase of the tariff for the services provided by the company since May 2013, the extension of the service supply area, during the analyzed period the company expanded its services in 2 more localities, which contributed to the increase of the billed water volume in 2016 by 29% compared to 2010.

The result from the operational activity records losses, which essentially increased – 29-fold in 2018, compared to 2010. In the year preceding the reorganization, the company recorded a 79 thousand MDL net loss. In the 2016-2018 period, the value of the indicator recorded an increase in 2016 and 2018 with profits and recorded losses in 2017. The net profit of 369.6 thousand MDL obtained in 2016 and the net profit 64.2 thousand MDL obtained in 2018, was influenced by the result from the financial activity, because the company recorded losses from the operational activity. The company obtained 202.6 thousand MDL in 2016 and 2354.9 thousand MDL in 2018 losses from the operational activity, table 6. The indicator *Profitability from sales revenue calculated on the basis of profit from operational activity*, recorded negative values in the 2016-2018 period as well as in the reference year – 2010. The maximum value of the indicator was obtained in 2018 with -31.9%, compared to – 2.2% that was obtained in 2010.

The *Profitability from sales revenue calculated on the basis of net profit (net loss)* indicator, recorded more positive results in 2016 and 2018, they were caused by the results of financial activity, namely foreign exchange differences related to long-term credit.

Table 7

Profitability indicators for JSC „Regia Apa- Canal Soroca”

Name of indicators	2011	...	2016	2017	2018
Sales revenue, thousand MDL	12567.4		15371.1	16557.9	18265.7
Profit/ loss from operational activity, thousand MDL	-1413.1		-7453.0	-5016.4	-4450.7
Net profit (net loss), thousand MDL	-745.8		-7113.6	-4153.4	-3806.0
Profitability from sales revenue calculated on the basis of profit from operational activity,%	-11.2		-48.5	-30.3	-24.4
Profitability from sales revenue calculated on the basis of net profit (net loss),%	-5.9		-46.3	-25.1	-20.8

Source: Developed by the author based on [AMAC, 2019; AMAC, 2018; AMAC, 2017; AMAC, 2012].

JSC „Regia Apa-Canal Soroca” was reorganized into a joint stock company in 2012. Sales revenues had an increasing trend in the 2016-2018 period compared to 2011. Sales revenues had increased by 45.3% in 2018 compared to 2011 and by 21.8% in 2016 compared to 2011. A factor that contributed to the increase was the updating of the service tariff in March 2013. The volume of billed water did not increase significantly. The volume of billed water has increased by 27.5% in 2018 compared to 2011, including due to the expansion of the service area in 4 localities, as seen in table 7.

The indicator *Profitability from sales revenue calculated on the basis of profit from operational activity*, recorded negative values in the period 2016-2018 and in the reference year 2011. The lowest point at -8.5% was in 2016, compared to -11.2% in 2011.

The *Profitability from sales revenue calculated on the basis of net profit (net loss)* indicator, also recorded negative results, from -5.9% in 2011 to -20.8% in 2018. The lowest point at -46.3% was in 2016.

Table 8

Profitability indicators for JSC „Regia Apa-Canal Orhei”

Name of indicators	2011	...	2016	2017	2018
Sales revenue, thousand MDL	16537.8		23401.6	24112.2	27169.9
Profit/ loss from operational activity, thousand MDL	-5283.3		-7585.9	-5754.3	-3639.4
Net profit (net loss), thousand MDL	-3902.0		-3060.1	-606.6	1491.0
Profitability from sales revenue calculated on the basis of profit from operational activity,%	-31.9		-32.4	-23.9	-13.4
Profitability from sales revenue calculated on the basis of net profit (net loss),%	-23.6		-13.1	-2.5	5.5

Source: Developed by the author based on [AMAC 2019; AMAC 2018; AMAC 2017; AMAC 2012].

The JSC „Regia Apa-Canal Orhei” started to apply corporate governance in 2012. In 2016-2018 there was a significant increase in sales revenue compared to 2011, although the last update of the service tariff was in April 2011. The main factor influencing the indicator was the volume of billed water, which increased in 2018 by 44.8% compared to 2011, as seen in table 8.

Profitability indicators have an upward trend. The *Profitability from sales revenue calculated on the basis of profit from operational activity* indicator, recorded negative values both in the period 2016-2018 and in the reference year 2011. The lowest point at -32.4% was in 2016, compared to -31.9% in 2011.

The *Profitability from sales revenue calculated on the basis of net profit (net loss)* indicator, recorded negative results, with a clear trend of improvement from -23.6% in 2011 to 5.5% in 2018. This was due to the results from financial activity, namely exchange rate differences for long-term loans obtained by the company from the World Bank and the European Bank for Reconstruction and Development.

JSC „Apa-Termo” Ceadir-Lunga was reorganized in 2010. Starting with 2016, the sales revenue indicator evolved positively, reaching in 2018 a value of 13.6 million MDL, it was 2.2 times more compared to 2009. The tariff for company services was updated in 2015, being contributing factor to the positive evolution of the indicator. Also a determining factor was the volume of billed water, that increased by 42.6% in 2018, compared to 2009

Table 9

Profitability indicators for JSC „Apa-Termo” Ceadir-Lunga

Name of indicators	2009	...	2016	2017	2018
Sales revenue, thousand MDL	6241.0		9973.1	11671.7	13644.2
Profit/ loss from operational activity, thousand MDL	-890.8		-4104.3	-4274.2	-3162.9
Net profit (net loss), thousand MDL	476.1		4.9	84.4	2413.3
Profitability from sales revenue calculated on the basis of profit from operational activity, %	-14.3		-41.2	-36.6	-23.2
Profitability from sales revenue calculated on the basis of net profit (net loss), %	7.6		0.05	0.7	17.7

Source: Developed by the author based on [AMAC, 2019; AMAC, 2018; AMAC, 2017; AMAC, 2010].

The *Profitability from sales revenue calculated on the basis of profit from operational activity* indicator, oscillated with negative values in 2016-2018 and in the reference year 2009. The lowest point at -41.2% was in 2016, compared to -14.3% in 2009, table 9.

Indicator *Profitability from sales revenue calculated on the basis of net profit (net loss)*, obtained positive oscillating results, with a clear trend of improvement from 7.6% in 2009 to 17.7% in 2018. This is due to the results from financial activity in the amount of 5.57 million MDL, namely the exchange rate differences referring to the long-term loans obtained by the company from the European Bank for Reconstruction and Development.

Table 10

Profitability indicators for JSC "Operator Regional Apa-Canal" Hîncești

Name of indicators	2010	...	2016	2017	2018
Sales revenue, thousand MDL	10705.0		9907.2	10820.2	11300.9
Profit/ loss from operational activity, thousand MDL	-478.9		-62.9	78	68.4
Net profit (net loss), thousand MDL	-61.8		7.6	10	68.6
Profitability from sales revenue calculated on the basis of profit from operational activity, %	-4.5		-0.6	0.7	0.6
Profitability from sales revenue calculated on the basis of net profit (net loss), %	-0.6		0.1	0.1	0.6

Source: Developed by the author based on [AMAC, 2019; AMAC, 2018; AMAC, 2017; AMAC, 2011].

JSC "Operator Regional Apa-Canal" Hîncești was reorganized in 2011. Starting with 2016, the sales revenue indicator evolved positively, reaching a value of 11.3 million MDL in 2018, which is 5.6% more compared to 2010. The tariff for company services was updated in June 2012.

The *Profitability from sales revenue calculated on the basis of profit from operational activity* indicator, had an increasing trend compared to 2010. In the 2016-2018 period, the indicator oscillated around 0%. The maximum value was recorded in 2017 by 0.7%, compared to -4.5% in 2010.

The *Profitability from sales revenue calculated on the basis of net profit (net loss)* indicator, recorded oscillating results, mostly positive, with a fine improvement trend from -0.6% in 2010 to 0.6% in 2018, as seen in table 10.

The research results show that the best values of the profitability indicators were recorded for the companies JSC "Operator Regional Apa-Canal" Hîncești, JSC „Regia Apa- Canal Orhei” and JSC „Apa-Termo” Ceadîr-Lunga, which also denotes an efficient activity of corporate governance structures. The Board of Directors of JSC „Regia Apa- Canal Orhei” and JSC „Apa-Termo” Ceadîr-Lunga is composed of 5 members, and the one from JSC "Operator Regional Apa-Canal" Hîncești has 3 members. Within the company's Board of Directors of the JSC "Operator Regional Apa-Canal" Hîncești and JSC „Apa-Termo” Ceadîr-Lunga are also of the employees of the water companies, which essentially contributes to increasing the efficiency of the company's corporate governance. Out of the 3 nominated companies, 2 are companies that provide services in additional localities than the reference one. JSC "Operator Regional Apa-Canal" Hîncești is a regional operator for additional 4 locations, and JSC „Regia Apa- Canal Orhei” for an additional 5 localities.

The leader, based on the analyzed indicators, is JSC "Operator Regional Apa-Canal" Hincesti, which

managed to improve even the profitability of the operational activity, evolving from negative to positive values. JSC „Regia Apa-Canal Orhei” and JSC “Apa-Termo” Ceadir-Lunga obtained positive results only for the *Profitability from sales revenue calculated on the basis of net profit (net loss)* indicator, influenced, in particular, by exchange rate differences, that is not an indicator which can be managed by the companies’ corporate governance structures.

JSC “Operator Regional Apa-Canal” Hincesti holds 3 members on the Board of Directors, of which 1 is a employee of the water works company. The company provides services in 4 localities in addition to the town.

The weakest results of the profitability indicators were obtained by JSC “Regia Apa-Canal Soroca”, with both indicators evolving on a strongly negative trend. The company’s Board is composed of 5 members, all of whom are councillors.

The results of the study show that the participation in the company’s board of employees from the water company has positive effects on the profitability of companies in the field of public water supply service.

CONCLUSIONS AND RECOMMENDATIONS

The companies in the field of water supply services are at the beginning of the path in the process of implementing corporate governance. Only 8 out of 40 water supply companies in urban areas in the Republic of Moldova are joint stock companies and the other companies have the municipal enterprise form of organisation as well as another form of organisation. The reorganisation into joint stock companies, in most cases, was imposed by signing agreements with international financing institutions but was not an intention manifested by local councils.

The positive effects of corporate management were identified in the JSC “Operator Regional Apa-Canal” Hîncești company, which registered positive and growing profitability indicators and at JSC „Apă-Termo” Ceadîr-Lunga, which recorded the highest growth rate in the *Profitability of sales income calculated based on the net profit (net loss)* indicator value. Both companies obtained a high score for the specific indicator of corporate governance *Board diversity*, which indicates that such an approach can lead to better profitability. But due to the fact that no performance indicators are established and the work of the Board is not evaluated, it is not possible, at this moment, to establish this relationship for certain. Applying the corporate management within JSC „Regia Apă-Canal Soroca” did not improve the economic situation. The company’s results have worsened dramatically compared to the reference year – 2011. This company, in terms of uniform diversity, has a board composed of 5 members – all local councilmen. In the research process, the lack of adequate involvement of shareholders in the management of companies was identified. Because the shareholders of water companies are local councils, they manage public property and have no direct interest in the efficient management of companies. This is also demonstrated by the results obtained after analyzing the financial condition of water companies, based on the Altman model for the 2016 – 2018 period. This analysis identified that all 5 companies have a Z-score of less than 1.8, respectively they are unconditionally insolvent. A positive aspect is the evolution with a weak tendency to improve the Z-score for most companies, except JSC „Apă-Canal Leova”. The participation of the water companies’ employees in the company’s board is not enough. Only in the case of 5 companies out of 8 in the Company’s Board, at least one employee of the company is present. Likewise, there are no *Supervisory Committees* comprising company employees.

In order to improve the corporate management within the companies, in the field of public water supply services, the following **recommendations** are proposed:

1. To assess the effectiveness of the corporate governance process, water companies should develop a set of *field-specific performance indicators* which would form the basis for the evaluating the company’s board and executive bodies work.

2. In the corporate governance process of companies in the field, the *evaluation of the Company’s Board* must be carried out (for exemple, every 3 years) in order to control the efficiency of its activity. This includes the evaluation of its composition, organization and functioning as a group, of competence and effectiveness of each member and committee, as well as of results achieved in relation to the established objectives.

3. Signing the *contracts of mandate* with the Company’s Board and with the executive bodies for the period was established with the indication of the development strategies of the water works companies and

the specification of the performance indicators of their activity. Reporting on the fulfillment of performance indicators should be performed quarterly. The fulfillment of the performance indicators must directly influence the remuneration of the members of the Company's Board and of the executive bodies.

4. The Company's Board should comprise a sufficient number of independent professional members. In the case of analyzed companies, the independent members could be hired from other larger or better performing companies in the field.

5. Holding the General Meeting of Shareholders in compliance with all procedures established by law and internal regulations of the company.

6. Approval of the *Corporate Governance Code* [Decision of the National Commission of the Financial Market no. 67/10, 24.12.2015].

7. Formation of *Basic Committees*. The company's board should set up committees for the preliminary examination of the most important issues in the company's activity, such as the *Remuneration Committee*, the *Risk Management Committee*, etc.

8. Formation of the *Supervisory Board* within the Company's Board – this being a non-executive body with attributions to monitor the activity of the executive bodies [Ordonanța de urgență a României nr. 109/2011, 30.11.2011:5]. In addition, the development of the participation of water companies' employees in the company's board, including the establishment of *Supervisory Committees* composed of company employees.

The development of *risk management practices*. None of the analyzed companies have such regulations. Water companies may face risks, which can significantly affect a large part of the population of the Republic of Moldova, since the targeted companies operate critical infrastructure the disruption or destruction of which, can have a major devastating impact on both the population and business, in affected areas. In order to be effective and consistent, any risk management policy must be clearly established by the company's governing bodies.

The territorial administrative units in the area of which the joint stock companies manage the water supply service, must become shareholders of the company in order to participate in the management process of the water companies.

The public water supply companies operate under a natural monopoly, the shareholders are local councils and the customers are well known and do not have the option to choose another service provider, the high level of insolvency of companies which were calculated based on the Altman model, the maintenance in the last period of the losses from the operational activity, the non-participation of the adjacent administrative-territorial units in the management of the companies in which the service is managed, are factors that emphasize the need for continuous improvement of the respective companies' corporate governance framework.

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**ANALYSIS OF THE INTERNAL AUDIT SUBDIVISION ACTIVITY
IN THE CORPORATE SECTOR OF THE REPUBLIC OF MOLDOVA**

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ABSTRACT

The actuality of the topic results from the importance of internal audit for owners, potential investors and creditors, as well as from the significance of internal audit as a basic element in corporate governance. At the present moment, there are no studies on the current situation and the role of internal audit in the country's corporate sector. Therefore, the author intended to perform the analysis of the internal audit subdivisions activity in the nominated sector. For this, the relevant research directions have been established, the purpose of which is to study the qualitative characteristics of the internal audit subdivisions. The author has conducted a qualitative study, through a semi-structured interview, and the information analyzed represents the October-December 2019 period. The main results of the study show that the basic functional tasks of an internal audit are the classic tasks, such as safety assessment and the effectiveness of internal control; monitoring the process of liquidating the weaknesses of the internal control system; developing recommendations for improving the internal control system. Failure to comply with the provisions of ISPPIA has been observed. The factors that most influence the activity of the internal audit subdivisions are their insufficient provision with employees and the duration of obtaining the necessary information. It was discovered that independent external evaluations are not performed and planned in the analyzed economic entities, which proves the non-compliance with ISPPIA, due to the lack of need for such an evaluation and the relatively short period of activity of internal audit subdivisions.

Keywords: *internal audit, corporate sector, qualitative characteristics, internal audit subdivision, research questionnaires, audit study.*

Actualitatea temei rezultă din importanța auditului intern pentru proprietari, potențialii investitori și creditorii, de asemenea din semnificația auditului intern în calitatea sa de element de bază în guvernarea corporativă. Autorul a constatat că la momentul de față lipsesc studiile vizând situația actuală și rolul auditului intern în sectorul corporativ al țării. De aceea, autorul și-a propus să efectueze analiza activității subdiviziunilor de audit intern din sectorul nominalizat. Pentru aceasta au fost stabilite direcțiile de cercetare relevante, una dintre care reprezintă studiul caracteristicilor calitative a subdiviziunilor de audit intern. În acest context, scopul cercetării constă în examinarea caracteristicilor calitative ale subdiviziunilor de audit intern din sectorul corporativ al Republicii Moldova. Pentru realizarea acestui scop de către autor a fost utilizată tehnica sondajului, fiind elaborate chestionare corespunzătoare domeniului de cercetare, care ulterior au fost transmise conducătorilor subdiviziunilor de audit intern din sectorul corporativ prin intermediul poștei electronice. Informațiile cuprinse în chestionare reprezintă perioada anului 2019. Rezultatele de bază ale studiului arată că sarcinile funcționale de bază ale auditului intern sunt sarcini clasice, cum ar fi evaluarea siguranței și eficacității controlului intern; monitorizarea procesului de lichidare a punctelor slabe ale sistemului de control intern; elaborarea de recomandări pentru îmbunătățirea sistemului de control intern. S-a observat nerespectarea prevederilor ISPPIA. Factorii care influențează cel mai mult activitatea subdiviziunilor de audit intern sunt asigurarea insuficientă a acestora cu angajați și durata de obținere a informațiilor necesare. S-a identificat că în entitățile economice analizate nu se efectuează și nu sunt planificate evaluări externe independente, ceea ce dovedește nerespectarea ISPPIA, din cauza lipsei necesității unei astfel de evaluări și a perioadei relativ scurte de activitate a subdiviziunilor de audit intern.

Cuvinte-cheie: *audit intern, sector corporativ, caracteristici calitative, subdiviziune de audit intern, chestionare de cercetare, studiu în audit.*

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Актуальность темы обусловлена важностью внутреннего аудита для владельцев, потенциальных инвесторов и кредиторов, а также из значения внутреннего аудита как основного элемента корпоративного управления. Автор констатировал, что на данный момент отсутствуют исследования, касающиеся нынешней ситуации и роли внутреннего аудита в корпоративном секторе страны. Поэтому автор предложил провести анализ деятельности подразделений внутреннего аудита в указанном секторе. Для этого были установлены соответствующие направления исследований, одна из которых – изучение качественных характеристик подразделений внутреннего аудита. В связи с этим, целью исследования является изучение качественных характеристик подразделений внутреннего аудита в корпоративном секторе Республики Молдова. Для достижения этой цели, автором была использована методика опроса, разработаны анкеты, соответствующие области исследований, которые впоследствии были переданы руководителям подразделений внутреннего аудита корпоративного сектора через электронную почту. Информация, содержащаяся в вопросниках, представляет собой период 2019 года. Основные результаты исследования показывают, что основными функциональными задачами внутреннего аудита являются классические задачи, такие как оценка безопасности и эффективности внутреннего контроля; мониторинг процесса ликвидации слабых мест системы внутреннего контроля; разработка рекомендаций по улучшению системы внутреннего контроля. Было отмечено несоблюдение положений ISPPIA. Наиболее важными факторами, влияющими на деятельность подразделений внутреннего аудита, являются недостаточное их обеспечение сотрудниками и продолжительность получения необходимой информации. Было выявлено, что в анализируемых экономических субъектах не проводится и не запланированы независимые внешние оценки, что доказывает несоблюдение ISPPIA из-за отсутствия необходимости такой оценки и относительно короткого периода деятельности подразделений внутреннего аудита.

Ключевые слова: внутренний аудит, корпоративный сектор, качественные характеристики, подразделение внутреннего аудита, исследовательские анкеты, исследование в аудите.

INTRODUCTION

The implementation of the Republic of Moldova – European Union (EU) Association Agreement and the intensification of market economy relations drives the reformation and modernization of the financial control system in our country, including the internal audit. Currently, many managers of economic entities are aware that internal audit is of significant importance and is an important and essential element in their economic management. Internal audit aims to provide managers with insurance and consultancy in order to achieve its objectives, offering recommendations for enhancing the effectiveness of the activity's result.

The importance of the research carried out in this field is conditioned by the implementation in our country of the Internal Public Financial Control, the model of which is elaborated by the European Commission, being part of the Acquis Communautaire and is to be transposed into the legal framework of all the new EU member states; also by developing a series of normative acts that regulate the internal audit of the public sector, which provide a wide spectrum of strict requirements regarding its exercise.

The increase of interest in the implementation of internal audit in the Republic of Moldova's corporate sector is conditioned by a number of factors, among which we can highlight the following: internal audit is an accessible resource, albeit underappreciated, the use of which contributes to increasing the efficiency of the entity; the big corporate scandals, which covered the United States of America and Europe (including the Republic of Moldova), have demonstrated the failures in the functioning of the external audit, the consequences of which can be the bankruptcy of the big companies; the internal audit became attractive for the owners of companies, who entrusted the management of the entities of the professional managers; the establishment of an effective corporate governance within the entity, the internal audit being an indispensable element of it, is a positive signal for the potential investors and creditors of the entity.

Currently, the internal auditors in the corporate sector are facing the problems of organizing and functioning of the internal audit, because these aspects are not sufficiently regulated under the normative aspect or provided in the decisions of the professional bodies, as practiced in other states. We consider

that, the circumstances set out above confirm the actuality and importance of the research topic.

One of the basic objectives of the research conducted by the author in the field of internal audit, is the complex examination of the activity of internal audit subdivisions (IAS) in the corporate sector of the Republic of Moldova. The research directions have been established by the author, which in our opinion are relevant for investigating the current situation of internal audit in the country's corporate sector. These include:

1. The qualitative characteristics of the internal audit subdivisions.
2. Human resources management.
3. Operational activity.

In this article the author focuses on presenting the first established research direction, such as, the analysis of the qualitative characteristics of the internal audit subdivisions.

The research hypothesis is based on the need to examine the qualitative characteristics of the internal audit subdivisions, which contributes to the understanding of the current situation of the activity of the internal audit subdivisions in the corporate sector of the country.

LITERATURE REVIEW

It is necessary to mention that appropriate studies are needed to highlight the problematic aspects in the organization and functioning of the internal audit in the nominated sector, also to elucidate the perspectives in its development. In this context, after researching the native specialized literature, the author has found that, currently, there are no empirical studies regarding the current situation and the role of the internal audit in the corporate sector.

In particular, the aspects studied by local authors refer to the internal public audit. Thus, the results of the research conducted by Cauș L. [Caus, 2008:235-238], [Caus, 2011:196-200] refer to the particularities of the implementation and regulation of internal audit in the public sector of the country, as well as to the elucidation of the planning stage of the internal audit missions. In his papers, author Iachimovchi A. [Iachimovshi, 2010:167-171], [Iachimovshi, 2009:335-339] presents the basic methodological aspects of internal audit planning and monitoring the quality of audit work. Author Ratcov M. [Ratcov, 2008:244-246], [Ratcov 2008:258-260] reports on some theoretical aspects of internal audit, such as its role, functions, timeliness and perspectives. In these circumstances, we aim to fill the "gap" created in the local literature and to deepen the internal audit research in the corporate sector of the country through the present analysis.

At the same time, we must note that at the global level there are various studies conducted by international prestigious bodies related to internal audit. Thus, the Institute of Internal Auditors periodically (once in five years) conducts the study "Common Body of Knowledge on Internal Audit at a Global Level" (Common Body of Knowledge, CBOK) [7], with the primary objective of obtaining information concerning internal audit practices worldwide. At the same time, the collected data are the basis of the empirical studies in the field. Analysing the content of the nominated study we find that the Republic of Moldova was not included in the studies performed in the field of internal audit.

Also, important research in the field can be found in the specialized literature from Romania – an EU member state. In this context, we can mention the work of researcher Sima A. [Sima, 2010:16-25], the results of which show that in organizations that have developed an internal audit function, the process of alignment with the International Internal Auditing Standards of the Institute of Internal Auditors, it is either fully implemented or is in the process of implementation. Relevant information is provided by another study in the field [Precob, Rusu-Buruiana, 2015:13-21], carried out by Precob C. and Rusu-Buruiana A. The results of the research carried out show that the evaluation of the risks of the audited company is the main criterion used by the internal auditors in the planning of their activity, and the biggest weight in the totality of the activities of the internal auditors includes the monitoring and evaluation of the risks, followed by the verification of the accounting processes and the preparation of financial statements.

The most recent research developed in Romania was carried out by the KPMG international audit company. Entities from different sectors of activity were included in the study. The research highlighted the aspects related to the challenges of internal audit, among which the main ones were determined: effectiveness of the risk management program, availability of employees' skills, complexity and

uncertainty of regulations, strengthening corporate governance and strategic processes [10].

At the same time, it is necessary to mention the advanced studies in the field of internal audit from the Russian Federation. Thus, the Institute of Internal Auditors in this country conducts research every two years on the current situation and the trends of developing the internal audit. The latest research was conducted jointly with KPMG in 2018 [11].

The results of the study show that the functional attributions at the present time of the internal audit subdivisions of the companies in the given country consist in evaluating the safety and effectiveness of the internal control system and consulting the management on various questions, and in the trends of the evolution of the internal audit the risk management evaluation is outlined.

Data sources and methods used. In this context, initially, in this paper we proposed to investigate the areas of internal audit, i.e. the entities that include its scope. This fact allows us to identify the prospects for the functioning of the internal audit.

The quantitative analysis of the data related to the entities registered in the Republic of Moldova presents the following results (table 1 and figure 1).

Table 1

Information related to the registration of entities in the Republic of Moldova

Nr.	The name	Number at 01.12.2019
1	2	3
1	Limited Liability Companies	87182
2	Individual entrepreneurs	28255
3	Joint stock companies	2372
4	Cooperatives (production, consumption, entrepreneur)	2338
5	State and municipal enterprises	1602
6	Non-commercial organizations	464
7	Other	1254

Source: Developed by the author based on data from P. E. "Public Services Agency" [12].

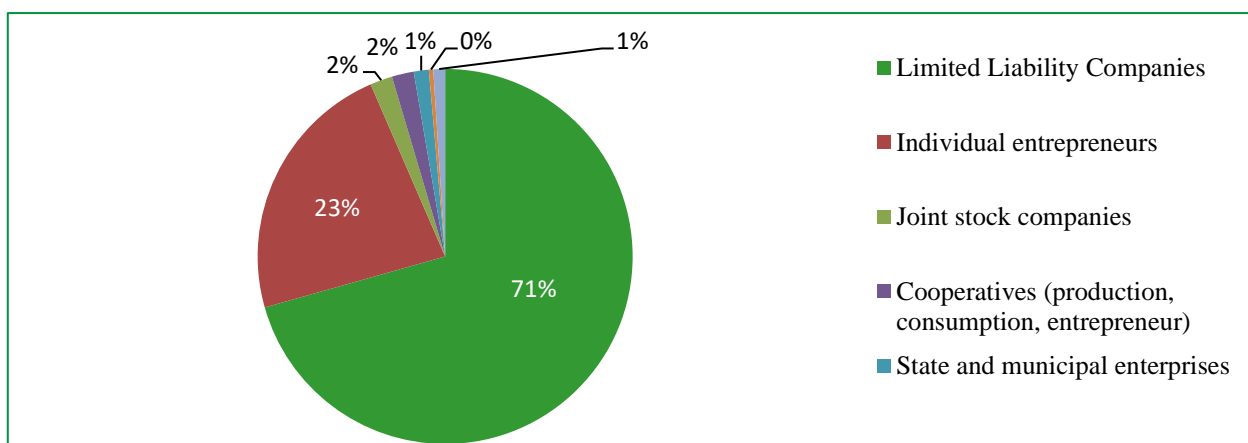


Figure 1. The structure of the entities that are registered in the territory of the Republic of Moldova, according to the legal forms of organization

Source: Developed by the author based on data from P.E. "Public Services Agency" [12].

We must mention that the internal audit is current for public interest entities. In accordance with the Law on Accounting and Financial Reporting [13], a public interest entity represents the entity the securities of which are admitted to a regulated market; the bank; insurer (reinsurer)/insurance company; body for collective investment in securities with legal personality; large entity that is a state-owned enterprise or a joint stock company in which the share of the state exceeds 50% of the share capital.

The quantitative analysis of the data related to the public interest entities registered in the Republic of Moldova presents the following results (figure 2).

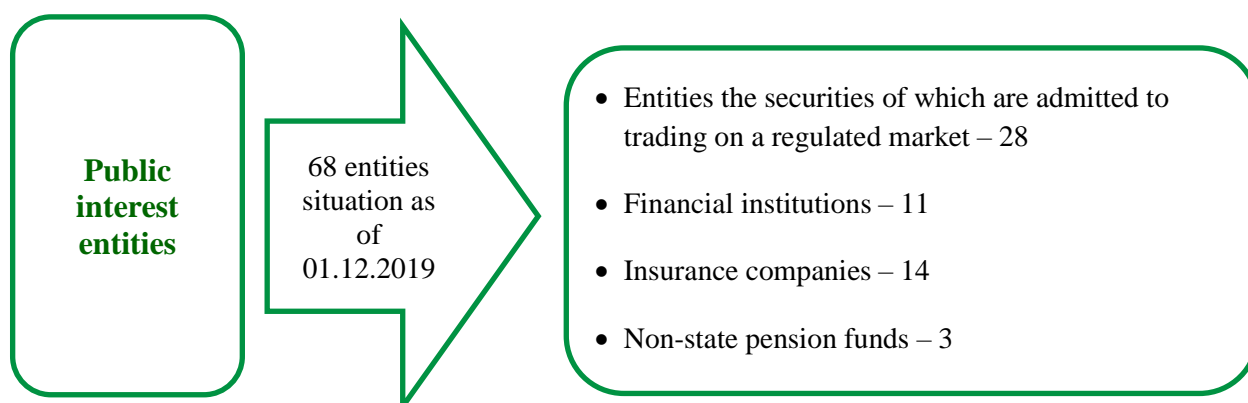


Figure 2. Information related to the registration of public interest entities as of 01.12.2019

Source: Developed by the author based on the data of the National Commission of the Financial Market (CNPF) [14].

Public interest entities, apart from non-state pension funds, have the organizational-legal form of a joint stock company. According to the information presented in table 1, there are currently 2372 joint stock companies, which form the basis of the corporate sector in the Republic of Moldova.

It is necessary to note that the present research was conducted using the qualitative research method, such as the semi-structured interview. For this purpose, the author developed questionnaires corresponding to the established research direction, which were submitted for completion to the heads of internal audit subdivisions of 20 entities in the corporate sector, operating in the financial-banking and financial-non-banking fields of the country. The information obtained through the questionnaires represents the October-December 2019 period.

Through the study, we aimed to identify and analyze the qualitative characteristics of the internal audit subdivisions. At the same time, the basic objective is to determine the compliance of the internal audit subdivisions with international advanced practices and the provisions stipulated by ISPPIA, in particular we consider ISPPIA 1300 "Quality Assurance and Improvement Program", ISPPIA 1310 "Requirements of the Quality Assurance and Improvement Program", ISPPIA 1311 "Internal Assessments", ISPPIA 1312 "External Assessments" and ISPPIA 1320 "Reporting on the Quality Assurance and Improvement Program" [15].

The analysis of the qualitative characteristics of the internal audit subdivisions covers the aspects related to:

- identifying the structures that fulfil the function of the internal audit and determining their age;
- establishing the attributions and functional subordination of the internal audit subdivisions;
- identification of the basic users of the internal audit subdivisions;
- assessing the degree of independence of the internal audit subdivisions from the management of the entity and the support from the board of directors;
- specifying the factors that influence the activity of the internal audit subdivisions;
- establishing the aspects related to the evaluations of the activity of the internal audit subdivisions and identifying evaluation indicators;
- assessing the degree of satisfaction of the head of the internal audit subdivisions with the results of the activity.

RESEARCH RESULTS AND DISCUSSIONS

The processing and analysis of the data obtained from the interviewed entities denote the following aspects of the internal audit activity. According to the "Qualitative characteristics of the internal audit subdivisions" research direction, structures that fulfil the function of internal audit were studied. Thus, in all the interviewed entities the function of the internal audit is performed by a distinct structure. This fact is appreciated positively and indicates a clear separation of the nominated function within the entities and, accordingly, the distribution of internal audit tasks.

Regarding the age of the internal audit subdivisions, we note that it is relatively young - in most entities the internal audit operates from 1 year to 5 years. In this context, it should be mentioned that globally and in Europe, the position is significantly older, with around 25% of companies having organized the position for over 25 years [Chersan, 2016].

Another important aspect of the research is the determination of the basic functional attributions of the internal audit. Among the basic functional tasks of the internal audit are the evaluation of the safety and effectiveness of the internal control; monitoring the process of liquidation of the weaknesses of the internal control system; elaboration of recommendations for improving the internal control system; management assistance in developing the internal control system and advising on various questions. At the same time, we see that in most of the entities subjected to the study the internal audit does not carry out the evaluation of the corporate governance and the effectiveness of the risk management system. This aspect proves non-compliance with the ISPPIA 2110 "Governance" and ISPPIA 2120 "Risk management" [15], which provide that the internal audit activity must evaluate and contribute to the improvement of governance processes and risk management, using a systematic and methodical risk-based approach.

In our opinion, an important aspect in the organization of the internal audit function is the positioning of the internal audit subdivisions in the management hierarchy of the entity. Practitioners in the field of internal audit [Kryškin, 2017] consider that one of the main factors behind establishing the positioning of the internal audit subdivisions is the level of subordination. One of the main possibilities outlined at the moment is the functional subordination to the board of directors/the audit committee. This form is received as a classic and is predominantly used by high-level corporate governance entities. For example, in the Russian Federation this variant is especially prevalent in companies that are included in the top 200 of the most developed entities. It is considered that this ensures maximum independence of the internal audit unit, despite the fact that the tasks of the audit committee are the establishment of the priorities in the activity of the internal auditors, as well as the approval of the budget and the remuneration of the head of the internal audit structure.

The results of the study present data on the functional subordination of the internal audit subdivisions in the corporate sector to the board of directors/audit committee, which is in accordance with the ISPPIA 1100 "Independence and objectivity", ISPPIA 1110 "Organizational independence" and the best international practices [15].

The author considers that the use of this possibility in the conditions of the economic entities in the corporate sector of the Republic of Moldova implies some difficulties, such as:

- for the local entities, the audit committee represents a new concept, which is not fully implemented in the practice of entities in both the corporate and public sectors;
- the tasks of the audit committee (provided in the Law on the audit of financial statements [18] do not include aspects related to establishing the remuneration of the head of the internal audit structure;
- the level of qualification of the members of the audit committee and their lack of experience do not allow to set clear objectives for the activity of the internal audit structure;
- performing the specific functions of the audit committee by the general manager of the entity.

Another question, to which we wanted to get an answer, represents the identification of the basic users of the results of the internal audit subdivisions. Thus, the core users of the results of the internal audit subdivisions in all the analyzed entities are the board of directors/audit committee and the senior executive management. Also, most of the entities included in the study indicate linear management and external audit among users. At the same time, the entities representing financial institutions also mention users such as the National Bank of Moldova and the National Commission of the Financial Market.

Additionally beneficial is the aspect that absolutely all entities report a high degree of independence from the management of the entity and also a maximum support from the board of directors/audit committee.

The analysis of the results of the study identified the factors that influence the activity of the internal audit subdivisions. In most of these entities they include: insufficient provision of the internal audit subdivisions with employees and the long time to obtain the necessary information, and the financial institutions additionally mention the factor - unplanned audit missions, which were not included in the annual audit plan.

As we know, requirement to perform evaluations of both internal and external audit activity is found among the basic provisions of ISPPIA, in particular ISPPIA 1311 "Internal assessments" and ISPPIA 1312 "External Assessments". Analyzing the information related to the performance of internal audit assessments, we see that, in the entities included in the study, external evaluations are not performed and are not planned. At the same time, the research highlights the causes of not conducting independent evaluations. These include the lack of need for such an assessment and the relatively short period of activity of the internal audit subdivisions.

At the same time internationally, for example, in Romania the independent evaluation of the internal audit activity is performed in 58% of entities [16]; and in the Russian Federation - in every fifth entity, included in the study [11].

Regarding the current evaluation of the quality of the activity of the internal audit subdivisions, we notice that it is performed in absolutely all the interviewed entities, which is appreciated positively.

Identification of indicators for evaluating the internal audit activity is of particular interest for research. In most entities these include: the level of fulfilment of the audit missions plan; the level of implementation of the recommendations, obtained from carrying out the audit missions and the results of the interview of the members of the board of directors/the audit committee. And the fourth entity included in the study mentions the following among the evaluation indicators: the number of risks eliminated/mitigated following the implementation of the recommendations; deviations from the audit mission plan (by time and resources) and the results of the interview of the audited structures.

And the level of satisfaction of the internal audit subdivisions' director with respect to the results of the activity of the given subdivisions is maximal in most of entities, while the fourth part of the entities considers it partially, taking into account the fact that there are always things to improve.

CONCLUSIONS

Currently, the existing research in the field of internal audit in the Republic of Moldova refers to the public sector of the country. We mention that the present research is the first empirical study of the current situation of internal audit in the corporate sector of the Republic of Moldova. One of the research directions established by the author is elucidated - the analysis of the qualitative characteristics of the internal audit subdivisions. We find that, at the present time, there is an increase of interest in the implementation of internal audit in the corporate sector through the awareness of the fact that it is significant and represents a basic element in the management of economic entities.

The research results denote the scope of the internal audit. This is represented by the joint stock companies, which form the basis of the country's corporate sector. The internal audit is actual for public interest entities, despite their importance to the public.

The main conclusions that were made following the study undertaken by the author on the qualitative characteristics of the internal audit subdivisions in the corporate sector of the Republic of Moldova, include the following aspects:

1. The internal audit function in the economic entities from the country's sector is relatively young, in most of the internal audit subdivisions entities it operates from 1 to 5 years. At the same time, it should be mentioned that globally and in Europe, the position is significantly older, around 25% of companies having organized the position for over 25 years.

2. We positively appreciate the fact that in all entities the internal audit function is performed by a distinct structure within them, which contributes to the clear separation of the responsibilities of the internal audit.

3. Among the basic functional tasks of the internal audit are its classical tasks, such as the evaluation of the safety and effectiveness of the internal control; monitoring the process of liquidation of the weaknesses of the internal control system; development of recommendations for improving the internal control system. In the same type, we observe a non-compliance with the provisions of ISPPIA 2110 "Governance" and ISPPIA 2120 "Risk management", which stipulate that the internal audit activity must evaluate and contribute to the improvement of the governance processes and risk management, using a systematic and methodical risk-based approach.

4. The study highlighted the factors that most influence the activity of the internal audit

subdivisions. Among them we can mention the insufficient insurance of this with employees and the length of time for obtaining the necessary information.

5. Another negative aspect, which was identified as a result of the study, is that in the analysed economic entities independent external evaluations are not performed and planned, which proves non-compliance with ISPPA 1300 "Quality Assurance and Improvement Program", ISPPA 1310 "Requirements of the Quality Assurance and Improvement Program", ISPPA 1312 "External Assessments" and ISPPA 1320 "Reporting on the Quality Assurance and Improvement Program". The entities motivate this by the lack of the need for such an evaluation and the relatively short period of activity of internal audit subdivisions.

At the same time, at the international level, the independent evaluation is given more attention, for example, in Romania the independent evaluation of the internal audit activity is performed in 58% of the entities; and in the Russian Federation – in every fifth entity.

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**THE MOLDOVAN BANK FRAUD (2012-2015).
A process tracing analysis of the Moldovan \$1 billion money laundering**

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ABSTRACT

In the 2012-2015 period, \$1 billion have been stolen from three Moldovan banks, which is the equivalent of 12% of the country's GDP. The highly fraudulent environment in the RM allowed for the successful application of fraudulent schemes for three years, without it being seized and frozen. This paper seeks to decipher the schemes that were applied as well as argue how the integration into the European Union would have lowered the corruption and thereby prevent the fraud from happening. Even though several scholars discussed the bank fraud and how it affected the relationship between Moldova and the EU, they do not address how the steps of integration into the European Union could gradually regulate the level of corruption in the RM and subsequently eliminate the possible methods of committing the bank fraud. Through a comparative analysis of Romania and the Republic of Moldova, I aim to demonstrate that the difference between the level of corruption and the stability of the banking system in these two countries is due to EU membership. Further, through secondary analysis of qualitative data, and semi-constructed interviews, I conclude that, in theory, my argument holds – the instruments the EU applies on the candidate countries would not have allowed the fraudulent schemes to be put into action. However, the EU failed to apply the conditionality concept on Romania and thus, it is possible that the money laundering in the RM could have happened even if it had been a member of the EU.

Keywords: bank fraud, Republic of Moldova, European Union; international relations, corruption, European integration.

După perioada 2012-2015, Republica Moldova a intrat într-o perioadă de stagnare economică din cauza fraudei bancare de 1 miliard de dolari, ceea ce reprezintă echivalentul a 12% din PIB-ul țării. Mediul extrem de fraudulos din RM a permis aplicarea cu succes a schemelor frauduloase timp de trei ani, fără a fi sesizate și înghețate. Această lucrare urmărește să descifreze schemele care au fost aplicate, precum și să argumenteze modul în care integrarea în UE ar fi scăzut corupția și, prin urmare, ar fi prevenit fraudă. Chiar dacă mai mulți savanți au discutat despre fraudă bancară și despre modul în care aceasta a afectat relația dintre Moldova și UE, aceștia nu abordează modul în care etapele de integrare în Uniunea Europeană ar putea reglementa treptat nivelul corupției din RM și ulterior elimina posibilele metode de comiterea fraudei bancare. Printr-o analiză comparativă a României și a Republicii Moldova, demonstrez că diferența dintre nivelul corupției și stabilitatea sistemului bancar din aceste două țări se datorează statutului de membru al UE. Mai mult, prin analiza secundară a datelor calitative și interviurilor, concluzionez că, teoretic, argumentul meu este valabil. Pe de altă parte, bazându-ne pe exemple empirice, UE nu a reușit să aplice conceptul de condiționalitate în România. Prin urmare, este posibil ca spălarea banilor în RM să se fi putut întâmpla chiar dacă ar fi fost membru al UE.

Cuvinte-cheie: fraudă bancară, Republica Moldova, Uniunea Europeană, relații internaționale, corupție, integrare europeană.

В период 2012-2015 годов из трех молдавских банков был украден 1 миллиард долларов, что эквивалентно 12% ВВП страны. Среда с высокой степенью коррупции в РМ позволила незаметно применять мошеннические схемы в течение трех лет. В этой статье расшифрованы применённые

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схемы, а также показано, как интеграция в ЕС снизила бы коррупцию и, таким образом, предотвратила бы мошенничество. Несмотря на то, что ученые обсуждали банковское мошенничество и то, как оно повлияло на отношения между Молдовой и ЕС, они не рассматривали, как шаги интеграции в Европейский Союз могли бы постепенно регулировать уровень коррупции в РМ и впоследствии устранить возможные методы совершения банковского мошенничества. Путем сравнительного анализа Румынии и Республики Молдова эта статья демонстрирует, что разница между уровнем коррупции и стабильностью банковской системы в этих двух странах обусловлена членством в ЕС. Кроме того, путем вторичного анализа качественных данных и интервью я прихожу к выводу, что теоретически мои аргументы верны, в то время как на самом деле ЕС не смог применить концепцию обусловленности в Румынии. Таким образом, не исключено, что отмывание денег в РМ могло произойти, даже если бы она была членом ЕС.

Ключевые слова: банковское мошенничество, Республика Молдова, ЕВРОСОЮЗ, международные отношения; коррупция, Европейская интеграция.

INTRODUCTION

Since the time of its establishment, the European Union has lived through a striking dimensional expansion with the completion of the essential elements of the European project. EU enlargement has started with the 6 founding states – Germany, France, Italy, the Netherlands, Belgium, Luxemburg - and it has gone through a series of evolutionary stages, reaching 27 member states. The Republic of Moldova is approached through the prism of the European Neighbourhood Policy, launched by the European Commission in May 2004 in response to the EU enlargement to the east and the need to avoid a new division of Europe (EEAS, 2016). Moldova's European path is certainly more difficult and much more radical compared to the experiences of other Member States, especially because of the high level of corruption. In this research paper I will reveal how the European Union institutions such as the European Commission and the European Council shape the political and economic behaviour of candidate countries, and especially of countries from Central and Eastern Europe, through the accession treaty, the process of negotiation and *acquis communautaire*. Seeing that the EU institutions dictate the rules of the game, I want to uncover what the game is and learn how it is played. (Steinmo, 2001).

The theft of the billion in the RM was an intricate process, which was successful on the strength of the complex schemes, applied in the 2012-2015 period. The schemes involved the rotation of a small amount of liquidity amongst three national banks – Social Bank, Unibank and Economy Bank. This event is accompanied by the liquidation of other numerous banks over the years, and so far, no efficient and transparent mechanism has been developed that would prevent fraud in the process of liquidating banks. For this reason, I examine the possibility that the theft would not have happened if the Republic Moldova had joined the European Union before the bank fraud. Theoretically, corruption should decrease considerably in a candidate country and such events as money laundering amounting to such colossal sums should not be possible. With this in mind, I put forward the following research question:

„How could the integration to the European Union prevent the bank fraud schemes of 2012-2015 in the Republic of Moldova?”

Likewise, my line of argument is that *if the RM had implemented and respected all the requirements imposed on an applicant country to join the EU, the level of corruption would have declined, and the bank fraud would not have happened.*

To answer the research question, I will first introduce you to the empirical background and tell why there is so much corruption in the RM. Next, I will discuss the theories on which I based my line of argument and my methodology choices. Following the methodology part, I will move to the analysis of this study, where I will present my findings and discuss if they confirm the theory. Lastly, I will develop the conclusion and reflect on how my theory, methodology and findings match.

LITERATURE REVIEW

Briefly presenting the Republic of Moldova from its historic context will help shed light and explain why there is so much corruption, why it was possible to carry out the bank fraud in the first place as well as why the European integration has been and still is such a long process for the RM. The RM has a rich history which plays a great role in its actual international, political and economic situation. The country is a relatively young, independent, developing state which has its origins in the Soviet Union and the Greater Romania. The

phenomenon of corruption has, for a long time now, been a big problem for Moldovan society. It has spread and infected all areas, institutions and the Moldovan community and it poses a major danger to the prosperity of the state and its economic, social and democratic development. The period that favoured the establishment and the growth of corruption in the country is comprised within the end of the 1980s and the beginning of the 1990s. This timeframe is characterized by the Moldovan transition and adaptation from an autocratic to a democratic regime and market economy. It is well known that these kinds of transitions are often accompanied by serious consequences, such as the escalation of corruption, if the society is in crisis (EJOVA & Prijilevscaia, 2012).

Corruption increased even more due to the 1998 regional crisis when Russia experienced a decrease in raw material prices, which amounted to 80% of Russia's export. Since Moldovan economy was heavily dependent on Russia's, it pushed 70% of the population into absolute poverty and 50% of the population into extreme poverty (Negură, 2016). In such an unhealthy economic environment, the Communist Party came to power, supported by a disappointed society with the present power structures and nostalgia for the previous political order. (Negură, 2016). The fierce transformations that the Moldovan society has undergone - such as deportations, industrialization, collectivization and famine - have created deep social and economic inequalities. These transformations have brought Moldova into a deep stalemate that seemed impossible to overcome in the period prior to the bank fraud. At the same time, all institutions were captured and controlled by politicians who did not want any change and had a major interest in maintaining the status quo. Thereby, there was no intellectuality, cohesive vision, or even a plan on how the Republic of Moldova should function further. There was vast instability in society on whether the country should join either the EU, or the Customs Union or any other entity imposed by the Russian Federation, or should seek union with Romania. There was no country project or a well-structured agenda for further actions (Negura, Sprinceana, & Ernu, 2016).

The neo-functional theory was developed by Ernst B. Haas. The core concept of this theory associated with European integration is 'spillover'. It refers to the process when cooperating countries that pursue a specific goal end up formulating new goals that need to be achieved to reach the original goal (Jensen, 2018). Applied to the case of the Republic of Moldova, the state aims to join the European Union with the ultimate goal of implementing changes for the better at the political, economic, and cultural levels, but also to have access to the single market. However, since the country faces such considerable problems as corruption, to achieve its goal it must set new political goals in the field of justice, for instance, to defeat this obstacle and become a Member State.

If the Moldovan state had implemented the Copenhagen criteria and parts of the *acquis communautaire* before the bank fraud, it would have gone through a gradual transition from a deep-rooted post-Soviet mentality, which gave rise to the corruption phenomenon, to European democratic current affairs. Consequently, the bank fraud most probably would not have happened. This argument was developed on the grounds of the top-down Europeanization theory. Hypothetically, the top-down phenomenon describes how the EU restructures institutions, processes and political outcomes in candidate countries (Börzel & Panke, 2018). I thereby assume that if the RM had decided to join the European community, the EU would have caused domestic changes because of the nonconformity in beliefs and institutions between the economic community and the candidate state. Top-down Europeanization has proven very efficient in shaping policies, politics and polity in cases of unstable democracy and new-comers, such as CEE countries. All the same, it is possible that a Member State might attempt a democratic backsliding, which demonstrates that Europeanization is not an irreversible process. For instance, the Hungarian Prime Minister made an attempt to reverse the institutional changes that were implemented as a condition of EU membership (Börzel & Panke, 2018). Yet, there are very few such cases.

The European Union conditionality is, in practice, the ability to influence the behaviour of a candidate country by making attractive offers under a specific condition or set of conditions. In the case of the RM, the attractive offer is to join the EU and the condition is, among others, to fight corruption. It is a mechanism that has been used with all the Central and Eastern European (CEE) countries. It is important to add that the conditions for CEE countries are much more detailed and comprehensive than for other countries. To illustrate, international financial institutions, such as the IMF or World Bank can offer financial benefits with the condition that a country implements specific economic policies (Grabbe, 2002). The set of conditions that are proposed to CEE countries are clear and fixed, as opposed to the highly politicized, complex and less clear

conditions imposed by the EU (Grabbe, 2002). Further, once these states join the EU, there is no clear mechanism to monitor corruption and sometimes the phenomenon comes back.

DATA SOURCES AND USED METHODS

The Method of Difference is one of the four modern comparative methods developed by John Stuart Mill. According to Mill, the world is consistent and there is a causal regularity underneath what seems to be an irregularity or a “confusing surface of things” (Moses & Knutsen, 2012). These causal regularities can be discovered by applying scientific methods of systematic comparison over areas. Thereby, in this research paper, I will compare the political and social welfare in Romania and the Republic of Moldova. I will focus on the level of corruption and the actions Romania has taken to prevent money laundering in the context of EU conditionality. These countries are relatively similar and share several common features such as culture, language and history, but are significantly different in levels of wealth, social welfare and political position. This paper assumes that, among others, the European Union membership accounts for this significant inequality between these two neighbouring countries. The presence of this explanatory factor in Romania and its absence in the RM can be used to explain the variation in such outcomes as the level of corruption and state welfare. One should, nevertheless, consider these two shortcomings when applying the comparative methods: over-determination and sampling bias. Both deficiencies can lead to erroneous conclusions about the world. Thus, I will combine the deductive and inductive approaches to “test hypothesis concerning causal arguments even when the number of observations is relatively small” (Moses & Knutsen, 2012).

Process tracing serves to find a causal relationship between an independent variable and the outcome of a phenomenon in the social world. In the present study, this process will help identify how the high level of corruption led to the “theft of the century” in the RM. I developed a causal relationship between corruption and the bank fraud of 2014 and analysed the causal mechanism connecting the two concepts. By definition, process tracing implies “attempts to identify the intervening causal process – the causal chain and causal mechanism – between an independent variable and the outcome of the dependent variable” (Beach & Pedersen, 2013). I will employ the *explaining outcome* process analysis, which is case-centric and can be thought of as a single-outcome study (Beach & Pedersen, 2013). I used it to explain how the mechanisms to produce this fraud were put into action.

To answer the research question of this paper I collected data from primary and secondary sources in a qualitative manner. I conducted semi-structured interviews, analysed academic documents and papers as well as theoretical reflections of such scholars as Ernst B. Haas, Börzel and Panke, Steinmo on Hall as well as Grabbe. Mostly, I collected data about the bank fraud from a report constructed by Kroll Associates UK Limited, registered in the United Kingdom, which was selected by the National Bank of Moldova to conduct preliminary investigations into alleged financial irregularities at the three Moldovan banks (Sirbu, 2015). Thanks to it, some of the persons and companies that participated in the money laundering were revealed and were later imprisoned. Doubtless, since it is not a report made by Moldovan institutions but a third party, I think it is highly trustworthy. Moreover, I analysed the accession treaty of Romania to predict what reforms would the RM have gone through as a candidate country. I choose the Romanian access treaty for the reason that the country is the most similar to the RM in ethnographic aspects. To collect qualitative, primary data I conducted semi-structured interviews. What made semi-structured interviews attractive is that the interviewer could depart from the list of questions if it was relevant and important (Bryman, 2012). Secondly, it allows accumulating solid facts from experts in the domain. In the interest of obtaining reliable information, I interviewed Moldovan economy expert Viorel Gîrbu.

RESULTS OF OWN RESEARCH AND DISCUSSIONS

Bank Fraud. Schemes and Methods

The first aspect to point out is that the money laundering process of \$1 billion from the three national banks unfolded in two phases: 1. The acquisition of the banks; 2. The perpetration of fraud schemes. Further, I will describe each of the phases.

The acquisition of the three banks 2012-2013

The Acquisition of Unibank (UB)

Between 2007 and 2012 the share structure of UB was composed principally of a single significant shareholder – Vienna Capital Partners Unternehmensberatungs AG, based in Austria. On 17 August 2012, 8 UK-registered companies, 12 Moldovan and 1 Russian citizen became the new shareholders of the bank,

each owning a stake of between 4.5% and 4.99%. At that moment, none of them could buy a stake in a bank of 5% or above, because conform the Moldovan law a person who holds a stake of 5% and above is considered a significant shareholder and requires formal approval from the National Bank of Moldova (Moldova, 2012). The source of funds used to purchase UB shares was loans from corporate entities, that wired funds through banks in Latvia, a non-OECD country. The same corporate entity was used to fund not only one but several shareholders. Further, in seven cases, shareholders individuals financed their purchase of UB shares with loans from an entity that had direct links to Ilan Shor, one of the suspects involved in the fraud (Kroll, 2015). The NBM and the Kroll report could not clearly identify how shareholder companies funded their share acquisitions, because they were shell companies and the declared beneficiaries were nominees. Thus, we could assume that their ultimate ownership of the shares was intentionally hidden (Kroll, 2015).

The acquisition of Social Bank (SB)

Prior to its acquisition in 2013, SB was owned by numerous minority shareholders who are apparently unrelated. As a result of the sale, 50% of the bank’s share capital was transferred to Moldovan, Russian and Ukrainian individuals as well as Moldova-based companies. Again, each of them did not hold 5% or more of the shares, as this would have required National Bank of Moldova approval. Reminiscent of Unibank, SB most shareholders had the role of nominees to mask the real beneficiaries. While some had close ties to Ilan Shor, others had profiles that did not match a typical investor who would be interested in purchasing stakes in a Moldovan bank, with their acquisition being financed through loans from offshore entities. All these individuals seem unrelated at first sight, but they actually share one noteworthy fact – the funding of share acquisition. The companies and individuals who acquired shares in the bank financed their acquisition through multiple offshore shell companies with common addresses and Latvian bank accounts (Kroll, 2015).

The acquisition of Economy Bank (BEM)

In 2013, the Moldovan state had had a majority stake of 56.12% in BEM. The BEM had liquidity shortfall because of a growing non-performing loan portfolio. The bank’s exposure at that time was mainly Moldovan companies (Kroll, 2015). The solution that was applied was share issuing to raise capital. Regardless, the Moldovan state did not have enough funds or, according to the economy expert Viorel Gîrbu, it simply did not want to acquire any additional shares (Gîrbu, 2:56). Consequently, the shares of the state were reduced to a blocking stake of 33.3(3)% plus one share. Then, an existing shareholder bought the number of shares lost by the state, reaching 33.8% and the rest were acquired by various Russian individuals via offshore entities. In a similar manner as that regarding BS and UB, not only did the shareholders had the same sources of funding, but also used their shares in BEM to guarantee loans issued by BS to various Moldovan companies.

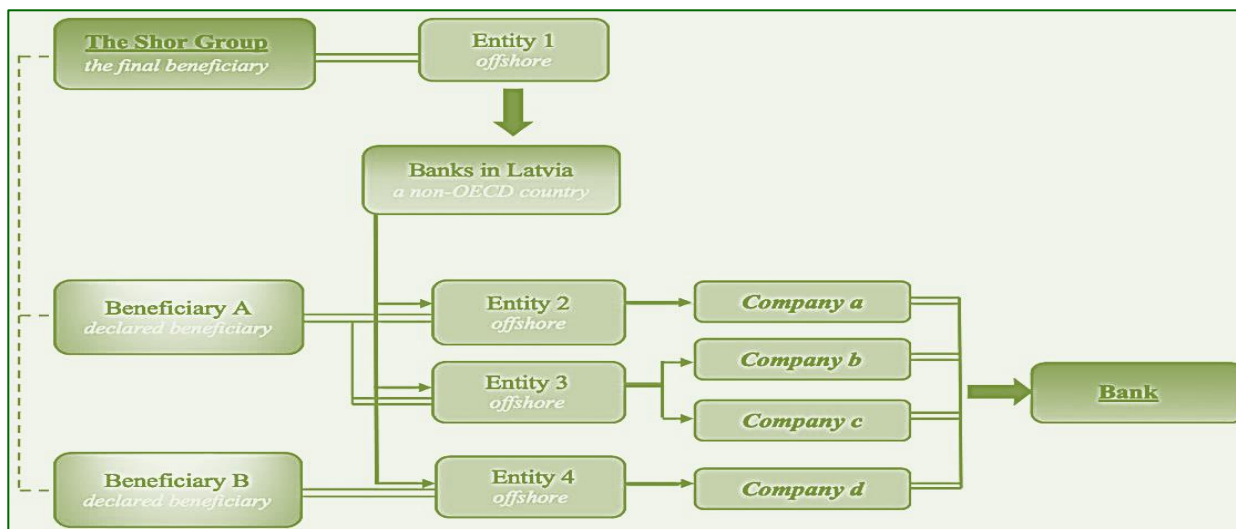


Figure 1. A summary of the ownership structure of the Shor Group and the ways of financing the acquisition of the three banks

Source: Elaborated by the author.

Figure 1 summarises the process of how the Unibank, Banca Socială and Banca de Economii shares have been bought. It illustrates the ownership structure of the Shor Group, which executed the bank fraud, as well as the method of financing the purchase of shares in the three Moldovan banks. The first aspect to point out is that the Shor Group, the final beneficiary of the bank fraud, tried to disguise its attempt to gain control over the banks. In order to do so, it enshrouded the fact that it was the final beneficiary of the Moldovan firms that were involved in the share acquisition by employing nominees or, as shown in Figure 1, declared beneficiaries. The connection between the declared beneficiaries and the Shor Group was kept in secret and this is represented by the blue dashed lines in the figure. At the same time, the blue straight lines show the ownership links. The flow of funds utilized to finance the share purchase is in red arrows. Shortly, the Shor Group instructed the offshore companies that it owns to wire funds through Latvian banks, a country out of the OECD zone, to the offshore entities. These, in turn, directly controlled the Moldovan individuals and companies that used the money to buy shares in the three financial institutions (Monahov & Jobert, 2017).

The perpetration of fraud schemes and money laundering – 2014-2015

At this point we will analyse the schemes applied by the Shor Group in the successful money laundering at greater detail. To begin with, the main goals behind the schemes were to:

- “maximize available liquidity for banks to lend to controlled firms
- prevent prudential indicators from deteriorating to avoid supervision from Central Bank
- extract money from the Moldovan financial system by laundering it to non- OECD banks”

(Monahov & Jobert, 2017)

Scheme 1

The first scheme, also known as the “Roseau transaction”, was put in action shortly after obtaining control over Banca de Economii. The origin of this name comes from the transaction performed by the financial institution of a part of its non-performing loan (NPL) portfolio to a UK based entity, Roseau Alliance LLP. It is unclear why this entity agreed to buy the entire NPL portfolio at face value and thereby effectively cancelling the “distressed assets” of BEM in exchange for cash (Kroll, 2015). Moreover, this company had been incorporated only one year before this transaction was held. For this reason, the Roseau Alliance entity is considered an investment vehicle/shell company that is also under the control of the holding company (Kroll, 2015). Consequently, the purpose of this transaction was to maximize the capacity of the bank to lend to companies and individuals controlled by the Shor Group (Monahov & Jobert, 2017).

Scheme 2

The second scheme applied by the Shor Group was loan shifting between client groups, firms and banks. The goal they wanted to achieve when shifting loans between firms was to “build trust in the form of a sound credit record allowing the controlled firms to request increasingly large amounts of credit without raising suspicion” (Monahov & Jobert, 2017). To do so, four strategies were employed:

1. “firms systematically borrowed money from any one of the three banks;
2. they have transferred the money to a firm whose credit was due to mature in the near future and
3. the firm whose credit matured repaid the loan, only to
4. later borrow again to repay another firm’s loan” (Monahov & Jobert, 2017).

The amount borrowed by firms was increasing every time they requested money from financial institutions with these, in turn, demonstrating healthy statistics in the allocated credits. The Shor Group was able to successfully use this scheme for a longer period without being detected thanks to two significant factors. First of all, there was a large number of firms and banks involved in this procedure and secondly, the funds transferred between the controlled firms were done through offshore entities. Accordingly, it was challenging at that instant to track linkages between the firms controlled by the holding company. Moreover, as long as the banks were receiving funds back, their liquidity was increasing, which enabled them to increase lending.

Scheme 3

Another means that the holding company employed to temporarily improve the prudential indicators was loan shifting in the ranks of client categories. The reason it succeeded is that the banks

insensibly decreased its exposure to non-controlled firms. This resulted in increased liquidity and the bank was more exposed to offer credit loans to controlled firms. However, the bank's "Large" Exposures standard increased (Monahov & Jobert, 2017), which means that the financial institution exposes itself too much to individual clients or groups of connected clients (EBA, 2020).

Scheme 4

The next method used was the Circular Bank Deposit Scheme. It had the same purpose as the others above: to diminish the aggravation of prudential indicators in the wake of loan issuance. This scheme was developed on the basis of the regulatory norms which affirms that if "a firm provides bank deposits as collateral for any given loan, then the loan's risk weighting is diminished to reflect the existence of collateral". In such a way, the bank's Capital Adequacy Ratio would decrease slower as long as the debtor provides collateral when requesting a credit. However, shell companies do not have capital at their disposal and thus are not capable to turn it into bank deposits. For this reason, the scheme was applied in such way that at least two banks opened a "deposit account with own funds in the name of the company to be credited" (Monahov & Jobert, 2017), so that the company can then present the documents to the bank it requests the credit from. Once the prudential indicator improves, the financial institution can issue more credits until it reaches the regulatory limits. Further, after the bank receives the deposit it issues similar deposits. Through this scheme, money can be "reused" endlessly to lower risk weights for loans (Monahov & Jobert, 2017).

Scheme 5

The last scheme finalized the process of money laundering by maximizing the available liquidity. The method is quite simple and straightforward: the banks that were under the control of the holding company borrowed money from other Moldovan non-controlled banks. In the financial environment of the time, non-controlled banks which had high liquidity were willing to lend because loan demand was weak, interest rates were low and there was no risk that the receiving institutions would not repay. But even if they failed at that point, there was a general expectation in the Moldovan financial environment that if a banking institution faced a failure, it would be saved anyway. That is why Moldovan banks often agreed to engage in interbank lending, and thus the controlled banks took advantage of this and borrowed large sums of money for long periods (Monahov & Jobert, 2017).

Analysis

Next, I will analyse how the EU strategy of enlargement to the CEE countries would have shaped the political and economic behaviour in Moldova. In order to open the EU accession negotiations, a country must meet the first Copenhagen criterion – *institution building*, which is a process of "training and equipping a wide range of civil servants, public officials, professionals and relevant private sector actors" (European Commission, 2001). A way to establish such institutions is through the twinning instruments, which were applied to the 2007 joining of Romania. By definition, it means that a country in the pre-accession stage can install "modern and efficient administrations, with the same structures, human resources and management skills similar to ones that already exist in the Member States" (European Commission, 2001). To illustrate, Romania has established the National Anti-Corruption Directorate (DNA) on the example of Spain. This institution is in the top five anti-corruption institutions in the EU and has achieved impressive results in "solving high and medium level corruption cases" (European Commission, 2017). This means that the implementation of an institution such as the DNA in the RM would have been necessary in its pre-accession period.

The second and more complex stage is the negotiations, which require reforms in all 35 chapters of the *acquis communautaire*. I will only analyze the ones that relate to the bank fraud. I will begin with chapter 9: Financial Services. This chapter refers to the compliance of the regulations in the field of financial services, namely the banking services with the EU *acquis*. The objective of this chapter of the *acquis* is to establish a high level of stability, security and efficiency in the financial system of the adherent countries, so they meet European requirements in the field of financial services. The National Bank of Moldova is the regulatory authority of the banking financial sector and has the power source to promote changes in the field to align banking operations with European requirements. Consequently, the institution would have to implement specific changes in the sector relying on the following reference document implemented in the European Union: Core Principles for Effective Banking Supervision. These principles have the purpose to reinforce the global financial system and eliminate weaknesses in

the banking system within a country (Basel Committee on Banking Supervision). In total, there are 29 principles, but I discuss the most efficient ones for this case:

- Principle 6: Transfer of significant ownership. *“The supervisor has the power to review, reject and impose prudential conditions on any proposals to transfer significant ownership or controlling interests held directly or indirectly in existing banks to other parties”.*

Under prudential review and conditions imposed, the major ownership restructure of the Unibank would have attracted the attention of NBM. The purchase of the UB shares by 21 identities, with a stake between 4.5% and 5% each is suspicious and thus, with external assistance, the NBM would have been able to identify the dubious share transfer to the Shor Group and reject it.

- Principle 19: Concentration risk and large exposure limits. *“The supervisor determines that banks have adequate policies and processes to identify, measure, evaluate, monitor, report and control or mitigate concentrations of risk on a timely basis. Supervisors set prudential limits to restrict bank exposures to single counterparties or groups of connected counterparties”.*

Such supervision from NBM would have prevented the three Moldovan banks to expose themselves only to firms and individuals controlled by the Shor Group.

- Principle 29: Abuse of financial services. *“The supervisor determines that banks have adequate policies and processes, including strict customer due diligence rules to promote high ethical and professional standards in the financial sector and prevent the bank from being used, intentionally or unintentionally, for criminal activities”* (Basel Committee on Banking Supervision, 2012).

This principle is crucial, because one of the main reasons the bank fraud was successful is the lack of means to track and evaluate the financial institutions' counterparties. If the NBM would have had the tools to access such information, it could have determined the linkage between companies, clients and banks, but also its profiles. For example, many individuals did not represent investor profiles, and several companies controlled by the holding company had been inaugurated a year before the schemes were applied.

The next chapter of the acquis that we shall take into consideration is chapter 24: Justice and home affairs. Among other things, European policies seek to fight internationally organized crime. Thereby, Member States must be adequately equipped to be able to comply with Union rules (European Commission). In the pre-accession period, countries must successfully integrate law enforcement agencies and other relevant bodies with efficient and strong functioning capacity. In 1993, the EU implemented three new instruments to ensure justice across the area. One of them is the most important to this study: a Convention. For example – Europol, whose responsibilities include to “streamline the competent authorities of the Member States and strengthen cooperation in the following area(s): money laundering associated with international criminal activities” (România, 2005). Equally important, the liaison officers within this institution work both in the member countries and in the countries outside the area. They are responsible for collecting information and communicating directly to the competent authorities about fraudulent acts in the host country. Cooperating with Europol would have helped to annihilate operation “Titirezul”, as it proved to be efficient in similar frauds. For instance, Europol helped the Spanish Guardia civil in operation “Usura” to stop money laundering schemes linked to two famous Russian criminal syndicates (EUROPOL).

A comparative analysis between Romania and Moldova

One of the main differences between Romania and the RM in the period before the bank fraud was the level of corruption and the functioning of the bank sector. According to the Corruption Perception Index (CPI), in 2012, Romania's score was 44/100, while Moldova's was 36/100 (CPI, 2012). At first sight, it might not appear as a big difference, but if we compare the level of corruption in Romania before it joined the EU, we will seize the result of the EU conditionality mechanism. Indeed, in 2004 Romania has scored 29/100, as reported by CPI, corruption being a significant problem for the country and its population. Moreover, the accession to the EU has shown a positive impact on the banking system. After 2007, the National Bank of Romania (NBR) strengthened its performance, becoming more efficient as it became a member of the European System of Central Banks (Dragan, 2010). The NBR, in the role of the main supervisor, has been able to efficiently monitor the national banks and has implemented “new measures to improve the prudential regulatory

framework and in collaboration with the Government signed some funding agreements with the IMF and the EU" (Dragan, 2010). This resulted in a healthy, safer banking market. The Moldovan highly corrupted environment resulted in the money laundering of \$1 billion, especially because of the lack of effective supervision, cooperation of the National Bank of Moldova with national and international agencies as well as prudential conditions. We can thus conclude that the explanatory factor in such contradictory outcomes is EU integration.

Counterargument

The accession of Romania to the EU might have shown positive progress towards fighting corruption and prevent money laundering, but its journey was not accompanied by a coherent policy against corruption. The problem was that the European Union has not developed an ample scenery against corruption for candidate countries. Even though in 1998 it established new strategies to evaluate the anti-corruption efforts in the CEE countries, it did not develop an effective way to evaluate these strategies. Besides, the Commission did not communicate these strategies in a clear, systematic manner in a single document to the candidate countries. The EU understood these weaknesses thus reinforced its strategies towards the accession of Romania (Szarek-Mason, 2010). The reinforced strategies included the possibility to postpone the year of accession if the countries were not prepared to meet the conditions of membership; and the implementation of a monitoring mechanism that verifies the progress in combatting corruption after the countries had joined the EU (Szarek-Mason, 2010). Even under such conditions, the 2005 and 2006 reports have shown that corruption was still a significant, widespread problem and there have not been significant improvements. However, this did not result in the postponement condition. Even with further monitoring strategies, Romania failed to meet the requirement. Consequently, the reinforced strategies of the EU Commission proved to be ineffective (Szarek-Mason, 2010).

Equally relevant is the fact that the Republic of Moldova could have joined the European Union even if it had failed to meet the conditions of membership. As economy expert Viorel Gârbu argues, in its European journey, the Republic of Moldova was at the same level as the Baltic states, which joined in 2004 and 2007. Similarly, if Romania succeeded to join, the RM would have succeeded as well. In addition, the financial institutions that participated in the bank fraud were from a European country, and those who participated have taken the necessary measures to cover and reap certain benefits regardless of the regulatory framework. According to Mr Gârbu, the European Union does not intervene so deeply in domestic policies and the implementation of the Romanian National Anticorruption Directorate was established because of effective leadership. He thinks that there was a person "*who wanted to fight corruption, but that person was not named by the EU. They were not delegated by the EU*". What's more, as the economy expert says, even though the RM was a Member State, the bank fraud could still happen, and the EU would not have taken any measures. The EU would not have cut monetary donations, because it would lose its leverage: "*For donors, money is not important, politics is important and also is the possibility to intervene in politics*" (Gârbu, 2020).

DISCUSSION

I will now continue with a concluding discussion on how the theories and findings harmonize, with little dispute. First, to access the single market, the Republic of Moldova would have to meet the first Copenhagen criterion, a fact that coincides with the concept of spillover. As discussed earlier, the EU applies the twinning tool to help a candidate country implement effective institutions following the example of a Member State. Thus, Moldova would have to resort to the help of a Member State to develop a modern and efficient administration as well as implement legislative and institutional models that work well. Following the fulfilment of the Copenhagen criteria condition, the RM would move to the negotiations stage, that is an appropriate example of Top-Down Europeanization. Both chapters 9 and 24 that are negotiated address the problem of international organized crime and money laundering and the measures that should be applied to prevent a violation of the banking system. The Core Principles for Effective Banking Supervision offer instruments that are imposed by the Commission in the pre-accession period to establish a high level of stability, security and efficiency in the financial system of the adherent countries.

The European journey of Romania is a representation of the conditionality concept. In its pre-accession period, the EU influenced its behaviour by imposing conditions to fight corruption.

Unfortunately, in the case of Romania, the conditionality concept was not efficient. Even though the country had shown progress, such as the establishment of the National Anticorruption Directorate, it did not meet the conditions of membership. The EU imposed the condition that the country had to step up and to carry out certain reforms if it wanted to become a Member State or its accession would be postponed for a year. Romania did not meet the condition but still joined the EU in 2007. Thereby, we can assume that the Republic of Moldova could have joined the EU even with high records of corruption. Even if the EU tried to apply its strategy of monitoring the progress of Moldova in its attempts to fight corruption in the post-accession period, the findings show that no drastic consequences would have been applied. It is very possible, thus, that the bank fraud could still have happened.

CONCLUSION

This research paper aimed to test the theory that the integration to the European Union could prevent the bank fraud schemes of 2012-2015 in the Republic of Moldova. Through a deductive and inductive approach, we can conclude two main points. Firstly, in theory, if the Republic of Moldova had implemented the necessary instruments and conditions imposed by the EU regarding money laundering and banking system, it would have destroyed any possibility of putting the fraudulent schemes into action. Reforms in the banking system were necessary for the RM in order to establish a high level of stability, security and efficiency in the financial system. The National Bank of Moldova would have had to “set and enforce minimum prudential standards for banks and banking groups” (Basel Committee on Banking Supervision) which would have informed the supervisor when these standards are violated. Moreover, an effective supervision from the NBM, which would have cooperated with national and international agencies would have provided the opportunity to observe and stop the bank fraud, if not preventing it in advance. Especially because the NBM would have had the power to “review the overall activities of a banking group, both domestic and crossborder”, this could have revealed its ways of transferring money abroad to finance the acquisition of shares in the bank. Moreover, cooperation with CEPOL would provide the NBM with innovative and advanced security and law enforcement training while cooperating with Europol, would offer assistance to the supervisor to collect information and “identify, prosecute, freeze or confiscate the instruments” of executing the bank fraud.

Secondly, based on Romania’s experience of fulfilling the European conditions, we can conclude that the bank fraud could still have happened, even if the Republic of Moldova had joined the European Union. This is because the EU conditionality on post-communist countries’ transition was general and indistinct. The EU did not have a distinct agenda, and its ways to influence the levels of government were not evident (Grabbe, 2002). As discussed before, even though Romania had been imposed to insure the fulfilment of numerous conditions for accession and several strategies to be verified upon, the country had not been provided with a clear plan and a comprehensive anti-corruption framework. As a result, Romania had not succeeded to meet the requirements against corruption and international organised crime and no drastic sanction had been imposed. In fact, Romania received further support for anti-corruption reforms. Thereby, if the RM would have shared the same journey to access the single market, most probably there would have been little impediments to carry out money laundering.

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THE IMPACT OF THE COVID-19 PANDEMIC AND THE DROUGHT ON THE PRICES OF THE MAIN AGRICULTURAL PRODUCTS OF ANIMAL ORIGIN IN ROMANIA

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ABSTRACT

Globally, the pandemic installed by the coronavirus has led to a change in the way business is conducted. In the context of the economic crisis knocking on the door, the states of the world are trying to take the most severe measures to mitigate the effects of this epidemic. One sector of the economy that needs to be protected is agriculture, because it provides the much-needed food for everyone. The role of farmers is very important in this equation, as they provide the necessary food stabilizing stocks of food that can be depleted faster. In this paper we want to determine the possible impact that the drought and the overlap of the COVID pandemic on it may have on the prices of agricultural products of animal origin in Romania. In this context, the level of prices in the first half of the previous year was compared with the level of prices in the first half of the current year, in order to be able to determine, from a statistical point of view, whether there are significant differences. It was found that for five of the six products analyzed, the prices in the first half of 2020 were higher than in the first half of 2019. Following this analysis, the correlation coefficients between the price level and the precipitation level were determined, and subsequently between the price level and the market demand, the latter influenced by the pandemic. It was found that both phenomena indirectly influenced the prices of agricultural products of animal origin.

Keywords: animal products, prices, COVID pandemic, drought, Romania.

La nivel global, pandemia instalată de coronavirus a condus la o schimbare a modului în care se desfășoară activitatea. În contextul crizei economice, care bate la ușă, statele lumii încearcă să ia cele mai severe măsuri pentru a atenua efectele acestei epidemii. Un sector al economiei care trebuie protejat este agricultura, deoarece oferă hrana atât de necesară pentru toată lumea. Rolul fermierilor este foarte important în această ecuație, deoarece aceștia asigură stocurile necesare de stabilizare a alimentelor care pot fi epuizate mai repede. În această lucrare dorim să stabilim impactul posibil pe care îl poate avea seceta și suprapunerea pandemiei COVID asupra prețurilor produselor agricole de origine animală din România. În acest context, nivelul prețurilor din prima jumătate a anului precedent a fost comparat cu nivelul prețurilor din prima jumătate a anului curent, pentru a putea determina, din punct de vedere statistic, dacă există diferențe semnificative. S-a constatat că pentru cinci din cele șase produse analizate, prețurile din prima jumătate a anului 2020 au fost mai mari decât în prima jumătate a anului 2019. În urma acestei analize, s-au determinat coeficienții de corelație dintre nivelul prețului și nivelul de precipitații, iar ulterior între nivelul prețurilor și cererea pieței, aceasta din urmă influențată de pandemie. S-a constatat că ambele fenomene au influențat indirect prețurile produselor agricole de origine animală.

Cuvinte-cheie: produse de origine animală, prețuri, pandemie COVID, secetă, România.

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В глобальном масштабе пандемия, вызванная коронавирусом, привела к изменению способов ведения бизнеса. В условиях стучащегося в дверь экономического кризиса государства мира пытаются принять самые жесткие меры для смягчения последствий этой эпидемии. Одним из секторов экономики, который необходимо защитить, является сельское хозяйство, потому что оно обеспечивает столь необходимую пищу для всех. В этом уравнении очень важна роль фермеров, поскольку они обеспечивают необходимые продовольственные стабилизирующие запасы продовольствия, которые могут быть истощены быстрее. В этой статье мы хотим определить возможное влияние, которое засуха и наложение пандемии COVID на нее может оказать на цены на сельскохозяйственную продукцию животного происхождения в Румынии. В этом контексте уровень цен в первом полугодии предыдущего года сравнивался с уровнем цен в первом полугодии текущего года, чтобы можно было определить со статистической точки зрения, есть ли значительные различия. Было установлено, что по пяти из шести проанализированных продуктов цены в первой половине 2020 года были выше, чем в первой половине 2019 года. После этого анализа были определены коэффициенты корреляции между уровнем цен и уровнем осадков, а затем между уровнем цен и рыночным спросом, на последний повлияла пандемия. Выяснилось, что оба явления косвенно влияют на цены на сельскохозяйственную продукцию животного происхождения.

Ключевые слова: продукты животного происхождения, цены, пандемия COVID, засуха, Румыния.

INTRODUCTION

An extreme drought phenomenon was registered in Romania, at the beginning of the 2019-2020 agricultural year, specifically at the beginning of September 2019 which greatly affected the main vegetable crops. The drought continued in the first quarter of 2020, so, in addition to autumn crops, spring crops were also affected. An indisputable proof in this respect is the fact that, at the proposal of the Ministry of Agriculture and Rural Development, a law was drafted (emergency decree no. 148/2020) regulating compensations for the affected areas (Official Gazette, 2020).

Over this difficult period for agriculture from a climatic point of view, the onset of the COVID-19 epidemic in Romania, which directly influenced the agri-food sector, also proved to be an overlapping cause. Butu et al. (2020), who studied the impact of the COVID-19 crisis on the buying behavior of fresh vegetable consumers found that the pandemic induced significant changes in the buying behavior of shoppers. In addition to these demand-related issues, it is considered that this crisis has also led to a reduction in the supply of products, given the limitations on trade.

Zhang et al. (2020), who wanted to assess the potential economic cost of the COVID pandemic in China for the agri-food system, found the following in his paper: the economic loss of the agri-food system is equivalent to 7%, about 27% of the total workforce having lost their jobs. At the same time, the results show that the continuous reduction of economic dependence on exports and the stimulation of domestic demand are key areas that require political support.

We consider that these two phenomena have to some extent influenced the evolution of agricultural product prices, so another research question is to what extent have the pandemic and drought affected the price of agricultural products of animal origin.

To this research question, there is a hypothesis based on other studies (Zhang et al. 2020, Anh and Gan, 2020, Fan and Zhang, 2020), namely that these phenomena indirectly influence the price level of agricultural products of animal origin. This hypothesis can also be supported by the findings of Cao et al. (2020), which conducted an analysis of the impact of the pandemic on agricultural imports and exports from China, and the authors note that exports were negatively affected, both in the short and long term.

MATERIAL AND METHOD

In this paper we want to analyze the price dynamics for the main agricultural products of animal origin in Romania, and then determine the influence that the COVID-19 pandemic may have, but also the severe drought since the beginning of the agricultural year. In this sense, we will analyze statistical data taken from the National Institute of Statistics (INS) both quantitatively and

qualitatively with reference to the price of these products, making a comparative analysis of the first half of 2020 with the first half of 2019, and subsequently aspects related to drought (precipitation level) will be analyzed with the help of meteorological data provided by different weather stations, whiel at the end the consumption of these products will be analyzed as a phenomenon of pandemic.

These data will be analyzed statistically using the t test, hypothesis testing and the Pearson correlation coefficient. The research will analyze a series of agricultural products of animal origin that are very important in human nutrition, namely: the main varieties of meat (cattle, sheep, poultry and pigs), cow's milk and eggs.

RESULTS AND DISCUSSIONS

In order to be able to determine the influence of the COVID-19 pandemic and the drought on prices, a quantitative analysis of the evolution of prices for the main agricultural products of animal origin in Romania must be carried out beforehand. This analysis will be performed comparatively, respectively it will put the price of products from the first half of 2019 against the price of products from the first half of 2020. Subsequently, the hypothesis will be tested according to which the price differs in 2020 compared to 2019, registering an increase, this analysis will be performed with the t test, from the Data Analysis package of MS Excel.

Beef meat

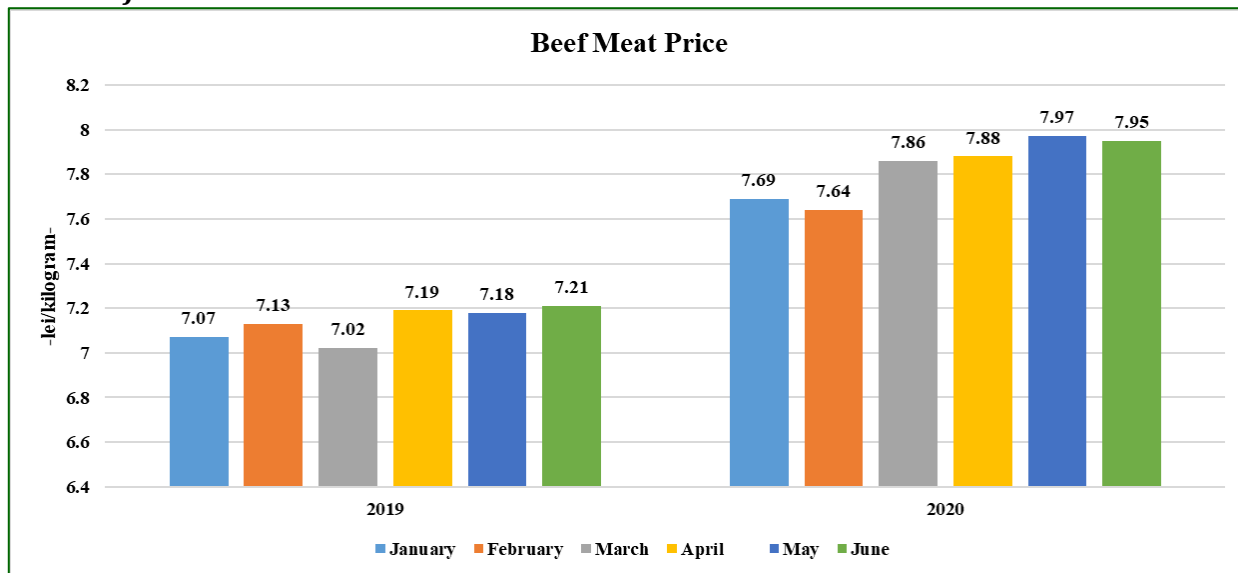


Figure 1. Dynamics of the average purchase price of beef Semester 1-2019 vs semester 1-2020

Source: Own processing based on INS data.

As can be seen from Figure 1, the price of beef in the first half of 2019 is slightly increasing, on average by 0.39% per month, with very little oscillation, the coefficient of variation being a very small 1.05%, and the semester average being of 7.13 lei per kilogram.

Analyzing the prices recorded in the first half of 2020, we can see a difference in both evolution and level, respectively, during this period, the price of beef increased by 0.66% per month, slightly steeper, with a coefficient of variation of 1.74%, while the average price per semester was 7.83 lei per kilogram.

In order to demonstrate, if this difference is statistically significant, the hypothesis will be tested using the t test, the hypothesis being that the average value of the first 6 months of 2019, differs from the average value of the first 6 months of 2020, respectively the difference between the means is different from zero.

Table 1

Hypothesis testing for the price of beef

	2019	2020
Mean	7.133333333	7.8317
Variance	0.005626667	0.0186
Observations	6	6
Pearson Correlation	0.48201872	
Hypothesized Mean Difference	0	
df	5	
t Stat	-14.26623245	
P(T<=t) one-tail	1.52452E-05	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	3.04903E-05	
t Critical two-tail	2.570581836	

Source: Own calculations based on the data in figure 1 using Data Analysis of MS Excel.

Table 1 shows that the absolute value of the statistical parameter t State is higher than the critical value (t Critical) and the significance level P is lower than the maximum accepted threshold of 0.05, which confirms the hypothesis, respectively the difference between the averages cannot be zero, in other words there is no possibility for the averages to be the same. As previously determined, the average price in the first half of 2020 (7.83 lei/kg) is 9.8% higher than the average price in the first half of 2019.

Sheep meat

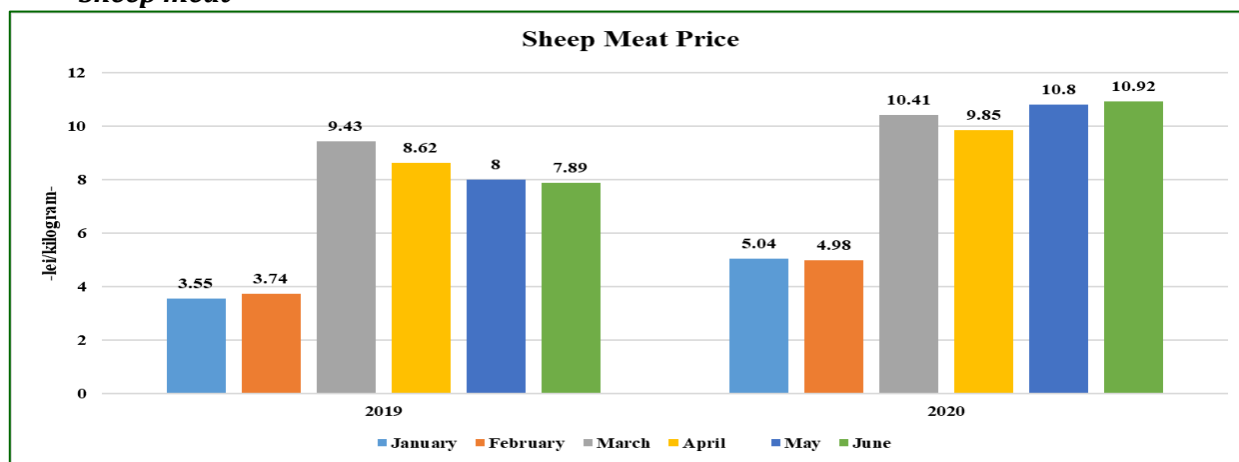


Figure 2. Dynamics of the average purchase price of sheep meat Semester 1-2019 vs semester 1-2020

Source: Own processing based on INS data.

As can be seen from Figure 2, the price of sheep meat in the first half of 2019, is increasing, on average, by 17.3% per month, with very high oscillation, the coefficient of variation being a very high 37.24%, and the average for the semester being 6.87 lei per kilogram.

Analyzing the prices recorded in the first half of 2020, we can see a difference in both evolution and level, respectively, during this period, the price of sheep meat increased by 16.72% per month, slightly slower, with a coefficient of variation of 32.97%, and the average price of the semester was 8.66 lei per live kilogram.

In order to demonstrate, if this difference is statistically significant, the hypothesis will be tested using the t test, the hypothesis being that the average value of the first 6 months of 2019, differs from the average value of the first 6 months of 2020, respectively the difference between the means being different from zero.

Table 2

Testing the hypothesis for the price of sheep meat

	2019	2020
Mean	6.871666667	8.6667
Variance	6.550536667	8.1625
Observations	6	6
Pearson Correlation	0.952450588	
Hypothesized Mean Difference	0	
df	5	
t Stat	-4.965876286	
P(T<=t) one-tail	0.002113365	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.00422673	
t Critical two-tail	2.570581836	

Source: Own calculations based on the data in figure 1 using Data Analysis of MS Excel.

It can be seen from Table 2 that the absolute value of the statistical parameter t State is higher than the critical value (t Critical), and the significance level P is lower than the maximum accepted threshold of 0.05, so it may be seen that the hypothesis is confirmed, respectively the difference between the averages cannot be zero, in other words there is no possibility for the averages to be the same. As previously determined, the average price in the first half of 2020 (8.66 lei/kg) is 26.12% higher than the average price in the first half of 2019.

Poultry

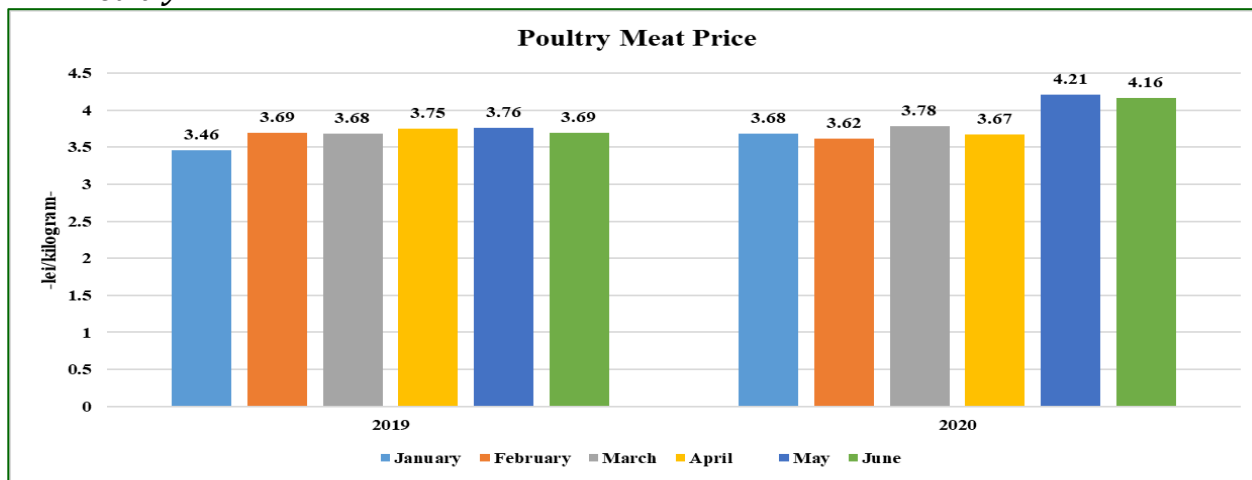


Figure 3. Dynamics of the average purchase price of poultry Semester 1-2019 vs semester 1-2020

Source: Own processing based on INS data.

As can be seen from Figure 3, the price of poultry in the first half of 2019 is slightly increasing, on average by 1.3% per month, the coefficient of variation being low, 2.97%, and the average of the semester being of 3.67 lei per kilogram. Analyzing the prices recorded in the first half of 2020, we can see a difference in both evolution and level, respectively, during this period, the price of poultry increased monthly by 2.48%, a slightly more alert pace, with a coefficient of variation of 6.81%, and the average price of the semester was 3.85 lei per live kilogram.

In order to demonstrate, if this difference is statistically significant, the hypothesis will be tested using the t test, the hypothesis being that the average value of the first 6 months of 2019, differs from the average value of the first 6 months of 2020, respectively the difference between the means being different from zero.

Table 3

Hypothesis testing for the price of poultry

	2019	2020
Mean	3.671666667	3.8533
Variance	0.011896667	0.0689
Observations	6	6
Pearson Correlation	0.381055414	
Hypothesized Mean Difference	0	
df	5	
t Stat	-1.831738757	
P(T<=t) one-tail	0.063242222	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.126484443	
t Critical two-tail	2.570581836	

Source: Own calculations based on the data in figure 1 using Data Analysis of MS Excel.

It can be seen from Table 3 that the absolute value of the statistical parameter t State is lower than the critical value (t Critical) and the significance level P is higher than the maximum accepted threshold of 0.05, so it cannot be estimated that the hypothesis is confirmed, respectively the difference between the means can be zero, in other words there is a possibility that the means are the same.

Pork

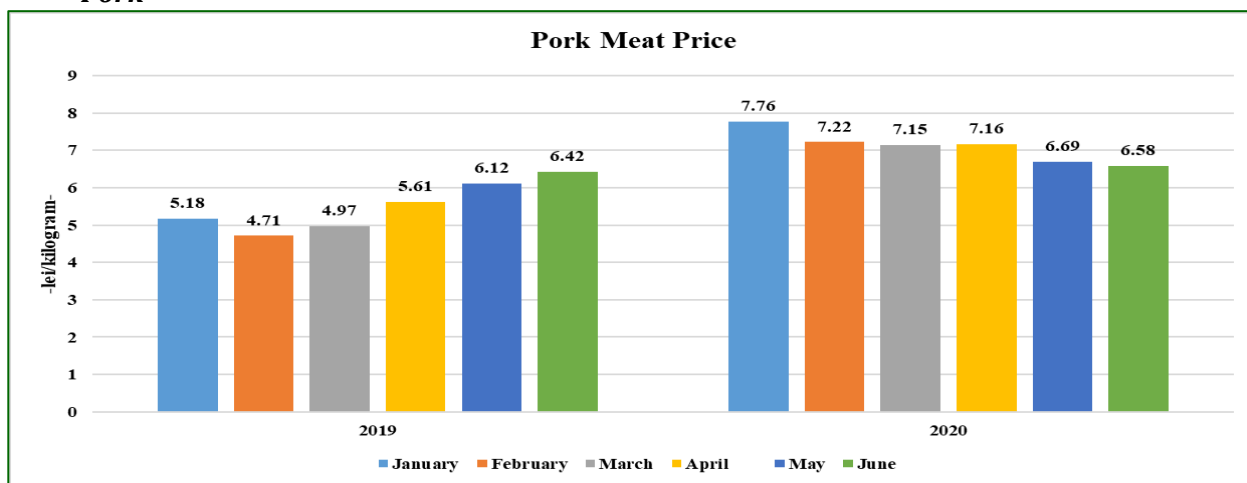


Figure 4. Dynamics of the average purchase price of pork Semester 1-2019 vs semester 1-2020

Source: Own processing based on INS data.

As can be seen from Figure 4, the price of pork in the first half of 2019 is increasing, on average, by 4.38% per month, the coefficient of variation being average, 12.2%, and the average of the semester being 5.5 lei per kilogram.

Analyzing the prices recorded in the first half of 2020, we can see a difference in both evolution and level, respectively, during this period, the price of pork decreased, but starting from another level, the monthly average was -3.24%, with a 5.96% coefficient of variation of and the average price for the semester of 7.09 lei per kilogram.

In order to demonstrate, if this difference is statistically significant, the hypothesis will be tested using the t test, the hypothesis being that the average value of the first 6 months of 2019, differs from the average value of the first 6 months of 2020, respectively the difference between the means is different from zero.

Table 4

Testing the hypothesis for the price of pork

	2019	2020
Mean	5.501666667	7.0933
Variance	0.450056667	0.1789
Observations	6	6
Pearson Correlation	-0.746096835	
Hypothesized Mean Difference	0	
df	5	
t Stat	-3.800656752	
P(T<=t) one-tail	0.006310001	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.012620002	
t Critical two-tail	2.570581836	

Source: own calculations based on the data in figure 1 using Data Analysis of MS Excel

It can be seen from Table 4 that the absolute value of the statistical parameter t State is higher than the critical value (t Critical), and the significance level P is lower than the maximum accepted threshold of 0.05, so it can be seen that the hypothesis it is confirmed, respectively the difference between the averages cannot be zero, in other words there is no possibility for the averages to be the same. As previously determined, the average price in the first half of 2020 (7.09 lei/kg) is 28.9% higher than the average price in the first half of 2019.

Cow milk

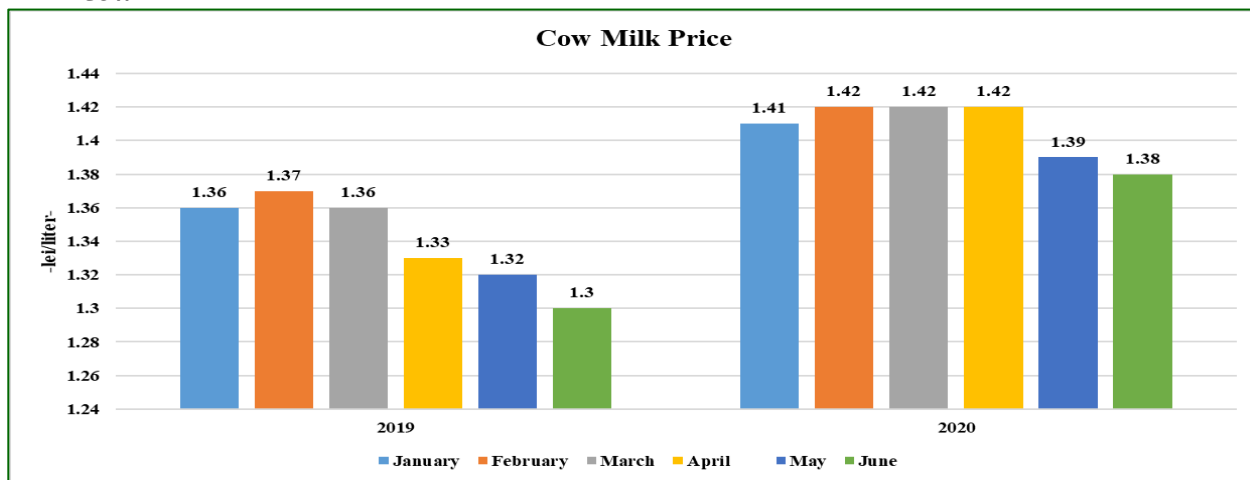


Figure 5. Dynamics of the average purchase price of cow's milk Semester 1-2019 vs semester 1-2020

Source: Own processing based on INS data.

As can be seen from Figure 5, the price of cow's milk in the first half of 2019, shows a decreasing trend, on average, by 0.9% per month, the coefficient of variation being a small 2.05%, and the average of the semester being 1.34 lei per liter. Analyzing the prices recorded in the first half of 2020, a similar evolution can be observed, but at a different level, respectively, during this period, the price of cow's milk decreased, but starting from another level, on average the monthly rate was -0.43%, with a 1.24% coefficient of variation the average price for the semester being 1.4 lei per liter.

In order to demonstrate, if this difference is statistically significant, the hypothesis will be tested using the t test, the hypothesis being that the average value of the first 6 months of 2019, differs from the average value of the first 6 months of 2020, respectively the difference between the means is different from zero.

Table 5

Testing the hypothesis for the price of cow's milk

	2019	2020
Mean	1.34	1.4067
Variance	0.00076	0.0003
Observations	6	6
Pearson Correlation	0.828552265	
Hypothesized Mean Difference	0	
df	5	
t Stat	-10	
P(T<=t) one-tail	8.54738E-05	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.000170948	
t Critical two-tail	2.570581836	

Source: Own calculations based on the data in figure 1 using Data Analysis of MS Excel.

It can be seen from Table 5 that the absolute value of the statistical parameter t State is higher than the critical value (t Critical) and the significance level P is lower than the maximum accepted threshold of 0.05, so it can be seen that the hypothesis is confirmed, respectively that the difference between the averages cannot be zero, in other words there is no possibility for the averages to be the same. As previously determined, the average price in the first half of 2020 (1.406 lei/l) is 4.97% higher than the average price in the first half of 2019.

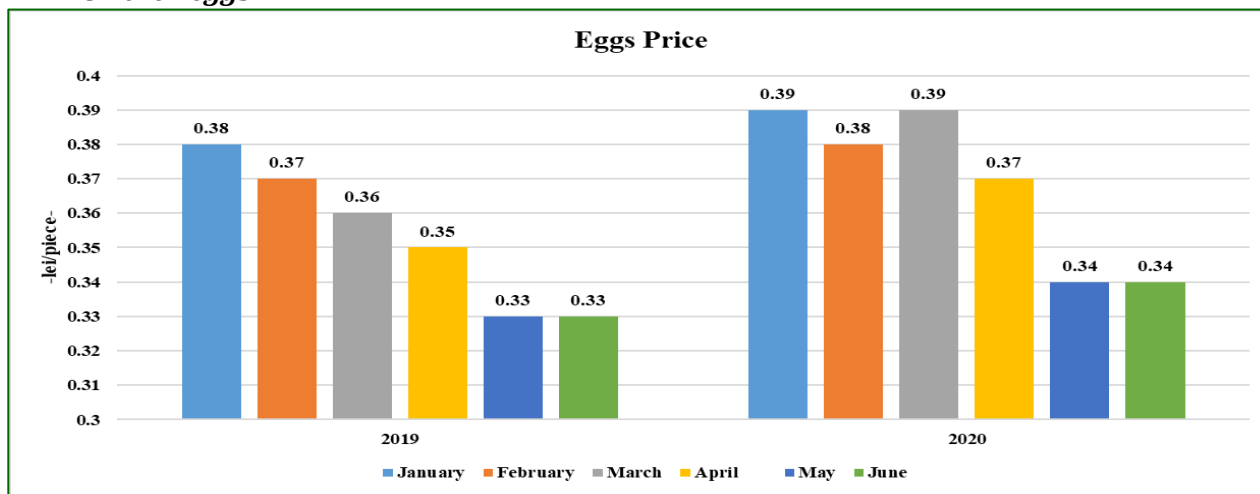
Chicken eggs

Figure 6. Dynamics of the average purchase price of chicken eggs Semester 1-2019 vs semester 1-2020

Source: Own processing based on INS data.

As can be seen from Figure 6, the price of chicken eggs in the first half of 2019 shows a decreasing trend, on average, by 2.78% per month, the coefficient of variation being small, 5.85%, and the average semester price being of 0.353 lei per piece. Analyzing the prices recorded in the first half of 2020, a similar evolution can be observed, but at a different level, respectively, during this period, the price of chicken eggs decreased, but starting from another level, on average the monthly rate was -2.7%, with a coefficient of variation of 6.29%, and the average price of the semester was 0.388 lei per piece.

In order to demonstrate, if this difference is statistically significant, the hypothesis will be tested using the t test, the hypothesis being that the average value of the first 6 months of 2019, differs from the average value of the first 6 months of 2020, respectively the difference between the means being different from zero.

Table 6

Hypothesis testing for the price of chicken eggs

	2019	2020
Mean	0.353333333	0.3683
Variance	0.000426667	0.0005
Observations	6	6
Pearson Correlation	0.933441006	
Hypothesized Mean Difference	0	
df	5	
t Stat	-4.391550328	
P(T<=t) one-tail	0.003538799	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.007077598	
t Critical two-tail	2.570581836	

Source: Own calculations based on the data in figure 1 using Data Analysis of MS Excel.

It can be seen from Table 6 that the absolute value of the statistical parameter t State is higher than the critical value (t Critical), and the significance level P is lower than the maximum accepted threshold of 0.05, so it can be seen that the hypothesis is confirmed, respectively the difference between the averages cannot be zero, in other words there is no possibility for the averages to be the same. As previously determined, the average price in the first half of 2020 (0.388 lei/piece) is 4.25% higher than the average price in the first half of 2019.

Following these analyzes on the price difference between the first half of 2020 and the first half of 2019, on the main agricultural products of animal origin, it can be stated that for 5 of the 6 products analyzed the prices increased significantly in 2020, compared to the same period of last year. Among the reasons it can be appreciated that the drought at the beginning of the agricultural year 2019-2020, continued with the one at the beginning of the calendar year 2020, significantly affected the crops, implicitly the animal feed. On the other hand, we consider that the Covid-19 pandemic indirectly affected the price of these products, which are somewhat dependent on imports, and the reduction of trade led to higher prices.

In this regard, two analyzes were performed on the two reasons stated above, thus, correlation coefficients were determined between the prices of agricultural products and the level of precipitation in the months under study.

Table 7

Correlation of precipitation with the price of the main agricultural products of animal origin

	Average rainfall	Poultry price	Beef meat price	Sheep meat price	Pork meat price	Cow milk price	Eggs price
Average rainfall	1						
Poultry price	0.49056	1					
Beef price	0.05613	0.61255	1				
Sheep meat price	0.34161	0.69479	0.50596	1			
Pork price	-0.02008	0.22955	0.79809	0.26272	1		
Cow milk price	-0.45690	0.08564	0.72107	0.04102	0.56559	1	
Eggs price	-0.73915	-0.51408	0.14983	-0.45112	0.21952	0.72759	1

Source: Own calculations based on data <https://www.catd.ro/> and INS using Data Analysis of MS Excel.

In table 7 it can be seen that there are only 3 links of medium and close intensity, between precipitation and the price of agricultural products (poultry, milk and eggs). There is a correlation coefficient of 0.49 between precipitation and the price of poultry, which suggests that there is a link of medium and positive intensity, contrary to the purpose of this analysis. For the other two quite strong relations, there is a correlation coefficient of -0.456 between the level of precipitation and the price of

milk and of -0.739 between precipitation and the price of eggs. These links of medium and high intensity, inversely proportional, show that when the level of precipitation decreases the price level for these two products increases, which is very possible to have happened this agricultural year as well.

In order to understand the impact that the COVID-19 pandemic had on prices, but also vice versa, the consumption of milk and eggs in the months analyzed and similarly correlated with the Pearson coefficient was analyzed.

Table 8

Correlation of average monthly consumption with the price of the main agricultural products of animal origin

Cow Milk	Monthly consumption	Price
Monthly consumption	1	
Price	-0.88902	1
Eggs	Monthly consumption	Price
Monthly consumption	1	
Price	-0.80535	1

Source: Own calculations based on INS data using Data Analysis of MS Excel.

As can be seen in Table 8, which determines the Pearson correlation coefficients between the price of milk and eggs and their average monthly consumption, in both cases, the coefficient has a close intensity relationship, but an inverse relationship. This can be contradicted by economic theory, but in this case, given that the value of the coefficients is over 0.8, representing a close relationship, it can be seen that when the price rose due to drought, and the difficulty of trade due to the pandemic, corroborated by the fact that the income level of the population decreased during this period, the consumption of these products of animal origin decreased, given the opposite trend to increase consumption of the main staple foods; the latter have replaced much of the animal protein, given the rising price and declining income of the population.

CONCLUSIONS

The aim of this paper was to determine the impact that the Covid-19 pandemic and the drought of this agricultural year may have on the prices of the main agricultural products of animal origin.

In this sense, the price levels were compared in the first half of 2019 and 2020, in order to determine the differences between them. Prices were studied for the following products: the four main species of meat (cattle, sheep, poultry and pigs), cow's milk and eggs. Following the analysis and testing of the hypothesis, using the t test, according to which the prices in the first half of 2020 are higher than in the first half of 2019, it was true for five of the six products analyzed, with the exception of poultry.

In order to determine whether the drought at the beginning of the agricultural year 2019-2020 and at the beginning of the calendar year 2020 affected the prices of the products under analysis, the level of precipitation in both periods and correlated with the Pearson correlation coefficient was taken into account. It was found that there is an indirect influence between the level of precipitation and the price of milk and eggs, in the sense that when the level of precipitation decreases, prices increase, this fact being easily explained given the plant production which is directly conditioned by meteorological factors and the share feed in the cost of obtaining milk and eggs is very high reaching almost 50%.

Analyzing the influence of the Covid-19 pandemic on the level of prices, the level of average monthly consumption was taken into account, this being recorded by statistics only for milk and eggs. Thus, performing a similar analysis, using the Pearson correlation coefficient, it was found that between the price level and the demand level there is a very close relationship, however, an inversely proportional one. Thus, it can be seen that although demand has decreased, the price level has increased. This strange phenomenon from the point of view of economic theory, is easy to explain given the situation we are going through. With the onset of the state of emergency, demand increased significantly, but this was only for staple and staple foods, coupled with declining household incomes and rising prices for animal products, there was a significant decline in consumption. The impact of the pandemic on the price of animal products can be identified in trade relations, which are altered by this unexpected phenomenon, so a reduction in supply on the market of these products has been noted by an increase in their price.

It can be concluded that both the drought and the COVID-19 pandemic indirectly influenced the prices of the main agricultural products of plant origin, the drought by decreasing plant production and thus increasing the cost of feed, and the pandemic by restricting trade, leading to declining market supply and rising prices, and this rise in prices coupled with declining revenues has led to a decline in the consumption of these products.

ANNEX

A1. Average Precipitation level

Precipitation level	2019	2020
January	78.75	9.725
February	11.475	52.075
March	36.6	37.6
April	48.95	25.15
May	152.7	93.025
June	87.15	148.125

Source: <https://www.catd.ro/>

A2. Dynamics of average monthly consumption

	Q1 - 19	Q2 - 19	Q1 - 20
Milk Demand	5.497	5.513	4.053
Eggs Demand	12.801	14.666	13.368

Source: NIS.

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**THE WELL-BEING OF THE OLDER PEOPLE IN THE REPUBLIC OF MOLDOVA:
DETERMINANTS AND CHALLENGES**

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ABSTRACT

It is attested at the national level that three-quarters of human capital aged 55 and over in Moldova represent an untapped potential for active aging, which means limited opportunities to get old in good health, to be active economically, to have a safe and secure social life. Meanwhile, more older people are in a group risk with high socio-economic vulnerability. According to national demographic prognoses, by the year 2035, every third person would be over 60. At the regional level, Moldova has the lowest indicators on the quality of life of the older people, on the human capital in older age and on the opportunities to empower this category of the population. The paper focuses to calculate and evaluate some indicators of well-being and social inclusion of the older people in the Republic of Moldova. The challenges which the older people population is facing (poor living conditions, financial and material deprivation, limited access, and quality of health services, restricted physical security, etc.) are highlighted. The analysis is based on the latest available national statistics and empirical data. To emphasize determinants of material wellbeing of the older people the binary logistic regression model had been developed based on primary data of the "Discrimination, abuse and violence against older people in Moldova" (2014, CDR, HelpAge) sociological survey of persons aged 60 and over. The factors, which have a significant impact on the material welfare of the older people, are residence area and age, labour market position, the migrant experience, educational attendance, self-perceived health, age-friendly community perception.

Keywords: older people, active aging, wellbeing, material welfare, Moldova.

La nivel național se atestă că trei sferturi din capitalul uman în vârstă de 55 ani și peste este un potențial nevalorificat și are oportunități limitate de a îmbătrâni în stare de sănătate bună, de a rămâne activ economic, de a avea o viață socială sigură. Între timp, tot mai multe persoane în vârstă se află în grupa de risc cu vulnerabilitate socioeconomică ridicată. Potrivit prognozelor demografice naționale, se estimează că până în anul 2035 fiecare a treia persoană va fi în vârstă de 60 ani și peste. La nivel regional, Moldova are cei mai mici indicatori privind calitatea vieții persoanelor în vârstă, capitalul uman la vârste mai înaintate și privind oportunitățile de împuternicire a acestei categorii de populație. Lucrarea se concentrează pe calcularea și evaluarea unor indicatori de bunăstare și incluziune socială a persoanelor vârstnice din Republica Moldova. În lucrare sunt evidențiate provocările cu care se confruntă populația în vârstă (condiții precare de trai, lipsuri financiare și materiale, accesul și calitatea limitată a serviciilor de sănătate, securitatea fizică limitată etc.). Analiza se bazează pe cele mai recente statistici naționale și date empirice disponibile. Pentru a sublinia factorii determinanți ai bunăstării materiale a persoanelor în vârstă a fost dezvoltat modelul de regresie logistică binară în baza datelor primare ale sondajului sociologic asupra persoanelor cu vârsta de 60 de ani și peste „Discriminarea, abuzul și violența împotriva persoanelor în vârstă din Moldova” (2014, CCD, HelpAge). Factorii, care au un impact semnificativ asupra bunăstării materiale a persoanelor în vârstă, sunt zona de reședință și vârsta, poziția pe piața muncii, experiența migrațională, nivelul de studii, sănătatea auto-percepută, percepția comunității prietenoasă cu vârsta.

Cuvinte-cheie: populația în vârstă, îmbătrânire activă, bunăstare, bunăstare materială, model de regresie.

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На национальном уровне три четверти человеческого капитала в возрасте 55 лет и старше представляет собой недоиспользованный потенциал и имеют ограниченные возможности стареть с хорошим здоровьем, оставаться экономически активными, иметь безопасную социальную жизнь. В то же время, все больше пожилых людей находятся в группе риска повышенной социально-экономической уязвимости. Согласно национальным демографическим прогнозам, каждый третий человек к 2035 году будет в возрасте 60 лет и старше. На региональном уровне в Молдове самые низкие показатели качества жизни пожилых людей, человеческого капитала в пожилом возрасте и перспектив расширения прав и возможностей для данной категории населения. В статье основное внимание уделяется расчету и оценке некоторых показателей благосостояния и социальной интеграции пожилых людей в Республике Молдова. Выделены проблемы, с которыми сталкивается пожилое население (плохие условия жизни, отсутствие финансовых и материальных средств, ограничения в доступе и качестве медицинских услуг, ограниченная физическая безопасность и т. д.). Анализ основан на самых последних доступных национальных статистических и эмпирических данных. Для того, чтобы подчеркнуть фактор важности материального благосостояния пожилых людей, была разработана модель бинарной логистической регрессии на основе первичных данных социологического исследования пожилых людей в возрасте 60 лет и старше «Дискриминация, жестокое обращение и насилие над пожилыми людьми в Молдове» (2014, ЦДИ, HelpAge). Факторами, которые оказывают значительное влияние на материальное благосостояние пожилых людей, являются место проживания и возраст, положение на рынке труда, опыт миграции, уровень образования, самооценка здоровья, благоприятное общественное восприятие возраста.

Ключевые слова: пожилые люди, активное старение, благосостояние, материальное благосостояние, регрессионная модель

INTRODUCTION

The aging coefficient of the population of the Republic of Moldova has increased significantly in the last 5 years, from a 17.5% (in 2014) to a 20.8% (in 2019) proportion of the population aged 60 and over, and from 10.3% to 13.7% for the population aged 65 and older (NBS 2019). Even if it ranks among the countries with a relatively young population, the median age of the population being 38.8 years (NBS 2019), the Republic of Moldova is aging faster compared to most European countries (Figure 1).

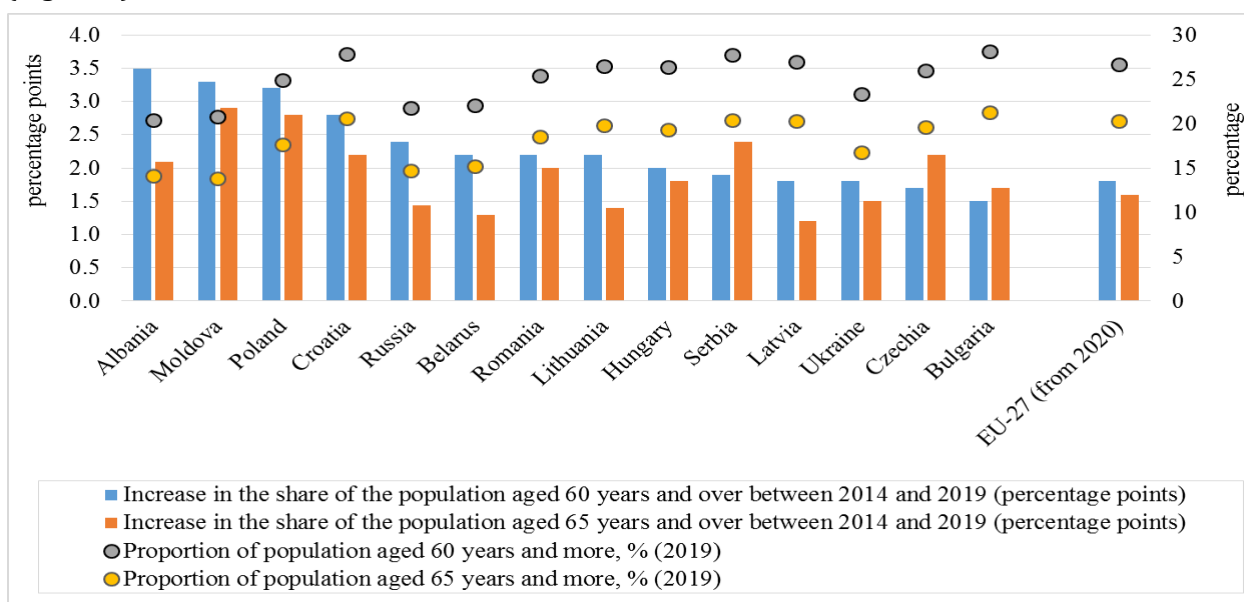


Figure 1. Population structure and aging in Moldova and some European country from the region, 2019

Source: Based on Eurostat (online data code: demo_pjanind); The Demographic Yearbook of Russia 2019; Ageing factor of the population of Moldova, as of January 1, 2014-2019. NBS, 2019.

In addition to one of the main reasons, which is the high mortality rate, the figures are also influenced by the low birth rate and the weight of the three large age groups (children, adults, and older people) in the total population. Furthermore, the driving force behind this trend is the massive emigration of working age people. During the 2007-2016 period, migration flows oscillated between 47-55 thousand people annually (Tabac and Gagauz, 2020) with an increase in the number of people migrating abroad. According to the latest census data (2014), 25% (or 805.5 thousand people) of the Republic of Moldova's total population are living abroad. Over 70% of emigrants are economically productive and of reproductive age (20-54 years).

On the one hand, there is a significant impact of emigration on the country's economy in terms of remittances, which initially served as a mechanism to reduce population poverty. Although in recent years, a decreasing trend in remittances due to weaker ties in the second generation of emigrants was attested, in 2019 remittances accounted for 16.3% of Moldova's GDP, and the country continues to rank among top states in Europe and Central Asia with the largest share of remittances in GDP (WB, 2020). On the other hand, the socio-economic losses from migration are proving to be much higher and longer-lasting, because qualified and young human capital is departing, including families settling abroad permanently, thus intensifying the tempo of the demographic aging process, the vulnerability of the population in old age, and the challenges for the socio-economic policy of Moldova.

Demographic prospects (Vienna Institute of Demography, 2018) attest that by 2025, the age group of 60 years old and over, will account for about 25% compared with the situation registered during the last Census (2014) - 17,3%. A national prognosis provided by the Centre for Demographic Research (Gagauz, 2018) estimates that by the year 2035, the population of the country could drop to 2,1 million and every third person would be over 60.

Moreover, the current precarious living standards and the low efficiency of social policies in Moldova reduces the opportunities for healthy and active aging of the population. According to national and international studies (Bussolo et al., 2015), Moldova remains behind at many components reported to the wellbeing of the older people. So, compared to European countries, Moldova has the lowest values at three international indicators for assessing the situation of the older people: *Global Age Watch Index* – 35.1% (HelpAge International, 2015), *Human Capital Index* for age groups 55-64 years old – 73.5%, and 65 age and over – 58.7% (WEF, 2016), *Active Aging Index* – 26.6% (updated version in 2019 based on Buciuceanu-Vrabie, 2016), which confirm that the aging process is compromised and imposes the biggest challenges for national policies.

LITERATURE REVIEW AND RESEARCH ON AGING IN THE REPUBLIC OF MOLDOVA

The rapid pace of the demographic aging process has generated changes in the approach to aging both from a generational perspective and from a stratification perspective. At the same time, there is a firm tendency to reject the concept of aging as a dysfunction. In international practice, the assessment of the standard of living and the quality of life of the older people in society is a central component in studies on population aging (UNECE, 2012; European Union, 2014). There is an objective approach to quality of life that can be measured by direct indicators (income and expenditure, poverty level, social and medical services, morbidity, infrastructure, and various utilities, etc.) and the subjective approach, where the quality of life is defined by self-assessment by the target group (Bowling, 2005).

Delimiting social strategies at the level of policies needed to protect, integrate, and improve the living standards of the older people becomes imperative. In the Republic of Moldova, the intensity of addressing the problems and needs faced by the older people as a social group has especially increased in the last decade. A significant contribution to the knowledge of the demographic aging process and its consequences at the national level were brought by authors Gagauz (2004, 2009, 2012, 2016), Paladi et al. (2009), Sainsus (2010), Cheianu-Andrei (2011), Savelieva et al. (2014), and others.

In the period 2010-2012 a complex research titled "The Aging Population in the Republic of Moldova" (Poalelungi et.al., 2012) was carried out, at the initiative of the government, to determine the real situation of the older people. Also, several studies on the problems faced by the older people and in particular, the abandonment of adult children due to labor migration (NBS 2010; Cheianu-

Andrei et al., 2011) as well as one of the first studies on violence and discrimination against elderly people in Moldova (Gagauz and Buciuceanu-Vrabie, 2015) were conducted.

The Republic of Moldova is committed to fulfilling the Regional Implementation Strategy of the MIPAA (2002) in order to join international practices and requirements aimed at promoting a society for all ages. The Roadmap on Integration aging in the Republic of Moldova (2011) was developed and the Program for the Integration of Aging Issues in Policies and its Action Plan on the Implementation of the Roadmap for Integrating the Issues of Aging in Policies 2014-2016 (Government Decision, 2014) was adopted in order to organically reflect the problems of aging in all policy areas at the national level and to pursue institutional adaptation to demographic processes. In 2016, according to international procedures, the relevant state bodies, with support of the UNFPA/UNDESA, organized an evaluation exercise on the implementation of MIPAA/RIS (The MIPAA Regional Implementation Strategy for the UNECE Region) in Moldova (Bodrug-Lungu and Stafii, 2016). In 2016, the Active Age Index (AAI) was developed, adjusted, and calculated (Buciuceanu-Vrabie, 2016) for the first time in the Republic of Moldova, being an important tool to assess and to monitor the MIPAA/RIS implementation, an indicator for comparing the active aging across European countries, and for identifying the strengths and weaknesses of a country for this component (Zaidi et al., 2013).

However, complex and current studies on the quality life of the older people are sporadic at the national level, and the present study seeks to fill the gaps by providing new evidence from the Republic of Moldova. The objective here is to analyze recent trends registered by elderly people wellbeing indicators and to assess the determinants associated with their material welfare.

DATA AND METHODS

In terms of this paper, wellbeing issues are reflected through objective data based on latest available official statistics, but also through the subjective data of empirical studies on the self-perceived views of the elderly on their material welfare.

To assess the standard of living and to calculate some indicators of well-being and social inclusion of the older people in the Republic of Moldova, the analysis of primary statistical data provided by the National Bureau of Statistics (NBS) and the secondary analysis of representative empirical studies were performed (Table 1). The latest available and accessible data were taken as a reference. The analysis had been performed only on the sub-sample of people aged 55 and over or people aged 60 and over, depending on the accessibility and the structure of each database. It was also differentiated by gender and area of residence (urban/rural).

Table 1

Latest available statistical and empirical databases used in the analysis

Survey	Year of reference	Source
Labour Force Survey (LFS)	2014-2018	National Bureau of Statistics (NBS)
Household Budget Survey (HBS)	2013-2018	NBS
Population and Housing Census	2014	NBS
Discrimination, abuse, and violence against older people	2014	Centre for Demographic Research (CDR), HelpAge
Public Opinion Barometer (POB)	2018	IPP (Institute of Public Policy, Moldova)
Pilot research Volunteer activity (as a component module of LFS)	2015	NBS
Pilot research Access of Health Care (as a component module of HBS)	2016	NBS

Source: Own compilation.

The binary logistic regression model was used for assessing the association between several demographic, socioeconomic, and psychosocial variables and the material welfare of the older people. Regression analysis was performed in the SPSS statistical analysis software, based on primary data of

the “Discrimination, abuse and violence against older people in Moldova” sociological survey (CDR, HelpAge, 2014), and included the sample of people aged 60 and over – 1096 cases (persons).

The dependent variable is *bad material welfare*, and was built on the alternative answer of personal income self-appreciation that „*it is not enough to cover even basic expenses*”. Thus, the *target group* in the regression model were persons aged 60 and over who attested a *hard material situation that isn't even enough for strict necessities*.

The independent variables integrated into the regression models are focused on:

✓ *demographic predictors* – age, sex, type of residence. The variable age was measured by five-year age groups and variables such as type of residence and sex were recodified.

✓ *socio-economic predictors* – the relationship with the labor market, the level of education, the migratory experience in the family, the state of health. All variables were recodified. The position on labour market was recodified and only measured by two categories: employed on the labour market, and un employed. The level of education is measured by three categories: tertiary, post-secondary non-tertiary, secondary level. The variable health assessment was recodified on three levels, the first one being positive and the last one being negative. Within the variable migration experience, only two levels were built: the existence, in the last three years at least, of a personal migration experience or the migration experience of a close family member (spouse, adult child), as well as lack of migration experience.

✓ *psychosocial predictors (or age-friendly community predictors)* – mental well-being (measured by self-perception of the attitude of others, the feeling of loneliness/isolation), social status (respect in society). The last regression model analyzes certain subjective assessments regarding the attitude that older people feel towards them. In this model, the analyzed variables were: I feel respect and a favourable attitude from those around me, I feel lonely and socially isolated, I feel that I am not treated with dignity and respect because of my age. All variables were recodified on two levels – positive or negative appreciation.

CONDUCTING RESEARCH AND RESULTS

According to the latest revised Moldova's demographic indicators (NBS, 2019), the profile of the population aged 60 and over attested that every third person is between 60-64 years of age and every 10th is over 80. The female and male population is aging differently: about 60% of the total number of the older people are women. About 71% of older women report in the 60-74 age group, and one in five in the 75-85 age group. Worth mentioning that, if other countries are aging as a result of an increase in life expectancy, the ageing of Moldova's population is developing in parallel with maintaining a high mortality rate. Moreover, low values of living standards cause a low expected duration of a healthy life.

Indicators in Table 2 reflect an overview of the elderly people quality of life in the Republic of Moldova. The situation is worrying. About three-quarters of the human potential aged 55 and over is untapped and has very limited chances to enjoy active and healthy aging, together with a participative, self-sufficient and secure life. The situation has been more difficult for women and the population of rural areas.

Table 2

Some indicators regarding the well-being and social inclusion of the elderly population of Moldova (latest available data)

	Total	Men	Women	Urban	Rural
Life expectancy (2018), years (NBS, 2019)	70.6	66.2	75.0	-	-
Life expectancy at age 60 (2018), years (NBS, 2019)	17.01	14.81	19.21	-	-
Healthy life expectancy at age 60 (2015), years (Gagauz et al, 2017)	11.25	10.7	11.8	-	-
Educational attainment of population aged 55 to 74 (share of older persons aged 55-74 with upper secondary or tertiary educational attainment (ISCED scale)), % (2018, LFS, NBS)	72.3	79.4	67.4	85.7	62.4
Access to health services of people aged 55 and over, % (2016, HBS, NBS)	65.2	71.4	61.5	70.5	62.1

	Total	Men	Women	Urban	Rural
Independent living arrangements of people aged 65 and older, % (2014, Census, NBS)	59.8	56.7	62.6	55.8	61.7
Independent living arrangements of people aged 75 and over, % (2014, Census, NBS)	62.3	58.2	65.3	56.0	65.0
The ratio of the median disposable income of people aged 65 and above to the median disposable income of those aged below 65 (2014, HBS, NBS)	55.3	65.8	43.7	48.6	57.8
No poverty risk for people aged 65 and older, % (2013, HBS, NBS)	84.1	84.5	83.8	91.1	79.1
Share of people aged 60 and over having enough income to cover basic expenses or /and more than basic expenses (self-report), (2018, POB, IPP)	53.3	68.8	43.1	59	46.9
Share of retirees (people aged 57/62+)* with average income greater than or equal to specific national thresholds of existence minimum, % (2018, HBS, NBS)	54.4	-	-	70.1	49.7
Physical safety of people aged 55 and older, % (2018, POB, IPP)	53.9	62.5	47.6	46.2	59.0
The mental well-being of people aged 60 and over, % (2014, CDR, HelpAge)	62.1	66.5	59.9	65.7	59.9
Lifelong learning among people aged 55 to 74 years, % (2014, Census, NBS)	0.2	0.2	0.2	0.4	0.1
Share of people aged 55 and older with high chances to actively and healthy aging, to participative, self-sufficiency and secure life (AAI, 2016), % (2019 updated version based on Buciuceanu-Vrabie M., 2016)	26.6	28.9	24.5	27.3	23.7

Note: *In Moldova women are retiring at age 57 and men at age 62. Starting to June 2017, retirement age was increased, with the intention to reach age 63 for both men and women by 2028.

Source: Own compilation based on national statistics and empirical databases presented in Table 1.

According to official statistics, the *relative median income* of people aged 65 and over is about 112 EUR which is almost twice smaller compared with the income of people aged below 65 (203 EUR) (last available data 2014, HBS, NBS). If pension systems may play an important role in reducing poverty among the older people in EU countries, in the Republic of Moldova, the small amount of pensions is one of the determinants for the material vulnerability of elderly people. For 65% of the population aged 55 and over the pension is their main source of personal income. The average monthly size of the retirement pension is about 83.4 EUR and only since 2018 has it slightly exceeded the value of minimum living expenses (79.9 EUR) for this category of the population (old-age retirees). If in the case of retired men, the value of the pension (98.4 EURO) exceeds the monthly subsistence minimum by about 20%, then in the case of women the pension (77.1 EUR) does not even complete the value of the necessary minimum for living. The gender gap between pensions is about 22%. It should be noted that, due to the higher share in the older population and the difference in longevity between women and men, 70.6% of the total retirees for old age are women. Therefore, a good part of the older population, especially women, have a precarious financial situation.

The analysis of empirical data in the field (BOP, IPP, 2018; CDR, HelpAge, 2014) attest that for every second older person aged 60 and over, monthly income is insufficient to cover even the basic needs, and this reality has been maintained over time. The situation is significantly different for older women and seniors from rural areas, where only 43% and respectively 47% are outside severe material deprivation, compared to men (69%) and those from urban areas (59%). With age, the financial situation becomes more difficult, the share of the older people who have no financial sources to cover their basic expenses is increasing (48.3% for those aged 60-64 and about 61% for those aged 80 and over).

Low standards of living influence all aspects of older people' life, including health. Over several decades, Moldova has not achieved sustainable progress in healthcare. Low health indicators

characterize the total population per general and the elderly in particular. The life expectancy at birth is about ten years lower than the average in EU countries and amounts to 75 years for women and 66.2 years for men (NBS, 2019). This reality is explained, in particular, through the maintenance of a high mortality rate among the working-age population, with a high gender gap, men being more affected (Pahomii, 2018). Life expectancy at the age of 60 for men is 14.8 years and for women is 19.2 years (NBS, 2019). According to the latest studies, healthy life expectancy at age 60 is 10.7 years for men and 11.8 for women, respectively. The proportion of time spent in good health at the age of 60 is higher for men (up to 74%) than for women (only 63%) (Gagauz et al., 2017). The gender aspect is evident: although women have a higher life expectancy than men do, the presence of various chronic diseases lead to more years in poor health and/or disability. Thus, it is found that in addition to the much more deficient financial situation and loneliness the quality of life of older women is exacerbated by a worse health status.

Among old people, one third appreciated (self-perceived) their health as bad and very bad, and more than two-thirds attested that they are suffering from various chronic diseases (NBS, 2016). Furthermore, the accessibility of medical services is reduced. Estimates based on official data (HBS, NBS, 2016) attests, only two-thirds of people aged 55 and over have access to medical services when they need them – a very low performance compared to the average result score of 88.2% per EU (UNECE/European Commission, 2019). Because of poorly developed infrastructure, access to medical services is even more limited for the aging people in villages – only 62%, compared to those in the city (about 71%). Besides, the discrimination by age is a widespread phenomenon in treatment access, diagnosis and long-term care (Poalelungi et al., 2012; Gagauz and Buciuceanu-Vrabie, 2015). According to the self-assessment of the needs (CDR, HelpAge, 2014), most of the older people expressed their imminent need for a financial aid (63.4%), purchase of medications (51.2%) and assistance regarding the obtainment of medical services (35%). At the same time, from the official statistics (NBS, 2019), we notice the monthly consumption expenditures of the seniors are concentrated mainly for food, household maintenance, medical care, and health. Despite free compulsory medical insurance for pensioners, older people spend monthly almost twice more funds for health and medical care than the country's average.

The results of the regression analysis presented in Table 3 have shown that, among demographic predictors, the *residence area* and *age* have the most significant impact on the older people's material welfare, while the impact of *gender* discrepancies is lower.

Table 3

Logit regression of material deprivation („hard material situation that is not even enough for the strict necessities”), demographic predictors

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Residence area	.368	.124	8.744	1	.003	1.445
	Sex	-.107	.131	.674	1	.412	.898
	Age	.109	.043	6.263	1	.012	1.115
	Constant	-.295	.152	3.785	1	.052	.744
Cases included in analysis 1088 (99.3%), Nagelkerke R Square 0.020							

Source: Author' calculations based on primary data of the sociological survey "Discrimination, abuse and violence against older people in Moldova" (2014, CDR, HelpAge).

Thus, in the *rural area*, the older people are about 1.5 times more exposed to the risk of poor material welfare than those from urban areas. Besides, aging increases the risk of material deprivation by 1.1 times. It should be noted that the first two independent variables are statistically significant ($p=0.003$ and $p=0.012$ respectively), while the sex variable is not ($p = 0.412$).

Referring to the socioeconomic predictors (Table 4), a significant impact has the *status/position of the older people on the labour market*.

Table 4

Logit regression of material deprivation („hard material situation that is not even enough for the strict necessities”), socioeconomic predictors

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Employment	.649	.216	9.036	1	.003	1.914
	Self-perceived health			8.500	2	.014	
	Very good/good	-.547	.195	7.892	1	.005	.579
	Fair health	-.248	.143	2.981	1	.084	.781
	Migration experience	-.345	.128	7.211	1	.007	.708
	Educational attendance			31.766	3	.000	
	Tertiary	-1.242	.236	27.643	1	.000	.289
	Post-secondary non-tertiary	-.647	.224	8.324	1	.004	.524
	Secondary	-.330	.181	3.313	1	.069	.719
	Constant	.415	.280	2.193	1	.139	1.514
Cases included in analysis 1079 (98.4%). Nagelkerke R Square 0.104							

Source: Author's calculations based on primary data of the sociological survey "Discrimination, abuse and violence against older people in Moldova" (2014, CDR, HelpAge).

For the seniors who are not employed, the probability and the risk to have precarious material conditions of living increases about 2 times. The presence of either personal *experience of emigration* or the *experience of emigration* by a close family member, in the last three years, reduces the risk for a bad material situation 0.7-fold. This could be explained by the dependence of remittances that cover some expenses. In 2018, remittances constituted around 8% of the retirees income sources (HBS, NBS, 2018), for those in rural areas twice more than in urban ones. Another socioeconomic determinant is *health*. By the regression model is attested that people who self-assess their health more positively are even less exposed to a negative assessment of material well-being – about 0.6 times for those who self-perceived their health as very good or good, compared to those with very bad or bad health perception. The same situation is observed regarding the older people's *education attendance*: the risk of material deprivation increases for people with a low level of education. It is important to note that the last two variables, both the health perceived of health and educational attendance are not statistically significant.

It is worth mentioning that the labour market in the Republic of Moldova is poorly developed and unfriendly to people of older age. In general a relatively high level of educational attendance among population aged 55-75 years is attested – about 72% hold at least upper secondary educational attainment (ISCED scale) (LFS, NBS 2018), compared to the 65,2% average in EU countries (UNECE, 2018). But, the lack of jobs, poor health in older age, the presence of stereotypes, the absence of lifelong learning opportunities (only 0,2% for population aged 55 years and over (Census, NBS, 2014), compared to 5.1% – the EU average (UNECE, 2018)) increase the vulnerability of remaining occupationally unintegrated at older ages.

More than 75% of the human capital aged 55-74 represent an untapped potential for the productive work sector (own calculations based on LFS, NBS 2019). From the perspective of age, only one in four is active on the labour market at the age of 55-64 years and only one in fourteen (7.6%) at age 65-74. Reality shows a clear gender and area gap: the employment is about 20% among women aged 55-74 (compared to men – 29%), and about 21% in rural areas (compared to 28% in urban

areas). In reality, employment in the rural areas is lower than the one in urban areas for the entire population as well. First, due to the lack of real jobs. There are no units of production (factories), and the activity in the agricultural field is for many an informal one, self-assured and unpaid. Secondly, rural areas have an even older population, and after retirement (at age 57 for women and age 63 for men), the opportunities to stay on the labour market are very small. In general, some of those working in education, public administration, health and social assistance can continue their activity. Another problem is health status. Both qualitative researches (Gagauz and Buciuceanu-Vrabie, 2015; Poalelungi et.al., 2012), as well as quantitative surveys (LFS, NBS, 2017), show that although some want to work, more than half do not because of their health.

According to official statistics of the total number of old-age pensioners, those who work after retirement account to about 21%, the share being higher for men and those in urban areas, amounting to a quarter. More than two thirds (68.5%) work in agriculture, public administration, education, health and social work. The extension of working activity has a positive effect on the financial situation of the older people. Based on LFS surveys it is attested that the vast majority (about 87%) of retirees who have a job, work out of the need to ensure sufficient income for their own family (LFS, NBS, 2017).

The last regression model analysis includes age-friendly community and social relation predictors (Table 5). Therefore, the impact of older people's perceptions or feelings about others' attitude towards them and their material welfare status was tested. So, the older people who feel a bad attitude towards them are about 3.5 times more at risk of material deprivation than those who feel a positive attitude from others.

Table 5

Logit regression of material deprivation („hard material situation that is not even enough for the strict necessities”), age-friendly community predictors

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Feel the respect and favourable attitude from those around	1.247	.378	10.874	1	.001	3.479
	Feel lonely and socially isolated	.229	.136	2.816	1	.093	1.257
	Feel that I am not treated with dignity and respect because of my age	.296	.134	4.904	1	.027	1.344
	Constant	-.107	.090	1.414	1	.234	.899
Case included in analysis 1002 (91.4%). Nagelkerke R Square 0.035							

Source: Author' calculations based on primary data of the sociological survey "Discrimination, abuse and violence against older people in Moldova" (2014, CDR, HelpAge).

Also, the elderly people who mentioned that they do not feel to be treated with dignity and respect because of their age, are 1.3 times more at risk of poor material well-being compared to those who enjoy a positive/friendly attitude from those around. In conclusion, it is shown that in an age-friendly community, which leads to intergenerational solidarity, that promotes positive attitude for age needs and which is open to help (old people)/the seniors, the quality of life and material wealth of the older people could be improved.

CONCLUSION

For the Republic of Moldova, it is obviously necessary to adapt to the demographic aging of the population much faster than developed countries. However, at the country level the serious obstacles to succeeding in this direction are highlighted. The deep socio-economic and political crisis of the last two decades, the level of national income, as well as social infrastructure and social welfare potential, is exacerbating the living standards of the population with enormous consequences for vulnerable groups such as the elderly.

Besides ongoing attempts to adjust social policies, including those concerning demographic security and the prevention of the effects of aging, to international requirements and recommendations, the quality of life and well-being of the older population has not changed. On the contrary, it is becoming more and more compromised and with very little chance for active aging, even for elderly populations in the future.

The presented analysis shows a large gender gap and discrepancy by area of residence. Older women and old population from villages are the most affected. Regression analysis highlights an equation of factors where age, residence area, relation with the labor market, migrational experience, health, age-friendly attitude and perception appears to be the most important among determinants of the material deprivation for elderly people.

The main policy challenges in the context of ensuring subsequent active aging in Moldova are the low standard of living and the citizens' low level of material well-being, and to a more profound extent for those of old age, a labor market that is poorly developed and unfriendly to elderly age, deficient leverage for various activities with social involvement, lack of solidarity between generations, and the shortage of independent, healthy and safe living conditions.

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**A CRITICAL REVIEW OF YOUTH-ORIENTED POLICIES
IN THE REPUBLIC OF MOLDOVA FROM THE PERSPECTIVE OF YOUTH TRANSITION REGIME**

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ABSTRACT

Youth issues have long been a focus of policy in Moldova, despite an uneven trend over time. The aim of the article is to analyze the main policy documents devoted to youth within key policy areas that invest in the development and efficient use of human capital from the perspective of the Youth Transition Regime. A mixed-method approach was applied: situation and contextual analysis, review and analysis of policy documents, reports and studies targeting young people. The review and analysis of policy framework has revealed that although youth issues are promoted through various policies, there is a lack of an integrated approach and a comprehensive evaluation mechanism on the implementation of youth policies, including cross-sectoral dimension. Youth-related policies falls into a 'transitional' regime characterized by an integrated education system, high rate of early leavers from education and training, high level of youth rate Not in Education Employment or Training – NEET, low popularity/prominence of Vocational Education and Training, poor concordance between the education system and the labour market. The evaluation of policy measures intended to facilitate the transition of young people to adulthood shows that individualized and compensatory approaches predominate. Policy actions are focused mainly on youth skills development and less on structural policy measures in cross-sectoral areas. There is a need to review and adapt youth policies and strategies to the current and real needs of youth by promoting participatory approaches that would reflect the diversity of youth in Moldova, especially in socially vulnerable groups.

Keywords: *young people, challenges, youth policy, transition regimes, welfare citizenship.*

Problemele tinerilor au constituit o sursă de preocupări pentru dezvoltarea unor politici de tineret în Republica Moldova, deși a avut o evoluție oscilantă de-a lungul anilor. Scopul articolului este de a analiza principalele documente de politici destinate tinerilor în domeniile-cheie care investesc în dezvoltarea și utilizarea eficientă a capitalului uman din perspectiva regimului de tranziție al tinerilor. A fost aplicată metoda mixtă: analiza situației și contextuale, cartografierea și analiza documentelor de politici, rapoarte și studii care vizează tinerii. Analiza cadrului de politici au arătat că în pofida unui număr important de strategii, programe destinate tinerilor, se atestă lipsa unei abordări integrate și a unui mecanism de evaluare complex privind implementarea politicilor de tineret. Politica de tineret se încadrează în regimul „tranzitoriu” caracterizat printr-un sistem de educație integrat, o rată ridicată a părăsirii timpurii a educației și formării, un nivel ridicat al ratei tinerilor înafara sistemului de educație, ocupare și formare profesională – NEET, o popularitate/proeminență scăzută a învățământului profesional tehnic, o concordanță slabă între sistemul de învățământ și piața muncii. Evaluarea măsurilor de politici menite să faciliteze tranziția tinerilor la viața de adult arată că predomină abordările individualizate și compensatorii. Măsurile de politici se concentrează mai mult pe abilitarea profesională și soluționarea deficiențelor individuale și mai puțin pe măsuri structurale în domenii intersectoriale. Este necesară revizuirea adaptarea politicilor și strategiile pentru tineret la nevoile lor actuale și reale, promovând abordări participative care să reflecte diversitatea tinerilor din Moldova, în special grupurile social vulnerabile.

Cuvinte-cheie: *persoane tinere, provocări, politici de tineret, regimuri de tranziție, cetățenie social.*

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Проблемы молодежи на протяжении долгого времени является предметом внимания политики Молдовы, несмотря на неравномерную тенденцию. Цель статьи - проанализировать основные документы по вопросам политики связанные с молодежью в ключевых областях, которые инвестируют в развитие и эффективное использование человеческого капитала с точки зрения молодежного переходного режима. Применялся смешанный подход: ситуационный и контекстный анализ, обзор и анализ стратегических документов, отчетов и исследований, ориентированных на молодежь. Обзор и анализ стратегических документов показали, что хотя вопросы молодежи продвигаются в рамках различных политик, отсутствует комплексный подход и всеобъемлющий механизм оценки реализации молодежной политики, включая межсекторальный аспект. Политика, связанная с молодежью, относится к «переходному» режиму, характеризующемуся интегрированной системой образования, высоким показателем досрочного ухода из образования и профессиональной подготовки, высоким уровнем показателя молодежи вне сферы образования, занятости и профессиональной подготовки – NEET, низкой популярностью/релевантностью профессионального образования и обучения, плохим соответствием между системой образования и рынком труда. Оценка политических мер, направленных на содействие перехода молодых людей к взрослой жизни, показывает, что преобладают индивидуализированные и компенсационные подходы. Действия политики сосредоточены в основном на развитии навыков молодежи и меньше на мерах структурной политики в межсекторальных областях. Необходимо пересмотреть и адаптировать молодежную политику и стратегии к их текущим и реальным потребностям, продвигая совместные подходы, которые отражали бы разнообразие молодежи в Молдове, особенно социально уязвимых групп.

Ключевые слова: молодежь, вызовы, молодежная политика, переходные режимы, социальное гражданство.

INTRODUCTION

It is widely agreed that investing now in human capital of youth will provide long-term benefits and contribute to the inclusive and sustainable economic growth of the country. Thus, it would possible to take advantage of the benefits of an active, innovative and skilled workforce and avoid significant social and economic costs due to educational and occupational exclusion of young people. There are also youth challenges related to demographic changes, high emigration rate, weak correlation of the education and training system with labour market requirements, poverty, social exclusion and other issues. These challenges create the requirement for a strong government's political commitment and need for specific policies and strategies tailored to certain categories of young people.

Broadly defined, national youth policy is `a government's commitment and practice towards ensuring good living conditions and opportunities for the young population of a country` (Denstad, 2009), as well is `a long-term strategy, a general framework accompanied by an action plan to be implemented in the youth field, previously approved by a governmental structure or public authority` (Pîslaru, 2019). According to country strategic documents, the youth policy in Moldova is `a set of principles, methods and measures designed to ensure participation opportunities, well-being, personal and professional development for young people` (Law on Youth, 2016). At least declaratively, it represents an integrated cross-sectorial approach, addressed to and involving young people, while starting from their needs.

The main aim of the article is to describe and analyse main policy initiatives in Moldova devoted to youth within key policy areas that invest in the development and efficient use of human capital and are relevant for the Youth Transition Regime. This includes an institutional and policy framework related to the education and training system, employment regulation and social security and protection system with an emphasis on youth transition policies. In addition, the extent to which these policies respond to the problems and needs of young people is estimated by taking the main indicators in the targeted areas as points of reference.

Despite high-level policy advocacy, the comprehensive and integrated youth policy has remained largely rhetorical and is scarcely studied based on new approaches. This study intends to

cover this gap by making interferences along the dimensions of youth transition theories. Moreover, the study targets to emphasize priority areas for future actions and measure by government for the development of a more comprehensive national youth policy.

LITERATURE REVIEW

Youth policy should respond to both country specific problems as well as global trends and challenges. Most studies in the field show that global trends and social changes, such as increasing inequality and exclusion, labour market insecurity, family fragility have affected the younger generations to a greater extent than the older ones (Taylor-Gooby, 2005; Walther & Pohl, 2007). The current era is usually characterized by the notion of `de-standardization` (Walther & Pohl, 2007) with important implications on the process of transition of young people towards adulthood, which involves a greater variety of family models and lifestyles, diversified educational pathways, as well as longer, varied, unstable and uncertain transitions to work (Leccardi, 2006), (Ganta & Shamchiyeva, 2016).

Similar to other countries in the region, young people in Moldova face multiple and interdependent challenges. The Youth Multidimensional Deprivation Indicator (Y-MDI)¹ shows that more than one-third (36.2%) of youth suffer from deprivation in multiple wellbeing dimensions such as education, employment, health, civic participation and social inclusion. Deprivations in employment and civic participation are more significant (40.5% and 41.4% respectively) (OECD, 2016). Moreover, many young people in Moldova are facing poverty and social exclusion, while the places of residence in which they live and work are most likely to influence their standard of living. Thus, there is evidence of widening social inequality between young people in rural areas compared to urban areas. Rural settlements, as well as small towns, have lower economic potential, higher poverty levels, limited access to many goods and services and also fewer opportunities for the development of young human capital (Crismaru, Gagauz, & Buciuceanu-Vrabie, 2018).

A particular concern is youth integration on the labour market as they are facing a number of challenges in the school to work transition. At the same time, economic recession and political instability still reduce their chances to integrate into the domestic labor market. Thus, researches focusing on the transition from school to work have both highlighted a range of individual and systemic factors that influence the occupational integration of young people in Moldova (Buciuceanu-Vrabie & Gagauz, 2017; Ganta & Shamchiyeva, 2016): limited number of jobs and low quality jobs, low salaries, informality; continuous emigration flows, dependence on remittances; regional and rural/urban discrepancies; unequal opportunities, low mobility; gender gap in the access and quality of employment (young women, especially with little children, being most discouraged on the labour market).

The cumulative effect of all these problems is leading to `dis-integration`, which means the disengagement and alienation of young population of the country from three central forms of citizenship. From political citizenship, as they feel that the government is not pursuing the right policies and the level of trust in public institutions is low. From economic citizenship, as they are unable to find jobs or to enter the formal labour market and from social citizenship, as they feel that the state is not giving them the kind of support through life transitions (Abbott, Wallace, & Mascateanu, 2010). As a result, many young people choose to go abroad and increasing rates of emigration during the last decades come to confirm that.

Therefore, not only the complexity of the problems is reiterated, but also the requirement for a comprehensive, cross-sectoral, coherent policy targeting different categories of young people in their transition to independent adult life.

Conceptual framework. The conceptual and analytical framework of relevant policy measures to support young people in transition to independent adult life is known as the Youth Transition Regime developed by Walther (Walther & Pohl, 2007; Walther, 2006) and the Youth Welfare Citizenship developed by Chevalier (Chevalier, 2016; Chevalier, 2017). The `Youth Transition Regime`

¹ This indicator measures the share of youth affected by multiple deficits in the areas of education, employment, health, civic participation and social inclusion at the same time, OECD, 2017.

encompasses the institutional and policy framework, which includes education and training systems, employment regulation and social protection system (Walther, 2006). The “de-standardization” of youth transition and the emergence of new risks of social exclusion have led to the development of new transition policies (‘activation’ policies, social investment policies etc.). These policies differ widely between countries, but all tend to reduce dependence on social protection towards labour market integration, while school-to-work transitions are primarily focused on ‘disadvantaged young people’. Young people are disadvantaged if they do not have key premises and resources for a standard transition process and refer to an interconnected model between the structure and the agency (Walther & Pohl, 2007) (Figure 1).

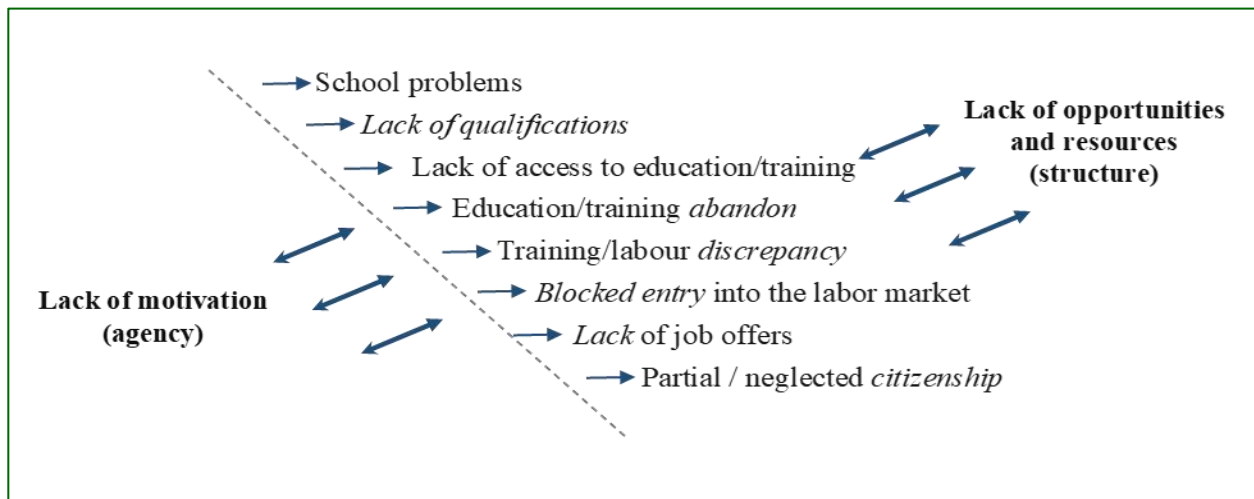


Figure 1. Interconnected model between the structure and the agency

Source: Walther, 2007.

Furthermore, in relation to school-to-work transitions two main ways of interpreting (diagnosing) and approaching (policies) disadvantages are identified:

✓ ‘Young people are disadvantaged because they are unemployed’ - a structural diagnosis that requires structural policies to increase labour demand. Relevant in countries where the youth unemployment rate is high.

✓ ‘Young people are unemployed because they are disadvantaged’ - a diagnosis that refers to individual deficiencies, i.e. lack of skills or unwillingness to work, and the need for policies aimed at helping young people by increasing their employability (training).

Another aspect in policy analysis is ‘preventive vs. compensatory’. If the policy actions are preventive, then the approach is broader and mostly related to infrastructure, while the compensatory ones are focusing on young people who are already facing disadvantages, for example those who have dropped out of school or are unemployed.

Chevalier [Chevalier, 2019; Chevalier, 2016] calls policies aimed at promoting youth autonomy ‘Youth Welfare Citizenship’, i.e. the possibility for young people to access financial resources for maintenance and participation in society, which is structured through state interventions and public policies. The state can promote this independence by helping individuals to get a job, a process called ‘economic citizenship’ regulated by education and employment policies. At the same time, it can offer young people resources in the form of aid/allowances, such as support for the family, for pupils/students, for purchasing a dwelling, unemployment benefits, which is called ‘social citizenship’. As well, Chevalier (Chevalier, 2019) specify that economic citizenship may have two forms - ‘inclusive’ (from the ‘learning-first’ perspective) or ‘selective’ (from the ‘work-first’ perspective). It is inclusive when it seeks to provide skills to all young people by reducing early school abandonment. Subsequently, employment policy proposes programs to provide a second chance to low-skilled young adults (i.e. in the EU there is the ‘Youth Guarantee’ program). On the contrary, it is selective when the education system is elitist and produces significant educational inequalities. The employment policy, from the

perspective of 'work-first' focuses on reducing labour costs and creating atypical jobs that would make it easier for young people to access jobs. It does not have the prerogative to compensate for inequalities in education or to offer a second chance, but rather to develop low-skill jobs. The 'social citizenship' is divided into 'familiarized' vs. 'individualized'. It is 'familiarized' when young people are considered children, given the high age limits (approximately 25 years) and they remain 'dependent children' in social protection. In turn, is 'individualized' when young people are considered adults, and lower age limits allow them to more easily access social assistance/allowances.

DATA SOURCES AND USED METHODS

In order to achieve study goals the mixed-method approach was applied: (i) situation and contextual analysis; (ii) desk review of relevant secondary data sources as international and national organization reports, governmental reports and primary data targeting young people; (iii) in-depth analysis of key youth policy documents, including cross-sectoral, analysis of existing policy evaluation reports and studies.

Existing relevant normative frameworks and policies were analyzed with a focus on: overall national normative framework and development policies that have a direct impact on youth policies. At the same time, assessment of existing Government Youth-Related Policies in response to youth needs, problems and vulnerability was implied.

RESULTS OF OWN RESEARCH AND DISCUSSIONS

National youth policy framework. A sufficient legal and conceptual strategic framework in the youth field, but also a series of important policy documents that regulate the activity and guide the country youth policies is attested. The national legal framework has been modified in accordance with new realities and trends, including at regional and global levels, and also in line with the provisions of international and regional treaties and conventions to which the Republic of Moldova is part. For the most part, the sector was strengthened with the approval of the National Strategy for Youth Sector Development (2014-2020) and Action Plan on its implementation (2014) and subsequently with the approval of the Law on Youth (2016).

This Strategy focuses mainly on expanding existing services and creating new ones in four strategic areas: youth participation; youth services; economic opportunities for young people; strengthening the youth sector. The evaluation report on the implementation of the Strategy have attested certain progresses in terms of developing structures for youth services and participation (youth centers, local youth councils, etc.), but also highlighted a range of systemic problems, such as reduced capacity at all levels concerning human and financial resources, a narrow spectrum of targeted services for different categories of young people, their concentration in the urban area, as well as a deficient mechanism of connection between the parties involved (Gagauz, Stratan, Buciuceanu-Vrabie, & Crismaru, 2020).

The Law on Youth (No 215 from 29.07.2016) regulates the principles and goals of youth policies based on cross-sectorial cooperation. The priority areas stipulated in the Law are economic opportunities; multilateral participation and development; healthy lifestyle; services and programs for youth people. This Law introduced important changes in the youth sector, ensuring a legislative update to the needs of youth, youth workers and specialists, other interested parties. This document included several new definitions and terms, such as non-formal and informal education of young people, peer educators, etc. The category of persons falling under the scope of this Law was extended to persons between the ages of 14 and 35 (in the Law of 1999 the category ranged between persons aged 16-30). Nevertheless, about half of the 55 provisions stipulated in the Law are vague and largely descriptive, meaning a low impact on the way the authorities address the issues of young people (UNICEF, 2017).

It should be mentioned that in the main legislative and normative acts "youth" is largely treated as a homogeneous group not distinguishing specific groups by age, gender, place of residence, ethnicity, etc. Even if young people with limited opportunities are mentioned in both the Law on Youth and the Strategy, specific groups are not delimited (e.g. young people with disabilities, ethnic minorities, unemployed, Education or Training young people, etc.).

Despite the improvement of the normative and institutional framework on youth sector, the effective implementation and enforcement of legislation remains a challenge. As a specialized central public administration body that develops and promotes youth policies nationally, the Ministry of

Education, Culture and Research does not have subordinated regional territorial units in the field of youth and does not have efficient tools and mechanisms to influence the implementation of the legal framework locally. At the same time, responsibilities delegated to Local Public Authorities regarding the identification of financial, material and human resources for promoting youth programs in the territory cannot be fully fulfilled due to limited financial, logistical and human possibilities.

Education policy beyond the lower secondary level. During the last decade several comprehensive documents that set the policy priorities in the area of education and training were developed and approved. These are the Education Development Strategy for 2014-2020 'Education 2020' and "Strategy for the Development of Vocational Education and Training (VET) 2013-2020". In 2014 a new Code of Education was adopted, establishing the legal framework for organizing, implementing and developing education, and provides the basis for modernizing the education and training system. The main objectives of the reference documents are to increase access to education for all children and young people, including vulnerable groups, and to provide quality education at every level, from early childhood development to higher education, ensuring that studies are relevant to the necessities of life, active citizenship and career success.

The country's educational system underwent several important changes over the past years. Thus, in response to demographic decline and low efficiency in primary and secondary education, a school network optimization has been carried out. These reforms targeted VET providers as well, but have not yet included higher education institutions. Whereas these optimization reforms have had some positive impact in urban areas, in rural areas they could not slow down the decline in key efficiency indicators (WorldBank, 2018). Moreover, despite the implementation of a costly VET reform aimed at supporting the socioeconomic development of the country, it has not fully reached its goals. The accessibility of higher education for a wider segment of young people has made vocational education less attractive with a decrease in the number of students in the VET system.

Therefore, the policy of education has been focused on reforms and was oriented towards expanding access to education, connecting to the new requirements and challenges. However, the main problems in this sector continue to persist: high rate of early leavers from education, high NEET rate, low quality and mismatch between education and labour market requirements and other issues. Thus, the rate of early leavers from education and training is actually quite high, the percentage of people aged 18 to 24 with at most lower secondary education and not in further education or training was around 21% in 2018 (NBS, 2019). This indicator is twice the EU average - 10.6% (Eurostat, 2019). Furthermore, in 2018 almost 24% or every fourth person aged 15-29 had NEET status. The rate is especially high among women compared to men (30,2% vs. 18,1%), which has validity for both urban and rural areas (NBS, 2019).

Policy measures. Analysing the policy measures in terms of youth transition dimensions, it may be concluded that policy measures are '*inclusive*' given that they try to provide skills and competencies to as many young people as possible, and then through training/vocational programs to give a second chance to low-skilled young people. At the same time, measures to reduce early school leaving are '*compensatory*' and not 'preventive' since they are aimed at young people who have already left the education system. There is no clear and functional mechanism for monitoring this phenomenon, there are no specific measures for prevention and intervention, and there is no cross-sectoral cooperation in combating this phenomenon.

Labour market policy for youth. One of the priority areas for intervention and development stipulated in the Law on Youth (2016) is 'economic opportunities for young people'. In the National Strategy for the Development of the Youth Sector (2014-2020) among the main objectives there are economic empowerment and entrepreneurship of young people for increasing employment opportunities. According to the Law on the Promotion of Employment and Unemployment Insurance young people aged between 16 and 24 are defined as a group that needs additional support on the labour market. In the National Employment Strategy (2017-2021) special attention is paid to employment policies of the young population for their integration and maintaining on the labour market. The emphasis is on increasing the social inclusion of all young people, facilitating the transition from school to work, focusing in particular on integration into the labour market.

Moreover, the National Employment Agency implements a range of active measures to stimulate employment, including counseling, guidance and vocational training. Although it does not promote specific measures for young people, according to activity reports, about 30% of the beneficiaries of these measures are people aged 16-29 (NEA, 2019).

Therefore, in the strategic reference documents, youth employment is included in the policy-making process as a cross-cutting issue of major importance. Nevertheless, the reports evaluations based on key labour market indicators confirm that country still faces serious structural problems, such as informal work, low labour market participation, insufficient and inadequate quality jobs, inequalities and skill mismatches (Buciuceanu-Vrabie & Gagauz, 2017), (Crismaru, Gagauz, & Buciuceanu-Vrabie, 2018). According to official statistics, in 2018 the employment rate among young people aged 15-24 years was 20,9%, which is the lowest compared to other age categories and it increases with the age (NBS, 2019). Thus, among people aged 25-34 the employment rate constitutes 50,3%, i.e. every second persons of this age is participating on the labour market. The employment rate varies significantly by area of residence and gender for both age categories. The rates are higher in urban areas and among young men.

Policy measures. Analyzing in terms of terms of youth transition dimensions, employment policy measures for young people are largely *individualized* as young people are seen as a disadvantaged group on the labor market. Thus, the actions are largely oriented towards increasing the employability of young people through counseling, professional training, etc. These are mostly *compensatory* and not *preventive* since they are oriented to young people already facing disadvantages. However, policy measures need to be more focused on promoting the growth of quality youth jobs. Macroeconomic and sectoral measures with provisions to improve employment and productivity, to promote entrepreneurship among young people are imperative in the case of Moldova.

Social welfare policy. In the Republic of Moldova these policies focus mainly on measures related to the social protection of families with small children and maintaining the jobs of mothers by granting a childcare leave of up to 4 years. The financial support of families with children provided by the state is applied in the form of allowances paid periodically or monthly upon childbirth and during childcare depending on the family's status on the labour market, income level and age of the child.

It can be concluded that these policies are mostly *family-centered* with a number of benefits for families with small children. After the latest amendments to the legislation, mothers have paid childcare leave up to 2,2/3 years and unpaid childcare leave up to 4 years. At the same time there is no multi-sectoral vision of providing benefits for each child up to 18 years as in most developed countries. Existing policies are mainly focused on categories of beneficiaries than on a targeted approach per child and the measures applied are carried out more post-factum to confirm poverty than to prevent it based on risk (Expert-Grup, 2014).

In the context of the Youth Transition Regime the access of young people to housing is a topic of major importance both in terms of policies developed by the state to support young people and in terms of policy modelling to reduce youth migration. According to the Law on Youth (2016), the State adopts specific measures to provide young people with housing by supporting the construction of houses for young people and young families and develop policies on purchasing dwelling by young people and young families.

In order to increase access to housing the "Prima Casă" (eng. 'First House') State Program (2017) was launched, designed to facilitate the access of individuals to purchase a home by contracting mortgages partially guaranteed by the state. A major objective of this program is to discourage the emigration of young specialists abroad. Although it was originally planned for young people up to 35 years old, it was later extended to people aged 18-45. The data show that since the launch of the "Prima Casă" (eng. 'First House') State Program so far 4031 applications have been registered, of which 3871 have been accepted (96%). Thus, according data available website, out of the 3871 beneficiaries, 2720 are families and 1151 are unmarried young people, the average age of the applicants being 31.3 years. Despite the efforts made by public authorities to increase access to housing for young people through the "Prima Casă" (eng. 'First House') State Program and other support programs, the number of young people benefiting from these programs is low, while the migration rate among them continues to increase.

CONCLUSIONS

In recent decades the legal and conceptual framework that defines and guides youth policies in the Republic of Moldova has changed considerably, in line with new realities and challenges. Despite the improvement of the regulatory framework, the implementation and effective enforcement of legislation remains a challenge, mainly due to limited financial, logistical and human possibilities of central and local public authorities.

The review and analysis of the policy framework has revealed that youth issues are promoted by various policies and some are part of national sectorial strategies. However, a lack of an integrated approach and a comprehensive evaluation mechanism on the implementation of youth policies is attested, including on a cross-sectoral dimension. Regardless of the intersectoral character of youth issues recognition and its stipulation in policy documents, the collaboration between different state institutions in the field of youth is insufficient and often purely formal.

Despite relatively large public investments in education system, as well as the implementation of important reforms and programs, educational and training institutions fail to cope with issues such as the mismatch between education and training outcomes and labour market requirements, high rate of early leavers from education and training, high NEET rate, etc. Subsequent actions aimed at increasing the employability of young people are not able to make up for the shortcomings in the early stages of human capital formation and the lack of adequate social investment in this area.

It can be stated that the Youth Transition Regime in Moldova falls under the 'transitional' category according to the classification developed by Pohl and Walther. It is characterized by an integrated education system, the predominance of general education; high rate of early school leavers; low popularity/prominence of VET; poor quality of education. At the same time, active employment measures are relatively underdeveloped; there is evidence of a focus on developing employment skills; high incidence of temporary/low quality jobs; mismatch of competencies.

The assessment of policy measures designed to facilitate the transition of young people to adulthood shows that individualized and compensatory approaches predominate. Policy actions are mainly focused on youth skills development and addressing individual deficiencies and less on structural policy measures in cross-sectoral areas. Although, in case of early education and training abandonment training, preventive measures are indicated. At the same time, it involves increased risks at the individual level and exerts more pressure on the family. Some of the provisions of policies aimed at promoting the autonomy of young people in terms of 'Youth Welfare Citizenship' are declarative in nature and hardly implemented.

Social policies are mostly family-centered, with a number of benefits for families with small children, albeit insufficient. The state's policy of increasing access to housing is at an early stage and still poorly developed, so it does not play a significant role in relation to the situation of young people in the country's housing market.

There is a need to review and adapt youth policies and strategies to the current and real needs of this population category. At the same time, given the strong segmentation of the young population from a socio-demographic, economic and aspirational point of view, specific, nuanced and adequately targeted institutional responses are needed.

Participatory development of the new youth development strategies by reflecting the diversity of youth in Moldova, the interests and needs of youth from various social groups, especially from the socially vulnerable ones must be promoted. This process should involve more discussions in focus groups with identified categories of youth who are facing specific vulnerabilities/needs and have limited opportunities to identify the desired support and activities that would be included in the strategy and plan in order to solicit their ideas for goals and actions.

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TRAFFIC-RELATED MORTALITY IN MOLDOVA

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ABSTRACT

This article analyses the mortality caused by road accidents in Moldova depending on the degree of involvement of pedestrians, cyclists, motorcyclists, drivers and passengers of transport units, depending on age and sex. Results suggest that traffic-related mortality in Moldova has shown an increased incidence among the young and working-age population, where a significant difference between males and females is observed. Among the youth, traffic-related deaths register between 10-27% of the overall mortality in both sexes. The risk exposure of dying in a traffic accident decreases with age and is less significant in the retired ages. During the years 1998-2015, avoidance of traffic-related deaths would have assured an increase in life expectancy between 0.40-0.56 years in males, and 0.09-0.23 years in females. The continuous increase in the number of transport units on public roads, as well as in the number of hours spent in traffic, influences the degree of exposure to the risk of death or injury as a result of road traffic accidents. Trauma resulting from road accidents increases the incidence of premature mortality and disability among the population, which is reflected by the decrease of healthy life expectancy. It is ascertained that the road accident mortality requires a detailed and comprehensive analysis given the multitude of factors influencing deaths and injuries related to a traffic accident among the population. Thus, in order to improve road safety and reduce mortality incidence among traffic participants, a range of actions has to be implemented by the liable actors, including through the international experience.

Keywords: traffic accidents, external causes of death, avoidable mortality, traffic-related injuries, road safety.

În prezentul articol este analizată mortalitatea cauzată de accidente rutiere în funcție de gradul de implicare a participanților la trafic (pietoni, bicicliști, motocicliști, șoferi și pasageri al unităților de transport), după vârstă și sex. Rezultatele sugerează că mortalitatea cauzată de accidente rutiere înregistrează o incidență sporită în rândul populației tinere și în vârstă de muncă, unde este observată o diferențiere semnificativă între bărbați și femei. În vârstele tinere, decesele prin accidente rutiere înregistrează între 10-27% în mortalitatea generală la ambele sexe. Expunerea asupra riscului de deces în rezultatul accidentelor rutiere scade odată cu avansarea în vârstă și este mai puțin semnificativă în vârstele de pensionare. În anii 1998-2015, evitarea deceselor cauzate de accidente rutiere ar fi asigurat o creștere a speranței de viață între 0,40-0,56 ani la bărbați și 0,09-0,23 ani la femei. Creșterea continuă a numărului de unități de transport, precum și a numărului de ore petrecute în trafic, influențează gradul de expunere riscului de deces sau vătămare ca urmare a accidentelor rutiere. Traumatismele rezultate în urma accidentelor rutiere sporește incidența mortalității premature și dizabilităților în rândul populației, ceea ce se reflectă asupra descreșterii speranței de viață sănătoase. Accidentele rutiere necesită o analiză detaliată și cuprinzătoare, având în vedere multitudinea factorilor care influențează numărul de decese și traumatisme în rândul populației. Astfel, pentru a îmbunătăți siguranța rutieră și a reduce incidența mortalității în rândul participanților la trafic, este necesară implementarea unui șir de acțiuni, inclusiv prin utilizarea experienței internaționale.

Cuvinte-cheie: accidente rutiere, cauze externe de deces, mortalitate evitabilă, siguranță rutieră.

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В данной статье анализируется смертность от дорожно-транспортных происшествий в Молдове в зависимости от степени вовлеченности различных категорий населения (пешеходов, велосипедистов, мотоциклистов, водителей и пассажиров транспортных средств), а также по полу и возрасту. Результаты показывают, что смертность, связанная с дорожными транспортными происшествиями (ДТП), вызывает существенные потери среди молодого и трудоспособного населения. В молодых возрастах, смертность, связанная с ДТП, составляет 10-27% от общей смертности для обоих полов. Подверженность риску смерти в ДТП уменьшается с возрастом и менее значительна для пенсионеров. В течение 1998-2015 гг. предотвращение смертей, связанных с ДТП, обеспечило бы увеличение продолжительности жизни на 0,40-0,56 года у мужчин и 0,09-0,23 года у женщин. Постоянный рост количества транспортных средств, а также количества часов, проведенных в движении, влияет на степень подверженности риску смерти или травматизма в результате ДТП. Травмы, полученные в результате ДТП, увеличивают численность преждевременных смертей и инвалидности среди населения, что отражается в снижении продолжительности здоровой жизни. Дорожно-транспортные происшествия требуют подробного и всестороннего анализа с учетом множества факторов, влияющих на травматизмы и смертность среди населения. Повышение безопасности дорожного движения и снижение уровня смертности, могут быть достигнуты, в том числе, за счет применения международного опыта.

Ключевые слова: дорожно-транспортные происшествия, внешние причины смерти, предотвратимая смертность, безопасность дорожного движения.

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INTRODUCTION

The gradual increase in the number of vehicles and transport units, as well as in the number of hours spent in traffic, has a direct influence on the risk of exposure to death or injury as the result of road accidents. Deaths due to traffic accidents cause significant losses among the young and working-age population, which has direct economic consequences. Injuries, as a result of traffic accidents, also may have a tangential effect on premature deaths, peoples' disabilities, and to contribute to the reduction in years of a healthy life span.

Persons under the incidence of risk-involvement in road accidents endure their consequences depending on the role of involvement in traffic, registering differentiation in mortality/morbidity rates for drivers, passengers, bicyclists, pedestrians, etc. The traffic-accident risk exposure differs considerably depending on populations' characteristics, such as age, sex, urban/rural residence, and other socioeconomic factors. Effective policy programs regarding traffic accidents diminution could prevent a certain number of deaths and traumas, which will improve the population's health and reduce economic losses.

Even though reducing road accident mortality is one of the main goals on the government's agenda, some legislative aspects, the constant increase in the number of cars on public roads, existing pedestrian and road infrastructure are maintaining relatively high mortality and injury incidence, especially compared to developed countries.

The purpose of this paper is to emphasize mortality dynamics due to traffic-related accidents in Moldova, as well as assessing population losses depending on age, sex, and the degree of involvement in a road traffic accident (pedestrian, pedal cyclist, motorcycle rider, car occupant, and others). The presented research is a country-level study, thus, at the regional level, traffic-related mortality may register a different incidence.

LITERATURE OVERVIEW

Traffic-related mortality and injuries in Moldova have been studied by different field researchers, which allows this problem to be regarded from an economic, social, demographic, public health, etc., perspective. A general overview regarding mortality caused by traffic accidents in Moldova was carried out by Bargan, where attention was focused on population losses (Bargan, 2016). Gagauz and Pahomii have highlighted a significant loss among the young population in Moldova as a result of motor vehicle

accidents (Gagauz & Pahomii, 2017). Moreover, it was pointed out that traffic-related deaths' are not uniformly distributed within a calendar year (Palanciuc & Cemirtan, 2015).

An important attention was paid to emergency medical help and post-traumatic interventions to the persons involved in traffic accidents (Ciobanu, 2011). It was highlighted that traffic speed, road infrastructure, existing legislation and regulations have a strong association with traffic accident incidence (Bricicaru & Burlacu, 2015).

Deaths caused by traffic accidents are presented as one of the major contributors to external mortality (Pahomii & Știrba, 2018) that can be avoided as a result of the improvement of road infrastructure and various policy implementations (Știrba & Pahomii, 2019).

Existing cross-country studies that approach traffic-related mortality highlight a relatively high incidence of mortality in Moldova with certain similarities to the countries in the region (WHO, 2015).

DATA AND METHODS USED

Data on cause-of-death distribution by age and sex were retrieved from the WHO mortality database, which presents a set of available years between 1996-2016¹ (WHO Mortality Database). In the presented research deaths were grouped in by major causes: pedestrian injured in transport accident (V01-V09); pedal cyclist injured in transport accident (V10-V19); motorcycle rider injured in transport accident (V20-V29); car occupant injured in transport accident (V40-V49); other land transport accidents (V30-V39, V50-V90).

Considering distorted population statistics in Moldova due to out-migration underestimation, provided calculations were based on estimated population distribution by age and sex, which includes a series of data where the last available year is 2015 (Penina, Jdanov, & Grigoriev, 2015). An accurate and recalculated official population distribution by age and sex has only been available since 2014 (NBS Database).

In order to perform life expectancy decomposition abridged life tables were calculated for each year in the analysed period, with the last opened age-group interval of 85+ for males and females.

Standardised death rates (SDR) were calculated based on the New European Standard Population (Eurostat, 2013).

RESULTS AND DISCUSSIONS

During the last decades, deaths due to traffic accidents have registered a steady and slightly fluctuating distribution in absolute values, with observed improvements in the last-analysed years. The number of annual deaths varied depending on population characteristics such as age and sex distribution, as well as their degree of participation in traffic as pedestrians, pedal cyclists, motorcycle riders, and car occupants.

The number of traffic-related deaths during the analysed years had been in a strong association with two important factors: population dynamics (that registered constant decrease due to natural decline and out-migration) (Gagauz et al., 2016) and a constant increase in the number of cars. Existing demographic waves, that resulted from age distribution dynamics, contributed through the years to certain changes in population risk exposure of being involved in a traffic accident.

Figures 1 and 2 show absolute numbers of traffic-related deaths by main causes for males and females. As we can see, the number of pedestrians who died in a traffic accident has decreased gradually since 1998 for both sexes, with a more accentuated numerical decline in males. Thus, the number of pedestrians who died in a traffic accident decreased from 147 males and 57 females in 1998 to 35 males and 29 females in 2016. This significant decline could be a result of the continuous implementation of road safety policies as well as improvements to automobile construction by manufacturers.

Even the number of deaths among pedal cyclists and motorcycle riders in a traffic accident is relatively low comparing to the overall number of deaths, we must point that the risk exposure of these traffic participants is highest, comparing with pedestrians and car occupants. The main reason for high-risk involvement in a traffic accident among cyclists and motorcyclists is due to their vulnerability from the perspective of infrastructure and road safety (including neglected safety rules

¹ Since 1998 data are not covering the left bank of the Nistru River.

such as wearing a helmet, speeding, etc.). At the same time, these traffic participants suffer the most severe health consequences from a road traffic accident, after which the resulting injury could lead to disability or death.

Considering the steady increase in the number of cars during the analysed period (Public Services Agency, 2020), as well as the observed suburbanization process towards main cities (Știrba, 2017), which lead to an increase in the number of hours spent in traffic, a significant diminution in the mortality due to traffic accidents was difficult to be expected. A challenging side in traffic-related mortality analysis is the national cause-of-death codification. Thus, a major number of deaths caused by traffic accidents are codified as V89.2 (person injured in unspecified motor-vehicle accident, traffic), which makes it difficult to distinguish the type of car-collision in which passengers and drivers were involved. Since 1998, a constant increase in the number of deaths that resulted in a vehicle collision was observed for both sexes. Consequently, a decreasing trend in the registered number of deaths due to car accidents was highlighted for males and females within the years 2009-2016.

An important step in mortality diminution due to traffic accidents was made in the context of the implementation of the National Strategy for Road Safety (Government Decision, 2011), that, besides the organizational factors, were focused on reducing behavioral negligence in road traffic (not wearing a seat belt, speeding, texting while driving, drunk driving, etc.), as well as raising awareness of traffic accidents. Besides that, some changes were introduced in the administrative and criminal codes to toughen penalties for violations and neglect of traffic rules. In addition, an important factor was the constant increase in the level of car safety, which helps to preserve the lives and health of drivers and passengers.

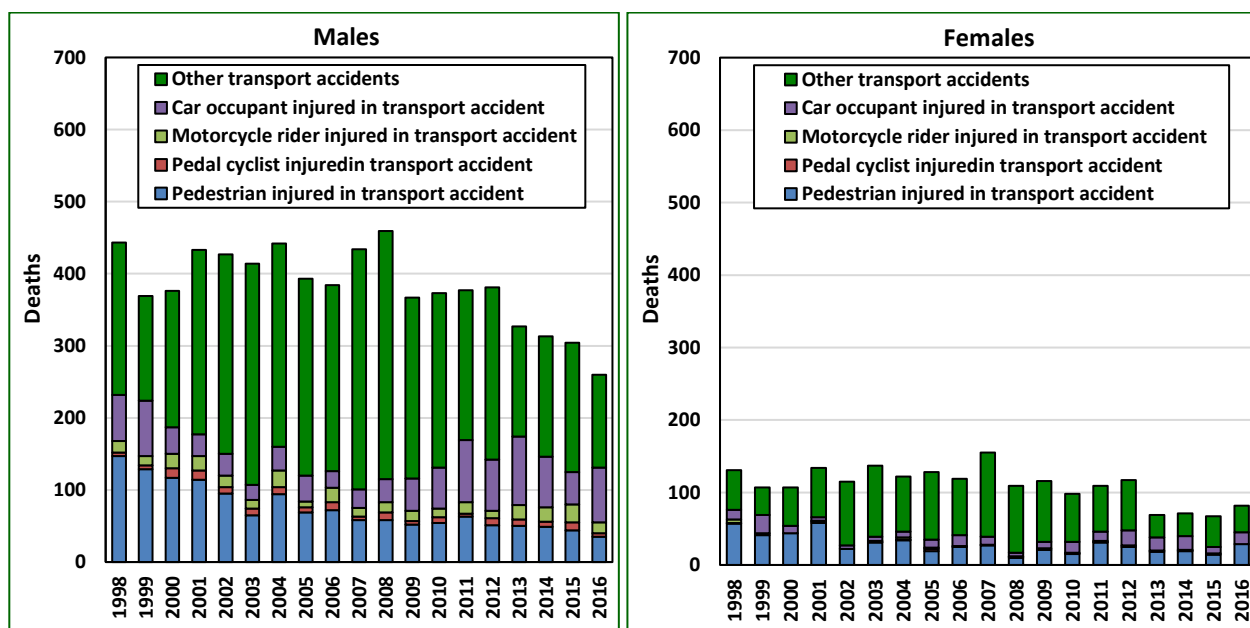


Figure 1-2. Number of traffic-related deaths by causes and sex, Moldova, 1998-2016

Source: WHO Mortality Database.

Traffic-related deaths have a significant contribution to overall mortality within the young population, for males and females (Figures 3-4). Such a situation resulting due to insignificant mortality incidence by other causes of death in young age groups, and relatively high-risk exposure to be involved in a traffic accident. Even the share of traffic-related deaths in overall mortality decreases starting with the age of 35 among both sexes, the probability of dying or being injured in a road accident is relatively high until the age of 60, especially for males. Thus, with advancing age, when the probability of death caused by degenerative diseases (circulatory system diseases, cancers, etc.) increases, deaths caused by road accidents have an insignificant contribution to the total number of deaths among the retirement age groups.

Even though the traffic-related number of deaths in overall mortality in the period 2007-2016 shows a greater influence on particular age groups, comparing to the years 1997-2006 (Figures 3-4), this is rather due to changes in general mortality. Moreover, an observed mortality diminution since 2008 has had a different pace in incidence reduction depending on the causes of death. Thus, traffic-related deaths continue causing significant losses among the young population, reaching between 10% and 27% in the total number of deaths in the age groups 5-9, 10-14, 15-19, 20-24, 25-29, and 30-34, for males and females.

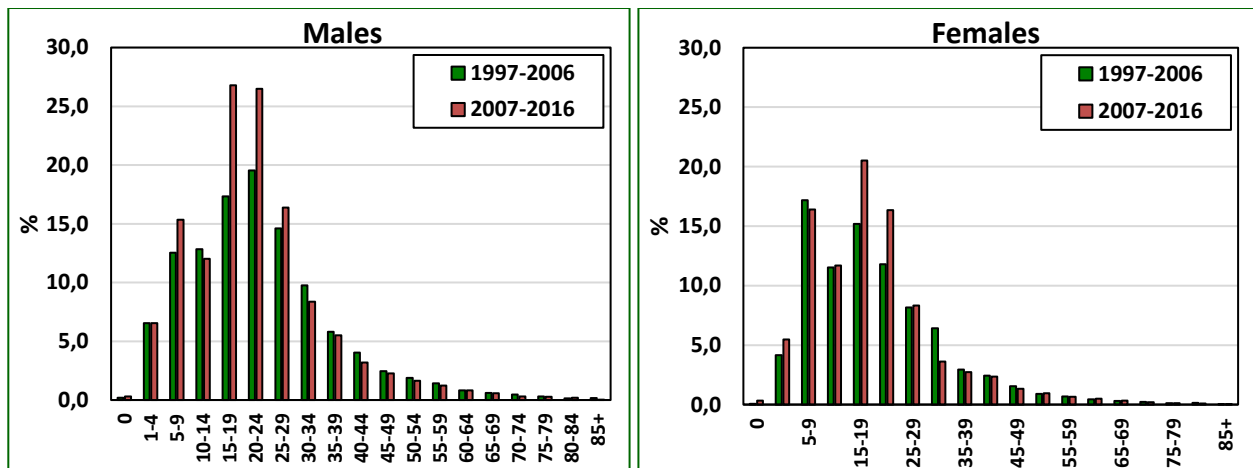


Figure 3-4. The share of traffic-related deaths in overall mortality in Moldova, by age and sex, for the 1997-2006 and 2007-2016 periods

Source: Own calculations based on data from (WHO Mortality Database) and (Penina, Jdanov & Grigoriev, 2015).

Traffic-related standardised death rate (SDR) by main causes (Figures 5-6) denotes an increase in the number of deaths for both sexes during 1999-2008. Since 2009, the number of deaths per 100 thousand population has registered a steady decrease. Despite highlighted changes in SDR due to traffic-related mortality dynamics over the years, a pronounced gap between the number of deaths in males and females has been observed. Thus, in males, the number of traffic-related deaths per 100 thousand population increased from 25.2 in 1999 to 29.4 in 2001, 30.7 in 2004, and 32.8 in 2004; after which, decreasing to 26.2 in 2011, 23.4 in 2013, and 21.4 in 2015. For females, the number of traffic-related deaths per 100 thousand population rose steadily from 6.8 in 1999 to 8.6 in 2003, and 9.5 in 2007, followed by a decrease to 7.7 in 2009, 7.5 in 2011, and 4.4 in 2015.

The number of pedestrians who died in traffic accidents decreased constantly during 1999-2015 in both sexes. Thus, in males, the number of deaths among pedestrians per 100 thousand population dropped from 9.8 in 1999 to 4.3 in 2015. In females, the number of pedestrians who died in traffic accidents per 100 thousand population decreased from 3.0 in 1999 to 1.0 in 2015. Even the observed diminution in mortality amongst pedestrians involved in a traffic accident was highlighted during the analysed years, the number of deaths (per 100 thousand population) in this population cohort being higher than those registered in developed countries.

Deaths among cyclists and motorcyclists are largely associated with males, due to the risk-exposure they face, considering their greater involvement in using this type of transport, compared to females. Therefore, the number of deaths in male cyclists per 100 thousand population ranged between 0.3 and 1.0 during the years 1999-2015. Motorcycle riders among males, who died in a traffic accident, registered between 0.7 and 1.7 deaths per 100 thousand populations within the years 1999-2015, with accentuated peaks in 2004 and 2015.

During the analysed years most of the deaths that occurred in traffic accidents are related to car occupants (drivers and passengers). At the same time, with the present traffic-related cause-of-death codification, it is challenging to distinguish the circumstances of deaths as a result of road accidents which involve cars, as well as commercial and public transport. Thus, a large number of deaths in the analysed period were codified as deaths caused by other transport accidents.

The standardized mortality rate for persons who have died as a driver or passenger has the highest share in overall road accident mortality during the analysed years. Besides this, a significant difference in mortality is observed between males and females, which could be explained as the result of a higher number of hours spent in traffic by males, including by professional reasons, as well as different behavioural risk-involvements, such as speeding, improperly worn seat belt, texting while driving, and other disregards for traffic rules. Traffic-related deaths among drivers and passengers also have a significant interconnection with road surface quality and road infrastructure maintenance.

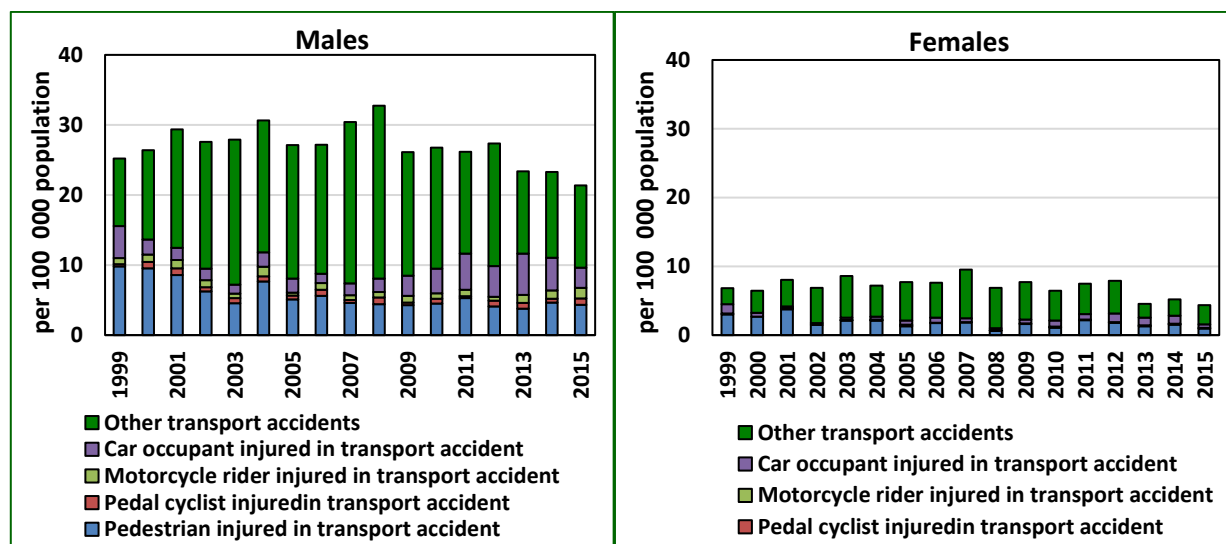


Figure 5-6. Traffic-related standardised death rates by causes and sex, Moldova, 1999-2015

Source: Own calculations based on data from (WHO Mortality Database) and (Penina, Jdanov & Grigoriev, 2015).

Life table distribution of deaths (d_x) that occurred in road traffic accidents show different incidence between males and females (Figures 7-8). Age distribution of traffic-related deaths within the hypothetical cohort emphasizes an oscillating increase among males in aged 15-19, 20-24, and 25-29, followed by a steady decrease in subsequent years. In females, traffic-related deaths are smoother distributed during the lifetime, with less significant losses among the population aged 0-14 and 85+.

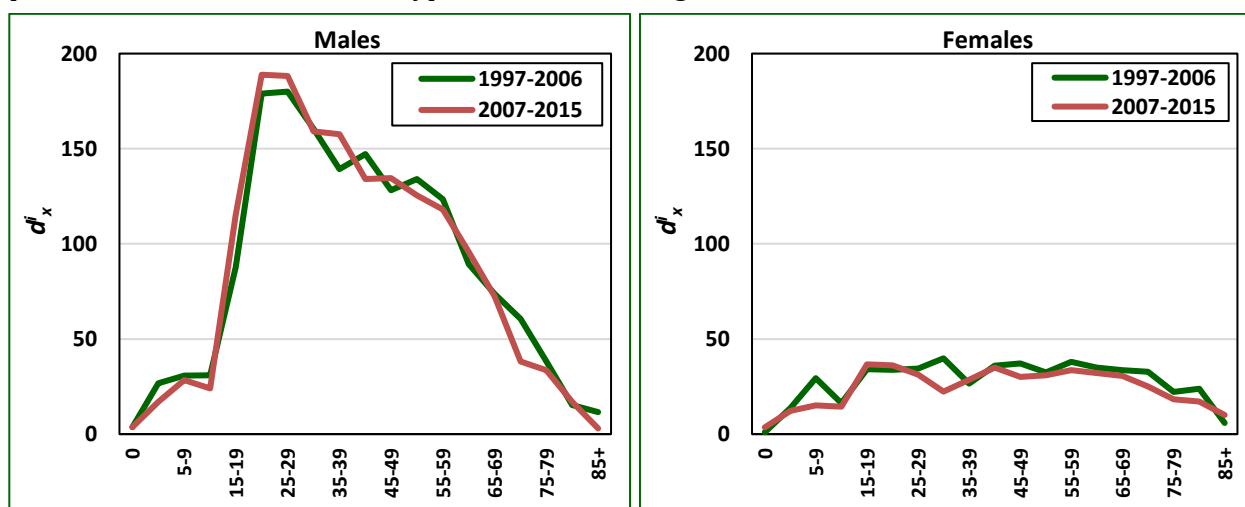


Figure 7-8. Life table distribution of deaths caused by traffic accidents by age and sex, Moldova, 1997-2006 and 2007-2015

Source: Own calculations based on data from (WHO Mortality Database) and (Penina, Jdanov & Grigoriev, 2015).

Deaths caused by road traffic accidents have had influenced a notable decrease in life expectancy within the analysed period, for both males and females (Figure 9). The observed losses in males' life expectancy due to traffic-related mortality, within the analysed period has shown fluctuated values between 0.40 and 0.56 years, with some improvements in the last observed years. In females, deaths caused by road accidents decreased life expectancy between 0.09 and 0.23 years during 1998-2015. Life expectancy losses due to traffic-related mortality, despite the absolute number of annual deaths, depend largely on the age of the persons' deaths. Thus, the deaths among the young population lead to greater losses in the number of person/years.

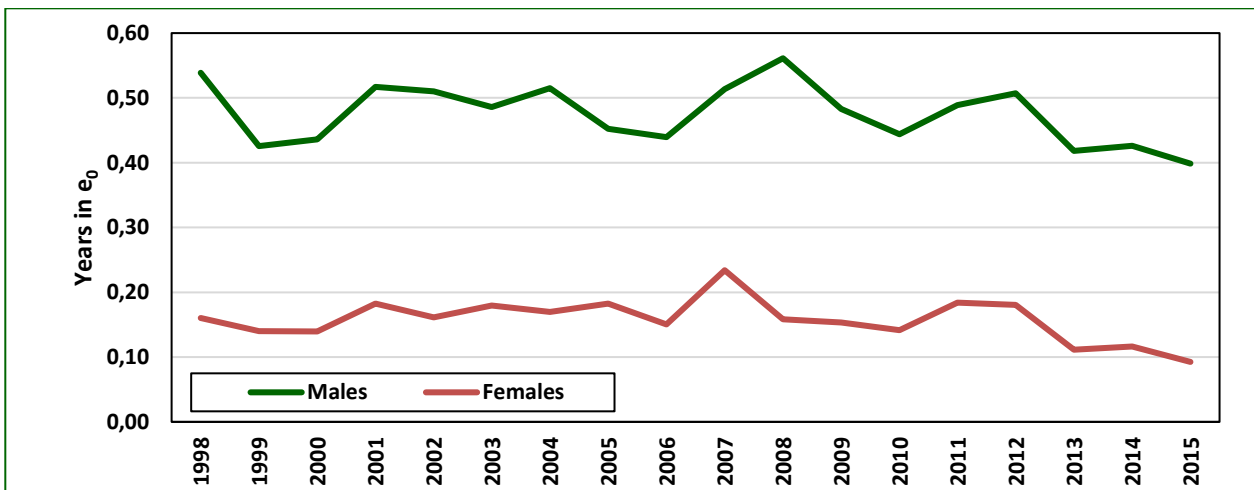


Figure 9. The average annual losses in life expectancy dynamics as a result of traffic-related mortality in Moldova, by sex, 1998-2015

Source: Own calculations based on the data from (WHO Mortality Database) and (Penina, Jdanov & Grigoriev, 2015).

The results presented show a country-level analysis regarding mortality caused by road accidents. Therefore, it is understood that mortality incidence from road traffic accidents differs between regions. Considering the lack of data regarding vital events registration and population exposure from the territory on the left bank of the Nistru River, the following region was not included in the research presented. It should be pointed, that 'small numbers' among specific causes of death may cause a fluctuating trend in mortality dynamics.

The number of traffic-related deaths generally depends on multiple factors (road infrastructure, law and traffic regulations, technical conditions of the vehicles, the number of traffic participants, etc.), and a single road accident may lead from zero to multiple deaths and injuries. Therefore, accidents need to be analysed in order to prevent them, as well as to ensure road safety.

CONCLUSIONS

During the analysed period, traffic-related mortality in Moldova has shown an increased incidence among the young and working-age population, where a significant difference between males and females was observed. The general trend in mortality caused by traffic accidents is emphasizing a slow decrease in synthetic indicators and absolute numbers, which is a result of the National Strategy for Road Safety implementation, as well as road infrastructure development, and steadily raising awareness of the danger of accidents in road traffic. The annual number of deaths due to road accidents derives largely from the population structure change, given that specific age groups of the population are most exposed to the risk.

The results suggest that the subject of road accident mortality requires a detailed and comprehensive analysis given the multitude of factors influencing deaths and injuries related to a traffic accident among the population. The presented research is not covering multiple factors that are influencing populations' health, morbidity, and injuries that may lead to premature death. Thus, the steady increase in the number of cars on public roads is increasing the volume of exhaust gases

and rubber dust from tires, which may lead to cancers and respiratory diseases, but also increases the risk-exposure of being injured in a traffic accident.

In the context of avoiding deaths and injuries caused by road accidents, a notable increase in life expectancy may be observed, mostly in males. A considerable diminution of mortality due to traffic accidents is possible in a condition of synergic actions of liable actors towards the approached problem. Thus, significant improvements to road infrastructure are needed in order to ensure road safety among traffic participants. Besides this, national policies related to traffic mortality diminution must consider existed international experience, which has shown considerable success.

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OTHER COMPARTMENTS

REVIEW¹
**to the monography "MANAGEMENT OF AGRICULTURAL
ENTERPRISES UNDER THE CONDITIONS OF INDUSTRY 4.0"**
**author Nelli AMARFII-RAILEAN, PhD in Economics, Associate Professor,
Republic of Moldova**

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Nelli AMARFII-RAILEAN

Managementul întreprinderilor agricole în condițiile industriei 4.0: Monografie/Nelli Amarfii-Railean; redactor științific: Perciun Rodica; Institutul Național de Cercetări Economice. – Chișinău: INCE, 2020. – 284 p.: fig. color, tab. Bibliogr.: 213-231 (215 tit.). – Referințe bibliogr. în subsol. – 100 ex. ISBN 978-9975-3463-0-6.

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The monograph investigates the possibilities of the adapting the IT products to elevate management efficiency in the agriculture sector in Republic of Moldova. The research aims to argue the importance of modern informational technologies products such as artificial intelligence, digital platforms, and blockchain in conception of new business models in agriculture. The author presents the latest research in the field of Industry 4.0 and argues the capacity of agricultural holdings to accept the challenges of digitization to increase the efficiency and competitiveness of indigenous agricultural products.

Keywords: *Industry 4.0, informational technologies, agricultural sector, enterprises, digital agriculture, management.*

The efficient and innovative development of the agricultural sector is one of the main problems facing the Republic Moldova economy at the present stage. The IT implementation in the activity of local enterprises and business digitalization is a prerogative of time. The sustainable development of the agricultural sector and management efficiency depends on the ability to adapt to new digital advances.

This monograph is a prolific study, with an advanced scientific and practical content. The research is addressed to license and master students from economic and agronomic specialties to managers of agricultural enterprises, IT specialists, as well as farmers interested in digitizing production processes and innovative development of agricultural entities.

This paper is based on a comprehensive study of scientific papers, reports of international bodies and national structures concerned with economic development, poverty eradication and ensuring well-being in rural areas through the implementation of ICT.

The monograph addresses the scientific concepts of Industry 4.0, digital agriculture, digital ecosystems, modern information technologies such as blockchain, artificial intelligence, automated processing of large volumes of data. The products of the digital revolution are approached as necessary tools for streamlining business management, increasing the competitiveness of agricultural products, minimizing environmental risks, but also for the sustainable development of the world's economy with **emphasis** on the development potential of the agricultural sector in Moldova.

The purpose of the research is to argue the need to implement information and communication technologies for agricultural development, development of new business models for efficient

¹ Date received: October 2020.

management of resources available in this sector, and studying the degree of capitalization of Industry 4.0 products in agriculture Moldova.

The research importance and scientific novelty is highlighted by the study of the industrial revolution concept evolution, the inclusion of this concept in the development policies and strategies of the countries of the world throughout history. The author emphasizes the need to recognize and understand the role of information technology in modern management. The concept of Industry 4.0 is designed in the agricultural sector and materialized in the new digital technologies widely applied in the activity of agricultural producers in many countries of the world.

The theoretical significance and the applicative value of the paper contribute to the deepening of the methodological basis of the enterprises' management in the agricultural sector by implementing IT products and estimating the digitalization potential of agriculture. Also, the monograph is identifying international and national practices and experience in the field of implementing innovative digital products in domestic practice. Adjusting the mathematical models of analysis to the competitive conditions of activity in the market economy; capitalizing on the possibilities of using software and programming languages in economic and financial diagnosis; implementation of automated models for processing information sources in the context of increasing the competitiveness of local agricultural enterprises and products.

It is interesting to analyze the degree of digitalization of the economy of the Republic of Moldova at the current stage and the level of preparation of government structures, industrial sectors, economic entities and citizens of the country to meet the challenges posed by the XXI century.

The author considers the digitalization potential of the agricultural sector, the financial situation and performance, the flow of subsidies and investments in agriculture, as well as state policies in the IT field as main premises for launching the agricultural sector and conceptualizing production processes and management of agricultural enterprises. The issue of innovative development of the agricultural sector is examined from a political, social, economic and scientific perspective.

The paper contains a rich factual study of the results of the activity and the liquidity and solvency problems faced by agricultural enterprises, in the conditions of environmental risks and poorly developed financing, traceability and insurance infrastructure. A special place in the paper belongs to the study of digital, mathematical and analytical tools, which capitalized in practice, will contribute to solving the problems of efficiency and competitiveness in the agricultural sector.

The author's visions, the analysis made and the proposed management models regarding the development of agricultural enterprises on the trajectory of Industry 4.0 are presented coherently in the four chapters of this monograph.

The content of the monograph is built on an impressive current bibliographic material that is logically structured with a rich theoretical material. The research consists of practical examples, tables, figures, and analysis models applied in domestic and international analytical practice, case studies on the implementation of modern information technologies in financial diagnosis of enterprises in the agricultural sector.

The first chapter of the paper "Industrial Revolution 4.0: the new paradigm of economic development" presents the theoretical aspects, the historical evolution and the impact of the Industrial Revolution 4.0 on the economies of developed countries and the level of digitalization of the national economy. The theoretical content is focused on the analysis of the concepts of Industry 4.0 and Agriculture 4.0, approached by foreign researchers: Shwab K., Christiansen B., Yüksel Ül., Deichmann U., Goyal A.; as well as Romanian, Russian and local scholars: Banabic D., Vasile A., Bajura T., Stratan A., Lapidus L., Volcov S. and others. The data provided by the international statistical portals and the National Bureau of Statistics are analyzed for the comparative analysis of the degree of digitalization of the economy of the Republic of Moldova and the perception of digital technologies as a tool for development and progress compared to other countries.

Chapter II "Industry 4.0 Management Tools" is dedicated to researching IT products for business management in the digital economy, such as: digital management and surveillance systems, industrial ecosystems based on IT technologies and innovative data analysis applications based on artificial intelligence. The author examines the IT products implementation to the modernization of

the agricultural sector in the Republic of Moldova. In this chapter, the author presents a new technology, designed to ensure the transparency of financial operations, which can be applied to ensure the traceability of agricultural products in the supply chain, blockchain technology.

In Chapter III "Perspectives of the development of the agricultural sector of the Republic of Moldova in the conditions of Industry 4.0", the author analyzes the state and evolution of indicators characterizing the development of the agricultural sector of the Republic of Moldova in the conditions of Industry 4.0, by diagnosing the degree of implementation of IT products, financial results of agricultural enterprises in the corporate and individual sector, the current state and prospects for modernization of production processes and rural infrastructure by subsidizing and implementing IT products in this sector.

Chapter IV "Prospects for the development of the agricultural sector of the Republic of Moldova in the conditions of Industry 4.0" presents investment projects and examples of modernization of agriculture by applying precision technologies, digital agricultural platforms and mathematical models based on information technologies.

The paper studies good examples of digitalization of agriculture in international practice, their role in solving problems related to ensuring the competitiveness of domestic agricultural products, ensuring the welfare of the population in this sector, infrastructure development and streamlining management in agriculture.

The author analyzed the Industry 4.0 perception degree by governance structures and society, the approach to the need and processes of digitization in national strategies and policies, as well as the level of preparation of the economy, to accept the challenges of the IT era.

The paper presented is original in its complexity, in the way it poses and solves the problems of enterprises in the agricultural sector in the context of ensuring management efficiency and competitiveness of agricultural enterprises.

The theoretical aspects of Industry 4.0, the implementation of ICT in various fields of activity, the digitization of agriculture and enterprises in the agricultural sector, the content of contemporary research in this field, brought in the paper will serve as a guide for many readers. The problem proposed by the author is not only the problem that is required and must be solved, but the very formulation of the problem is a scientific novelty of great practical importance. For the solution of which theoretical and methodological arguments are brought.

The author's conclusions theoretically and practically argued can be used to increase the productivity of enterprises, examine new models of business management in agriculture and accept the new challenges of the Industrial Revolution 4.0.

In the monograph, the author proposes several original models for analyzing the efficiency of management and financial performance of agricultural holdings in both the corporate and individual sectors.

Through its topicality, scientific and practical value, research is an essential contribution to the literature, modernization of management and reform of agriculture and the national economy through the prism of Industry 4.0.

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