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/DIGITAL ECONOMY: THE ROLE OF DATA-DRIVEN INDUSTRIES AND CHINESE GIANT TECH COMPANIES: THE CASE OF HUAWEI IN AFRICA

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Key words: data-drive industries, Africa, China, giant tech company, Huawei

Introduction. It is without a doubt that technology and innovation play big roles in making some countries manufacturing-savvy making them wealthier than others. Countries that encourage their firms to innovate, and those that invest in educating their people and pushing the boundaries of science and technology, generally grow richer than those that do not. Yet the hope that ideas and technologies would flow across borders like air and be adopted by poor countries letting them catch up quickly with the developed and rich world, has been realized only in very little parts of the world. For example, Asian countries such as Japan, and later Taiwan, South Korea and China embraced many of the world's latest technologies to build formidable manufacturing economies. But Africa was largely left out of the most recent waves of globalization, in which labor-intensive manufacturing moved out of Europe and America and into Asia. In the year 1990, African countries accounted for about only 9% of the developing world's manufacturing output. By 2014 that share had further slumped to only 4%.

Methodology and literature review. In his article entitled "China in Africa: win-win development or a new Colonialism," Nick Van Mead (2018) posited that for over the past nine years, China overtook the United States of America as Africa's largest trading partner. And although Kenya and Ethiopia were the only two African nations among thirty signing economic and trade agreements at the Belt and Road Forum (Barf) in Beijing in May of 2017, China has been busy on the continent (Nick Van Mead, 2018). While East Africa has been the main focus of the Belt and Road on the African continent, Chinese infrastructure projects (including those of Huawei) stretch all the way to Angola and Nigeria, with ports planned along the coasts from Dakar (Senegal) to Libreville (Gabon) and Lagos (Nigeria). However, as Kadi, T.H.T. (2002) observed, Trade between China and North Africa has increased significantly since the early 2000s, but it has largely reproduced patterns of unequal exchange. Since they were unveiled, the Belt and Road Initiative (BRI) and the Chinese government's 2016 Arab Policy Paper have signaled the promise of a qualitative shift in China's engagement with the region. China has committed to increase investments in high-value-added sectors and to boost cooperation in science and technology with countries across North Africa.

China has become a global power, but there is too little debate about *how* this has happened and what it means. Many argue that China exports its developmental model

and imposes it on other countries. But Chinese players also extend their influence by working through local actors and institutions while adapting and assimilating local and traditional forms, norms, and practices. Skidmore (2022) however observed that, projects in the region, unveiled with great fanfare, have ultimately struggled. This includes the great Chinese Belt and Road in East Africa. A connecting thread across such cases has been China's inability to manage the political complexities associated with infrastructure development Three main reasons have been attributed to this: First, the political leadership with whom they are dealing is either too weak or too venal to challenge contract terms that decidedly favor China; and, second, these same leaders will be strong enough to fend off resistance to ambitious infrastructure projects by opposition politicians and civil society groups while also mobilizing the financial resources necessary to sustain expensive, long term projects (Skidmore, 2022). But in an article entitled, "Billionaire Ren Zhenfei to focus on Survival amid global recession", Ren Zhengfei, the billionaire founder of Chinese smartphone and telecom giant Huawei, says his company must focus on survival and cut back on business lines that can't turn a profit as the global economy is poised to enter a recession over the next decade, according to local media reports. (Wang,2022)

Scientific novelty. This article critically investigates whether the Chinese technologies giant, Huawei, could step in and help Africa fill in the technology-gap and help African countries catch up with manufacturing to enable to continent the be abreast with the most recent waves of globalization, in which labor-intensive manufacturing moved out of Europe and America and into Asia. This, when achieved, stands to help Africa develop its digital and technological bases for economic growth and development.

*Huawei***.** Founded in 1987, Huawei is a leading global provider of information and communications technology (ICT) infrastructure and smart devices. Th company has approximately 195,000 employees and operate in over 170 countries and regions, serving more than three billion people around the world. Huawei's mission is *"to bring digital to every person, home and organization for a fully connected, intelligent world."* To this end, the company drives ubiquitous connectivity and promotes equal access to networks to lay the foundation for the intelligent world; provide diversified computing power to deliver ubiquitous cloud and intelligence; build powerful digital platforms to help all industries and organizations become more agile, efficient, and dynamic. The company redefines user experience with Artificial Intelligence, offering consumers a more personalized and intelligent experience across all scenarios, including home, travel, office, entertainment, and fitness & health.

Huawei and Manufacturing Technology. Chang, et al (2009) posited that, if you walk into a bookstore in Beijing in China, and you will find shelves filled with books

about Huawei Technologies. Chang et al (2009) described Huawei as one of China's fledging multinational companies and a major force in the international telecommunications equipment industry, which is rewriting the rules of competition in a global industry. Chang et al (2009) also confirmed Huawei as the first non-state-owned Chinese company to have successfully expanded its operations internationally, and some observers said, it had become a model for other Chinese companies and a source of national pride. Despite the challenges facing the global economy and the telecommunications industry, Huawei achieved contract sales of US$16 billion, representing a 45% year-over-year increase, with approximately 72% of its revenues coming from international markets (Chang et al, 2009).

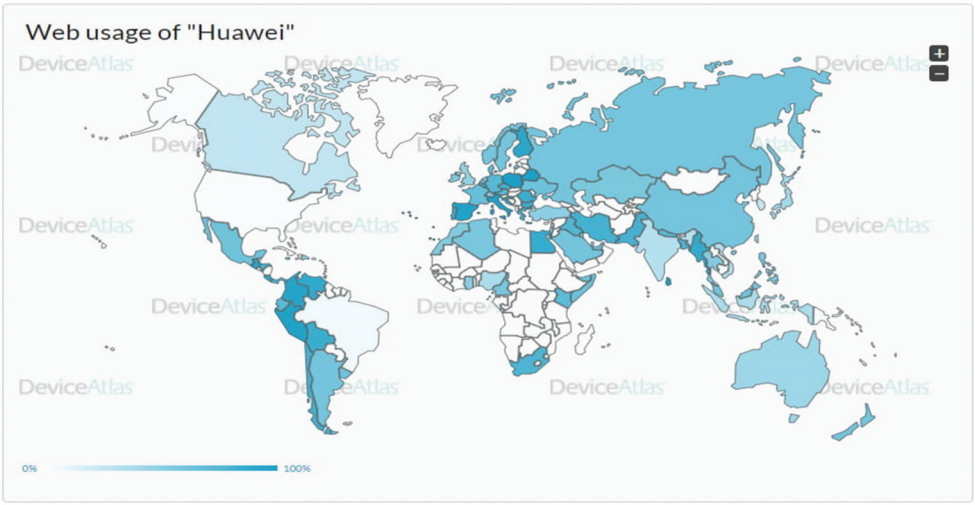

Figure 1. Global Web Usage of "Huawei"
Source: Canalys (2018)

Figure 2 shows Huawei's sustainable growth across the world. The company hugely replicates this growth on the African continent. In less than a decade, Huawei has penetrated almost every market around the world, investing heavily in its business and technology product lines, which includes fixed networks, mobile networks, data communications, optical networks, software and services, and terminals (Chang et al, 2009). According to an industry insider, Huawei segments the telecom equipment industry into three major categories: Internet switches, fixed line networks and wireless networks. "Huawei is currently the number three global company in wireless networks and number two in fixed line and switches," says founder and CEO Ren Zhenfei. "But Huawei's goal is to become number one in all three segments," he concluded. Its competitors include both well-known European and American companies, such as Alcatel-Lucent, Cisco Systems, Nokia Siemens Networks and Ericsson Telephone Co., as well as lower-cost Chinese competitors such as ZTE Corp.

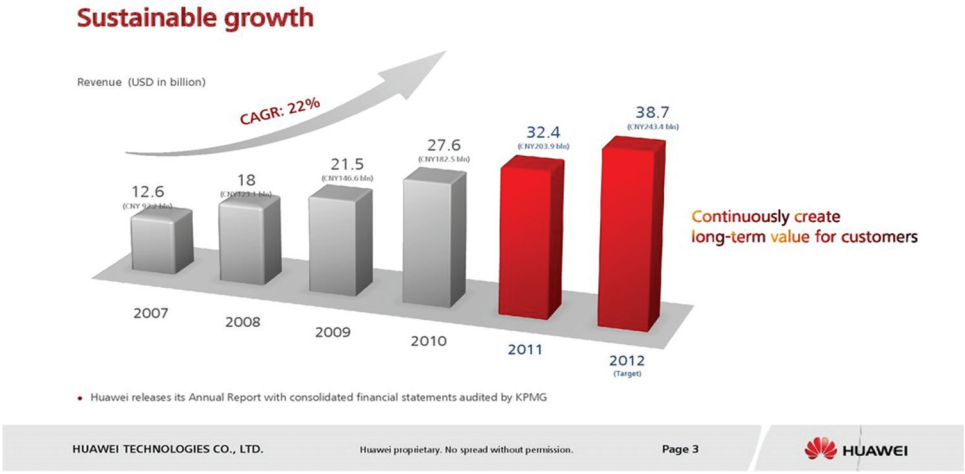

Figure 2. Huawei's Sustainable Growth in World Contracts

Source: Huawei Technologies Co. Ltd

Huawei in Africa. Huawei entered the African market in the year 1998. The company remarkably successfully dispelled the "made in China" image of low cost and low and inferior quality. Huawei also successfully shifted its role from a manufacturer to that of a complete solutions provider. Chang et al (2009) posited that, as at today, Huawei creates some of the most sophisticated telecommunications equipment in the world and, according to the company, is "not making it cheaper - it's making it better," armed with its combination of a corporate culture marked by Communist roots and leading Western business practices, Figure 3 shows the fierce competition between the world three major mobile smartphone companies, Samsung, Apple, and Huawei. They are all jockeying for the African market.

Putting Michael Porter's (1990) Competitive Advantage theory of low price and product differentiation as its theoretical backbone, Huawei executed a strategy composed of superior pricing, customer service and brand awareness to penetrate and dominate the African market, one in which few multinationals have been successful. (See Figure 3 below). Huawei has established a reputation as the preferred low-cost, yet high-quality mobile network builder. Its sales in Africa had topped US$2 billion across forty countries by 2006 (Chang et al (2009). According to the former head of Huawei's operations in West Africa, Wilson Yang, Huawei's profit margins in Africa can be up to ten times greater than those it realizes in China. Huawei manages to achieve tremendous margins while still pricing itself only 5%-15% lower than its major international competitors, Ericsson and Nokia. Furthermore, Huawei is cautious not to price itself too low so that it will not be seen as yet another low-cost Chinese provider. In contrast,

Huawei's main Chinese competitor in Africa, ZTE, consistently prices 30%-40% below EU competitors and, its products are perceived as being of inferior quality.

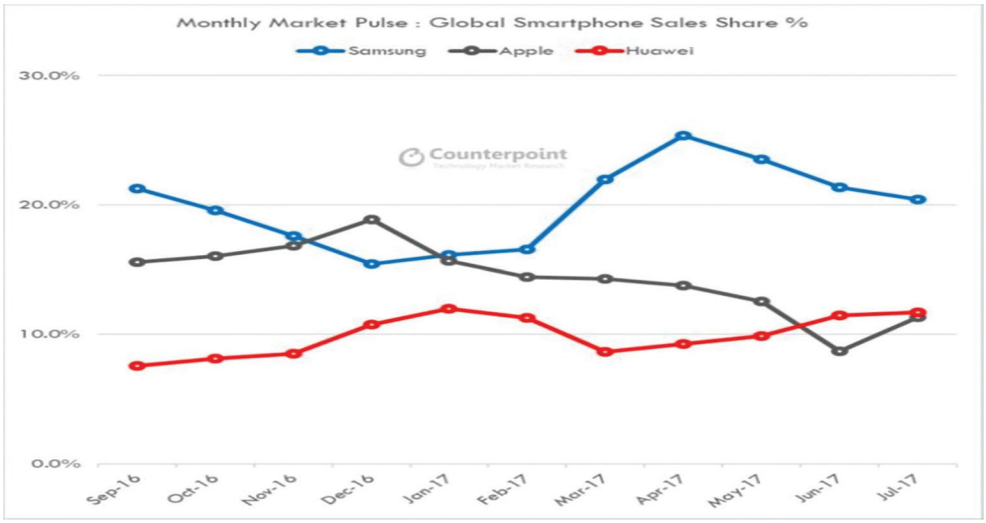

Figure 3. Global Smartphone Sales' Shares: Samsung, Apple, and Huawei
Source: Peru 21

Figure 4 shows Huawei companies' penetration and dominance on the African Continent. The company has made its presence felt in all regions of the African continent and consolidated its growth on the continent. Another factor behind Huawei's African success is the company's attention to superior customer service. Between the year 2000 and 2001, Huawei faced a barrage of challenges. The company's IT investment had dried up, profit margins shrank, and the market faced oversupply, leading to profit growth to evaporate. Learning quickly from IBM, Huawei developed and concentrated on unmatched service attention and commitment to service which eventually came to dominate the firm's global strategy. Indeed, superior service became the distinguishing feature of Huawei's business model in Africa and its core competitive advantage. As confirmed by Yang, this business model leading to this approach by Huawei to customer service, ultimately led to global growth. Yang continued to conform that, Huawei brought a Chinese attitude to both work ethic and relationship building in Africa. The upshot of this was that Huawei's clients soon realized they could rely on Huawei 24 hours a day, seven days a week. This close supplier-customer relationship helped engender that reliability and soon yielded loads of benefits to both the supplier and the buyer. Suddenly, Huawei reputation for superior service and higher quality further catapulted the company's new introductions into decision makers in new African markets, faster network building and advanced notification of competitive bids. This hugely enabled Huawei to price its products safely below competition.

Figure 4. Huawei's penetration and dominance of the African market
Source: Wadeisor Rukato (2016)

According to Chang et al (2009) Huawei is also using its business in Africa as a training ground for establishing itself as a global brand through three distinct channels: policy, local investment, and marketing. They also posited that, Huawei leverages its resources and products to connect with development policies throughout the African continent. Recently, Huawei opened a new training facility in South Africa, its fifth training center on the continent. A sixth is currently being built in Angola. Huawei now provides a training for up to 2,000 people annually on the continent.

Huawei has built several training centers across Africa. This study establishes the purpose of these centres in Kenya and Nigeria and presents original data on their success based on their objectives. Fieldwork was conducted in 2018 and follow-up interviews continued by phone until 2021. But, as Tugendhart (2021) argued, Huawei's investments offered no significant opportunities for knowledge transfers that could foster technological or industrial upgrading in Kenya or Nigeria's telecommunications sectors, for example. In part, this was due to domestic obstacles in the host countries. But, like other international equipment vendors operating in the region, knowledge transfers were also hindered by the limited scope of Huawei's investments and the boundaries on the knowledge it was willing to share with domestic employees. Tugendhart (2021) concluded, however, that Kenya and Nigeria's governments may have underestimated the leverage they had over international equipment vendors to induce more meaningful

opportunities for knowledge transfer. At a forum with the African Development Bank in the year 2007, Huawei set out a vision for Africa that is centered on, "bridging the digital divide and enriching the lives of Africa." With this, Chang et al (2009) asserted that Huawei prides itself on giving back to the African community; one of the ways that it makes this manifest is through donating educational communications equipment to schools on the continent. Chang et al (2009) concluded that, Huawei Technologies has built a world class enterprise, reaped tremendous profits in Africa over the last decade and is still contributing to growth on the continent. Using Africa as an example, in China, domestic media have heralded Huawei's success as a model for other Chinese companies trying to transform themselves from domestic entities into global players. What this means is that, as Chinese Corporations leaders face challenges going forward, they need to look back and pick up the lessons Huawei learned in Africa.

Correlation Analyses and Hypotheses Development. Survey on Huawei Technology as the Best Technology for Manufacturing and Development in Africa. This paper carried out a survey via the distribution of questionnaires to a number of Africans to gauge their (respondents') views on whether Huawei Technology is Best Technology for boosting Manufacturing and Development on the African continent. This is in line with the research topic as well as what the article set out to investigate.

Correlation Analyses. The following correlation analyses were made on selected independent variables and the dependent variable:

Figure 6. Huawei Technology and Economic Development in Africa

Correlations

		Will Huawei Technology ameliorate economic development in Africa	Most Africans prefer Huawei Technology
Will Huawei ameliorate economic development in Africa	Pearson Correlation	1	.748
	Sig. (2-tailed)		.000
	N	25	25
Most Africans prefer Huawei Technology	Pearson Correlation	.748	1
	Sig. (2-tailed)	.000	
	N	25	25

Source: The Author

Figure 6 shows a correlation between Huawei Technology and Economic development in Africa. The dependent variable is Economic Development in Africa, and the independent variable is Huawei Technology. The correlation between two variables shows a significance level of .000. This indicates that there is a very strong correlation between Huawei technology in Africa and economic develop-ment in Africa.

Figure 7. Chinese Manufacturing Firms (Huawei) and African enthusiasm for Chinese technology in Africa for economic development.

		Will Huawei ameliorate Economic Development in Africa	Africans have huge enthusiasm towards Chinese manufacturing firms in their countries
Will Huawei ameliorate Economic Development in Africa	Pearson Correlation	1	.696
	Sig. (2-tailed)		.000
	N	25	25
African have huge enthusiasm towards Chinese manufacturing firms in their countries	Pearson Correlation	.696	1
	Sig. (2-tailed)	.000	
	N	25	25

Source: The Author

Figure 7 shows the correlation between Chinese Manufacturing Firms (Huawei) and African enthusiasm for Chinese technology in Africa for economic development. The dependent variable is Economic Development in Africa, and the independent variable is Chinese Manufacturing Firms (Huawei). The correlation between these two variables shows a significance level of .000. This indicates that there is a very strong relationship (correlation) between Chinese Manufacturing Firms (Huawei) and African enthusiasm for Chinese technology in Africa for economic development.

Figure 8. Huawei Technology and Lower Cost for Huawei Technology for Economic Development in Africa

		Will Huawei ameliorate Economic Development in Africa	African Countries would benefit from lower cost Huawei Technologies for development
Will Huawei ameliorate Economic Development in Africa	Pearson Correlation	1	.532
	Sig. (2-tailed)		.006
	N	25	25
African Countries would benefit from lower cost Huawei Technologies for growth	Pearson Correlation	.532	1
	Sig. (2-tailed)	.006	
	N	25	25

Source: The Author

Figure 8 shows a correlation between Huawei Technology for Economic development in Africa and Lower cost benefits for African countries. The dependent variable is Economic Development in Africa, and the independent variable is Huawei Technology with Lower costs for African countries. The correlation between these two variables shows a significance level of .006. This indicates a weak correlation of the two variables. It is bordered on being significant but was not less than the accepted level of significance ($p>0.05$). Figure 9 shows a correlation between Huawei Technology for

Economic development in Africa and governments' acceptance of Huawei technology. The dependent variable is economic development in Africa, and the independent variable is governments' acceptance of Chinese (Huawei) Technology. The correlation between these two variables shows a significance level of .057. This indicates that correlation value of .057 is slightly outside the margins of significance. It is bordered on being significant but was not less than the accepted level of significance (p>0.05

Figure 9. Huawei Technology for Economic Development in Africa and African Governments' Acceptance of Huawei Technology.

		Will Huawei ameliorate economic growth in Africa	Various governments in Africa should champion Chinese Technology
Will Huawei ameliorate Economic Development in Africa	Pearson Correlation	1	.386
	Sig. (2-tailed)		.057
	N	25	25
Various governments in Africa should champion Chinese Technology	Pearson Correlation	.386	1
	Sig. (2-tailed)	.057	
	N	25	25

Source: The Author

Figure 10 above shows a correlation between Huawei Technology for Economic development in Africa and Chinese Huawei technology to boost the three main sectors of economic development in Africa: Agriculture, Industry and Services. The dependent variable is Economic Development in Africa, and the independent variable is Huawei Technology to boost Agriculture, Industry and Services in Africa. The correlation between these two variables shows a significance level of .005. This indicates that there is a "suggestive" relationship (correlation) between the two variables. This should be encouraging for African countries.

Hypotheses Testing. Two main hypotheses were proposed. These were tested by running a regression analysis using SPSS. The following results were obtained: The results of the first hypotheses showed a significance of .006. This indicates that, the hypotheses bordered on a statistically significant value, although it just fell short of being significant. Although the results of the statistical analysis do not give a clear-cut indication that African countries would benefit from lower cost Huawei Technologies for development, it definitely suggested to the positive that this is possible. The results of the second hypotheses above showed a significance of .035. This indicates that, the hypotheses value is less than the *significance* level. The initial response to this result would be to reject the hypothesis that, Chinese Technology manufacturing in Africa stands to boost the export of many African countries. Again, although the results of the statistical analysis do not give a clear-cut indication that Chinese Technology manufacturing in Africa stands to boost the export of manufactured products in many African countries, it definitely suggested that it could be a positive idea that could be tried.

Figure 10. Huawei Technology for Economic development in Africa and Chinese Huawei technology to boost the three main sectors of economic development in Africa:

Agriculture, Industry and Service

Correlations

		Will Huawei ameliorate Economic Development in Africa	The development of Chinese Huawei Technology has the potential to boost the economies of African Countries by improving agricultural, industrial and hospitality sectors
Will Huawei ameliorate Economic Development in Africa	Pearson Correlation	1	.545
	Sig. (2-tailed)		.005
	N	25	25
The development of Chinese Huawei Technology has the potential to boost the economies of African Countries by improving agricultural, industrial and hospitality sectors	Pearson Correlation	.545	1
	Sig. (2-tailed)	.005	
	N	25	25

Results of the Regression Analysis. Hypothesis 1. African Countries would benefit from lower cost Huawei Technologies for development

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.955	1	3.955	9.056	.006[b]
	Residual	10.045	23	.437		
	Total	14.000	24			

a. Dependent Variable: Will Huawei ameliorate Economic Development in Africa

b. Predictors: (Constant), African Countries would benefit from lower cost Huawei Technologies for development

Hypothesis 2. Chinese Technology Manufacturing in Africa stands to boost the export of manufactured products in many African **countries**

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.518	1	2.518	5.044	.035[b]
	Residual	11.482	23	.499		
	Total	14.000	24			

a. Dependent Variable: Will Huawei ameliorate Economic Development in Africa

b. Predictors: (Constant), Chinese Technology manufacturing in Africa stands to boost the export of manufactured products in many African countries

Conclusion. This paper set out by asserting that technology and innovation play big roles in making some countries run big manufacturing industries which make them richer than other countries. The paper stated that the continent of Africa was largely left out. The paper sought the views of available Africans as to whether the presence of a

Chinese technology giant (Huawei) in Africa could help engender manufacturing at high levels in Africa. Correlation tests were run on various variables and mixed results were obtained. Two hypotheses were developed on the theme and tested; the results were not quite significant but gave positive suggestions.

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Digital Economy: The Role of Data-Driven Industries and Chinese Giant Tech Companies: The Case of Huawei in Africa

Key words: data-drive industries, Africa, China, giant tech company, Huawei

It is without a doubt that technology and innovation play big roles in making some countries manufacturing-savvy making them wealthier than others. Countries that encourage their firms to innovate, and those that invest in educating their people and pushing the boundaries of science and technology, generally grow richer tmhan those that do not. Yet the hope that ideas and technologies would flow across borders like air and be adopted by poor countries letting them catch up quickly with the developed and rich world, has been realized only in very little parts of the world. For example, Asian countries such as Japan, and later Taiwan, South Korea and China embraced many of the world's latest technologies to build formidable manufacturing economies. But Africa was largely left out of the most recent waves of globalization, in which labor-intensive manufacturing moved out of Europe and America and into Asia. In the year 1990, African countries accounted for about only 9% of the developing world's manufacturing output. By 2014 that share had further slumped to only 4%.

PREDICTIONS OF TOP 5 EUROPEAN FOOTBALL LEAGUE MATCHES

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Key words: football, odds, monte carlo simulations, predictions, machine learning.

Introduction. Sports gambling industry has always been an interesting research area for both scientists and hobbyists who are trying to beat the bookmakers. While several strategies are claimed to beat the bookmakers using arbitrage or expert predictions, long term returns of those strategies are not consistent. Very interesting approach is used in [Kaunitz, Zhong and Kreiner, 2017] which does not aim to outperform the forecasting models of the bookmakers but uses the odds throughout the betting market to find mispriced odds. It is shown that the inefficiency of the betting market can be exploited to consistently beat the bookmakers. Some relatively accurate models to predict outcomes of football matches are proposed in [Melnykov, 2013] and [Dyte and Clarke, 2000, pp. 993–998].

This particular project aims to develop a web application which can give betting predictions on the upcoming matches of the major European leagues. We do not aim to outperform bookmakers in their predictions, rather we aim to create a simple predictor, test and deploy it. Firstly, we collect the data of matches from the past seasons. Than we propose a learning model based on the indicators which we find relevant in predicting the outcome of a certain match. After estimating the performance of the proposed model we implement Monte Carlo simulations to understand the profitability of the predictions. Finally, we deploy the program in the form of simple web application which provides predictions on the upcoming matches of top 5 European leagues.

Methodology and literature review. Since we aim to not only develop a predictive model but also simulate bets, we also need the closing odds on the outcomes that is 1X2 odds. For that purpose, we crawled the sports statistics web page [Odds Portal, 2019], which contains both historical data and closing odds on the outcomes of the matches. The sample of the crawled data is shown in Table 1 below. We have crawled past matches starting from season 2010 to 2018 for the top 5 European leagues, namely, La Liga (Spain), Bundesliga (Germany), Legue-1 (France), Serie-A (Italy) and Premier League (England).

In Table 1 “coef1”, “coefX” and “coef2” show the closing odds corresponding to win of first team, draw and win of the second team. The variable “matchDate” will be used to figure out the evolution of the club rating during the season.

country	league	season	matchDate	team1	team2	goals1	goals2	ceof1	coefX	coef2
france	ligue-1	2015-2016	2015-09-13	Marseille	Bastia	4	1	1.50	4.19	7.25
france	ligue-1	2015-2016	2015-09-13	Nantes	Rennes	0	2	2.64	2.90	3.09
france	ligue-1	2015-2016	2015-09-13	GFC Ajaccio	Monaco	0	1	4.28	3.13	2.04
france	ligue-1	2015-2016	2015-09-12	Lorient	Angers	3	1	1.99	3.20	4.29
france	ligue-1	2015-2016	2015-09-12	Montpellier	St Etienne	1	2	2.82	3.10	2.72
france	ligue-1	2015-2016	2015-09-12	Nice	Guingamp	0	1	2.26	3.14	3.50
france	ligue-1	2015-2016	2015-09-12	Toulouse	Reims	2	2	1.97	3.38	4.10
france	ligue-1	2015-2016	2015-09-12	Troyes	Caen	1	3	2.37	3.21	3.16
france	ligue-1	2015-2016	2015-09-12	Lyon	Lille	0	0	1.88	3.32	4.61
france	ligue-1	2015-2016	2015-09-11	Paris SG	Bordeaux	2	2	1.26	5.85	12.73

Table 1. Sample of 10 scrapped entries

Now we present the transformation of the raw data to be able to create a predictive model. As mentioned above we aim to predict the outcome of a given match. First of all, we need to figure out what are our predictor variables. For our model we chose

- ratings of the competing teams
- head to head statistics
- home advantage

As for the ratings of the clubs we chose the Elo rating system which is quite popular choice in creating the ratings of competing sides in different kinds of sports. Ratings of the competing clubs and home advantage are more or less obvious indicators which affect the outcome of a football match. Let us introduce the head to head statistics indicator which aims to estimate the advantage between two particular clubs based on their past games. Why this indicator is important? Take for example Barcelona and Real Sociedad. Starting from season 2013 until 2016, Sociedad which has low rating as compared to Barcelona, played incredibly well against the latter (4 wins, 4 losses and 2 draws). We see that there is a total equality during this particular period of time. However, Barcelona does not demonstrate this kind of head to head statistics against all the teams with ratings similar to that of Real Sociedad. It means that this statistic describes the advantage between two particular competing sides. We calculate head to head statistics indicator between team 1 and team 2 matches with the following formula:

$$H2H_{t1t2} = \frac{1}{N}\sum_{i}^{N}\left({O^{i}}_{t1t2} - {O^{i}}_{t2t1}\right)$$

where ${O^{i}}_{t1t2}$ is equal to 1 if on the i^{th} match - $t1$ vs $t2$ the winner was $t1$, -1 if the winner was $t2$ and 0 if the match was ended with draw. By this definition of head to head statistics 1 and -1 mean absolute advantage of either home or away team and 0 would mean an absolute equality in past matches. It is evident that the head to head statistics lies between -1 and 1. Now that we have cleaned the data and figured out our predictor variables we create the predictive model. First what we have tried is Artificial

Neural Networks. So as we can see from Table 2, we have four predictor variables - $Elo1$, $Elo2$, $H2H$ and $Home\ Team$. To build the NN we used Machine Learning library Keras. Because, we have only 4 predictor variables our network is rather simple - it is a NN with 3 Dense layers. As the outcome of the match is a categorical response variable, in the last layer we should use the "softmax" activation function which return probabilities corresponding to every outcome category.

team1	team2	elo1	elo2	h2h	home
Celta Vigo	Valencia	1677.64294434	1806.46362305	-0.625	team1
Mallorca	Osasuna	1671.00817871	1706.91992188	-0.1111111111111111	team1
Atl. Madrid	Betis	1850.27404785	1735.38085938	0.6363636363636364	team1
Real Sociedad	Mallorca	1737.5546875	1678.74633789	0.16666666666666663	team1
Valencia	Barcelona	1801.70471191	2078.6640625	-0.7857142857142857	team1

Table 2. Sample data after processing and adding the predictor variables

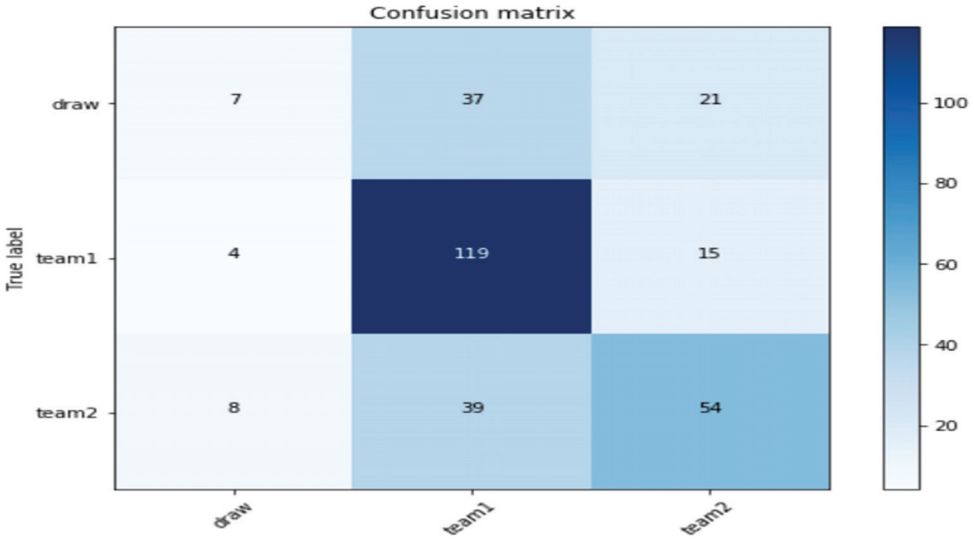

Figure 1. Confusion matrix of Premier League predictions

For building the model we take the matches of past 9 seasons of top 5 European leagues starting from 2010 until 2018. We split the data into train, test and validation sets. 20 percent of the data we took as a testing data. The rest of the data was split to training and validation sets by the proportion 80: 20. Let us look at the model performance for Premier league. As we can see from Fig. 1, the model predicts very few draws. This is rather expected because the probability of the draw before the match is the least, that is bookmakers always favor the winning odd of one or the other side and not the draw. From the other hand, it is good to have a model which predicts draws since the odds for draws are always higher as those are considered the least probable outcomes

pre-match. For Premier League predictor we have got an accuracy of nearly 60%. From confusion matrix we can also calculate the number of matches on which the predictor totally failed. For 39 matches the predicted value was 'team1' but the actual value was "team2" and for 21 matches the predicted value was 'team2' but the actual outcome was "team1". The predictor totally fails on 19% of the time, and the rest of the predictions fail only by one step. Completing similar analysis on the other 4 leagues we can give approximate estimation on leagues which are more or less predictable than the others.

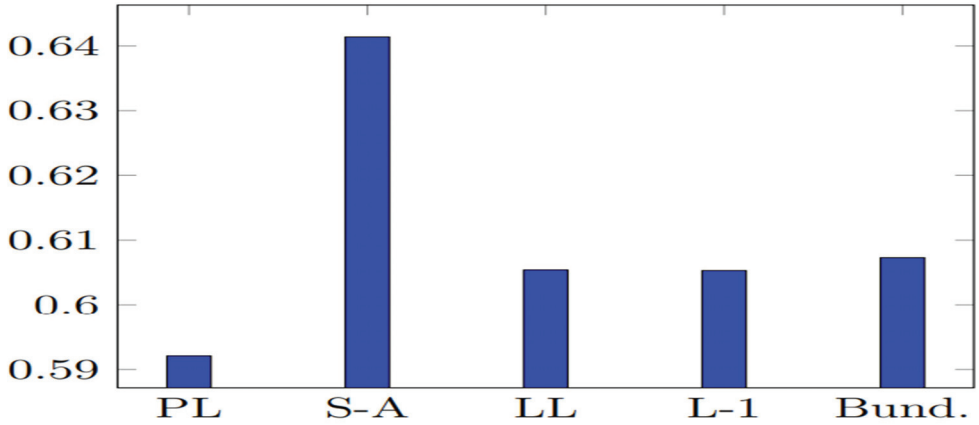

Figure 2. Predictability by top 5 national leagues

From Fig. 2 we can see that the least predictable national championship is the Premier League. The matches of La Liga, Bundesliga and French league are almost equally predictable. Finally, the most predictable of all with prediction accuracy of nearly 65% is Italian championship.

Scientific novelty. The scientific novelty of this article is that a model is proposed here, which predicts the probability of winning the matches of the main European league. Using the predicted odds, we present betting strategies, analyze their profitability. Article also assesses the predictability of the top 5 European football tournaments. Finally, using the results of the predictions, a web application was created, which gives predictions about the upcoming football matches of the top 5 European leagues.

Analysis. From Fig. 2 we have the prediction accuracies for top 5 European league matches. The problem is how to figure out, if it is bad or good. Considering the fact that our model does not tend to predict draws, it is quite reasonable result. However, from the perspective of profitability analysis accuracies do not illustrate anything. This is the point, where we need to use betting simulations. For example, we can take 10 matches randomly from the test set, predict their outcomes, simulate 1 dollar bet on the coefficient that corresponds to the predicted outcome and if it is correct get a profit equal to that particular coefficient minus our bet of 1 dollar. However, the profit, estimated in

this way, is completely ra//////ndom and if let's say in one set of games we achieve a 6 dollars of profit from 10 matches, for next set of 10 matches we can lose 10. The reason behind this is the ultimate randomness of the outcome of a match. Moreover, different profit values are the results of different realizations of outcomes of 10 observed matches.

Date from: 18.05.2021 League: Italy Get predictions

Team 1	Team 2	Date	Prediction
Fiorentina	Genoa	26 May	**Fiorentina**
AS Roma	Parma	26 May	**AS Roma**
Atalanta	Sassuolo	26 May	**Atalanta**
Bologna	Napoli	26 May	**Napoli**
Cagliari	Udinese	26 May	**Draw**
Torino	Lazio	26 May	**Lazio**
Frosinone	Chievo	26 May	**Chievo**
Inter	Empoli	26 May	**Inter**
Spal	AC Milan	26 May	**AC Milan**
Sampdoria	Juventus	26 May	**Juventus**

Table 3. Predictions of the upcoming matches of Serie-A

So, to avoid this kind of delusions and to be more general we conduct random simulations of 10 matches N times. We chose 10 matches in similarity to 10 matches that are played during every match week. The key points of the algorithm of Monte-Carlo simulations are introduced below. For every round of simulation generate a uniformly distributed random number r. If r is less than the away win probability of the home team we consider the outcome of the match as away team win. If r is less than the away win probability plus the draw probability the outcome is considered to be a draw. Otherwise, it is considered as home team win. This technique comes from probability theory and is quite natural approach in simulating random events with some probabilities (see [Wang, 2012]). After having the outcomes of the simulated matches, we simply compare them to the outcomes that were predicted by our model. In case of correct predictions, we add a profit equal to value of corresponding coefficient minus our 1-dollar bet. Using this algorithm we conducted 1000 simulations of 10 matches chosen from the test set. For every round of simulation, we obtained a profit that corresponds to one of 1000 realizations of the simulation. So, to obtain the long term profit estimate we need to average the profits over all of the realizations. For arbitrarily chosen 10 matches we obtained profit estimate equal to $0.51. However, this technique is limited to the specific domain of the training data. Here, we must note that even if we had a model which is 100% accurate based on past data that does not in any way mean that it will succeed on unseen data. So, beating the bookmakers is something that is nearly impossible task to achieve. We chose to create simple web page which gives users the

opportunity to get predictions on future matches of their chosen league. When user selects a league and a date, the application returns the list of matches that will take place in an interval of 7 days after the specified date with the predictions on the outcomes of those matches. We used Java framework - Spring MVC to serve as a back-end of our application. The predictions on future matches are done beforehand after match week.

Conclusion. We proposed a simple predictive model for the matches of top 5 European leagues. The predictor variables were Elo ratings, home advantage and head to head statistics. It turns out that by our model the less predictable league is English Premier League and the most predictable is Italian Serie-A. We also deployed our predictor by creating a simple web application which gives users the opportunity to get predictions on the upcoming matches.

Disclaimer*: Authors of this paper are not in any way responsible for the monetary losses caused by following any ideas and procedures included in this project. Bet responsibly.*

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Predictions of top 5 European football league matches

Key words: football, odds, monte carlo simulations, predictions, machine learning

Beating the bookmakers is something that is nearly impossible task to achieve. However, in this paper we propose a model to predict winning odds of major European league matches. Particularly, the predictions were done on top 5 (England, Spain, Italy, France and Germany) football league matches. To create an accurate predictor, we used Machine Learning to build an Artificial Neural Networks. Using the predicted probabilities, we introduce betting strategies and analyze their profitability using Monte Carlo simulations. To create more precise model, we set predictor variables such as ratings of the competing teams, head to head statistics and home advantage. We also estimate the predictability of top 5 European football competitions. The analysis is done based on historical data of matches and the closing odds on outcomes of matches. Finally, we deploy the results of the predictions by creating a web application which gives the predictions on the upcoming football matches of the top 5 European leagues.

ANTHROPOLOGICAL APPROACH ON MIGRATION, MOBILITY AND TRANSNATIONALISM BETWEEN THE BALKANS AND EU MEMBERS STATES

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Key words: migration, economy, mobility, transnationalism, Balkans, EU, consumption

Introduction. We are living in "the age of migration" – this title of a publication of Stephen Castles and Mark J. Miller (1993) suggests that the rise of international migration is one of the most important phenomena of the latter 20th and early 21st century. During the last five decades, the amount of international migration has grown enormously, from 82 million in 1975 to 175 million in the year 2000 and 232 million in 2013, which represents 3 % of the world's population.

Socio-cultural transnational activities cover a wide array of social and cultural transactions through which ideas and meanings are exchanged. Recent researches have established the concept and importance of social remittances which provide a distinct form of social capital between migrants living abroad and those who remain at home [Wimmer & Glick Schiller, 2002, 301]. There are often a combination of factors, which may play out differently for women and men. Gender roles, relations and inequalities affect who migrates and the impacts on migrants themselves, as well as on sending and receiving areas. Migration can provide new opportunities to improve women's lives and change oppressive gender relations – even displacement as a result of conflict can lead to shifts in gendered roles and responsibilities to women's benefit. However, migration can also entrench traditional roles and inequalities and expose women to new vulnerabilities as the result of precarious legal status, exclusion and isolation.

Methodology. While some argue that the "virtual" world is a different "social space" than the "real world," some ethnographers argue that there is one social world which contains both traditional and technologically advanced modes of communication and sites of social activity [Vertovec, 2004, 3]. "Virtual reality" is not a reality separate from other aspects of human action and experience, but rather a part of it. Therefore, ethnographers should define the field or setting of their research on the basis of their research topic, rather than arbitrarily or prematurely excluding one arena or the other. The ethnographic research reveals a variety of approaches to how the setting of online research is defined. Migration can provide a vital source of income for migrant women and their families, and earn them greater autonomy, self-confidence and social status. At the same time, women migrants, especially if they are irregular migrants, can face stigma and discrimination at every stage of the migration cycle. Before departure, women can be faced with gender-biased procedures and corrupt agents. In fact, gender

discrimination, poverty and violence, can provide the impetus for women to migrate or enable women to be trafficked in the first place. During transit and at their destination women can be faced with verbal, physical and sexual abuse, poor housing and encampments, sex-segregated labour markets, low wages, long working hours, insecure contracts and precarious legal status. And upon return to the source country they may be faced with broken families, illness and poverty.

Literature review. Scholars define stages of the migration process in which the incorporation of a gender perspective is essential [Vásquez & Marquardt, 2003]. The first, the pre-migration stage, includes factors such as gender relations and hierarchy and roles of men and women in their own country. The second, crossing the border, refers to migration policies in countries of origin and destination - which can affect differently the migration of men and women, migration strategies, occupations and stereotypical images of male and female roles and the potential entry of women in the receiver labour market. Finally, the post-migration stage, deals with the impact of women in a given flow, the labour market and the receptor status of the roles in the family and at home.

According to a typology proposed by Mauricio Ambrosini, "circulatory transnationalism", based on the continuous movement through the borders, between the sending and receiving countries, but also within the latter one, and towards other countries, goes along with a "connective transnationalism" The last two models identified by Ambrosini are the "mercantile transnationalism", based on the circulation of the commodities, and the "symbolic transnationalism", focusing the repertories of cultural consumption and representation of identities (national, ethnic, religious, and so on). Among the most significant studies in this area we consider particularly valuable the analysis conducted by C. Brettell (2006, 327-34), A. Çaglar (2001, 601-13), S. Castles (2002, 1143-68, J. Dahinden (2010, 51-71, T. Faist (2000, 189 – 222), N. Glick Schiller (2010, pp. 109-129), E. Morawska (2001, pp. 175-212), and others. The migration champion of Europe- the Balkans- gained this reputation in the beginning of the 1990s. This period was characterised by rather contradictory trends in the Eastern and Western sub-regions. Scholars are differencing three periods after the fall the Berlin Wall of migrations from the Balkan: The first period is from 1989 to the mid-1990s which also mark the end of the wars in former Yugoslavia, the second period started after the Dayton Agreement of 1995 in the first decade of the new century with the EU accession of Romania and Bulgaria (2007) and the third period when European integration is already reality, forthcoming or pending for the whole region. The first period is characterized by the sudden and huge increase of the migration flows, considerable increase of the intensity of labor and non-labor migration and literal "flight" of the Western and Eastern Balkans towards two opposed migration poles. The second period has two characteristic trends- transition to post-conflict migration flows on the Western Balkans and gradual and slow Europeanization

of the migrant on the Eastern Balkans. The third period is characterized with a labour migration which gradually occupies a central position as the main source of the migration. Balkan migration flows may be divided into two large groups: 1) "Non-labor" (trafficking, retirement or asylum) and 2) "labr migration" (emigration, including curricular migration and the free movement of people and immigration, return, including that of representative of Diaspora). Non-labor migration is extremely heterogeneous [Pries,. 2007, 34], while some retired migrants start their own business.

Labor migration has stable traditions on the Balkans, where it is referred to by the word "gurbet", "pechalbarstvo" etc. It is among the most stable sources of labour migration in Europe. The most targeted destination for the migrants are Germany, Italy, Switzerland, Austria, UK, Sweden, Greece etc.

Scientific novelty. Despite the problems of terminology, the transnational approach is very fruitful for conceptualizing not only the migration history of the Balkans but also the overall history of the region. This does not mean that all social phenomena should be conceived as transnational, or even that there was anything "transnational" before the nation was invented. Socio-cultural transnational activities cover a wide array of social and cultural transactions through which ideas and meanings are exchanged. Recent research has established the concept and importance of social remittances which provide a distinct form of social capital between migrants living abroad and those who remain at home. These transfers of socio-cultural meanings and practices occur either during the increased number of visits that immigrants take back to their home countries or visits made by non-migrants to friends and families living in the receiving countries or through the dramatically increased forms of correspondence. The profile of the Balkan's labor migrant unfolds in the wide expanse between the two poles- so called "euro- plumbers" and "euro-stars". The jobs of the first group often fall under the term "3D"- Difficult, Dirty and Dangerous. Migrants from the Balkans are typical reflection of dual labor market theory according to which there are sectors which are not attractive for the locals and are being filled by foreign workforce. In this case the sectors are construction, tourism, hospitality, domestic help, care for elderly etc. To the second category of migrants has been given a different label: "brain drain". This category of migrants is at the center of political and academic discourse in all countries [Morawska, 2001, 75]. "Brain drain" is a serious curse for fragile economies because it disempowers the most highly qualified and innovative segment of the workforce. Labor migration today is central to all national migration models in the Balkans in relation to all flows.

Analysis. In recent years, migratory movements have become an issue which has been studied by diverse scholarly disciplines and approaches [Levitt & Glick Schiller, 2004]. Social and Cultural Anthropology with their specific methods have also significant contribution to theoretical issues about mobility and migrations. While macro

approaches focus on the stream of population, political and economic restrictions and possibilities of influence over migrations, anthropologists direct the attention to the micro- and mezzo-level of analysis, where the family and household are among the main units of analysis. According to anthropologist migration is an important part of livelihood strategies followed by the households in order to distribute and manage the income risks. It is a strategic choice of combination of activities by families and their members to maintain, secure, and improve their livelihoods and invest in education or business activities. These conceptions are popular in anthropological studies and actually allow viewing migrations beyond the theories that conceptualize migrants as passive actors subordinated to cost-benefit calculations or pushed and pulled by different factors (salaries, work places etc.). Household centered migration theories construct household as an entity with clear plans, strategies and aims, one that makes unanimous decision based on equality of power and commonality of interest among household members. Migration theories can be classified according to the level they focus on. Micro-level theories focus on individual migration decisions, whereas macro-level theories look at aggregate migration trends and explain these trends with macro-level explanations [Guarnizo, 2003, 1211]. The meso-level is in between the micro and macro level, e.g. on the household or community level and can explain both causes and perpetuation of migration. Taking on account the transnationalism literature, four primary challenges on researching of transnationalism can be identified: First, instead of expanding the notion of transnationalism to a new catch-all concept, and of 'viewing transnational relations in any corner', it is necessary to *define appropriate units of analysis for transnational societal phenomena*. The simplest transnational societal unit of analysis could be a 'transnational social relation', like the communication and interchange between a migrant and his or her family abroad. In order to use the transnationalism concept in a more precise manner, transnational studies should focus not on transnational relations in general, but on transnational *societal units* as relatively dense and durable configurations of transnational social practices, symbols and artefacts. To this end, it is necessary to explicitly define the specific relation between the (transnational) *units of analysis*, the (local, national, regional or global) *units of reference* and the (micro, meso or macro) *units of research*; these components characterize the transnational perspective and distinguish it from a global or simply comparative point of view. A second task identified by the scholars of transnational studies is *empirical transnationalism*: the need to measure the *real empirical extent* of transnational social phenomena and especially of durable and dense *transnational societal units*. On the one hand, the multifaceted and ubiquitous existence of transnational social *phenomena* and *relations* is a direct result of building socio-geographic container units such as nations, states and societies - and in this broader sense transnational relation are recognized as commonplace in transnational studies. On the other hand, transnational *social* or *societal spaces3* could also be

conceptualized in a narrow sense. A third challenge pointed out by transnationalism studies is to analyze the *internal structures and processes* of such transnational societal units as well as the *interrelation between transnational and non-transnational types of societal units of analysis*. As a fourth *desideratum* of current transnationalism studies, there still remains the need for developing an adequate methodology and satisfactory methods for transnational research. Scholars defined some excellent general rules for transnationalism studies, such as the famous 'followings' (follow the people, follow the thing/commodity chain, follow the metaphors, follow the plot/story/allegory, follow the life/biography, and follow the conflict). An important element in the changing gender specifics of the migratory flows is the tendency for the females to migrate individually. Aiming at finding employment, they migrate without accompanying males often as heads of families. The potential positive role of migration for women's emancipation and empowerment has, however, its 'downside', which deserves attention. Female migrants remain more vulnerable towards the migration risks as they are exposed to a greater extent than men with respect to violent labour and sexual exploitation, unfavorable working conditions and low pay.

Conclusion. Gender issues and gender standpoints occupy a central place in analyses of contemporary migration dynamics. It is true that the initial interest of migration literature that brought gender at the forefront has been a sort of "rectification" of a historic injustice. Going further beyond the initial perception of female migrants as followers of their husbands through family reunification and as keepers and "transmitters" of tradition and cultural identity of the country of origin to the children by focusing on daily life and culture, women migrants have been largely reinvented, revisited and reconfigured. Gender has embedded itself in social research and theory not just as a significant factor but as an essential part of any social dynamics. Migration seems to be gendered; migration studies as well. Nevertheless, the ways gender is perceived and used analytically remains an open question. As far as digital networks are concerned, definitions seem to be more problematic and need to be further theorized, in particular when they intersect with migrant social networks. In fact, the term "network" as well as the term "digital" could easily be characterized as "fuzzy buzzwords", since they are often used, abused, and misused, reaching to a point that they "mean everything and at the same time nothing".

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Anthropological approach on Migration, Mobility and Transnationalism between the Balkans and EU members states

Key words: migration, economy, mobility, transnationalism, Balkans, EU, consumption

During the past decades, globalization has come within the purview of anthropology. Today, migration, mobility and the social groups they produce – refugees, tourists, labour migrants – are on anthropology‘s research agenda. Increasingly, anthropologists study the cultural effects of the worldwide diffusion of commodities, technologies and media products, as new communication and transportation technologies bridge huge distances in ever briefer intervals of time, and release people from geographically restricted communities of interaction. Cultural artefacts – not just material things but also political ideas, scientific knowledge, images of the future and interpretations of the past – travel further and more swiftly than ever before. They are available simultaneously almost everywhere. However, their accessibility is restricted to those social actors who have the economic means or the cultural capital to make use of them.

CONTEMPORARY MANIFESTATIONS OF COMMON THREATS AND ECONOMIC RISKS DERIVED FROM THEM

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Key words: economy, threats, risk management, competition, cooperation, economic security

Introduction. Our main objective is to identify the need for cooperation, particularly regional and global strategy development in the context of neutralizing common threats and increasing competitiveness, and to present the prerequisites for its implementation. Therefore, we will look at the connection between threats - economic risks - competitiveness, we will consider the role of cooperation in reducing these threats. Finally, the threats that cause certain economic risks with their possible impact on the country's competitiveness will be presented.

Methodology. In general, threats of a global nature, i.e. common to almost all countries, are not decreasing, but increasing. In addition, some of them, instead of being reduced, become more acute and deepen. One of the important examples of what has been said is the threat of food, which, according to the definition of the United Nations, turns into a threat of hunger. In particular, the director of the UN World Food Program, David Beasley, has predicted that humanity will face mass starvation, political instability and uncontrolled migration if measures are not taken to solve the current food crisis [Beasley, 2022]. According to him, due to the aggravation of this problem, next year will be much worse. He believes that people in different parts of the world will have difficulties in the next 12 months due to the increase in food prices. Beazley emphasized that neglecting this problem threatens the world with food shortages.

Literature review. Among the general threats, the energy crisis is getting worse, which leads to another inflationary risks that are difficult to manage so far, which has a chain effect on all levels of competitiveness, and leads to structural and other changes in the economies of individual, including developed countries.

Among other common threats, we highlight so-called non-tariff barriers to foreign trade, blockades of transport communications in political and armed conflict or other conditions, which prevent local companies from entering foreign markets and forming their external demand, which in turn can lead to the following results:

- reduction of internal consumption and export volume of goods and services of an individual company at the micro level, further decline of the competitiveness [Boltho, 1996, pp. 1-16] of the companies producing them based on the reduction of the scale effect;

- reduction of extensive investments at the meso level and slowing down the development of national competitive advantages and innovative activities, scientific and technical capacity, suspension of the introduction of modern production mechanisms [Danziger & Haveman, 2001, 23],

- growth of development disparities, property inequality and stratification of society at the macro level, increase of dependence on imports, new risks of intellectual security of the given sector [Dinu et al., 2021, 948-963],

- reducing the volume of trade turnover with neighboring countries at the regional level, which has a negative effect on the efficiency of the economy and the competitiveness of the processing industries in particular [Leontief, 1953, 332-349]

.Global warming is also among the common threats and negatively affects the economies of regions and individual countries.

- at the macro level, although worldwide lockdowns led to a reduction in global emissions in the first half of the 2020s, the experience of the 2008-2009 financial crisis suggests that emissions can again cause major damage to the biosphere and economy. The transition to a greener economy in Armenia cannot be delayed until the upheaval caused by the epidemic subsides. "Failure to mitigate climate change" is one of the most significant and likely risks to damage the economy's competitiveness identified in our research.

Scientific novelty. One of the prerequisites for solving the mentioned problems is the development of competition based on production factors. At this stage, all national economies operating successfully in the world market and their branches achieve their competitive advantages almost exclusively due to the main factors of production: natural resources, various crops in agriculture and favorable conditions for their processing, a sufficient amount of cheap and skilled labor. In such an economy, competition between firms within a country takes place solely on the basis of low prices in product areas that require unsophisticated or cheap and readily available technology.

Analysis. Undoubtedly, one can add to the listed threats the threat of the Corona pandemic, which suddenly broke out for the economies of all countries, which brought with it risks in almost all branches of the economy. As a result, many countries closed not only external but also internal borders. The coronavirus is a serious blow to the modern world, which developed political systems should have faced. Not only health, but also economic, political and social departments had to respond promptly and appropriately. The COVID-19 pandemic is not only claiming millions of lives, but also negatively affecting the economy. The economic shock of the pandemic, in the form of massive job losses, has exacerbated imbalances, with long-term consequences, and an uneven recovery could lead to the worst. It is worth noting that about 60% of respondents to the Global Risk Perception Survey conducted by experts at the World

Economic Forum in Davos considered "infectious diseases" and "livelihood crisis" as the main short-term threats to the world. In particular,

- at the micro level, the crisis gave a new impetus to the current trends in the business sector; The business risks stemming from these trends have been exacerbated by the pandemic and include stagnation in developed countries and loss of potential in emerging markets, the collapse of small businesses, widening gaps between large and small firms, a decline in market dynamism and a worsening of mismatches.

- at the macro level, it is difficult to achieve long-term sustainable development under these conditions.

- at the meso level, not only individual industries have been affected, but COVID-19 has accelerated the fourth industrial revolution, expanding the digitization of human interaction, e-commerce, online education and telecommunications. These changes will transform society long after the pandemic and will include positive changes, including the possibility of telecommunications and the rapid development of vaccines. But they also exacerbate the risk of creating inequality.

Among the common threats, wars are perhaps the most important. in the twenty-first century, they cause especially great damage in the post-Soviet area. In 2022, Russia-Ukraine, Azerbaijan-Armenia and other armed conflicts were added to them. All this, taken together, not only does not contribute to the effective management of existing risks at the micro, meso and macro levels, but also creates and increases new threats. In particular:

- investment and innovative activities are disrupted;

- artificial obstacles arise for the effective realization of scientific and technical ability;

- in conditions of regional isolation, monopolies in various branches of the economy are increasing;

- hinders the introduction of modern production mechanisms;

- they create fertile ground for the increase of military expenses, the increase of internal and external state debt, the decline of the country's solvency, the shadow economy and its criminalization;

- the use of discriminatory approaches in foreign trade;

- it becomes difficult to ensure food security, energy security, security of information and other spheres;

- new obstacles are emerging for the security of communication and transport communications in the region;

- problems are created in the region in the protection of the environment and in the joint fight against natural and man-made disasters.

We also emphasize the information threat, which is an essential part of modern hybrid wars, and which is the subject of every state's attention even in peaceful conditions. The risks derived from this are present at both macro, meso and micro levels. In purely economic terms, the mastery of large volumes of data, which is necessary for large companies to effectively coordinate work with branches and partners scattered around the world.

Obviously, an insufficient level of information security leads to a decrease in competitiveness for a given company at micro, meso levels, and for international or joint ventures also at regional and global levels, and in competing countries leads to an increase in competitiveness at micro, meso and macro levels. In the case of Armenia, IT programs are mainly developed by order of foreign companies, not having a great demand in the local market, at the macro level, IT is not integrated much into the economy and turns other countries into a "technological attachment"; In turn, this also creates information security risks for competitiveness at the micro, meso and macro levels in the face of fierce competition abroad.

In 2022, sharp changes in exchange rates and increased financial volatility in various regions and the world intensified, which, together with the gradual increase in the use of crypto-currency, has the following impact on risk management and competitiveness. On the macro level, on the one hand, it promotes free competition, on the other hand, it increases the instability of the financial system, in the case of attractive investment projects abroad, it increases the outflow of foreign currency from the country if there is an unstable situation in the country, it increases the level of dollarization of the economy and the instability of the national currency in relation to foreign exchange and crypto currency, etc. , and at the macro, us and micro levels risks arise in terms of financial security, which negatively affects competitiveness at all levels. Thus, steps aimed at increasing economic competitiveness at all levels are carried out in the context of existing and growing risks in domestic, regional and global economies. It is noteworthy that the high degree of interdependence of countries, which is expressed mainly by the index of openness, indicates a decrease in the elasticity of the national economy and a decrease in its resistance to the manifestations of crisis situations in the global area.

Effective management of economic risks arising from common threats also requires studying their current state, assessing possible impacts at the micro, meso, macro, regional and global levels, as well as making certain predictions based on the analysis of trends related to current risks. The expert community in 2022 and the following main risks are more important and predicted for the coming years:

- a financial asset bubble can burst wildly in large economies, meaning that the prices of housing, mutual funds, stocks, and other assets in the large economy become increasingly disconnected from the real economy;

- sharp deterioration of system-forming important branches of industry, that is, collapse of systemic branches or companies of significant importance for the world economy, financial markets and society;

- debt crises in large economies. corporate or public finances will be overwhelmed by debt accumulation and debt servicing in major economies, leading to mass bankruptcies, defaults, insolvency, liquidity crises or sovereign debt crises;

- failure to stabilize the trajectories of price fluctuations due to the inability to control the uncontrollable increase (inflation) or decrease (deflation) of the general price level of goods and services;

- the spread of illegal economic activities, that is, the global spread of informal and illegal activities that undermine economic progress and growth;

- prolonged economic stagnation, which will be manifested by almost zero or slow global growth for many years;

- severe commodity shocks - sharp shocks in the supply and demand of globally important commodities (chemicals, emissions, energy, food, metals, minerals, etc.) that strain corporate, government and personal budgets.

Features of external cooperation and competition of the economy of the Republic of Armenia. We believe that healthy and fair competition is a prerequisite for development at the micro, meso and macro levels, unless we are talking about natural monopolies, cooperation is MORE beneficial at the regional and global levels.

Finally, without cooperation, only those /mainly large/ countries that have achieved a high level of competitiveness, can apply the scale effect and have a refined and effectively applied toolkit of economic diplomacy can freely compete in foreign markets.

Table 1. Armenia's competitiveness rating and index until the pandemic

indicator	last	previous	measure	date[1]
Competitiveness rating	69.00	70.00		2019 december
Competitiveness index	61.28	59.86	points	2019 december

[1] 2019 is mentioned as a pre-pandemic year.

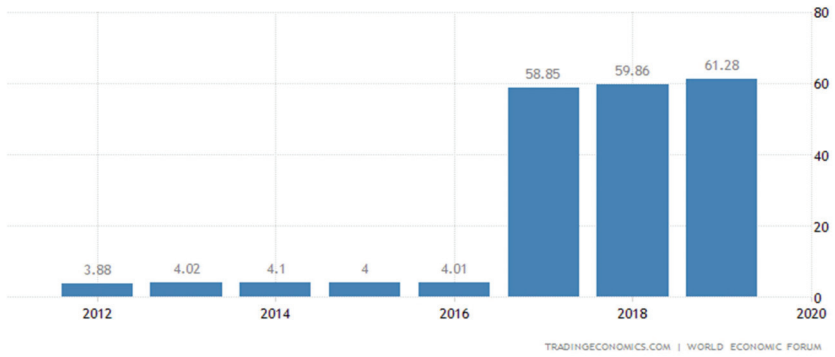

Figure 1. Competitiveness of Armenia 2012-2020

For now, Armenia is seriously lagging behind its competitors and neighbors in the development of competition at almost all levels, which is crucial for competitiveness. In the 2019 global competitiveness report published by the World Economic Forum, Armenia scored 61.28 points out of 100[1]. Therefore, cooperation can contribute to the process of raising these levels in various fields and help to establish a number of preconditions necessary for development.

Armenia's economy, for example, at this stage is highly sensitive and vulnerable to global economic crises and changes in foreign exchange rates, which lead to fluctuations in demand and relative prices. It also turns out that it is extremely vulnerable to the loss or weakening of existing factors and diversification of industrial management, product and geography of its realization, even in case of rapid changes in the situation. A clear proof of this was a certain slowdown in the growth rate of exports of a significant part of domestic goods in case of devaluation of the national currency in 2022. Instead, the possession of natural resources in individual branches, in this case, certain reserves of copper, molybdenum, gold, etc., can provide Armenia with a high per capita income for a long time, but, as we will show below, this is still not a sufficient basis for a sustainable increase in the efficiency of the economy.

Another prerequisite is the development of investment-based competition, which is in decline in Armenia[2]. In this case, the competitive advantage of the economy may be based on the willingness and ability of local enterprises to invest actively, even aggressively. It is an important prerequisite that companies invest in modern, efficient equipment and the best technologies available on the world market, and that these investments are also aimed at acquiring new licenses, creating joint ventures, and ensuring other conditions for increasing the competitiveness of more modern and

[1] Armenia Competitiveness Index, https://tradingeconomics.com/armenia/competitiveness-index
[2] https://fip.am/15132

specialized branches and sectors. In fact, few developing countries have reached this stage, but Armenia has no choice.

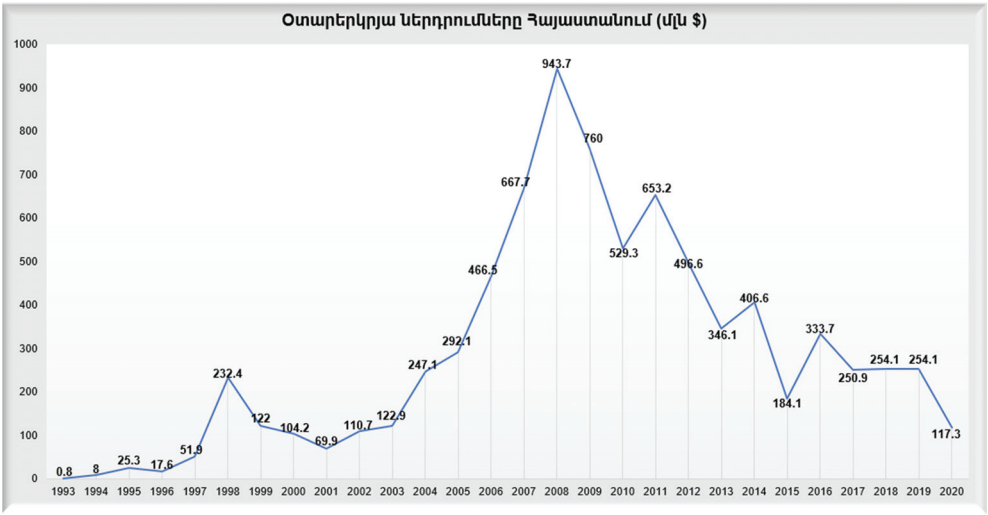

Figure 2. Foreign investments in Armenia, 1993-2020

The next prerequisite is the development of competition based on innovation, which can mainly happen in countries at different levels of economic development. Initially, various industries can initiate to achieve a higher level of competitive advantage through innovation. This process can then be extended to other areas as well. In this way, sprawling development creates the potential for capital inflows and cross-sector financing that are essential to spur economic growth. If we take into account that among the developed countries Great Britain reached the stage of innovation in the first half of the 19th century, the USA, Germany and Sweden during several decades at the end of the 19th and 20th centuries, Italy and Japan reached this stage only in the 70s of the 20th century. AD, then one can imagine what Armenia should do to ensure this prerequisite.

Conclusion. Competition based on wealth, as a prerequisite, unlike the previous ones, ultimately leads to a decline in production. The driving force of the economy is already acquired abundance. The main problem is that the economy, guided by the wealth created earlier, begins to lose the ability to consolidate the acquired positions and advantages. This is mainly due to the fact that the interest of investors, managers and individuals is changing in a direction that undermines the sustainability of investment and innovation processes and, therefore, economic growth. New goals are set (Germany, Sweden), which are often very welcome from a social point of view, but which, however, crowd out the interests promoting economic progress. International experience

proves that at this stage companies begin to lose ground in international competition. This is mainly due to the fact that they pay more attention to maintaining their previous positions than to strengthening them; companies' interest in increasing investments is decreasing. One of the symptoms of moving to this stage is the increase in the number of so-called mergers and acquisitions of companies [Angwin, 2015]. Firms with excess capital seek profitable investment opportunities without the risk of starting new firms. The increase in corporate takeovers may also reflect a desire to eliminate competition and increase stability. Acquisitions create the illusion of progress without creating new companies or strengthening the competitiveness of existing ones. Often they further slow down innovation. It should be noted that obvious signs that the economy has entered a rich phase may not appear for a long time due to inertia existing due to consumer loyalty or established market positions. However, as soon as a few leading segments begin to lose their competitive edge, this process immediately spreads to other areas. Industries that have not innovated for a long time become poor buyers for their suppliers and lose the ability to sustain, let alone accelerate, innovation in the industries they serve [Reshetov et al., 2018, 271-276].

However, until Armenia reaches a certain level of income and savings, the main danger it faces is not a transition to wealth, but a gradual regression. Decreased competition, delay in the creation of new factors, decline of interest at all three levels or lack of its structures and deterioration of the quality of demand are not all the phenomena and factors that lead to a decrease in the speed of modernization and renewal. A typical example of a country facing such a threat is present-day Denmark [Murad et al., 2018, 12]. As positions weaken in leading industries and sectors, a decline in wages and living standards inevitably follows.

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Tatul MANASERYAN

Contemporary manifestations of common threats and economic risks derived from them

Key words: youth employment, unemployment, skilled labor, labor market, "brain drain", economic security

In this article, our goal is to identify the need for cooperation, particularly regional and global strategy development in the context of neutralizing common threats and increasing competitiveness, and to present the prerequisites for its implementation. Therefore, we look at the connection between threats – economic risks - competitiveness, we will consider the role of cooperation in reducing these threats. Finally, the threats that cause certain economic risks with their possible impact on the country's competitiveness will be presented. As soon as firms lose high-order competitive advantages, there is a decline in production in the local industry, and then local firms turn to price competition. Slowing wage and job growth, rising unemployment further reduce interest in increasing production efficiency, leading to further weakening of market positions. The level of personal income of the population begins to decrease compared to other developed countries, which has a negative impact on the quality and variety of domestic demand.

PREVENTIVE DIPLOMACY IN CONFLICT RESOLUTION

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Key words: diplomacy, state, conflict, communication, conflict, preventive diplomacy

Introduction. Diplomacy has been developed throughout history since ancient times, and today it represents a very important factor in the functioning of Global society as a whole. Over the time, the methods of diplomacy have changed, perfected and improved, so we can say that today diplomacy has become a complex system, functional and useful in every respect. Thus, one of the skills which is used is negotiation, which has a multiple role especialy in a field of Preventive diplomacy.

Methodology and literature review. *Preventive diplomacy in conflict resolution in the light of the United Nations.* According to Ted Robert Gurr, only during 1993 and 1994, about fifty serious and urgent ethno-political conflicts took place in the world. While in the report of the UN Development Program (UNDP) A Human Development Report, it is estimated that during 1993, 52 major conflicts took place in 42 countries in the world, and that another 37 countries in the world were rocked by political violence. Out of a total of 79 countries that were affected by conflicts and political violence, 65 are from developing countries. Since the fall of the Berlin Wall, there have been over 90 armed conflicts, of which the largest number are ethnic conflicts (Croatia, Bosnia and Herzegovina, Somalia, Rwanda, Chechnya, Tajikistan, Kurdistan, etc.) [Sahadžić, 2009, 113]. Due to the large scale of internal armed conflicts[1], especially in the last few decades of the last century until today, including the "Arab Spring"[2], one gets the impression that international law is powerless to use existing legal solutions. Namely, the attempt was made in 1992 with the Agenda for Peace[3] and its Addendum from 1995. It has been shown that preventive diplomacy is an acceptable solution in the newly created situation, but with one shortcoming, it is difficult to implement it[4].

[1] The causes of internal armed conflicts have an ethnic, religious and economic component. They are followed by a large number of civil victims. And that: a large number of dead civilians, displaced persons and refugees. Organized crime often flourishes parallel to internal armed conflicts, such as: smuggling of weapons, people, narcotics, trafficking in human organs, prostitution.
[2] The goal of which is not only the overthrow of the regime, but also has religious elements.
[3] It was adopted at the suggestion of Boutros Boutros Ghali, Secretary General of the UN.
[4] The Arab Spring case is also in support of this influence wave ‹spilled over› from society to the State in: Tunisia, Egypt, Libya and Syria - where the fighting continues till today.

Only with use of the UN Charter, especially through Chapter VII, and the activation of the Security Council, UN activities can achive some results. However, it should not be forgot that armed interventions are often approached without the consent of the aforementioned UN bodies, which is a direct violation of the UN Charter, and as a result, weakens the international legal system when it comes to preserving peace in the World, and Peace should be the main goal of the UN Charter.

Scientific novelty. Preventive diplomacy is introduced as a major tool to establish peace and security. Namely, it is very likely that humanity is facing only one in a series of challenges to which humanity must respond. One, and maybe the most important problem is all about the need to change (revision) the UN Charter. It is even possible that the Amendment of the UN Charter is carried out unobtrusively through the 1992 Agenda for Peace as well as its 1995 Supplement.

In the essence of the Agenda for Peace is Preventive Diplomacy, which means preventing the emergence of disagreements between the parties, but also preventing that disagreements turning into conflicts and preventing the spread of other misunderstandings when spread of conflict arise. Namely, the essence of preventive diplomacy lies in negotiation.

Analysis. The agenda for peace draws attention to the fact that it is obviously better to prevent conflicts through early warning, quiet diplomacy, and in some cases preventive deployment of forces, than to be forced to undertake major political-military efforts to resolve the conflict once it has already broken out. The author of the Agenda for Peace draws attention to the experience that has shown that the biggest obstacles to success in these efforts are not, as is widely assumed, a lack of information, analytical skills or ideas for a UN initiative. Success is often hampered at the outset by the unwillingness of one side or the other to accept UN assistance. This also applies to interstate and internal armed conflicts[1].

The basic principles of modern international law in relation to preventive diplomacy and conflict resolution, apart from the Agenda for Peace from 1992, also refer to Article 2 of the UN Charter, which prohibits the use of force and obliges member states to resolve their disagreements by peaceful means, but in such a way that international peace, security and justice cannot be threatened.

Chapter VII of the UN Charter, which elaborates on the issue of the collective security system, is particularly important. The Agenda for Peace emphasizes respect for

[1] UN 1945-1995: between recognition and rule: UN Charter, Agenda for Peace, Agenda for Development, Security Council Resolutions, On the Circle in the former Yugoslavia and other appendices, "International Policy" "Official Gazette" Faculty of Law, Faculty of Political Sciences, Institute for International Politics and Economy, Belgrade, 1995, p. 99.

the fundamental sovereignty and integrity of states, which is the cornerstone of the organization. It is also vital to strengthen institutions that can provide a long-term and sustainable base for global peace and security. Since 1992, numerous centers for preventive diplomacy have been established around the world, namely: the United Nations, the Organization for European Security and Cooperation, the Inter-Parliamentary Union, the Association of Southeast Asian Nations, American conflict prevention institutions and many others. While the instrument in the cooperation strategy for reducing global violence is the International Court of Justice, whose jurisdiction is the prosecution of individuals for crimes of genocide and other crimes against humanity. Thus, the International Court of Justice acts as part of the UN preventive diplomacy strategy, helps the parties to the conflict to clarify their positions and positions, calms tensions and gives additional time for sensitive bilateral negotiations[1].

As a crucial importance for the success of preventive diplomacy, are not only early warning, which can control the moment when a third party will become involved in conflict resolution, but also political factors and the will of the parties involved in disouties.[2]

Diplomacy, like war after all, is only an instrument in the service of politics. So the concept of preventive diplomacy does not take shape by chance. it as a methodological practice which requires adapting the entire mechanisms and international networks. In fact, it does not promise a world in which resorting to force would become superfluous [Pirońanac, 2004, 356-357].

Of course, it should not be overlooked that the OUN is faced with a great challenge to give answers on many questions about "prevention of armed conflicts", such as the overall situation in the Middle East, the area of the former USSR, as well as solving the Palestinian and Cyprus problems. The rhetoric of "arms rattling" and "some new spring" in some powerful states is also running through the media[3]. So, one could freely say that the world is a "powder keg" that can explode into a devastating total war, the only, still open question is - which internal armed conflict and which country will

[1] Retrieved from the link: http://www.doiserbia.nb.rs/img/doi/0025-8555/2009/0025-85550902112S.pdf, Maja Sahadžić, Preventive diplomacy in international law and its application in the territory of the former Yugoslavia, Scientific source paper, MP 1-2, April 2009, p. 123-128. Access 11.08.2022

[2] On the example of the disintegration of the SFRJy, only later did the negotiations that resulted in the Dayton Agreement take place, the achievement of which depended both on the negotiating skills of mediator Richard Holbrook and those who decided to negotiate. More about it at: http://www.patriotskifront.com/index.php?option=com_content&view=article&id=164:–q–q&catid=34:geo-politika&Itemid=50, interview with Vladislav Jovanović, "CIA obsessed with Kosmet, broke up the Balkans", (Č). Access 11.08.2022

[3] More about it at: http://www.srpskapolitika.com/Tekstovi/Komentari/2012/latinica/017.html. Access 11.08.2022.

play the role of "fuse". The international community can avoid this outcome precisely by applying all instruments from the arsenal of "preventive diplomacy", which have not been used in recent years[1].

The Ukrainian crisis and the UN. The dynamics of the multi-year unresolved Ukrainian crisis have eroded the relations between Moscow and Brussels since the annexation of Crimea in 2014, and the Russian military invasion / special operation / in 2022. has moved the European Union and the Western allies (within NATO) to increase the scope of sanctions and various politically motivated economic retributive measures in light of expressing their solidarity with Ukraine and her territorial sovereignty.

International organizations such as the United Nations or the OSCE have acted from a different perspective since the beginning of the war in Ukraine, while the dynamics are mainly shaped by the positions of the leading EU member states such as France and Germany, as well as the positions of the EU and NATO.

Admittedly, it should be borne in mind that the last straw of rationality in the entire tragic situation is that NATO refrains from its direct engagement in Ukraine, in order to avoid a much more dangerous direct clash with Moscow. Quite understandably is the the question which arises as : why the organization, as UN, which is in charge of peace and security is not more actively involved, except in the humanitarian part, while other forms of preventive diplomacy to achieve peace are absent. Obviously, the world community is completely divided and at this moment everyone is focused on themselves, with the goal of making the best possible profit, while the population remains alienated, and does not know what awaits them in the future.

Conclusions. Unfortunately, the United Nations failed to prevent the outbreak of war in Ukraine, i.e. to preserve international peace and security through preventive diplomacy. The reason for this is that Russia, as one of the parties to the conflict, blocked the adoption of a binding Security Council resolution that would refer to its military actions in Ukraine.

We think that the United Nations will have a much more significant role after the war is over in terms of the humanitarian dimension and solving the refugee problem, as well as establishing facts and producing knowledge related to that situation.

The UN is already providing some help through its specialized agencies, although experts have the impression that, in addition to strong rhetoric, the Secretary General of the world organization could have used his intermediary role more significantly and

[1] We are talking about the instruments that Ban Ki-moon, Secretary General of the United Nations Ban Ki-moon present ahead of the opening of the session in the Security Council. http://www.vesti.rs/Nju-York/Preventivna-diplomatija-generalnog-sekretara-OUN.html. access 11.08.2022.

provided good services in communication between the warring parties. It encourages the activation of the role of the General Assembly and its condemnation of the Russian invasion, which is an expression of global conscience, albeit without the power of a binding decision. It remains to be seen whether the role of the General Assembly can be further strengthened through practice and more active use of the Resolution United for Peace, in the adoption of which in 1950 the SFRY played an active role. This would allow the General Assembly to step forward politically and take responsibility for respecting the UN Charter and restoring international peace and security if the Security Council is temporarily paralyzed. As, unfortunately, the consequences of the war in Ukraine will be visible even after its end, we think the role of the UN will become more and more important as time goes by, because it is a long and difficult road from the end of the conflict to the achievement of a lasting and positive, long term, peace.

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Preventive diplomacy in conflict resolution

Key words: diplomacy, state, conflict, communication, conflict, preventive diplomacy

The concept of preventive diplomacy essentially represents a political activities that is well thought out and skillful, and in a basic elements that is one possibility of exercising power. Its main task is to enable states to achieve the goals of their foreign policies without using force, propaganda or law. Diplomacy consists of different elements which in a final goal are all communication between representatives of States who are in charge of foreign policy affairs through formal negotiation or inconspicuous communication. In this paper, we will try to look at the effectiveness of preventive diplomacy in negotiations to prevent conflicts.

Mathematical modeling of life quality assessment of the population of the Republic of Artsakh

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Key words: life quality of the population, correlation analysis, regression analysis, multiple linear regression, determination coefficient, model quality, optimization methods, adjusted determination coefficient.

Introduction. The object of the study, the results of which are presented in this article, is the life quality of the population of the Republic of Artsakh. The subject of the study is the assessment tools and the possibilities of modeling the quality of life in conjundfction with the components of its structure. The purpose of the study is to analyze the current state of the methodological foundations and to choose a methodology for building a model of the link between the quality of life and the components of the structure of life quality of the population.

What is the starting point when considering such a controversial category as the quality of life? What should underlie its definition? Even with a superficial analysis of it at an intuitive level, it seems obvious to any researcher that the basic concept, the closest in meaning, synonymous with the quality of human life is human satisfaction with life - as the degree of compliance of actual parameters and living conditions with human expectations. In this, the opinions of the majority of researchers reach relative unity. The very concept of "quality" defines exactly the relationship of the correspondence of life to some indicators, the value of which allows us to talk about its high or low level.

Literature review. Also, many Western researchers in the field of psychology consider the concept of “happiness” close in terms of quality of life - a similar comparison can be found in the works “Psychology of Happiness” by M. Argyle M., “The Idea of Happiness in the Russian Mentality” by I. A. Dzhidaryan I. A., “Independence of Positive and Negative Influences” by E. Diener and R. A. Emmons. Indeed, the question of the quality of human life is largely close to the question of happiness. However, the concept of "happiness" is not usually used in scientific circulation due to some of its ephemeral nature, inaccessibility for analysis. In addition, happiness is not amenable to differentiated measurement, since it means the highest level of satisfaction with life (with regard to happiness, it is customary to use the characteristics “presence-absence” rather than “more-less”). While life satisfaction can

be divided into a certain number of levels, measured on a certain scale (it is acceptable to talk about higher or lower life satisfaction). Therefore, it is most expedient to compare the quality of life with life satisfaction, and only a high quality of life will invariably have happiness as a constant companion. Widely known classifications of needs were proposed by K. Alderfer (in existence, in relationships, in growth), D. McClelland (in achievement, in joining, in power), F. Herzberg (hygienic and motivating factors), the classics of Marxism- Leninism (natural needs and those created by society), V. P. Makhnyrylov (physiological, social), L. Ya. Baranova (material, spiritual), A. I. Rofe (physical, spiritual, social), Tarasenko V. I. (existence and development), Podmarov V. G. (providing, vocation, prestige), Zavelsky M. G. (desire to possess benefits that bring comfort and pleasure, needs associated with the realization of human abilities), Genkin B. M. (needs of existence, the need to achieve goals in life) [8].

To achieve unity in the approach to the quality of life, it is necessary to ensure unity in the classification of needs. According to the most general approach, needs can be conditionally divided into non-supporting (including material needs, needs for a favorable environment), social (social, including political and status) and spiritual (including all types of development needs, knowledge and self-determination). This typology of needs is successfully consistent with most classifications. The complexity of modeling socio-economic systems is due to the multidimensio-nality, abundance and ambiguity of the relationships of key parameters of the economic and social nature (difficult to formalize cultural, ethnic, psychological factors), a wide list of input and output variables, external and internal signals [1]. At the same time, the relevance of the formation of such models remains in connection with the declining level and life quality of the population of Artsakh in recent years, especially in connection with the economic crisis caused by the coronavirus pandemic, the political situation, and the war in Artsakh.

What is Standard of Living? The definition of standard of living is the level of material wealth and income available to a person or community. It is usually measured by standards such as life expectancy, literacy rates, access to education and health care, and housing conditions. Some of the most common ways to measure the standard of living are through Gross Domestic Product (GDP) per capita and per capita income. Per capita income is the average income of each person in the country. Standard of living can measure both economic factors and noneconomic factors but it tends to place a heavier emphasis on economic factors [9]. Standard of living is important because it is a measure of the well-being of society. A high standard of living indicates that people in a society are able to live long, healthy lives and have access to resources that allow them to lead productive and fulfilling lives. A low standard of living, on the other hand, indicates that people in a society are more likely to experience poverty, poor health, and limited opportunities. This also has implications for the economy, as a low standard of living can lead

to a decrease in productivity and an increase in inequality. The criteria for assessing a high standard of living and a low standard of living include measures of factors such as:

- Access to clean water and sanitation
- Access to adequate shelter
- Access to healthcare
- Access to education
- Reasonable working hours
- Livable wages
- Healthy diet

The main purpose of the article is mathematical modelling of the quality and standard of living of the population of Artsakh, in particular, modeling of processes and systems (in order to identify the relationship of its heterogeneous parameters). Approbation of the method of mathematical modelling on the example of the life quality of the population of Artsakh, allowed forming a number of formalized models of the relationship and mutual influence of various indicators.

The assessment of the life quality and well-being of the population of Artsakh and its individual regions is of great theoretical and practical interest both for scientific research and for public authorities due to the fact that improving the well-being of citizens and managing the quality of life has come to be regarded as a strategic goal in many countries. In Artsakh, this trend is also noticeable. Interest in the issues of the life quality and the well-being of the population covers the widest range of topics, so it is not surprising that researchers from various scientific disciplines, such as economics, medicine, philosophy, sociology, psychology, pedagogy, etc., are studying these issues. In this regard, there is an urgent need to create a methodology for assessing the quality of life of the population, which would allow, on the one hand, to take into account the many components of public life that reflect the real living conditions of people, and on the other hand, the implementation of such a measurement could be carried out promptly and on a regular basis for optimal support of management decisions. Up to date, the history of the scientific study of well-being and life quality has more than half a century, and during this time a wide variety of components of the quality of life, approaches to its measurement and evaluation have been proposed.

In the most general, the whole variety of well-being theories can be divided into two large groups - theories of objective and subjective well-being, depending on what types of data are used to assess well-being in a particular practical model. In the case of objective theories, well-being is measured primarily on the basis of income and consumption data. Recently, this approach has begun to include not only economic factors, but also other, non-economic aspects of well-being, such as value needs, human capabilities, stability, gender issues, etc. Subjective theories of well-being operate in less

specific categories, such as happiness, life satisfaction, etc., i.e., well-being is measured on the basis of people's subjective judgments about their lives. This classification of theories of well-being is practically universally recognized; it fixes the differences in the tools for assessing well-being, but is insufficient to capture what well-being is in fact.

Methodology. Artsakh is a complex socio-economic system, which is character-rized by a large number of heterogeneous variables and feedbacks, and also combines continuous, discrete and probabilistic processes. To manage such a complex system, appropriate tools are required. Of the quantitative methods, one can note the apparatus of probability theory and mathematical statistics, optimization methods, in which there theoretical models (operations research apparatus) are used and applied to describe complex systems and predict their state in the short and long term. Here it is also appropriate to note the forecasting of time series (in terms of forecasting in the future). There are two equivalent ways to define the model - graphically, using a diagram, or using a system of linear multiple regression equations and covariance relations. We will use a system of linear multiple regression equations. But before revealing the true type of link between variables, we will determine the correlation coefficient between indicators of the life quality of the population [2].

Scientific novelty. In our models, only the correlations of the independent variables are specified or estimated. The consistency and quality of the generated model is assessed using various indicators, the main of which are the Fisher criterion, the coefficient of determination, Student's criterion. For each putative causal relationship, standardized regression coefficients are calculated. Standardized regression coefficients show by how many units the result will change on average if the corresponding factor changes by one unit with the average level of other factors unchanged. The standardized regression coefficients are comparable to each other, which makes it possible to rank the factors according to the strength of their impact on the result. The indicators of the quality and standard of living in our study are as follows: average monthly nominal wages/salaries of workers (AMD, Y_1), GDP (million AMD X_1), average number of employed population (1000 people, X_2), minimum pension (in AMD, Y_2), fixed minimum wage (drama, Y_3), number of poor people (X_3), total poverty line (X_4), number of registered diseases (diagnosis established for the first time is common, X_5), incidence of mental disordersamong population (total people, X_6), income of the population per capita (thousand drams, Y_4), income of the population (total, Y_5), average life expectancy - men (X_7), average life expectancy - women (X_8), birth rate by years (total, X_9), mortality by years (total, X_{10}). The algorithm for assessing the link between the quality of life and the component of tlife quality of the population includes several stages:

First stage. Grouping of explained variables.

Second phase. Definition of a group of explanatory variables.

Third stage. Rationale and modeling of the link between explained and explanatory variables.

Fourth stage. Modeling the impact of indicators on the quality and standard of living of the population, checking the results.

Analysis. Given the insufficient number of indicators that need to be analyzed to assess the quality and standard of living of the population, we had to consider only those whose number allowed us to use methods of mathematical statistics: correlation and regression analyses. Therefore, we had to limit ourselves to the availability of data where complete information is present. It is shown that the quality of life is a complex dynamic category, which is revealed through heterogeneous components. The qualimetric system of the level and quality of life includes: the level of well-being, demographic indicators, the quality of the population and other components. The software for mathematical modeling is the software application such as Statistica Minitab and Statgraphics. Below are the results of correlation and regression analysis for controlled and controlling variables.

Table 1. The results of correlation and regression for controlled and controlling variables

Матрица коэффициентов корреляции

	Time	Y_1	X_1	X_2	Y_2	Y_3	X_3	X_4	X_5
Y_1	0.985 0.000								
X_1	0.949 0.000	0.962 0.000							
X_2	0.834 0.000	0.752 0.000	0.662 0.000						
Y_2	0.984 0.000	0,982 0.000	0.947 0.000	0.703 0.000					
Y_3	0.979 0.000	0.980 0.000	0.929 0.000		0.982 0.000				
X_4	0.727 0.064	0.793 0.034	0.266 0.564	0.805 0.029	0.776 0.040				
X_5	0,799 0,000	0.770 0.000	0.792 0.000	0.520 0.009	0.765 0.000	0.714 0.001		-0.849 0.016	
X_6	-0,687 0.000	-0.665 0.000	0.661 0.000	-0.398 0.054	-0.656 0.001	-0.661 0.003			0.58 0.003

Y_4	0,951 0,000	0.919 0,000	0.963 0,000	0.748 0.001	0.965 0,000	0.943 0.000	* *	* *	0.864 0,000
Y_5	0,972 0,000	0.958 0.000	0.987 0.000	0.581 0.011	0.981 0.000	0.977 0.000			0.879 0.000
X_7									0,551 0.041
X_8	0.763 0.002	0.729 0.003	0.777 0.001		0.724 0.003	0.667 0.009			
X_9	0.575 0.002	0.51 0.007	0.394 0.046	0.653 0.000					0.590 0.002

	X_6	Y_4	X_8	X_9
Y_4	-0.573 0.02			
Y_5	-0.661 0.003	0.996 0.00		
X_9		0.496 0.051	-0.567 0.034	
X_{10}			-0.842 0.000	0.475 0.012

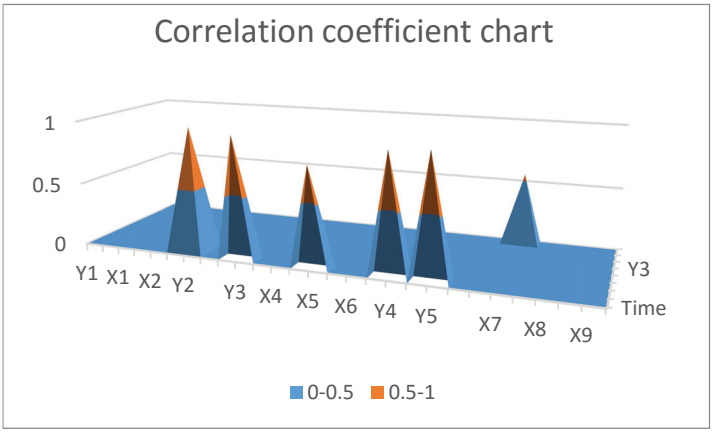

Figure 1. Correlation coefficient chart

Multiple Regression - Y_1
Dependent variable: Y_1
Independent variables: X_1, X_5

Table 2. Coefficients of the regression equation and their significance

		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
X_1	0,461	0,0385	11,961	0,0000
X_5	0,656	0,135512	4,8385	0,0001

Table 3. Analysis of Variance

Source	*Sum of Squares*	*Mean Square*	*F-Ratio*	*P-Value*
Model	2,84131E11	1,42065E11	757,15	0,0000
Residual	4,12787E9	1,87631E8		
Total	2,88258E11			

R-squared = 98,57 percent
R-squared (adjusted for d.f.) = 98,51 percent
Standard Error of Est. = 13697,8
Mean absolute error = 10235,7

Table 4. 95,0% confidence intervals for coefficient estimates

		Standard		
Parameter	*Estimate*	*Error*	*Lower Limit*	*Upper Limit*
X_1	0,461	0,039	0,381	0,541
X_5	0,656	0,136	0,375	0,937

This table shows 95,0% confidence intervals for the coefficients in the model. Confi-dence intervals show how precisely the coefficients can be estimated given the amount of available data and the noise which is present. The output shows the results of fitting a multiple linear regression model to describe the relationship between Y_1 and 2 independent variables. The equation of the fitted model is

$$Y_1 = 0{,}46076 * X_1 + 0{,}655673 * X_5$$

Since the P-value in the ANOVA table is less than 0,05, there is a statistically significant relationship between the variables at the 95,0% confidence level. The R-Squared statistic indicates that the model as fitted explains 98,568% of the variability in Y_1. The adjusted R-squared statistic, which is more suitable for comparing mo-dels with different numbers of independent variables, is 98,5029%. The standard error of the estimate shows the standard deviation of the residuals to be 13697,8. This value can be used to construct prediction limits for new observations by selecting the Reports option from the text menu. The mean absolute error (MAE) of 10235,7 is the average value of the residuals.

Multiple Regression - Y_2

Dependent variable: Y_2

Independent variables: X_1, X_5

Table 5. Coefficients of the regression equation and their significance

		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
X_1	0,1136	0,0136	8,374	0,0000
X_5	0,2244	0,0479	4,689	0,0001

Table 6. Analysis of Variance

Source	*Sum of Squares*	*Mean Square*	*F-Ratio*	*P-Value*
Model	2,11688E10	1,05844E10	460,71	0,0000
Residual	4,59482E8	2,29741E7		
Total	2,16283E10			

R-squared = 97,88 percent

R-squared (adjusted for d.f.) = 97,77 percent

Standard Error of Est. = 4793,13

Mean absolute error = 3689,48

The output shows the results of fitting a multiple linear regression model to describe the relationship between Y_2 and 2 independent variables. The equation of the fitted model is

$$Y_2 = 0{,}113551 * X_1 + 0{,}224413 * X_5$$

Since the P-value in the ANOVA table is less than 0,05, there is a statistically significant relationship between the variables at the 95,0% confidence level. The R-Squared statistic indicates that the model as fitted explains 97,88% of the variability in Y_2. The adjusted R-squared statistic, which is more suitable for comparing mo-dels with different numbers of independent variables, is 97,8%. The standard error of the estimate shows the standard deviation of the residuals to be 4793,13. This value can be used to construct prediction limits for new observations by selecting the Reports option from the text menu. The mean absolute error (MAE) of 3689,48 is the average value of the residuals.

Table 7. 95,0% confidence intervals for coefficient estimates

		Standard		
Parameter	*Estimate*	*Error*	*Lower Limit*	*Upper Limit*
X_1	0,114	0,0136	0,085	0,142
X_5	0,224	0,048	0,125	0,324

This table shows 95,0% confidence intervals for the coefficients in the model. Confidence intervals show how precisely the coefficients can be estimated given the amount of available data and the noise which is present.

Multiple Regression - Y_3

Dependent variable: Y_3

Independent variables: X_1, X_5

Table 8. Coefficients of the regression equation and their significance

		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
X_1	0,153	0,022	7,15	0,000
X_5	0,242	0,079	3,06	0,008

Table 9. Analysis of Variance

Source	*Sum of Squares*	*Mean Square*	*F-Ratio*	*P-Value*
Model	3,26183E10	1,63091E10	397,34	0,0000
Residual	6,56735E8	4,1046E7		
Total	3,3275E10			

R-squared = 98,03 percent

R-squared (adjusted for d.f.) = 97,9 percent

Standard Error of Est. = 6406,71

Mean absolute error = 4266,43

The output shows the results of fitting a multiple linear regression model to describe the relationship between Y_3 and 2 independent variables. The equation of the fitted model is

$$Y_3 = 0{,}153102 * X_1 + 0{,}242374 * X_5$$

Since the P-value in the ANOVA table is less than 0,05, there is a statistically significant relationship between the variables at the 95,0% confidence level. The R-Squared statistic indicates that the model as fitted explains 98,03% of the variability in Y_3. The adjusted R-squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 97,9%. The standard error of the estimate shows the standard deviation of the residuals to be 6406,7. This value can be used to construct prediction limits for new observations by selecting the Reports option from the text menu. The mean absolute error (MAE) of 4266,43 is the average value of the residuals. This table shows the statistical significance of each variable as it was added to the model. One can use this table to help determine how much the model could be simplified, especially if you are fitting a polynomial.

Table 10. 95,0% confidence intervals for coefficient estimates

Parameter	*Estimate*	*Standard Error*	*Lower Limit*	*Upper Limit*
X_1	0,153	0,0214	0,1077	0,1985
X_5	0,242	0,0792	0,0744	0,4102

This table shows 95,0% confidence intervals for the coefficients in the model. Confidence intervals show how precisely the coefficients can be estimated given the amount of available data and the noise which is present.

Multiple Regression - Y_4

Dependent variable: Y_4

Independent variables: X_1, X_5

Table 11. Coefficients of the regression equation and their significance

		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
X_1	0,0027	0,00033	8,123	0,0000
X_5	0,0066	0,00102	6,687	0,0000

Table 12. Analysis of Variance

Source	*Sum of Squares*	*Mean Square*	*F-Ratio*	*P-Value*
Model	7,01844E6	3,50922E6	394,45	0,0000
Residual	133447	8896,49		
Total	7,15189E6			

R-squared = 98,13 percent

R-squared (adjusted for d.f.) = 98,1 percent

Standard Error of Est. = 94,3212

Mean absolute error = 77,1417

The output shows the results of fitting a multiple linear regression model to describe the relationship between Y_4 and 2 independent variables. The equation model is

$$Y_4 = 0{,}00265907 * X_1 + 0{,}00685266 * X_5$$

Since the P-value in the ANOVA table is less than 0,05, there is a statistically significant relationship between the variables at the 95,0% confidence level. The R-Squared statistic indicates that the model as fitted explains 98,13% of the variability in Y_4. The adjusted R-squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 98,1%. The standard error of the estimate shows the standard deviation of the residuals to be 94,32. This value can be used to construct prediction limits for new observations by selecting the Reports option from the text menu. The mean absolute error (MAE) of 77,14 is average value of the resi-duals.

Table 13. 95,0% confidence intervals for coefficient estimates

		Standard		
Parameter	*Estimate*	*Error*	*Lower Limit*	*Upper Limit*
X_1	0,00266	0,000327	0,001961	0,003357
X_5	0,00686	0,001025	0,004664	0,009037

This table shows 95,0% confidence intervals for the coefficients in the model. Confidence intervals show how precisely the coefficients can be estimated given the amount of available data and the noise which is present.

Multiple Regression - Y_5

Dependent variable: Y_5

Independent variables: X_1, X_5

Table 14. Coefficients of the regression equation and their significance

		Standard	*T*	
Parameter	*Estimate*	*Error*	*Statistic*	*P-Value*
X_1	0,468	0,039	11,941	0,0000
X_5	0,795	0,121	6,546	0,0000

Table 15. Analysis of Variance

Source	*Sum of Squares*	*Mean Square*	*F-Ratio*	*P-Value*
Model	2,08659E11	1,0433E11	810,33	0,0000
Residual	2,18875E9	1,2875E8		
Total	2,10848E11			

R-squared = 98,97 percent

R-squared (adjusted for d.f.) = 98,9 percent

Standard Error of Est. = 11346,8

Mean absolute error = 9029,89

The output shows the results of fitting a multiple linear regression model to describe the relationship between Y_5 and 2 independent variables. The equation of the fitted model is

$$Y_5 = 0{,}468257 * X_1 + 0{,}794647 * X_5$$

Since the P-value in the ANOVA table is less than 0,05, there is a statistically significant relationship between the variables at the 95,0% confidence level.

The R-Squared statistic indicates that the model as fitted explains 98,97% of the variability in Y_5. The adjusted R-squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 98,9%. The standard error of the estimate shows the standard deviation of the residuals to be 11346,8. The mean absolute error (MAE) of 9029,89 is the average value of the residuals.

Table 16. 95,0% confidence intervals for coefficient estimates

		Standard		
Parameter	*Estimate*	*Error*	*Lower Limit*	*Upper Limit*
X1	0,4682	0,0392	0,3855	0,5509
X5	0,7946	0,1214	0,5385	1,0507

This table shows 95,0% confidence intervals for the coefficients in the model. Confidence intervals show how precisely the coefficients can be estimated given the amount of available data and the noise which is present.Time series - the sequence of the recorded signal (observed). This approach is used when it is not possible to construct the equations of motion. Currently, there are two qualitatively different approaches to the study of time series:

- statistical
- dynamic

Statistical approaches include probabilistic models. To dynamic one – Takens - Mane embedding theory. A modern idea of the possibility of describing observables is given by embedology, which combines elements of dimensional theory, information theory, topology, differential dynamics, and the theory of dynamical systems.

Basis: there is a range y_n and noise — sequence of uncorrelated and identically distributed random variables ξ_i with a zero mean. So we can write that

$y_n = F(y_{n-1}, \dots, y_{n-m}, \xi_n, \dots, \xi_{n-k})$ (5)

where k and m are several finite numbers

The basic models are models of ARMA (Auto Regression Moving Average):

$y_i = a_0 + \sum_{j=1}^{m} a_i y_{i-j} + \sum_{j=1}^{k} b_j \xi_{i-j}$: (6)

Finding the coefficients is a possible solution to the identification task, and the ratio for y_i can be used to predict the m previous ones.

The average value is usually used as the predicted value:

$$\hat{y}_i = a_0 + \sum_{j=1}^{m} a_i y_{i-j} \qquad (7)$$

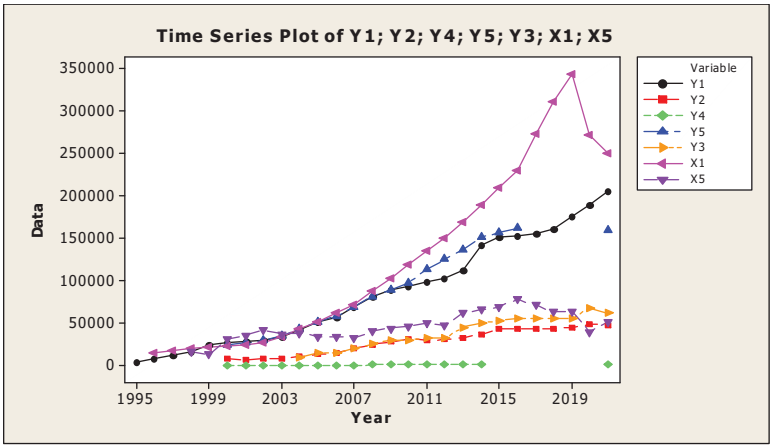

Figure 3. Time series for $Y_1, Y_2, Y_3, Y_4, Y_5, X_1, X_5$

and the preceding values are known exactly. It should be emphasized that noise is an integral part of the model; in its absence, the behavior is unlike the range under study

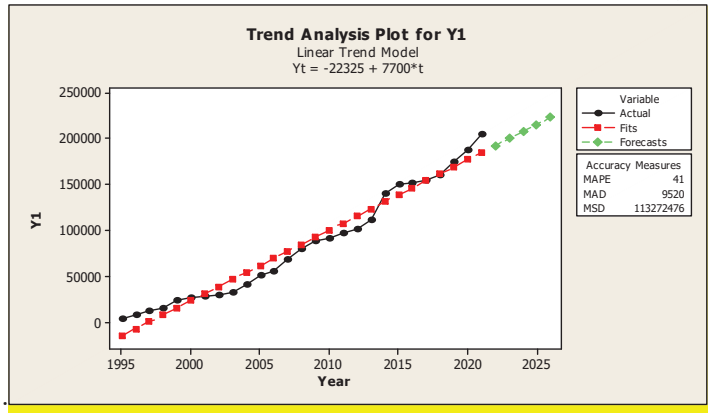

Figure 4. Forecasting the average monthly nominal wage

Trend Analysis for Y1

Data Y1
Length 27
NMissing 0
Fitted Trend Equation
Yt = -22325 + 7700*t
Accuracy Measures
MAPE 41
MAD 9520
MSD 113272476
Forecasts

Period	Forecast
2022	193285
2023	200985
2024	208685
2025	216386
2026	224086

Conclusions. Thus, mathematical modelling made it possible to identify and visualize explicit and latent relationships between various indicators of the quality and standard of living and indicators of the level of economic development (private, factorial). The results are well reflected with the identified patterns in the process of regression analysis, as a result of which we received qualitatively new information and new data. The results of mathematical modelling (based on the apparatus of probability theory and mathematical statistics) made it possible to identify latent variables (economic and healthcare), to form high-quality mathematical models of individual indicators of the quality and standard of living of the population of Artsakh and the impact of economic development indicators on them. There were identified economic indicators that can be considered as managers in regulating the quality of life of the population - GDP, average monthly nominal wages, arage pension, minimum pension, per capita income, total income, social sphere - the number of poor, the number below poverty lines. Each of these indicators determines most of the dispersion of the values of the quality and standard of living of the population of the region, according to the developed model. Consequently, it is precisely on their regulation that the efforts of regional authorities should be directed to intensify the socio-economic development of the territory and improve the lives of its citizens. Economic indicators have been identified that can be considered as managers in regulating the quality of life of the population - GDP, average monthly nominal salary, salary pension, minimum pension, per capita income, total income, social sphere - the number of poor, the number below the poverty line. Each of these indicators determines most of the spread of values of the quality and standard of living of the population of the region, according to the developed model. Consequently, the efforts of the regional authorities to activate the socio-economic development of the territory and improve the lives of its citizens should be directed to their regulation. As a result of correlation and regression analyses, the following results were obtained: as an assessment of the level and quality of life of the population, per capita income, average monthly nominal salary, average pension, minimum pension, minimum wage, total income were considered as financial indicators. These indicators acted as controlled variables, the following were identified as informative control variables: GDP and newly registered diseases. That is, in order to increase the average monthly nominal salary, the average pension size and the minimum pension size, the minimum wage, the state should take measures to increase GDP, reduce the number of illnesses (i.e. increase preventive measures to prevent morbidity).

Research will continue in order to increase the number of indicators in different areas. There was an attempt to look at housing conditions: that is, the provision of housing for the population, but due to insufficient information (studies were conducted in conditions of incomplete information), we received not reliable and not adequate models.But as we postulate the data, in the future we will include both quantitative and qualitative indicators from different areas of the population's life.

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Mathematical modeling of life quality assessment of the population of the Republic of Artsakh

Key words: quality of life, correlation analysis, regression analysis, multiple linear regression

Practically, the Standard of Living of people of a country is reflected in the way in which people live, such as how much money they have to spend on, how their houses are constructed, how educated they are, what facilities are available to them, etc. Standard of Living is a measure of comparison which is used to different countries, or regions, on the basis of metrics such as level of comfort, wealth, material possessions and basic necessities, which the residents have access to, in those geographic areas. Real income per person and poverty rate are the two indicators that determine the standard of living. It analyses the quantity of material goods and services produced and sold in a particular region like a state or country. Basically, to measure the standard of living components which can easily be quantified are taken into consideration like income, employment opportunities, poverty, cost of goods and services, life expectancy, infant mortality, rate of inflation, etc. Here it must be noted that: High standard of living results in more demand for comfort and luxury products, whereas a low standard of living less demand for comfort and luxury products. It is based on both the quality and quantity of the available goods and services and how they are distributed among the population. Standard of living implies the availability of the level of welfare to the people of a certain area, indicating the ease by which they can comfortably fulfil their needs.

Blockchain Innovation and Information at HHH University: Issues of Methodology

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Key words: blockchain, innovations, information technologies, Technology Acceptance Model, transactions

Introduction. Blockchain is an electronic ledger system that available to the public as an open-source technology (Dogru, Mody, & Leonardi, 2018). The ledger system allows disparate users to make electronic records of their transactions through a time-stamping system that links each transaction to previous and next transaction in a chronological manner (Dogru et al., 2018). Each electronic record of a transaction is termed as a block and is liked to a particular user. The linked system allows several users to record transactions in a controlled yet open manner. The ledgers can only be updated after the participants in the transactions reach a consensus (Dogru et al., 2018). Further, all the data entered into the system cannot be erased ensuring that the system retains an authentic and verifiable record, or all the transactions made by the users. The system is secured through cryptography and the networked nature of transactions (Dogru et al., 2018). The nodes of a distributed ledger do not trust each other and independently verify the validity of the transaction record before applying them to new transactions. The encryption used in blockchain transactions utilizes a digital fingerprint generated through the use of a hashing function (Dogru et al., 2018). Each block on the chain is connected to the next by a hash value. The nodes that connect the chain verify the validity of a transaction by automatically determining its conformity to the rules set in the smart contract. Blockchain platforms differ by the confirmation process used to enter new transac- tions to the ledger.

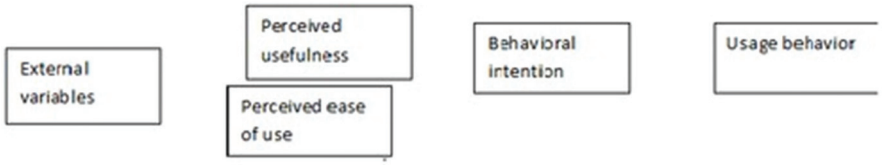
Methodology and literature review. The diffusion of innovation theory (DIT) explores the mechanisms that shape the adoption of a new con- cept, product, practice or perspectives. It was popularized by Everett Rogers (Sahin, 2006). Rogers argued that only a few people are open to new ideas and are willing to adopt them for real life applications. As the early adopters influence more people to adopt the technology a critical mass of adopters develops, and the innovation gets diffused amongst the population until it reaches a saturation point (Sahin, 2006). Rogers classified the adopters into five distinct categories. The innovators are technology enthusiasts and appreciate technology for its sake (Lyytinen & Damsgaard, 2001). The early adopters are visionar- ies who adopt the technology and act as opinion leaders. They are natural trendsetters and are attracted to high-risk high reward investments. They are not particularly cost sensitive (Lyytinen & Damsgaard, 2001). The early majority are the pragmatists who adopt innovations that make business sense and have proven reliability. They abhor complexity and only take advice from trusted friends. The late majority is

very conservative but adopts technology due to peer pressure and economic necessity (Lyytinen & Damsgaard, 2001). They are very skeptical, cost-sensitive and only adopt innovations in order to keep up with the competition. The laggards are very skeptical of innovations and prefer the status quo and only invest in a technology if there are no viable alternatives (Lee, 2009). The theory asserts that the innovators make 2.5% of the users while early adopters make 13.5% of the users (Lyytinen & Damsgaard, 2001). Early and late majority users comprise 34% respectively while the laggards comprise 16 of the users. The theory aims to streamline innovations such that they meet the needs of all the five categories of users. The theory considers peer networks to be an important component of the adoption of an application as it is through these networks that innovators and early adopters stimulate mass adoption of the tech- nology. Rogers (cited in Lyytinen & Damsgaard, 2001) identified five predictors of the success of an innovation. The predictors are the relative advantage offered by a technology, observability, compatibility, complexity and trialability (Teo, 2011; Lyytinen & Damsgaard, 2001). Relative advantage is the potential of an innovation to be perceived as better than the technology it replaces. Compatibility is the degree to which an application is perceived to be compatible with the prevailing conditions, experience and the needs to potential users. Complexity relates to the degree to which an innovation is considered difficult to comprehend and use (Lyytinen & Damsgaard, 2001). Trialability is the degree to which an application can be tested and modified. Observability relates to quality of the innovation having high visibility such that it stimulates discussions among peers (Sanson-Fisher, 2004; Venkatesh et al. 2014). Rogers opined that the five factors account for 49-87% of the variations that exist among different innovations.

Analysis. *Technology Acceptance Model (TAM).* Changes in technology disrupt the established business models threatening the existence of some busi- ness while offering new approaches for doing business (Taherdoost, 2018). Typically, the established firm seeks ways of harnessing new technologies to improve their competitive position. The adoption of the new technology is dependent on several factors including its availability, convenience, security and customer needs (Taherdoost, 2018). The rate of adoption of a technology is dependent on the interaction between speed of technological change and natural barriers to technology acceptance. The technology acceptance model (TAM) (Figure 1) is a theory of technology adoption developed by Fred Davis and attempts to model user acceptance of new technologies. Theory tests technologies based on the two parameters of perceived usefulness (PU) and perceived ease of use (PEU) (Targowski, 2003; Surendran, 2012). Perceived usefulness tests the subjective likelihood of a user benefiting from the use of a new technology. The perceived ease of use tests potential users' expectation that the use of the new technology will be effortless. However, other factors also influence the user's perception of the new technology. Venkatesh and Davis (cited in Surendran, 2012) found that the

two constructs of perceived usefulness and perceived ease of use had a direct influence on user behavior.

Figure 1. TAM model



Davis proposed six items four of which are most commonly used on PU (Lai, 2017). These factors are the effect of the technology on productivity, impact of the technology on job performance, impact of the technology workplace effectiveness, overall usefulness of the technology in relation to one's job (Lai, 2017). All the four factors have been found to have an acceptable degree of internal consistency. Similarly, four items are commonly used to assess the PEU parameter (Chuttur, 2009; Lai, 2017). These items are ease of using the technology, ease of manipulating the application, difficulty in interacting with the system and overall ease of employing the technology (Chuttur, 2009). These four factors have been found to have an acceptable level of internal consistency. Overall, TAM has been used on many empirical studies and found to employ reliable tools that produce reliable results. Instructively, the influence of some factors varies with the stages of the imple- mentation process (Davis, 1985). Irrespective of the variables used, the TAM model never goes beyond explaining 40% of the variance in the use of new applications (Chen et al. 2017). Finally, most of the studies involve self-reported use.

Blockchain Technology (TAM and DIT). A promising template for the adoption of the blockchain technology is the adoption of the internet. The blockchain technology builds on the peer-to-peer network that has been very successful on the internet. Just like email was the first application of the internet, the Bitcoin is the first application of blockchain (Swan, 2015). The email facilitated bilateral communication the same way Bitcoins facilitate bilateral financial transactions. Further, the blockchain is an open and distributed network just like the internet (Swan, 2015). For the blockchain to gain widespread adoption by firms, it must portend economic advantages for those firms as envisaged in TAM. Firms were incentivized to adopt the internet due to its capacity to substantially lower the cost of communication (Iansiti & Lakhani, 2017). Similarly, for blockchain to be adopted by firms, it has to substantially lower the cost of transactions. This will stimulate its adoption by firms as the preferred system for recording transactions (Swan, 2015). Such a shift will stimulate the emergence of firms that offer blockchain based applications that will facilitate the widespread adoption of the technology. Blockchain has huge potential for lowering transaction costs as most

organizations incur high costs in reconciling transactions (Swan, 2015). A typical transaction may take weeks to be verified and ap- proved as parties to the transaction cannot verify the transaction automatically and have to rely on in- termediaries who act as guarantors of asset transfer (Iansiti& Lakhani, 2017). With blockchain, ledgers are duplicated on several databases that are run by parties to a transaction. When one ledger is altered, the other ledgers are updated concurrently. This means that the ledgers are updated instantaneously as the records of value and assets change hands. This approach eliminates third-party intermediaries who are needed in the traditional set up to verify or endorse the transfer of ownership.

Information Technology Management. The adoption of the blockchain technology is consistent with the technology diffusion theory. The first stage in the adoption of blockchain is the development of a single-use and highly focused application that is favored by innovators. This has already happened with the development and adoption of crypto- currencies that offer alternative payment methods (Swan, 2015). The second stage of adoption involves implementing applications with a few users to extract instant value for the organization. This stage will involve the creation of localized private networks that connect organizations through a distributed ledger system by the early adopters (Swan, 2015). Indeed, several firms in the financial sector have already adopted the technology on a pilot scale and use it to process and validate financial transactions. Meanwhile, Canada is experimenting with a cryptocurrency to be used for interbank transfers (Iansiti & Lakhani, 2017). Financial experts anticipate that there will be a proliferation of private blockchain networks in several industries. The third phase of adoption involves applications that have widespread mass market utilization (Iansiti & Lakhani, 2017). In the case of cryptocurrencies, their widespread adoption will need to overcome challenges posed by decentralizing currency transactions and changing consumer behavior. The final stage involves the transformation of the existing systems after widespread adoption. Smart contracts are by far the most transformative blockchain application (Swan, 2015). They will automate payments and asset transfer once terms are agreed. For instance, smart contracts can be used to execute payment once shipments have been delivered. A widespread adoption of smart contracts has the potential to transform traditional organizational structures and processes. The transformation will have the effect of eliminating intermediaries such as lawyers and auditors while the role of managers will change drastically (Swan, 2015). It is at this stage that the late adopters and the laggards will have no choice but to embrace the technology.

Block Chain Technology and Security. Blockchain is more than just an electronic record of transactions as it also has a feature called smart contracts which enables users to transact without downtime, minimal risk of fraud and censorship. By far the most popular application of the blockchain technology is in the digital currencies such as the

Bitcoin (Benton & Radziwill, 2017). However, blockchain has several other applications in commerce and social transactions such as creating digital records of asset ownership (Glaser, 2017; Mendes-Da- Silva, 2018). The use of blockchain in such transactions and record keeping will be stimulated by the fact that transaction data is distributed, and the cryptographic system makes the system rather tamperproof.

Blockchain systems are synonymous with the Bitcoin and other cryptocurrencies because of their notoriety as the first widely accepted currency that is not under the control of a central authority. This application has attracted diverse reactions from different stakeholders but has most importantly represented a paradigm shift in the approaches used to make networked transactions and track changes (Mougayar & Buterin, 2016; Benton & Radziwill, 2017). The technology had the effect of transferring user trust in currencies and important transactions from humans to machines. Bitcoins use algorithms that run on machines spread around the world that integrate transactions in the chain using a process that requires intense computing work otherwise known as mining (Benton & Radziwill, 2017). Bitcoin mining has become a sector on its own evolving companies that specialize in mining. The miners are rewarded for scrutinizing transactions for their validity through a proof of work mechanism. Once all transactions have been confirmed there exists a consensus among the nodes such that all blocks are aligned in a continuous chain (Benton & Radziwill, 2017). The blockchain ledger cannot be altered or deleted once the transaction has been confirmed by all the chains. Therefore, blockchain is reputed for its integrity.

Conclusion. The blockchain technology has a huge potential for applications in systems requiring a reliable yet accessible distributed record system has can be used to service delivery in networked systems (Vo, Kundu, & Mohania, 2018). Furthermore, most economic and social systems in the modern world re- quire system administrators to create and maintain client records. Blockchain can be used in the health, financial, social security and educational institutions to create and maintain client records (Vo, Kundu, & Mohania, 2018). Currently, most of these institutions use the services of third parties to store and maintain client records exposing them to corruption either through mischief or failures in the storage system. Such problems could be mitigated through the use of blockchain systems. Mixed method research involves the use of both qualitative and quantitative methods in the same study. A major challenge of mixed method research is integrating the findings of the qualitative and quantitative research during data analysis and interpretation (Harrison et al., 2017). For a study to be classified as a mixed method research, it must integrate quantitative and qualitative methods at the design, analysis, interpretation and presentation phases (Madu, 2003). Mixed method research is used for research topics or questions that are best explored using methods that are more comprehensive than either qualitative or quantitative methods used in

isolation (Schmee & Oppenlander, 2010; Harrison et al., 2017). The method is used for research questions that are complex and multifaceted. It seeks to benefit from the strengths of both methods while moderating their weaknesses to produce a balanced interpretation of a phenomenon.

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Vardan MKRTTCHIAN

Blockchain Innovation and Information at HHH University: Issues of Methodology

Key words: blockchain, innovations, information technologies, Technology Acceptance Model, transactions

Blockchain has become an epidemic and significant decision that organizations may make in the next few years, enabling institutions to integrate business functions, operations, and processes in a decen- tralized distributed ledger technology. This technology will transform the business world and economy in solving the limitations created by centralization and system inefficiency. Accordingly, with the high demand and complexity of growing economies such as the HHH University countries, the need for a typical solution technology is a game changer. This will lead GCC to a solid economic base. Blockchain technology can be applicable in many different fields such as Banking, education, Health, finance, government and trade. This article will address the literature review and methodology of Blockchain technology and innovation at the GCC, particularly in Saudi Arabia. Also, more research can be conducted in the future as the system may be integrated in these countries.

ON THE ISSUE OF ASSESSING THE DAMAGE CAUSED TO THE ENERGY SYSTEM AS A RESULT OF THE 3-RD ARTSAKH WAR OR THE 44-DAY WAR

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Key words: economic damage, the "golden rule of economics" principle, autonomous energy producer, investment policy, capitalization growth.

Introduction. In the work, the amount of damage suffered by the energy system as a result of the 44-day Artsakh war was fundamentally coordinated and evaluated, as well as different points of view and professional approaches were analyzed, as a result of which it was revealed that the need for structural reforms to increase energy efficiency due to changes in the structure and rules of operation of the energy sector. Moreover, the effectiveness of reforms in the energy system is due to the involvement of strategic investors, as well as the conclusion of contracts with internationally recognized energy services partners, the introduction of innovative technologies related to energy saving, and the complex involvement of energy service companies.

Methodology. In the article, the current situation in the field of energy and gas in the Republic of Artsakh was calculated, as well as the amount of damage suffered as a result of the war, using statistical, mathematical and comparison methods, using various formulas developed by theorists. Energy system is one of the most important components of inclusive economic growth and development of any country. This sector is characterized by continuous transformations in line with new challenges, the purpose of which is to ensure a stable operation in the sector [Jenergetika, 2011, 398].In the other hand, the regulation of the energy sector is part of the state policy, the purpose of which is to balance the interests of consumers and license holders, to create uniform conditions of activity for license holders, and to promote the formation and development of a competitive market, guaranteeing the rights of consumers, by exercising the powers assigned to the Commission [Mikayelyan, 2021, 327-331]. Thus, the energy system is a hub of interaction between the private and public sectors, the operation of which has a large and wide-ranging environmental and social impact. It creates new jobs, opens opportunities for doing business, and also activates the work of business structures. As a result, it was argued that the differences in formulas are due to the fact that the company implements constant or unchanging financial, operational and investment policies, without taking into account the risks that always accompany the development process, on the contrary, their main emphasis is placed on capitalization growth.

Literature review. Being one of the most important and driving sectors for the economy, energy greatly supports and supports technical and technological developments. Modern technologies are "penetrating" the energy sector, and innovations are

causing changes in the sector, highlighting the opportunities for the development of alternative energy [Michaelyan, 2020, 235-244]. The features of social development had a significant similarity in the formation of energy markets, in particular, the increase in the consumption and demand of energy resources as a result of the use of new technologies, the reduction of costs, as well as the definition of a new tariff policy in that system. The current state of energy in the Repub-lic of Artsakh, as well as the amount of damage suffered as a result of the war, were substantiated in the article. In terms of increasing the efficiency of the strategic manage-ment of the energy system, the assessment of the relationship between economic growth and the indicators characterizing that system has been widely used. According to V.G. The principle of Belolipetsky's "golden rule of economy" can also be applied to the ener-gy system. Another author M. Kisilyov [Kiselev, 2001] considered the efficiency of the energy system according to sales volume, profit growth rate and exchange rate factor.

Novelty. The losses and the amount of financial damage of the Energy companies ("Artsakhenergo" CJSC, "Artsakhgas" CJSC, "Artsakhhek" CJSC) as a result of the 44-day Artsakh war were estimated (according to the "golden rule" principle and the "Boston Consulting Group" model), and also proposed is to review the methods and principles of financial strategy in the NKR energy system due to economic changes and geopolitical realities.

Analysis. On September 27, 2020, the 3rd Artsakh War or 44-day war began, in particular, the Azerbaijani-Turkish military aggression and geopolitical events had disastrous consequences for the Republic of Armenia and the Republic of Artsakh: thousands of victims and prisoners, tens of thousands of wounded, huge material and moral losses, the loss of all territories “adjacent to Nagorno-Karabakh”, The loss of parts of the Askeran, Hadrut, Martuni, Martakert regions of Nagorno-Karabakh, the cities of Shush and Hadrut, the defeat of the Armenian army, the redrawing of a number of border regions of the Republic of Armenia in favor of Azerbaijan, a sharp deterioration in relations with the allied states and earning a reputation of an unreliable and irresponsible partner.

Obviously, although in case of such huge losses it is difficult to separate internal and external factors from each other. A sad fact is the surrender of 7 districts, which were under the control of Armenian forces for almost 3 decades, in particular the loss of Hadrut and Shushi, which are part of the Republic of Artsakh, the deployment of Russian peacekeepers, the land communication between Azerbaijan and Nakhijevan (which is part of it) through the territory of Armenia, thousands of victims and wounded, many thousands of internally displaced persons, more than 70 percent of Artsakh came under the control of Azerbaijan and there is great uncertainty and many questions. The 3rd Artsakh War ended with an unspeakably painful decision on November 9, 2020. One of the economic losses recorded in the country during the 3rd war of the Republic of Artsakh is that before the war the Lernahovit community of the Kashatagh region of

Artsakh consisted of 3 villages. Until 2016, the villages of Yeznagomer and Spitakadzhur, which were inhabited 15 years ago, had no electricity. And in the village of Shirvakan, there was only electricity for a few hours a day.

In recent years, the rapid construction of hydroelectric power plants in Artsakh has provided electricity to these never-before-electrified communities. The aforementioned villages were supplied with electricity from the "Akunk" HPP, which was built in 2016. As a result of the war, it went completely under Azerbaijani control. Villages belonging to the Lernahovit community also passed to Azerbaijan. The large and small HPPs operating in Artsakh provided electricity not only to the population of Artsakh, but the electricity they produced was also exported to Armenia. For Armenia it was a small, but relatively cheap electricity, and for Artsakh it was an additional opportunity to ensure the operation of the economy. The shutdown of the Metsamor nuclear power plant due to repair work, the temporary shutdown of the 5th electrical generator unit of the Hrazdan TPP, safety problems with hydroelectric power plants operating in Southern Armenia and Artsakh, the loss of a number of hydroelectric power plants as a result of the war have put Armenia before new energy challenges, at the same time having a serious impact on the country's economy.

As a result of the 44-day war, the Republic of Artsakh lost a number of hydroelectric power plants, some of which were dismantled, and the main equipment and some infrastructure facilities were transferred to the Republic of Armenia. Moreover, before the war, the Martuni region of the Republic of Artsakh was supplied from the Shushi-Karmir Shuka-Martuni transmission line, and after the war most of the line remained under enemy control.

In general, as a result of the war, the Republic of Artsakh lost hydroelectric power plants with an installed capacity of 112,5 MW, including:[1]

- Sarsang HPP: 50 MW;
- 4 HPPs: 12-13 MW;
- 1 HPP: 12 MW.

Before the war, there were HPPs with an installed capacity of 187,5 MW in the Republic of Artsakh, but as a result, only HPPs with an installed capacity of 75 MW remained. We have calculated the current state of energy in the Republic of Artsakh, as well as the amount of damage caused by the war. "Artsakhenergo" CJSC was established on December 29, 1998. The company is mainly engaged in the distribution and sale of electricity. Distribution of electricity is carried out at fixed tariffs by the

[1] https://www.energyagency.am/category/noroutyounner-ev-mijocaroumner/arcakhy-112-5-mvt-drvatsqayin-hzoroutyamb-

Public Services Regulatory Commission of the Republic of Artsakh. It serves more than 30,000 subscribers[1].

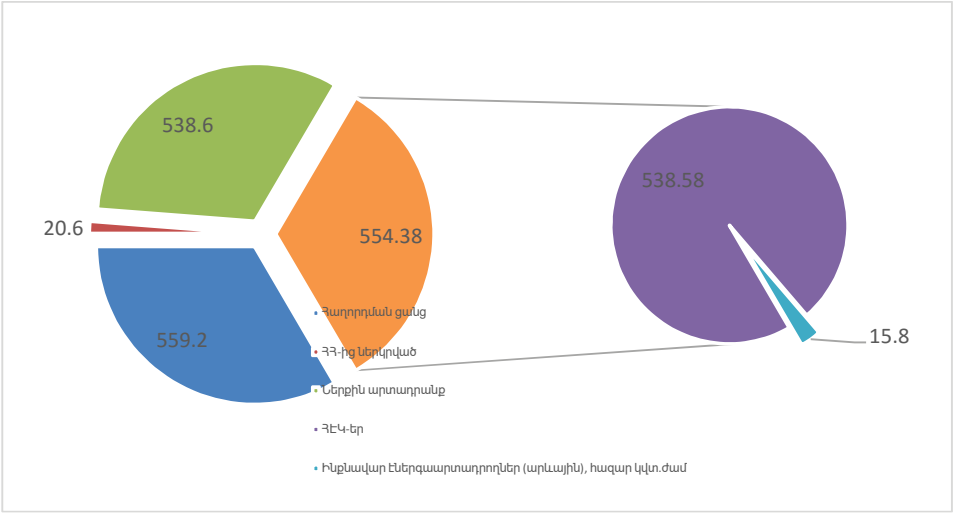

Figure 1. Structure of electricity supplied to the transmission network of "Artsakhenergo" CJSC in 2020 (million kWh)

. Transmission network
. Imported from RA
. Domestic production
. HPPs
. Autonomous energy producers (solar), thousand kWh

After the war, eight hydroelectric power plants operate in the Republic of Artsakh, and one hydroelectric power plant is under construction. According to "Artsakhenergo" CJSC, in 2020, 559.2 million kWh of electricity was supplied to the transmission networks, including imported from Armenia: 20.6 million kWh, domestic production: 538.6 million kWh, of which: HPPs: 538.58 million kWh, autonomous energy producers (solar) - 15.8 thousand kWh (Figure 1). 207.0 million kWh of electricity was transferred to the enterprise that sells electricity flows, including 186.4 million kWh for export. Electric power purchased for internal consumption was 352.2 million kWh, of which total supply to consumers, i.e. sales, was 311.7 million kWh, and electricity consumption for own needs was 1.0 million kWh. Actual losses of electric power amounted to 39.5 million kWh or 7.1%. As a result of the 44-day war in Artsakh losses of HPPs are recorded, the assessment of the financial damage of which has no exact amount, as a general assessment of the damage caused to the Artsakh energy system as a result of the

[1] http://www.artsakhenergo.am/content.php?catid=3

war does not exist yet. For example, there is a point of view that the lost HPPs with sub-stations may be worth about 200 million USD, as they were all privately owned.[1]

According to the preliminary energy balance for 2021, it was planned to import 330 million kWh of electricity from Artsakh, but it is possible to replace it with electricity generated from domestic resources of Armenia. Power supply has been fully restored in Artsakh, except for the Martuni district. Unfortunately, it should be noted that the electricity produced in Artsakh does not supply the entire population.

Looking at the financial statement of "Artsakhenergo" CJSC, "Reserves" in 2020 decreased by 21% compared to 2019, while "Accumulated Losses" increased by 48.9% over the same period. In addition, in the statement of the cumulative financial result of "Artsakhenergo" CJSC, the net loss in 2020 increased by 104.1% compared to 2019.

According to Table 1, the amount of financial losses of "Artsakhenergo" CJSC as a result of the 44-day Artsakh war is estimated at 12791324 AMD.

Table 1. Assessment of financial losses of "Artsakhenergo" CJSC in 2019-2020 (thousand AMD)

Indicators	2019	2020	2020 vs. 2019, %	Financial loss (2020 vs. 2019)
Supplies	1046525	863005	-21.3	-183520
Accumulated loss	-6148885	-12024346	48.9	-5875461
Net loss	265547	-6466796	104.1	-6732343
Just a financial loss				**-12//791324**

From the point of view of increasing the efficiency of the strategic management of the energy system, the assessment of the relationship between economic growth and indicators characterizing this system has become widespread. At the same time, the paper highlights the application of the principle of the "golden rule of economics"[Belolipetsky, 2005] according to which the growth rate of profit (GRP), sales proceeds (SP) and change in the balance sheet currency (C) should not be equal to each other [Kiselev, 2001]

RP> SP>C> 100% (1) [Lavlinskaya A., 2019, 4-7].

- the rate of profit is higher than the rate of sales proceeds, which justifies the cost reduction,

- the growth rate of sales proceeds is greater than the company's assets, which justifies the efficient use of the company's resources,

- the economic potential of the company increases compared to the corresponding basal period.

[1] https://www.armtimes.com/hy/article/204871

Based on the data on the financial position of the company, the paper calculates the "golden rule" principle of "Artsakhenergo" CJSC, which does not correspond to the formula (2).

Table 2. Assessment of the "golden rule" principle of "Artsakhenergo" CJSC (thousand AMD)

Indicators	2019	2020	2020 vs. 2019, %	RP> SP>C> 100%
Gross profit	4882207	4770108	-2.4	does not match
Revenue from sales	15393720	16667731	7.6	
Own capital and liabilities	3114253	12018344	74.1	

R. Higgins' internal growth rate, also called the company's sustainable growth model, is calculated using the following formula:

$g = \frac{(ROExb)}{(1-ROExb)}$ **(2)** [Lavlinskaya, 2019, 4-7]

where:

g – is the sustainable growth rate in % terms,

ROE – is the return on equity ratio

b – is the accumulation factor.

According to another approach, such as the R. Higgins model, growth opportunities are determined by the internal resources of the company, and the efficiency of production and commercial activities through the profitability of net assets. This model characterizes the steady growth of the company at the expense of its own sources of financing. However, the activities of companies are often associated with the inclusion of not only their own, but also borrowed capital. Therefore, in terms of strategic management of the company, the model developed by the Boston Consulting Group has gained wide popularity. This model is a system of equations that allows you to calculate the increase provided by the growth of assets, liabilities and equity. The latter considers the stable growth of the company as an increase in sales due to the stability of the operating and financial policies [Lavlinskaya et al., 2019, 705-709]:

$$g = \frac{NI}{S} x \frac{S}{Ax} x \frac{A}{E}\left(1 - \frac{DIV}{NI}\right) \textbf{(3)}$$[1]

where:

g – is the sustainable growth rate in % terms,

NI is the number of income before tax,

A – is the amount of assets,

S - sales volume,

[1] https://upravlenets.usue.ru/images/56/3.pdf

DIV – is the derived investment value,
E – own capital.

The differences in the formulas presented are due to the fact that the company implements a constant or unchanging financial, operational and investment policy, without taking into account the risks that always accompany the process of development, on the contrary, their main emphasis is on the growth of capitalization.

Table 3. Sustainable growth strategy of "Artsakhenergo" CJSC based on the Boston Consulting Group model (thousand AMD)

Indicators	2019	2020
Gross profit before tax,	4882207	4770108
Total assets	17714690	10273922
Revenue from sales	15393720	16667731
Own capital	4404956	-2061840
Income related grants	15253	7963
Gross income related grants	4866954	4762145

As it can be seen from the data in Table 3, in 2020 all indicators decreased compared to 2019, and using the formula (3) the following calculation was made:

- g_{2019}=0.01
- g_{2020}=0.02

The results show that the operational and financial policies pursued by "Artsakhenergo" CJSC have not changed to some extent.

Conclusion. The factors affecting the energy system of the Republic of Artsakh, as well as the extent of their influence, were coordinated.

The paper calculated the losses of " Artsakhenergo" CJSC and the reasons for the decrease in the level of profitability of CNG plants. In addition, the point of view was distinguished, according to which not all schemes of global development and various integrations are applicable in Armenia and Artsakh, and so far the main developments are due to the rather wide spread of alternative energy receiving stations. In addition, by applying video-methodological approaches, the assessment of the "golden rule" principle of "Artsakhenergo" CJSC was substantiated. It was concluded that with current operational and financial policies, the company cannot grow faster than the growth rate g without resorting to financial borrowing. Therefore, if "Artsakhenergo" CJSC wants to grow at a faster pace, it is necessary to change the approaches to financing activities, adjust the main parameters of financial leverage, clarify and agree changes in the dividend policy with the owners or ensure more efficient use, and in the presence of

existing resources, in other words it means to increase the level of economic profitability of assets.

Yevgenya MIKAYELYAN

On the issue of assessing the damage caused to the energy system as a result of the 3-rd Artsakh war or the 44-day war

Key words: economic damage, the "golden rule of economics" principle, autonomous energy producer, investment policy, capitalization growth.

The article analyses scenario approaches to the development of the energy system of the world, as well as agreeing on the positive and negative sides, and proposes practical mechanisms to improve the efficiency of the energy system of the NKR. Modern models of energy development are presented in the article, of which 6 are mainly used. The necessity of using the SCANNER model to improve the efficiency of the energy system of the NKR is especially emphasized, because it is as close to reality as possible. The paper calculated the losses of " Artsakhenergo" CJSC and the reasons for the decrease in the level of profitability of CNG plants. In addition, the point of view was distinguished, according to which not all schemes of global development and various integrations are applicable in Armenia and Artsakh, and so far the main developments are due to the rather wide spread of alternative energy receiving stations.

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DISTRIBUTED LEDGER TECHNOLOGY CHALLENGING ANTI-TRUST AND COMPETITION LAW

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Key words: regulation, distributed ledger technology, block chain, anti-trust competition law

Introduction. Since the appearance of Distributed Ledger Technology there is a new field of challenges to regulators and authorities opening up. Most attention in the public and media has been put on the Bitcoin-Blockchain based on the Open Distributed Ledger Technology. Blockchains are basically algorithm with decentralized data storage on a peer-to-peer network lacking a centralized administration. The software for most blockchain applications is open source and keeps the ledger of all transactions ever occurring on public files. If a blockchain is administrated, it is not an Open Distributed Ledger anymore.

The inherent decentralizing and anonymity aspects of DLT makes it difficult to define an appropriate jurisdiction. In traditional law, and in absence of any agreement stating otherwise, DLT disputes are normally settled by state courts. But state courts mostly do not have the authority and tools to act in this environment. Missing a clearly defined legislative umbrella for transaction with DLT the regulators have to concentrate on the gatekeepers between the Distributed Ledger and the real world. Here they can regulate through compliance regulations or through determining which ledger is recognised within the existing legal and regulatory system. International initiatives for developping international law for facing the new challenges will be necessary for the future.

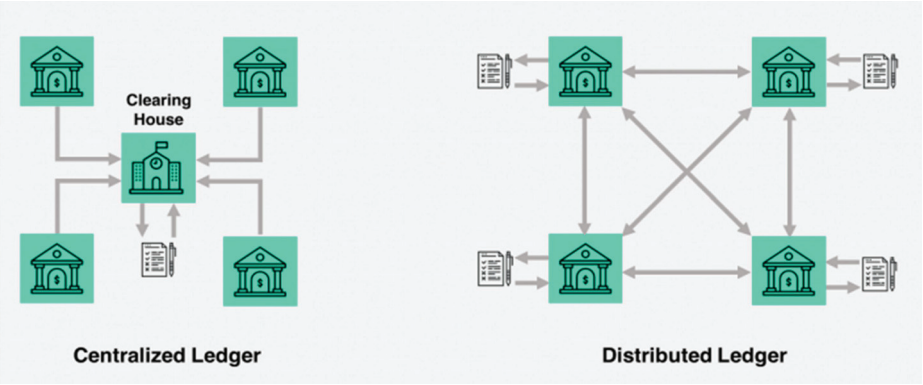
Methodology and literature review. Still, the fact that some researchers state that Bitcoin with its underlying block-chain has already started to create a supranational economy in which the classical idea of a legal person is obsolete, (Starodubcev, «Bitcoin created a supranational economy», 2016) this paper aims to start discussing the possible frictions between blockchain applications, their stakeholders and legislative and regulative authorities. The main challenge for regulators and society is an increasing asymmetry between the blockchain industry, its stakeholders and the legal system and consumer. Today's approach by various governments to implement more and more legal restrictions on the internet will not prove sustainable (UNESCO, 2017/2018, World Trends, 2017) DTL and Blockchain technology is definitely a challenge to legislative

and regulative authorities that is asking for massive capacity building and adjustments of existing legal frameworks to give an answer to the challenges of tomorrow.

Short introduction to Distributed Ledger Techology (DLT). Ledger Technology has been used for a long time even before the digital version of it existed. Maintaining ledgers is a fundamental tool for accounting since the beginning. The technologies to maintain the ledgers might have changed over time but one thing was always inherent- a third party was registering, validating and overlooking each transaction. This was a basic for the validation and trust the involved parties had into this accounting system.

Distributed Ledger Technology (DTL) is now the first form of ledger that is not relying on any third party for verifying and registering transactions. It delegates the maintenance of the ledger and the responsibility to validate into the hands of all user of the ledger. This creates a decentralized system of a data register that is transparent, reliable, fast and incorruptible.

Analysis. Through its dynamic form DLT has much more potential than static paper-based Ledgers. As we already know DLT data are not secured and verified at a centralized place which could become a Single Point of Failure. DLT is avoiding the inclusion of any central authority or intermediate to process, validate or authenticate data. Data will only be included in the DTL after consensus of all parties maintaining the system is reached.



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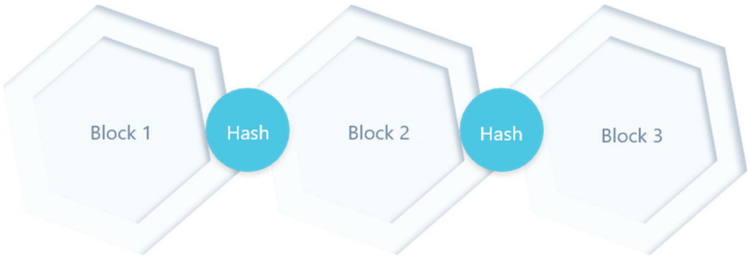
For inclusion into the DLT all new data will be stamped with the date and time and will be referenced with a unique cryptographic signature. All participants of the DLT can at all time access all data and therefor there is a verifiable and auditable history of all information in a dataset available.

A Distributed Ledger is decentralized through its technology. As soon as any administrator has the control over the network it is not decentralized anymore. So DTL is a first step towards Blockchain technology. But it is important to understand that DTL do not necessarily build up blockchains. It can also be used to build other networks that are maintaining decentralized datasets securely.

Still Blockchain is the most prominent application using Distributed Ledger with a very specific technological basis. In blockchains, groups of datasets with cryptographic signatures are linked to each other to build a chain of datasets. One of the best example for such an Open Distributed Ledger is Bitcoin as the leading Cryptocurrency.



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The conclusion is that Distributed Ledger Technology and Blockchains are not the same. Blockchain is in any case using DTL but DTL has not to be a blockchain in each case. The potential of DTL in the future is far greater than solely the use of blockchains, going into multiple areas of our business and private life.

Blockchains and it's most prominent application Bitcoin. We have seen that Blockchains are Distributed Ledger so basically an algorithm with decentralized data storage, lacking a central administrator, and where the participants know nothing on each other. Best known as the technology behind bitcoin as the leading cryptocurrency. Bitcoin and its underlying blockchain technology were first introduced by Satoshi Nakamoto in his paper "Bitcoin: A Peer-to-Peer Electronic Cash System" (Satoshi, 2008).

The whole software for cryptocurrencies is open source and keeps the ledger of all transactions ever occurring on public files. The records of all transactions are secured on the computers that build this ledger, but not the whole ledger on all but only small blocks with references to other blocks on all these computers worldwide, linked and secured using cryptography. This means, any alternation of any block cannot be done without alternation of all subsequent blocks which makes the system permanent, efficient, incorruptible and auditable. So, each transaction and its identification is validated by at least three parties involved in maintaining the whole system and "mining" new blocks of information containing data relating to the actual transaction.

By solving mathematical problems presented by the system these blocks are added to the existing blockchain, so all members of the system have access to the data. If a transaction is not verifiable with the existing blockchain the new blocks will not be integrated and so the integrity of the system is guaranteed. Blockchains have been described as potential secure and efficient solution for several applications4 5 6. (Plant, 2017, Popper, 2017, Arthur, 2017) It is also widely expected that blockchains will track integrity and provenance of other special products like pharmaceuticals, diamonds or seafood in future. Blockchain will change the way of exchanging data and the ability to transact globally in various fields, including financial services. Beside the public blockchains, like the one used by bitcoin, there are new applications like consortium blockchains where the consensus process is limited to predefined nodes of the blockchain i.e. participants and members of the consortia. The access to the blockchain can be public or restricted or even hybrid. In a fully private blockchain the write permission is kept by one organisation but it might be possible to have public reading permission or even that could be restricted to certain stakeholders of the blockchain. In contrast to the public blockchains, consortium or private blockchains can easily change rules and entries in the ledger and even revert processes. But having a central entity controlling the blockchain and being capable of interfering with the algorithm, especially for the challenges discussed in this paper, might solve the problem to define a responsible legal entity and take legal actions against it. This makes a big difference to Open Distributed Ledger Technology where such a legal entity is difficult to define.

Legal Responsibility in an Open Distributed Ledger using Artificial Intelligence. Especially Open Distributed Ledger that have no administrator with any possibility to interact with the decentralized ledger are creating a new challenge to our law systems. The inherent decentralizing aspects make it difficult to define an appropriate jurisdiction. In traditional law, and in absence of any agreement stating otherwise, disputes regarding legal problems involving DLT are normally settled by state courts. But the inherent structure is creating nearly insoluble problems to such state courts. Transactions are conducted completely independently from the physical location of the involved legal entities. Stakeholders can act in various jurisdictions simultaneously in high anonymity with decentralised storage on large peer-to-peer computer networks. Bitcoin with its underlying blockchain has already started to create a supranational economy in which the classical idea of a legal person is obsolete (Starodubcev, 2016) whereas the supranational law is not really designed to address these new developments yet .

As the courts and states have enormous problems to tackle in these new scenarios there are some ideas how to come into a position to be able to regulate the markets beside self-regulation. One opinion on this jurisdictional issue is: “that at a simple level, every transaction potentially comes under the legislative umbrella of wherever the node

exists whether in respect of financial services or data protection." (Brandman, 2016). Whereas the author also states that this means that blockchains would then need to be compliant with a potentially unwieldy number of legal and regulatory regimes. Given this, the locus of a relevant "act" could be unclear as the transactions may have occurred simultaneously in a few different places, which again makes it nearly impossible to determine the competent jurisdiction. The unsolved questions regarding competence of jurisdictions in these new challenges of the new digital economy will become more and more important in our business and private life.

Whether in a distributed ledger, a blockchain consortia or a private blockchain, a deep cooperation and interaction between stakeholders is necessary to take full advantage of the potential. Blockchains are unified platforms with unified processes to maintain its structures. Attention has to be paid to the fact that all information shared between the stakeholders are only used to help the consortia to achieve legitimate goals and not violate competition laws and regulations. In future artificial intelligence could open a completely new field as blockchains will start to operate independently to optimize prices and profits by using the data stored within the ledger and trigger decisions and actions automatically. For state legislation it is very difficult to implement regulations that have to be followed in a system that is outside its sphere of influence and action. An autonomous system maintained and managed by the users themselves over which no stately organization has any influence and control might start a supranational economy in which the classical idea of a legal entity is obsolete.

Legislative and Regulative Approaches. Within this new digital economy there is no technical necessity for the stakeholders to be attached to any jurisdiction. The high degree of anonymity of stakeholders in an Open Distributed Ledger is a extreme challenge for legislation as - for example - will still do not know the real identity behind "Nakamoto Satoshi" who presented the first concept of bitcoin to the public back in 2008. Our existing legal frameworks are based on the state's monopoly on violence. If any actor decides not to follow the regulator's regulation he goes to court. But who we can bring to court in a Open DLT?

As first step for implementing regulations some states defined some rules for self-regulation like Switzerland through the Swiss Crypto Valley Association publishing the ICO Code of Conduct for Switzerland in January 2018. Despite the softness of such regulations it is very difficult to establish a harder regime comparable to traditional regulation of markets. Mainly because the concept of legal entities is nearly impossible to maintain with Open Distributed Ledger Technology. All legal entities that can be defined as such are gatekeepers of the underlying blockchain that exists virtually.

As mentioned before, the potential of Open Distributed Ledger Technology can only be presumed today. To quote Leanne Kemp, CEO of Everledger, from the IBM

Institute for Business Value report: "At its core, blockchain is a shared ledger that allows participants in a business network to transact assets where everyone has control but no one person is in control " (IBM, 19th Edition). Validated supply chains will be available to the consumers, healthcare data will be managed in blockchain consortia models, and financial trading platforms will be managed through blockchains. Smart contracts will facilitate, execute and enforce agreements through blockchain technology and will guarantee proper fulfilment of the agreement and secure storage of data. This technology will make the use of intermediates and middleman more and more neglectable.

Further discussing the challenge to regulate Open Distributed Ledger through state authorities we have to answer some questions first. It seems appropriate to start discussion with the most prominent application based in an Open DLT, today still Bitcoin. On-ledger currencies such as Bitcoin are completely different to sovereign currencies, fiat or not. A Bitcoin can not be exchanged for any commodity as it is not backed by any trusted institution or government. The worth of a Bitcoin is purely a function of the demand in the markets which leads to a significant volatility. For that reason the Bitcoin is traded in the markets more like an asset than a currency.

We should remind that the main purpose of regulating a currency is to make a currency stable and predictable for international trade. Monetary interventions try to control inflation and to store the value to make a currency a fair medium of exchange. But do we have to ensure the stability of a cryptocurrency? As long as there are reliable market information for consumers we can surely delegate the risks of the volatility to the consumers. It is not a problem for regulators to solve (Deloitte, 2016). We should concentrate on the traditional monetary tasks of Governments and their agencies and remember that the fast majority of distributed ledgers operate inside established regulatory regimes.

Early in the history of the Bitcoin there was concern that the anonymity would enable money laundering and fraud easily. These concerns have been proven unfounded.

While the Open Distributed Ledger of Bitcoin itself exists outside of regulatory structures, it must be connected to the real world so for example the market value of a Bitcoin can be realized. These bridges or gatekeepers between the DLT and the real world are today subject to existing regulations and have to adhere to compliance requirements. Through regulation of these gatekeepers regulators have a powerful tool to indirectly manage the ledger itself. This is regardless the ledger's content: be it assets, contracts or entitlements. To enable the transfer of ownership of a physical asset recorded with DLT, the ledger itself has to be recognized by the legal system. Regulation of Open Distributed Ledger can effectively be organized by determining which ledger is recognised by the existing legal and regulatory system.

The coming years will show an enormous development of blockchain technology impacting all aspects of life on a day to day basis. The main challenge for regulators and society is an increasing asymmetry between the blockchain industry, its stakeholders and the legal system and consumer. Today's approach by various governments to implement more and more legal restrictions on the internet will not prove sustainable (UNESCO, 2017/2018, World Trends, 2017). All regulations and restrictions should consider the specific aspects of Distributed Ledger Technologies and Blockchains and not diminish the potential positive effects of economic growth and innovation.

Conclusion. Distributed Ledger Technology is opening a challenging new field for legislative regulations and law enforcement. The decentralized and autonomous technology and structure of the peer-to-peer network and the complete impossibility of direct intervention by any state institutions poses unseen challenges. Blockchains based on DLT might prove to be agnostic to any jurisdictional rules based on traditional legislative understanding. Blockchain consortia using artificial intelligence will go beyond the market structure as we have it today. Artificial Intelligence combined with a blockchain might well trigger decisions and actions automatically and without interference of any blockchain stakeholders in the future.

By just implement more and more legal restrictions on the internet, state actors will not be successful in regulating the DLT and their blockchains. Such rough intervention will not prove sustainable.

Even if Blockchains based on DLT itself might give great concern to regulators we still have to remind that most DLT applications are operating within established regimes. The ones existing outside of regulatory structures can be strongly influenced indirectly through regulating the gatekeepers that connect the DLT with the real world. Then all content of the ledger has sooner or later to be transferred into the real world. At this stage regulations can be effective.

Still capacity building has to be emphasized to keep the asymmetry of information between regulators and industry as small as possible. Self-regulation by the market players will be necessary to support. International coordination of regulations and addressing the problem of missing legislative umbrellas for decentralized databases can only been addressed globally.

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Distributed ledger technology challenging anti-trust competition law
Key words: regulation, distributed ledger technology, block chain, anti-trust competition law

Distributed Ledger Technology (DLT) enables a way to secure decentralized datasets without involvement of third parties or intermediates secure, auditable and incorruptible. The specific way of storing data on worldwide peer-to-peer networks makes any attempt to regulate such applications very difficult as they are not residing in a specific area of influence of any given regulation or jurisdiction. DLT might prove to be agnostic to any jurisdictional rules based on traditional legislative understanding. Also in future it might be possible that artificial intelligence could be put into position to trigger decisions automatically based on such applications which will become a major challenge for competition and anti-trust regulators. Based on the Bitcoin technology we will see that there are fair possibilities to regulate the ledgers indirectly through existing legal and regulatory systems. The ones existing outside of regulatory structures could be controlled indirectly through regulating the gatekeepers that connect the DLT with the existing regulated structures. Selfregulation might also play a part to make these technologies widely acceptable.

FEATURES OF PHARMACEUTICAL INSURANCE FINANCING IN THE CONTEXT OF HEALTH INSURANCE IN DEVELOPED AND DEVELOPING COUNTRIES

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Key words: health insurance, Medicine Package Reimbursable by Insurance, healthcare costs, retail pharmaceutical costs

Introduction. Health insurance, which also includes drug reimbursement, has expanded access to drugs in many countries, including Argentina, China, Egypt, South Africa, and Vietnam [WHO 2004/2007]. Health insurance schemes are convenient for both the citizens and their governments as they help manage the financial burden by sharing the overall cost of health care among different partners. Policymakers need to assess the most appropriate mechanisms for pooling health risks, as low- and middle-income countries have high levels of out-of-pocket costs, and choosing the right mechanisms for interaction between the public and/or private sectors can ensure a high level of health protection.

In the context of discussing the mentioned health financing models, it is important to understand the feasibility of implementing this or that system, including the distribution of financial burden and benefits, technical efficiency and other factors.

The distribution of the burden and benefits of the health care system can be represented by three axes:

- Who pays and how much?
- Who gets – what and when?
- Who gets paid and how much? [Mossialos et al., 2002]

Insurance systems in Canada, Germany, Japan, Singapore, the United States, and other developed countries are diverse and include the most expensive (US) and cheapest (Singapore), single and multiple insurers, state and employer sponsored insurance, and other types of insurance.

Methodology. Quantitative and qualitative research methods were used in the article to study the features of health insurance and, especially, drug insurance financing in developing and developed countries. In order to comprehensively understand the problem, the authors also used statistical, mathematical (graphical), comparative and

structural analysis methods within this research. Using quantitative methods, the authors analyzed statistical data available in the field to answer their research questions. Then, based on the results of the quantitative analysis of the problem, they also gave qualitative assessments describing the situation.

In general, two methods are used in the theory: the hypothetico-deductive method, used mainly by neoclassical economists, and the historical-deductive method, advanced by classical and Keynesian economists. Despite the fact that both research methods have their advantages, however, taking into account the fact that the issue of health care is an important socio-economic problem, the authors chose the historical-deductive method. The theoretical, informative and methodological basis for the article are the works of foreign economists, which are related to the health insurance processes.

Literature review. There are several health insurance models that may or may not include drug eimbursement.

- State-funded systems through ministries of health or national health services.
- Social health insurance systems.
- Voluntary or private health insurance, etc.

Ministry of Health/National Health Service Systems. These systems generally have three main properties. First, their primary funding comes from general revenues. Second, they provide health insurance to the entire population of the country. Third, their services are delivered through a network of public providers. Broad coverage means that major risks are compensated, rely on a broad base of income, operate under state control. Although national health service systems receive the "theoretical benefit" of providing free health care to the entire population (minus any applicable user fees), the reality is less encouraging. These systems are quite vulnerable from the perspectives of allocated budgets, political priorities, corruption and inefficiency, lack of appropriate incentives and accountability. And in low-income developing countries, public health spending is quite low. Unlike social health insurance systems, which are mainly financed by wage payments, national health service systems can rely on a very broad base of income from tax and non-tax sources. Most national health service systems are integrated systems. The simplicity of managing these systems enables the healthcare system to be organized with lower transaction costs. For this reason, publicly funded systems have enabled successful public health programs in many developing countries.

Social or public health insurance, which implies that it is mandatory for certain groups of the population, the allocations of the insurance system are made from payroll deductions, there is cross-subsidization between high and low risk, as well as high and low income population groups. Social health insurance contributions are usually linked to income and shared between employees and employers. These systems are typically characterized by the presence of independent or quasi-independent insurance funds that

rely on mandatory earmarked contributions from wages. In this case, there is a clear relationship between targeted allocations and entitlement to a defined package of health benefits. These systems cover only limited population groups, if successfully operationalized this insurance coverage can be expanded to include wider segments of the population. The state generally defines the main attributes of this system, although the funds are generally non-profit and controlled by the government.

The financing base of social health insurance systems is also mainly formed from budget allocations, but they are not enough to fully compensate these costs, especially if this coverage is used by wide sections of the population. Social security contributions can also have a negative impact on employment and economic growth if they increase costs for workers or employers [Gottret & Schieber, 2006].

Scientific novelty. As we have seen, in this model, insured persons pay regular, usually salary-based, fees, and independent quasi-governmental agencies are the main governing bodies of the system and act as payers for health care. Thus, in France these payments are income-based, usually shared between employers and employees, but insurance is entirely voluntary (also called private social health insurance). Compulsory health insurance in Switzerland is managed by private insurance companies. In countries with social health insurance systems, general taxation is an important source of revenue for health systems, but sometimes the money collected is not enough to provide universal coverage because the number of insured persons is often greater than those paying into the systems.

In the case of social health insurance, the state defines the main characteristics of the system: the conditions, the content of the insurance package, the procedure for calculating and collecting payments [Busse et al., 2004, 33-81]. Most social health insurance systems are managed through sickness funds. Sickness funds often collect payments directly, although in some cases, resources are first collected by the state and then redistributed by the funds. Social health insurance funds are financed either in their own institutions or on the basis of contracts for health services provided by private and public providers. Insurance services, their quality, prices, payment terms and other requirements subject to regulation are defined in the contracts.

Depending on the country, there may be several funds (Argentina, Chile, Colombia, France, Germany, Japan, Netherlands and Russia) or one fund (Estonia and Hungary). Beneficiaries can be linked to one fund or another by employment (Argentina, Bolivia, and Mexico), by age (Japan), or by individual choice (Chile, Colombia, Germany).

Analysis. Social health insurance systems are more or less comprehensive, depending on the resources of the system, and usually fully or partially compensate the

benefits defined in the package. Social health insurance is seen as an easy and efficient way to raise resources to offset health care costs, since it is believed that payroll deductions are easier to collect than general taxes. At the same time, social security contributions can increase labor costs, and if the government is a large employer, wage payments will significantly increase government spending.

Private or voluntary health insurance often complements publicly funded coverage, especially in high-income countries. Private health insurance is paid for by non-income-based premiums (not tax or social security contributions). Voluntary health insurance is defined as any health insurance that is paid for through voluntary contributions. Although both types of coverage are different, private forms of health insurance are also voluntary in most countries (with the exception of a few countries, such as Switzerland and Uruguay, where the purchase of private coverage is mandatory for all or a portion of the population. Private/voluntary health insurance plays an important role in public or social coverage;

• Primary- as the main source of insurance coverage for the entire population or specific population groups.

• Duplicative- covering the same services or coverage as public insurance, but differing in providers, timing, quality, and other amenities.

• Additional- with cost-sharing coverage in public programs.

• Extra- for services not covered by public coverage.

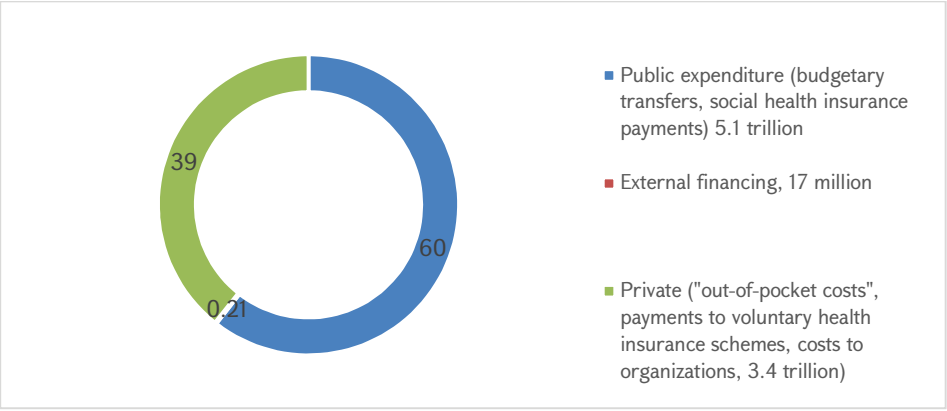


Figure 1: Major sources of funding for global health expenditure, 2019[1]

The complexity of private/voluntary health insurance markets raises questions about their adequacy and feasibility in low-income countries. Application of this model is appropriate in middle-income countries with large literate urban populations. These require and imply regulatory frameworks, political support, and well-functioning financial and insurance markets. However, coverage of health services, including medicines,

[1]Compiled by the authors based on data from WHO Global Health Expenditure Database, 2021.

is higher in several European countries than in other regions of the world. The healthcare system responds to the challenge of universal access to quality healthcare by applying various mechanisms for collecting and distributing financial resources in the healthcare sector. From this point of view, sources of funding for the health sector, funded health functions, health service providers, etc. are important. About 60% of health expenditure came from public sources, while 40% came from domestic private sources.

Health systems in EU member states are organized and financed in different ways, but universal access to quality health care is considered one of the general principles of EU health systems. State schemes financed 28.2% of all healthcare expenditure in the EU in 2019, while compulsory health insurance schemes and compulsory medical savings accounts accounted for 51.5%. The last two sources accounted for 79.7% of the funding. In 2019, more than half (53.5%) of healthcare spending in the EU went to curative and rehabilitative care, while almost a fifth (18.4%) went to the purchase of medical products, including medicines. In terms of spending, hospitals are the largest health care provider (accounting for 36.4% of spending), followed by ambulatory health care providers (25.5%) and retailers and medical product suppliers (17.5%)[1]

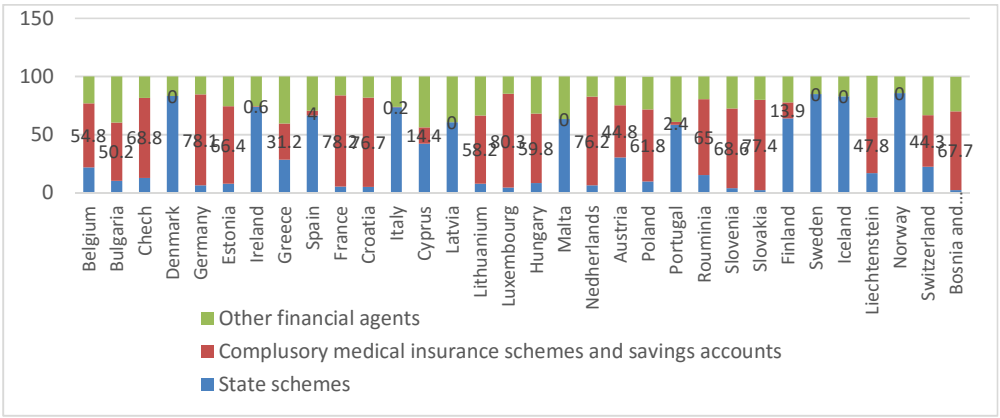


Figure 2. Health expenditure in the EU by funding schemes, % (2019)[2]

As we can see from Figure 2, the share of public and state-mandated insurance schemes in total current health expenditure is particularly high in Luxembourg, Sweden, Germany, France, Denmark, the Netherlands, Croatia, the Czech Republic and Romania. Most EU member states were dominated by state schemes or mandatory schemes / accounts. In 2019 more than three-quarters of the total expenditure on healthcare is accounted for by compulsory social insurance schemes, particularly in Luxembourg

[1] https://ec.europa.eu/eurostat/data/database Healthcare expenditure by financing scheme
[2] Compiled by the authors based on data from https://ec.europa.eu/eurostat/data/database Healthcare expenditure by financing scheme.

(80.3%), France (78.2%), Germany (78.1%), Slovakia (77.4%), Croatia (76.7%) and the Netherlands (76.2%), while in Spain, Portugal, Ireland and Italy this figure is less than 5.0%. It should be noted that mandatory schemes/accounts do not exist in Denmark, Latvia, Malta and Sweden. Private health insurance is an alternative to mandatory social health insurance. In some countries, certain groups of the population that are not included in the field of compulsory social insurance must use the services of private insurance markets. In other countries, people have the option of joining a private medical or social health insurance system.

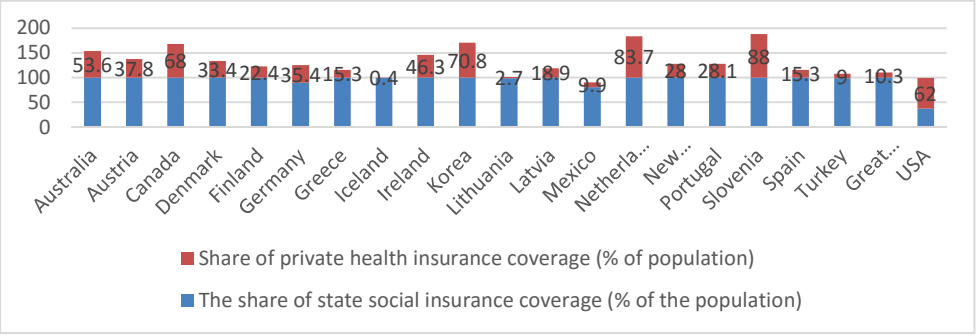


Figure 3. Private and public health insurance coverage in several OECD countries (% of population)[1]

Private health insurance often offers coverage for services not covered by social insurance, such as dental care for adults, homeopathic medicines or cosmetic surgery. This form of supplementary insurance is available in almost all OECD countries. Furthermore, policyholders can avail additional coverage through co-payments and co-insurance [Greß, et al/, 2002].

In 2019, spending on retail sales of pharmaceuticals (not counting drugs used during hospital treatment) accounted for one-sixth of total healthcare spending in OECD countries. Expenditures on pharmaceutical products constitute the third largest expenditure group after inpatient and outpatient care.

Pharmaceutical costs have two main components: prescription and over-the-counter drugs. In 2019, prescription drugs accounted for 79% of pharmaceutical spending in OECD countries, and over-the-counter drugs accounted for the remaining 21%. The differences are due to country-specific differences in prescription drug coverage, as well as the prices and availability of different drugs. Poland was the only OECD country where the cost of over-the-counter drugs exceeded that of prescription drugs.

[1] Compiled by authors oecd.stat Social Protection based on public, private health insurance data.

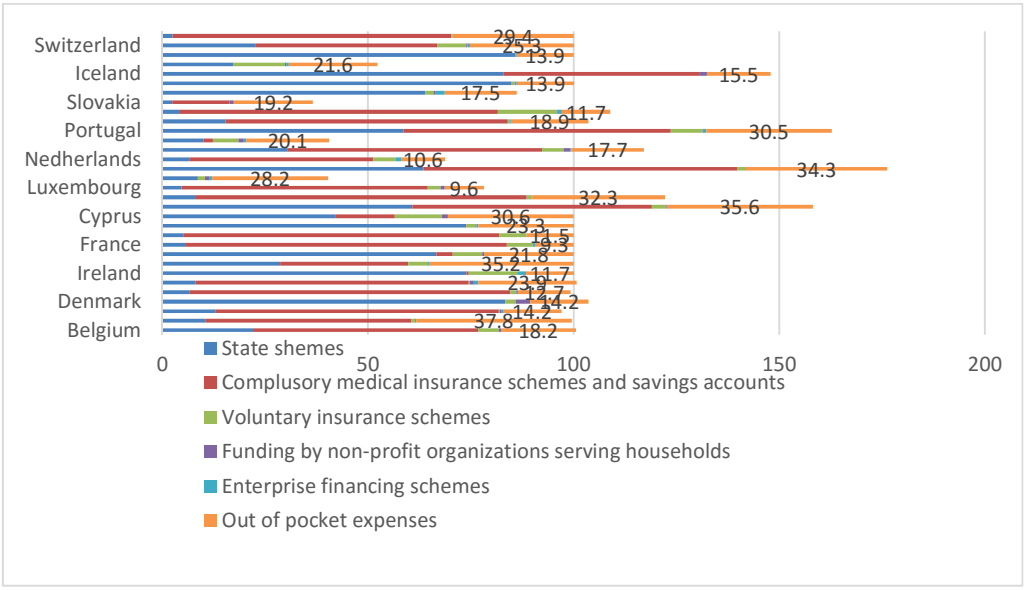


Figure 4. Current health expenditures by funding sources, 2019, in %[1]

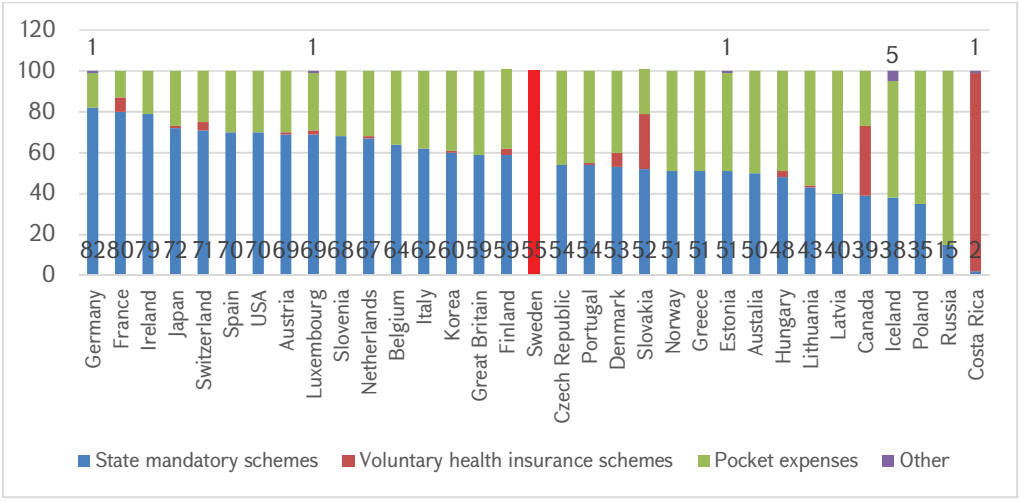


Figure 5. Expenditures on retail pharmaceuticals by type of financing, 2019 (or nearest year), 2019, in %[2]

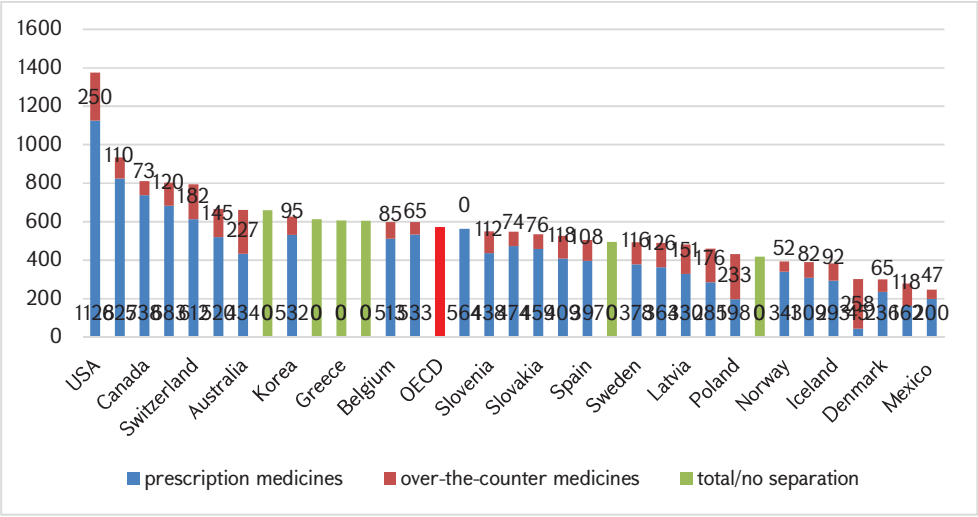
As we can see from the chart, in OECD countries, state and compulsory insurance schemes accounted for the largest share of pharmaceutical retail spending, around 56%.

[1] Compiled by authors on ec.europa.eu/eurostat/data healthcare expenditure by financing scheme.
[2] OECD (2021), Health at a Glance 2021: OECD Indicators, OECD Publishing, Paris, https://doi.org/10.1787/ae3016b9-en.

In countries such as Germany and France, this figure is over 80%. In contrast, voluntary health insurance schemes reimbursed an average of 3% of drug procurement costs. In Slovenia and Canada, one third of pharmaceutical costs were reimbursed by private insurance. Out-of-pocket costs were used to purchase 41% of pharmaceuticals, especially in Poland and Latvia.

Many factors affect the level of spending in pharmaceutical retail per capita, including distribution and supply costs, prescriptions, pricing and government procurement policies, new drug introductions, and more. As a result, retail pharmaceutical spending in OECD countries per capita averaged $571 in 2019[1].

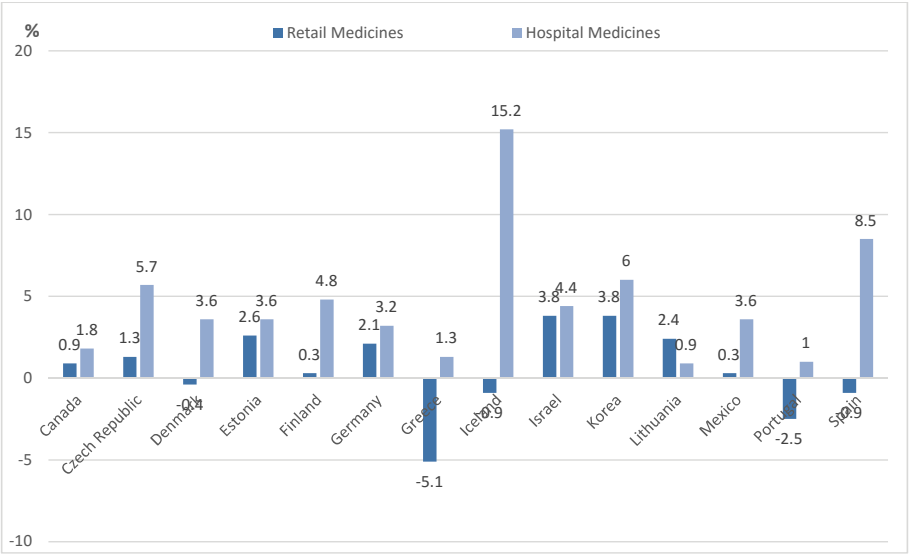
Figure 6. Per Capita Retail Pharmaceutical Expenditures, USD, 2019 (or nearest year)[2]



As we can see from the chart, these costs in the US are quite high, even double the OECD average. Per capita retail pharmaceutical spending was lowest in Mexico and Costa Rica. Overall, retail pharmaceutical consumption has been growing in recent years. This is also affected by differences in drug prices. Thus, the representative basket of health services and goods varies considerably by country. Thus, in Iceland and Switzerland the same basket is 72% more expensive than the OECD average, while in Chile and Greece they are 2/3 of the OECD average. Turkey has the lowest price level among the OECD countries[3]. Analysis of retail pharmaceutical costs only represents a fraction of the cost of pharmaceuticals in the health care system, as drug costs in the hospital sector can also be significant.

[1] https://doi.org/10.1787/ae3016b9-en.
[2] Ibid
[3] Ibid

Figure 7. Average Annual Growth of Retail and Hospital Pharmaceutical Expenditures, in Real Terms, 2010-2019 (or nearest year)[1]



As we can see from the chart, hospital pharmaceutical spending has increased significantly over the past decade due to the introduction of new high-value drugs and treatments, particularly in the fields of oncology and immunology. As we can see, spending on pharmaceuticals in hospitals has grown faster than on retail drugs, with the highest growth rates recorded in Iceland and Spain. Retail pharmaceutical costs have fallen in countries such as Greece and Portugal. In Greece, this significant reduction is due to the implementation of a policy to reduce the "wasteful use" of medicines.

Conclusion. As we can see, drug insurance is one of the elements of the health insurance system, within the framework of which the population is provided with free medicines or a part of their cost is reimbursed, with the aim of solving such problems as disease prevention among the working population, increasing the life expectancy of citizens, population abandonment from self-medication, saving on expensive medicines, maintaining income and diverting funds for other needs.

However, no model of universal health insurance is widely accepted, and there may not be universal health coverage, so a number of countries are debating private and public insurance implementation schemes from the perspective of equity, efficiency, and sustainability.

[1] OECD (2021), "Pharmaceutical expenditure", in Health at a Glance 2021: OECD Indicators, OECD Publishing, Paris.

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Features of pharmaceutical insurance financing in the context of health insurance in developing countries
Key words. health insurance, Medicine Package Reimbursable by Insurance, healthcare costs, retail pharmaceutical costs

Health is one of the fundamental human rights that is necessary for the realization of many other rights, in particular, the right to development, it is also necessary for a decent life. An essential element of everyone's right to health is the right to access quality medical technology, including medicines. Essential medicines meet the priority health needs of the population. Existing health systems must ensure that necessary medicines can be obtained at any time, in sufficient quantities, in appropriate dosages, of guaranteed quality, and at a price that is acceptable to both the individual patient and the community as a whole. In this context, the main goal of the article is to study and understand the features of drug insurance financing in developed and developing countries, presenting different models of health insurance and their implementation mechanisms. The authors have also studied the main sources and directions of financing global healthcare costs.

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SOCIO-ECONOMIC POTENTIAL OF ARMENIAN REPATRIATION[1]

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Key words: repatriation, diaspora, economy, growth strategy

Introduction. Sociological research among 500 families in Armenia was carried out by us in all 12 regions of Armenia, in total in 33 cities; including 301 in Yerevan, 36 in Masis, 11 in Gavar, 10 each in Gyumri, Vanadzor, Hrazdan and other cities. The task of the sociological study was to find out whether the relatives who left them intended to return to their homeland, various answers were received. In fact, only 10% answered that their relatives were going to return in the near future. Another 13.8% expressed hope that they would return sometime in the future. However, the majority of respondents (63.2%) noted that they have no intentions to return, and most likely never will again. Comparative analysis showed that the reasons why they left Armenia are fully correlated with the conditions of their possible return. This is, first of all, the improvement of socio-economic conditions in the country and the availability of work, as well as guarantees of peace and the absence of the threat of war.

For comparison, we note that in 2019, the Armenian Institute in London conducted the "Armenian Diaspora Survey 2019", within which 3,000 Armenians were interviewed in Argentina, Canada, Lebanon and Romania. When asked if they were going to move to live in Armenia, 4% answered that they were determined to return to their homeland in the near future (2% in Argentina, 3% in Canada, 12% in Lebanon and 3% in Romania), another 23 % answered that they would like to return if circumstances change in Armenia [1].

Repatriation potential of the resource of the Armenian diaspora. Today we live in different socio-political conditions, and in a favorable situation, many of the Armenian diaspora in Russia may well return to their homeland. All groups of our respondents stated that repatriation is possible if there are several basic conditions: the security of the population, the economic development of the country and the availability of jobs. But even having a good repatriation resource, the authorities of the republic should be able to

[1] The article was written within the framework of the project "The Socio-Economic Potential of the Armenian Diaspora in the Context of Integration Processes in the EAEU" of the RA Science Committee. (Code: 20RF-043).

provide all these conditions and return people to their homeland. So far, Armenia has not been able to limit the annual migration out of the country.

After all, 7-8 million Armenians scattered around the world may well provide a fairly solid repatriation resource of 1-1.5 million people. But for this it is necessary, first of all, to improve national legislation, develop and implement special state programs for repatriation. Initially, the new Armenian government made grandiose statements about encouraging repatriation and creating new jobs. In 2020, a state program of primary support was approved, aimed at the reintegration of citizens returning to the RA. It consists of two components: counseling assistance and housing rent compensation. The reintegration program is implemented by the European Border and Coast Guard Agency (FrontEx). Since January 2022, 17 people have received rent compensation under this program. These are mostly voluntary repatriates from Ukraine who moved to Armenia due to the military situation. The total number of those who received assistance under this state program for 3 years amounted to 105 people[1].

The project of the European Return and Reintegration Network (ERRIN) in Armenia is currently being considered, as well as the development of the EU4Impact project and a new return project to be launched in the near future. It will also be implemented in Armenia for a period of 3 years with the potential to support up to 375 families annually. Of course, these measures are absolutely not enough to organize a large-scale repatriation program for the Armenian diaspora. The RA Ministry of Diaspora Affairs should have dealt with this matter. However, the new government of the republic abolished this ministry, and instead appointed a chief commissioner for diaspora issues under the government of the republic. But he was not very successful in the task of consolidating the Armenian diaspora.

New trends and problems in the migration situation. Nowadays, certain changes have taken place in the dynamics of people leaving and coming to Armenia. The flow of visitors from Russia has increased. The Ukrainian crisis, sanctions against Russia and partial mobilization forced many Russian citizens to leave the country [4]. Since the beginning of hostilities, a fairly large flow of immigrants to Armenia has formed. Migration from Russia has changed qualitatively, not only Armenian repatriates come, but also highly qualified specialists in the field of information technology, as well as private entrepreneurs and businessmen.

Their arrival is mainly for political reasons, here the main role was played by sanctions. Armenia should be interested in the work of highly qualified specialists. This

[1] The 13th forum of organizations dealing with reintegration issues was held. http://migration.am/news/488?lang=hy [Date of access: 05/27/2022].

will also have a positive impact on the potential of Armenia if the RA government actively works in this direction and creates appropriate conditions, especially in those areas that are most conducive to the development of the economy. The creation of appropriate conditions will also help to avoid a massive exodus of these specialists when sanctions against Russia are eased.

The number of people who came from Russia in 2022.

- According to expert estimates, 90,000 Russian citizens arrived in Armenia.
- 938 registered as individual entrepreneurs.
- Another 268 have registered LLCs [2].

The reasons for the increase in emigration from Russia to Armenia during the period of sanctions are as follows:

- the possibility of entry on internal Russian passports;
- recognition of Mir bank cards;
- direct flights;
- Development-friendly IT legislation.

In the IT sector, the income tax rate is 10%, for comparison: for other areas, income tax is 21%.

During January-June 2022, 9,917 foreigners received Armenian citizenship. While for the whole of 2021, only 3,448 people received Armenian citizenship [4]. They move to Armenia for economic reasons. IT companies are sometimes moved by entire offices, along with their families. This is a kind of economic migration in modern conditions with signs of the so-called digital nomad (digital nomadism). In the West they are called "digital nomads". These are people who do not depend on the geographical place of work and carry out their activities, constantly moving around different countries of the world. They work using laptops, phones and the Internet, working "from a distance". According to the Minister of Economy of the Republic of Armenia, "dozens, if not hundreds of IT companies" have filed applications to transfer their activities to Armenia. Many of them are ready to stay and work in Armenia if everything goes well for them [3].

Especially in the context of the sanctions applied to Russia, in order to coordinate migration flows, the Armenian government should play a key role in the formation of appropriate procedures that allow legislative and organizational solutions to the problems of emigration, the formation of organizations, and the reduction of unemployment. Without state coordination and support, it is difficult to coordinate migration flows aimed at economic growth.

The development strategy of the Armenian economy should be based on the development of export potential in the few available growth points. Armenia's access to

foreign markets is hampered by information, production, infrastructure and personnel obstacles, to overcome which it is necessary to use all possible means of regulating foreign trade and all opportunities for integrating into the world economy, allowing Armenian manufacturers to achieve economies of scale.

The Government of Armenia should, in particular:

• deepen cooperation with the EAEU member states;

• take the necessary steps to realize the opportunities for the Union countries of the free trade zone in Meghri;

• intensify cooperation with partner countries of the region, providing the most favorable conditions for Armenian products to access these countries.

The Government of the Republic of Armenia needs to continue work on creating an appropriate legal framework for international economic cooperation, raising and strengthening the international prestige of Armenia, and taking steps to deepen cooperation with landlocked countries to solve problems with transit.

Conclusion. We have to admit that labor emigration in Armenia is actually often treated as a way to alleviate tensions in the domestic labor market and increase the inflow of financial resources from the diaspora. There is a complex global problem here, caused by a deepening gap in birth rates and incomes of the population between different countries and regions of the world. The main condition for remigration is not only the creation of new jobs with decent wages, but also the mitigation of the stratification of society, the elimination of injustice, corruption, the creation of a legal and social society. In an open economy such as Armenia, an increase in the output of domestic producers is possible if they can compete with foreign producers. To do this, it is necessary to use modern technologies, equipment and materials. The inflow of foreign direct investment into the economy should also be stimulated. An additional channel for stimulating the improvement of technologies is the growth of exports of finished products. Modernization of the economy is closely interconnected with the state of foreign trade.

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Gevorg POGHOSYAN, Ashot TAVADYAN
Socio-economic potential of Armenian repatriation
Key words: repatriation, diaspora, economy, growth strategy.

The article presents the results of socio-economic studies of the repatriation resource of the Armenian diaspora. New trends in the migration situation have been studied. The reasons for the increased flow of immigrants to Armenia are indicated. The idea is substantiated that the current migration situation is a unique chance for Armenia to improve its demographic and economic situation. High-priority tasks for streamlining migration flows under the sanctions, taking into account Armenia's membership in the EAEU, have been identified. The results of the conducted sociological researches can help increase the efficiency of using the potential of the Armenian diaspora in the socio-economic development of Russia and Armenia.

FOREIGN DIRECT INVESTMENT AND INCOME INEQUALITY IN ARMENIA: AN ECONOMETRIC ANALYSIS

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Key words: income inequality, Palma ratio, foreign direct investment, non-linear relationship

Introduction. The theoretical literature on the relationship between FDI and income inequality is characterized by conflicting theories, such as modernization or dependency and world-systems theories. Modernization theory is related to neoclassical economics and suggests that an increase in foreign capital at the early stages of development may exacerbate income inequality; however, this effect is expected to diminish as FDI increases further. This theory is consistent with the Kuznets hypothesis, which considers the relationship between economic development and income inequality as characterized by an inverted U-shaped curve [Kuznets, 1955]. Thus, the relationship between FDI and income inequality can also be described in the same way. Dependency and world-systems theory deviates from modernization theory by arguing that FDI can attract capital-intensive production, which restricts employment and therefore increases income inequality [Mihaylova, 2015].

Methodology. As the results of the studies show, the Palma coefficient characterizes the level of inequality quite accurately [Ghazaryan, 2022a], so this ratio was chosen as an index of inequality for the empirical assessment of the income inequality in Armenia. The following model was constructed to assess the FDI-income inequality relationship:

$$Palma_t = \beta_0 + \beta_1 FDI_t + \beta_2 FDI_t^2 + \beta_3 X_t + \varepsilon_t \qquad t = \overline{1999, 2020}\,, \tag{1}$$

where $Palma$ characterizes the level of income inequality calculated by the Palma ratio, FDI is foreign direct investment, FDI^2 is the square of FDI, which reflects the possibility of a non-linear relationship between FDI and inequality. All variables are taken with their natural logarithms so that the obtained coefficients are interpreted as elasticity coefficients. X is a vector of other control variables included to improve the robustness of the estimates, as well as to assess the effects of other macroeconomic factors on inequality. Real GDP per capita, share of urban population, secondary and higher education enrollment rates, government spending on health and education, unemployment and female employment rates, as well as inflation were chosen as control variables. Descriptions of and details about all variables are in Table 1. If the evaluation results show that the relationship between FDI and income inequality in Armenia is characterized by a U-shaped (i.e. $\beta_1<0$ and $\beta_2>0$) or inverted U-shaped (i.e. $\beta_1>0$ and

β_2<0) curve, it will mean that FDI in Armenia alleviates (exacerbates) income inequality, but the effect will change upon reaching a certain stage of development. This will occur at the turning point, estimated by the partial derivative of the equation (1) that captures the marginal effect of FDI on income inequality. The turning point at which the effect of FDI reverses occurs at the point where the partial derivative equals zero. Solving that equation for FDI yields the turning point.

Table 1. Measurement units of variables, definition and data collection source

Variable	Definition	Measurement unit	Source
Palma	Palma coefficient	$\frac{\text{richest 10\%'s share}}{\text{poorest 40\%'s share}}$	WB WDI[1] and author's calculations
FDI	FDI (net inflows)	US dollar	UNCTAD WIR [23]
GDP	real GDP per capita	constant 2017 $, PPP	WB WDI
URB	share of urban population	as a percentage of the total population	Statistical Committee of RA[2]
SSE	gross secondary school enrollment rate	ratio of actual and expected values	WB WDI
TSE	gross tertiary school enrollment rate	ratio of actual and expected values	WB WDI
EXPHLT	government expenditure on healthcare	% of GDP	WB WDI
EXPEDU	government expenditure on education	% of GDP	WB WDI
UNEMP	unemployment rate	% of labor force	WB WDI
EMPF	female employment rate	% among working-age women	WB WDI
INFL	inflation, consumer prices	annual %	WB WDI

Table compiled by author

$$\frac{\vartheta Palma}{\vartheta FDI} = \beta_1 + 2\beta_2 FDI = 0 \quad \Longrightarrow \quad FDI = \frac{-\beta_1}{2\beta_2} \tag{2}$$

If the relationship between FDI and inequality is characterized by a non-linear function, then the convexity (concavity) of that function is determined by the sign of β_2: if β_2<0, then the relationship is concave, if β_2>0, then it is convex [Kaulihowa, 2018].

Literature review. Some panel studies of developing countries support the view that FDI exacerbates income inequality [Basu et al., 2007; Reuveny et al., 2003; Choi et al., 2006]. Some studies have shown that the impact of FDI on inequality varies depending on the country's level of economic development: in developed countries, the impact of FDI is negative, that is, the level of inequality decreases, but in the case of

[1] https://databank.worldbank.org/reports.aspx?source=world-development-indicators
[2] https://www.armstat.am/en/

developing countries, it is the opposite. Although FDI aggravated income inequality in the case of developing countries, the non-linear component showed that this effect decreases further [Figini et al., 2011]. This finding is consistent with the modernization theory of FDI, which states that the impact of FDI varies by stage of development. Meanwhile some researchers have found no significant relationship between FDI and inequality [Te Velde et al., 2004; Milanovic, 2002; Sylwester, 2005].

Real GDP per capita was included in the model as a traditional measure of economic development. Some studies check the presence of a non-linear (inverted U-shaped) relationship between GDP and income inequality. However, recent literature generally doesn't support Kuznets's hypothesis that GDP growth has a positive effect on inequality in the short term and a negative effect in the long term [Meschi et al., 2009]. Economic growth can have both a positive and a negative impact on income inequality. Aghion argues that economic growth should mitigate inequality in the country [Aghion et al., 2002], but the effect can be the opposite if this growth isn't efficient and just increases the incomes of the rich people. Opinions on the impact of urbanization on inequality vary, as empirical studies in this context have produced mixed results. The analysis carried out for African countries showed that there is a positive relationship between urbanization and inequality [Sulemana et al., 2019]. The analysis made for four Asian countries showed that urbanization exacerbates inequality in the Philippines, Indonesia and India, while in China the effect is negative [Kanbur et al., 2013]. The results of some studies show that this relationship can also be characterized by an inverted U-shaped curve [Wu et al., 2017]. Education promotes the acquisition of a profession and the development of skills, so it is believed that educated people have more opportunities to move into high-paying employment. That is, the greater the number of people involved in education, the more people will be able to raise their incomes, which is expected to reduce inequality. It is the level of education that increases the skilled labor force, which in turn alleviates the level of inequality in the country [Jensen et al., 2007]. Government expenditures on education and healthcare contribute to the formation of human capital in the country, which in the long run can lead to an increase in incomes and their effective redistribution. Many studies have shown that these social costs are effective levers for income redistribution. Government expenditure on education can increase individual productivity as well as create opportunities for poor people to move into higher paying jobs. It is important that this social spending is targeted especially at the poor, which will reduce inequality and poverty in the short term [Anyanwu et al., 2010]. High unemployment rate can exacerbate inequality as it pushes more people to the bottom of the income distribution [Shahbaz, 2010]. Since gender inequality is strongly associated with income inequality both in the world and in Armenia [24], the factor characterizing the level of women's employment was also included in the model. The unemployment rate is expected to have

a positive effect and the female employment rate to have a negative effect on inequality. The results of some studies are in line with our expectations [Lee et al., 2013]. Inflation can have contradictory effects on inequality. Some researchers argue that inflation should alleviate income inequality by redistributing income from the rich to the poor, while empirical results prove otherwise [Scully, 2002].

Scientific novelty. In order to evaluate the relationship between FDI and income inequality in Armenia, the Palma ratio was evaluated as an indicator characterizing the level of inequality. Results of the empirical analysis revealed that FDI-income inequality relationship in Armenia is characterized by an inverted U-shaped curve. It has been argued that FDI exacerbates income inequality, but there is a turning point after which further increases in FDI will alleviate inequality. That turning point was estimated as a 19% share of FDI in GDP.

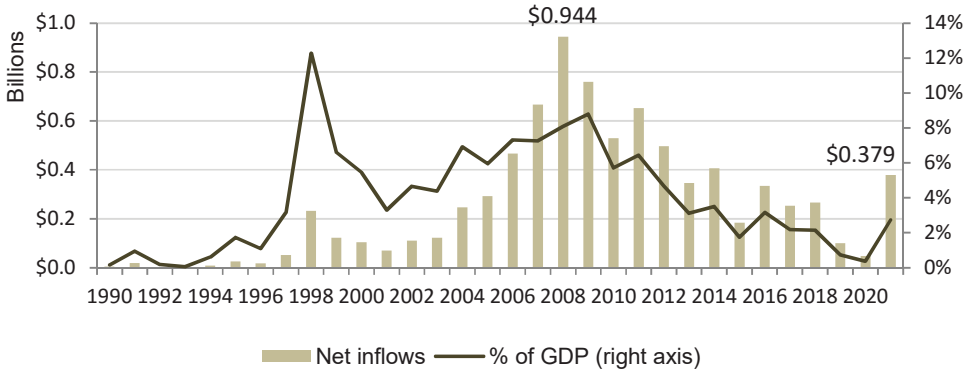

Figure 1. Dynamics of foreign direct investments in Armenia

Analysis. Until 2008, the net inflows of FDI were growing at a high rate, and in that year about 944 million dollars of foreign capital came to Armenia. However, after the crisis, the trend was changed, reaching only 47 million in 2020. The sharp decline in that year was mainly due to the outbreak of Covid-19, which caused them to decrease by more than 53% compared to the previous year. During the same year, this indicator decreased by 80% in Europe and by 35% in the world [23]. The downward trend of FDI in the post-crisis years is mainly due to the unfavorable investment climate in the country, which is related to the tax and customs policy, as well as the war tensions in the region. However, the investments in 2021 have increased considerably, amounting to about 380 million, and have even approached the volume of 2014.To evaluate the constructed model, the stationarity of the series was first checked, for which the unit root (ADF) test according to Akaike's criterion was applied (Table 2). Variables that are I(1) processes were included in the models by first difference. We have estimated 9 models, the empirical results of which are presented in Table 3. In the first model, the influence of FDI and real GDP per capita on the dynamics of income inequality was evaluated. As

stated earlier, squared term of FDI has been added to check the presence of a non-linear relationship. And indeed, the results show that the relationship between FDI and the level of inequality in Armenia is characterized by an inverted U-shaped curve, which supports Kuznets's hypothesis that in the early stages of development, the impact of FDI on inequality may be positive, but after reaching a certain level of development, the sign of this impact may change.

Table 2. Panel unit root tests

	Variables in levels		Variables in 1st differences	
	Intercept	Trend and intercept	Intercept	Trend and intercept
ln Palma	-3.003158*	-3.219416	-3.564697**	-1.118100
ln FDI	-3.187460**	-3.275109**	-5.708935***	-5.515924***
ln GDP	-0.038661	-3.472029*	-3.555235**	-3.507428*
URB	-3.738007	-2.414662	-3.989907***	-3.564848*
SSE	2.944709*	3.641304*	-5.671146***	-4.853413**
TSE	-2.878197*	-3.935003**	-3.846005***	-3.781914**
EXPHLT	-3.047728**	-2.558830	-5.444644***	-3.594307*
EXPEDU	-3.276050**	-3.357629*	-5.171605***	-4.975384***
ln UNEMP	-4.153794***	-2.393031	-4.360294***	-4.905582***
ln EMPF	-1.399005	-1.973998	-6.276622***	-6.176976***
INFL	-3.547162**	-3.455660*	-4.780494***	-4.573295***

Notes: * p<0.1, ** p<0.05, *** p<0.01 Source: author's calculations

This study uses the Serial correlation LM test to check autocorrelation and Breusch-Pagan-Godfrey test to check heteroskedasticity in the residuals, as well as histogram-normality test to check the normal distribution of the residuals. According to the results of the tests shown in Table 3, we have to accept the null hypotheses, i.e. there is no autocorrelation, the residuals are homoscedastic and normally distributed.

The results show that economic growth is exacerbating inequality in Armenia, which means that it is mostly distributed among the top decile groups, thus further exacerbating income polarization. In the second model, the level of urbanization was added and found to have a negative effect on the level of inequality. This may mean that people, moving from villages to cities, are generally able to get a job and earn more than they could while living in the countryside. Such trend is certainly positive in the short term, but excessive urbanization may have a negative impact on the overall development of the country, since as a result some aspects of the economy (e.g. agriculture) will suffer. Secondary and higher education enrollment rates were included in models 3 and 4, respectively. As the obtained results show, secondary education has a negative but statistically not significant effect on the level of inequality. Turning to higher education, we can argue that it has a negative and statistically significant, but minor effect on inequa-

lity: a 1 percentage point increase in enrollment mitigates inequality by only 1%. This means that people with higher education do not have significant advantages in occupying high-paying positions in the Armenian labor market. In the 5th and 6th models, the shares of government expenditures on healthcare and on education were included.

Table 3. Empirical results and residual tests (dependent variable: Palma ratio)

	1	2	3	4	5	6	7	8	9
ln FDI	4.9*** (3.43)	6.0*** (4.36)	4.7** (2.33)	5.1*** (4.02)	4.8*** (3.99)	5.9*** (4.85)	6.6*** (4.39)	5.2*** (3.57)	5.1*** (3.18)
ln FDI^2	-0.1*** (-3.46)	-0.2*** (-4.39)	-0.1** (-2.33)	-0.1*** (-4.03)	-0.1*** (-3.97)	-0.1*** (-4.87)	-0.2*** (-4.43)	-0.1*** (-3.60)	-0.1*** (-3.20)
Δ ln GDP	0.8** (2.16)	0.5 (1.50)	0.9* (1.80)	0.3 (0.71)	0.6* (1.82)	0.4 (1.35)	1.0*** (2.99)	0.9** (2.43)	0.8* (1.96)
ΔURB	-	-0.4** (-2.24)	-	-	-	-	-	-	-
SSE	-	-	-0.002 (-0.29)	-	-	-	-	-	-
TSE	-	-	-	-0.01** (-2.49)	-	-	-	-	-
EXPHLT(-1)	-	-	-	-	-0.4** (-2.58)	-	-	-	-
EXPEDU(-3)	-	-	-	-	-	-0.1** (-2.59)	-	-	-
Δ ln UNEMP	-	-	-	-	-	-	0.6** (2.21)	-	-
Δ ln EMPF	-	-	-	-	-	-	-	-0.7 (-1.10)	-
INFL	-	-	-	-	-	-	-	-	0.003 (0.24)
Constant	-46.7*** (-3.38)	-57.4*** (-4.31)	-44.8** (-2.28)	-47.8*** (-3.95)	-45.6*** (-3.95)	-55.8*** (-4.79)	-62.2*** (-4.35)	-48.9*** (-3.52)	-48.0*** (-3.15)
Obs.	21	21	16	21	20	20	21	21	21
F-stat (prob.)	9.79 (0.00)	10.34 (0.00)	4.72 (0.02)	11.16 (0.00)	11.65 (0.00)	13.45 (0.00)	10.25 (0.00)	7.74 (0.00)	6.95 (0.00)
adj. R^2	0.569	0.651	0.498	0.670	0.692	0.724	0.649	0.574	0.543
Table 3 (continued)									
Turning Point	19.0%	19.1%	19.1%	19.2%	19.3%	19.2%	19.0%	19.1%	19.0%
Histogram - Normality Test									
JB (prob.)	0.78 (0.68)	1.09 (0.58)	0.87 (0.65)	0.52 (0.77)	1.78 (0.41)	4.21 (0.12)	0.55 (0.76)	0.68 (0.71)	0.93 (0.63)
Serial Correlation LM Test									
F-stat (prob.)	0.87 (0.44)	1.18 (0.34)	0.78 (0.49)	1.52 (0.25)	1.32 (0.30)	1.34 (0.29)	0.11 (0.90)	0.61 (0.56)	0.69 (0.52)
Heteroskedasticity Test (BPG)									
Obs*R-sq. (prob. χ^2)	3.41 (0.33)	3.41 (0.49)	4.46 (0.35)	1.96 (0.74)	4.57 (0.33)	4.37 (0.36)	5.33 (0.25)	4.73 (0.32)	3.76 (0.44)

Notes: * p<0.1, ** p<0.05, *** p<0.01, t-values are in parentheses.

Source: author's calculations

As the impact of social costs is not expected immediately, but after a certain time, so these variables were included into the model with their lagged values. As the results

show, health spending affects inequality with a lag of 1 year, and education spending with a lag of 3 years. A 0.1 percentage point increase in the share of health and education expenditures alleviates inequality by 3% and 1.1%, respectively. The effects of unemployment rate and female employment rate on income inequality are estimated in models 7 and 8, respectively. The results show that a 1% increase in unemployment exacerbates the level of inequality by about 0.6%, and the female employment rate has a negative but statistically insignificant effect. The effect of inflation on inequality is estimated in model 9, and the results show that this effect is statistically insignificant.

Conclusions. Summarizing the results of all evaluated models, we can state that the relationship between FDI and income inequality in Armenia is characterized by an inverted U-shaped curve. This means that FDI exacerbates income inequality, but there is a turning point after which further increases in FDI will alleviate inequality. Considering the formula (2), we can suppose that Armenia will reach that turning point when the share of FDI in GDP exceeds the 19% threshold. Empirical results show that economic growth in Armenia is accompanied by deepening inequality: a 1% increase in real GDP per capita exacerbates inequality by 0.5-1%. Rising unemployment rate also exacerbates inequality, while urbanization, enrollment rate in higher education, and government expenditures on healthcare and education mitigate it. Secondary school enrollment rate, female employment rate and inflation have no statistically significant impact on the level of inequality.

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Foreign direct investment and income inequality in Armenia: An econometric analysis

Key words: income inequality, Palma ratio, foreign direct investment, non-linear relationship

As the results of the studies show, the growth of FDI, providing the society with capital and advanced technologies, promotes human development [Ghazaryan, 2022b]. However, there is a lot of evidence that the increase in FDI also leads to the deepening of income inequality [Chintrakarn, 2012]. Taking into account the debates in the theoretical literature about the FDI-inequality relationship, as well as the various results of empirical studies, this article aims to reveal the nature of the FDI-income inequality relationship in Armenia. For this purpose, a regression model was constructed, where the square of FDI was also included in order to check the possibility of non-linear relationship. Models were estimated using the OLS method, and estimations were performed using the EViews 10 software package. The empirical results show that the relationship between FDI and income inequality in Armenia is characterized by an inverted U-shaped curve. This means that FDI exacerbates income inequality, but there is a turning point after which further increases in FDI will alleviate inequality.

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THE EFFECTIVENESS OF INSTAGRAM REELS AS A MODERN INTERNET MARKETING TOOL

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Key words: trends, social media, productivity, management, Instagram Reels

Introduction. Modern society is characterized by rapid pace of scientific and technical development. The emergence and rapid development of the Internet in the digital economy has helped to bring goods and/ or services to the international market faster and without hindrances. Competent use of modern Internet technologies today affords unlimited opportunities for communication with customers. According to *kepios.com* website, there has been a significant increase in the number of Internet users over the past 10 years. If in 2012 there were 2.18 billion users, then at the beginning of 2022 the number was 4.95 billion. These indicators once again emphasize the ever-increasing role of the Internet marketing. Internet marketers have a number of tools at their disposal, due to the effective use of which effective promotion and sale of the product and/or service will be carried out. In this article, we have referred to one of the social platforms that are a tool of the Internet marketing - the Instagram social network, particularly highlighting the new trending feature - Instagram Reels.

Methodology. In this article, we have analyzed the effectiveness of using the new trend of Instagram Reels. For the study, a comparative analysis with the Tik Tok platform was carried out, the results of which were presented in the table prepared by the author. The reels created and downloaded by various famous people on the Instagram social platform acted as research material, as well as the positive influence of the latter in the process of promoting this or that product and/or service was studied.

Literature review. First of all, it is worth mentioning that Instagram is one of the most popular social platforms today, which is used by more than a hundred million users, and it is also a unique photo editor that attracts users thanks to this unique feature. It allows you to take photos and immediately post them on the Internet, without pre-processing, using specially designed photo filters. Because Instagram is such a visual platform, it is the best suited for the businesses that are focoused on evoking feelings ion customers and providing them with visual ideas. Which is why, out of all the available platforms, Instagram is a good choice for business (Lim & Yazdanifard, 2014). For example, one of the same popular social networking sites, Facebook, does not have the same wide range of possibilities for editing photos, applying filters and creating popular “stories”. On the whole, the photo is a symbolic tool of geobranding, since it affects the target audience through the visual senses. On Instagram, famous people upload personal

photos and display their lifestyle. Fans imitate their idols, try to be close to them by using the brands they use, trust the choices that celebrities trust. As a basis for analysis, we took the Instagram pages of a number of well-known Armenian and international organizations, bloggers, who promote their own brand, product and/or service via this platform, through the new trend of Instagram reels. Today, the Instagram platform is doing its utmost to become universal, including the most popular features of various social sites. A clear proof of this is the emergence of Instagram Reels, which includes features from the popular social media site called Tik Tok. Today, there are not enough scientific studies on the Instagram social platform and especially on the new trend of Instagram reels. As a theoretical basis, we have accepted the works, ideas, and the effective experience of using this tool in various organizations of various Armenian and foreign famous people and thinkers. The consequences were made taking into account the problems encountered during the activities of the above-mentioned persons.

Scientific novelty. The scientific novelty of the article lies in the fact that, as a result of the study, the problems of evaluating the effectiveness of Instagram Reels were identified and standards were developed that allow them to be solved. The value of the results of the article is attributed to the increasing role of the social websites, and the particular significance of the result is highlighted to the extent that the analyses and results in the article will contribute to the effective selection of this or that platform inj the process of developing the Internet marketing strategy. ***Analysis***. Today, the Instagram platform is doing its utmost to become universal, including the most popular features of various social sites. A clear proof of this is the emergence of Instagram Reels, which includes features from the popular social media site called Tik Tok. In the article, we have also highlighted some important and new features of the Instagram platform, which make it possible to apply marketing features.

- *Longreads inside Instagram* - this is a new format on Instagram, it is long texts with photos and links. It is intended to provide step-by-step instructions, but is not available in all countries;
- *Instagram Guides* - creates a selection of beautiful images on any topic;
- *Instagram Reels* - a newly available feature that allows you to create attractive videos that spread like a “virus”
- *Shopping tag* - is a new important feature of s-commerce, because it enables trading. It is applied during sales of goods and/or services. It is recommended to use when you need to create a card for each product. It enables to create an analogue of an Internet store, make an online purchase without going to the website, i.e. shopping within Instagram [shopping tags];

• *Live Rooms* or sometimes they say *"live rooms"* – enable to create a new communication platform, develop business pages, communicate with followers, customers. However, this feature is not available in all countries, either.

Analysis. The rapid development of Instagram Reels, Live Rooms, Shopping tag, Instagram Guide, the emergence of new trends make the Instagram platform not only interesting and competitive, but also compels to conduct more in-depth studies.

Instagram Reels, a new tool on the Instagram social platform, applies a variety of filters, as well as music when shooting short videos. It is a new feature launched in 2019. At first it was used in Brazil, Germany and France, and starting from 2020 it was used in more than 50 countries, including the USA and Great Britain. Our study shows that this new Instagram feature attracts many followers, expanding the boundaries of the target audience. According to the data from www.influencermarketinghub.com, with the introduction of Instagram Reels, users of the Instagram platform increased by 4.3% per month [Instagram reels stats]. In this work, the comparative analysis we performed between Instagram Reels and Tik Tok plays an important role. Using Table 1, we attempted to provide a comparative analysis between Instagram Reels and Tik Tok, by presenting the advantages and disadvantages of the latter. The table was compiled by the author.

Table 1. Comparative analysis between Instagram Reels and Tik Tok platform

Tool	Tik Tok	Instagram Reels
Advantages	Wide selection of visual and sound effects.	More quality content
	In the analytical section of the platform, one can even see that the sound effects have received more likes from users.	Availability of a separate tape for watching Reels, which allows one to watch the Reels themselves.
	A large selection of licensed audio content. Licensing is one of the important circumstances, because often due to its lack, the audio sound in videos can be blocked.	An in-app tool that allows the existing followers to submit content using the new tool while attracting new ones.
Disadvantages	Video recording is the only content format.	Sound effects lack that make videos attractive.
	Unlike Instagram, Facebook social platforms, the analytical part has not yet been fully developed, as a result of which it is more difficult to make predictions related to the number of possible likes of this or that post.	Users can only create their own videos or download videos from the device's library, meaning that Duet and Stitch features are missing.
	A large part of the audience is made up of representatives of the Z generation, therefore, when choosing this platform, it is necessary to take into account the fact for whom the promoted product or service is intended.	Lack of paid promotion.

Our studies show that the possibility of viewing Instagram Reels only in the horizontal position of the phone and replacing the videos with one another has its advantages, since the display is not targeted at a specific audience, followers, but also the users who are interested in the product and/or service offered. Reels definitely has its advantages and is a useful feature for all industries. The latter enables to increase interest in the page and product and/or service. Here everything depends on creative thinking and not avoiding innovations. However, this new feature is not fully applicable in all countries. For example, in Russia, until recently, music was inaccessible. Unfortunately, this feature is not widely used in Armenia, it is mainly used by bloggers. Instagram Reels is not completely studied. Extensive work is being carried out to understand the algorithm for selecting a target audience and displaying Reels. Our studies show that one of the negative aspects is the lack of possibility of paid promotion. However, the audience and content, unlike Tik Tok, undergo a rigorous selection. It should be noted that one of the advantages of the Tik Tok platform is the simplicity and speed of logging in and gathering an audience. If a "viral" advertising is required to promote a product, the Tik Tok platform is definitely the choice, and Reels is the best choice to appreciate the aesthetics. As noted earlier, this new feature of Instagram social platform is not widely used in the Republic of Armenia. For example, if the Coca Cola Armenia official page has 8,457 followers and only one Reel [cocacola_am], and the latter's views were only 2,272, then the Coca Cola official page has 2.8 million users, 12 Reels and an average of 52.7 thousand views [cocacola], and for example, the official page of the largest Armenian producer Alex Group on the Instagram social platform has 55.6 thousand followers, and on average the Reels have 60.7 thousand views [alexstoresyerevan]. For the sake of comparison, it is worth noting that the latter does not even have an official page on the Tik Tok social site. It should be noted that today Armenian bloggers are actively using Reels to promote their brand, increase the number of views and followers. For example, photographer and blogger Arusik Markosyan was one of the first to start making Instagram Reels. She has about 90 thousand followers. She has made more than 180 Reels, and the average number of views is more than 100 thousand views [arusikmarkosyannn], and for example, in the Republic of Armenia Shalunts, a quite well-known food blogger, has 101 thousand followers, 36 Reels, on the average the latter's views, about 80 thousand views [shalunts_fitcorner]. These data once again emphasize the fact that the new trends and new features of the internet marketing in the Republic of Armenia are most applicable in the sphere of bloggers. Recently, Father Khosrov, who has not only his official page on the Instagram platform, but also actively participates in Reels [ter_khosrov], has made a lot of "fuss". Father Khosrov has 881.1 thousand followers and his content is mainly in Russian, because he is the prelate of the spiritual pastor of the Riga St. Grigor Lusavorich Church. For example, one of his posts is about how to enter a church in the right way. And he introduced that video in an

interesting way. In this case, by using a new tool, the latter tries to instill spiritual values in a more modern and accessible language among young people.

Conclusion. The Internet and social networking sites are actively becoming an integral part of our daily lives, and this fact enables organizations to gather a larger target audience around them. One of the advantages of social media is that it is beneficial not only for the seller, but also for the buyer, since it allows one to build more long-term relationships, allows to convey more and more meaningful information to the buyer, and it is also possible to leave opinions and comments on the given product or the service and get an urgent response and solution. Marketing on social sites is of interest because it enables a large number of people to "rush into" the information space, regardless of their will, desire and preferences, at the same time it contributes to the increase of the target audience and the expansion of sales volumes. In the table, we noted the lack of Stitch and Duet features as a disadvantage of Instagram Reels, because, in our opinion, these features make videos more profitable from the point of view of product and /or service promotion. The Stitch feature allows you to use fragments of other users' videos, and the Duet allows you to shoot joint videos with other users, recording the user's reaction to an already finished video. Our studies show that the above two features contribute to more effective cooperation with the target audience and also increase the target audience. According to www.datareportal.com, Instagram is the 2nd most downloaded app [favourite social platforms]. This fact makes the Instagram platform the most effective tool for the Internet marketing. Today, in the conditions of the development of the digital economy, work efficiency also depends heavily on the virtual intellectual capital (VIC) and the Internet resource (IR) is of particular importance. Considering the fact that VIC characterizes the demand and quality of Internet resources in both Russian-speaking and English-speaking digital virtual information space [Ваганян, Ваганян, 6-7], so it should be used to evaluate Internet platforms, it is a new standard. Summarizing the above, we can clearly state that the Instagram platform, with all its features and trends, is an effective tool for the Internet marketing. We suggest paying more attention to new trends, particularly Instagram Reels, because new trends are the beginning of a new toolkit. For example, when choosing Instagram social platform, we suggest taking into account the speed of changing the tape, considering "advertising blindness", using GIFs more often, paying attention to video design. We suggest using the platform not only as a sales or promotion platform, but also to develop the platform as a platform to attract the attention of investors, treat hashtags more competently. It is noteworthy that the Reels are displayed first as a result of a search using hashtags, therefore, the competent use of hashtags is also veryimportant in this case, as it contributes to increasing the effectiveness of the time factor of Internet marketing. It is worth highlighting the VIC and IR indicators, which will give an idea of the effective use of the given platform. Considering the fact

that Reels does not attract a specific target audience, but is available to all users of the Instagram social platform, it provides an opportunity to expand the target audience, so competent use of this tool will contribute to attracting more followers in the Republic of Armenia. Among the positive aspects of Instagram Reels, several technical advantages can be distinguished: a wider selection of music, various filters, as well as great possibilities for video editing. The fact of being free is also one of the advantages.

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The effectiveness of Instagram reels as a modern internet marketing tools

Key words: trends, social media, productivity, management, Instagram Reels

The purpose of this article is to study the effectiveness of Instagram reels, one of the modern trends in internet marketing tools. The object of study is the Instagram social platform, and the subject are Instagram reels. As a task, we singled out the study of the advantages of Instagram reels, comparing it with the Tik Tok social platform.

The modernity of the topic lies in the fact that the new trend has a fairly wide recognition and opportunities: shooting short videos, simplicity of use, expansion of the target audience, as well as the availability of watching other similar videos; all of this makes this tool more interesting from the scientific point of view. The scientific novelty of the article lies in the fact that as a result of the study, the problems of evaluating the effectiveness of Instagram reels have been identified and criteria have been developed that allow solving those problems. In the article, a comparative analysis was carried out between Instagram reels and Tik Tok social media, which are competitors. The relevance of the topic lies in the fact that the new trend has a fairly wide recognition and opportunities: shooting short videos, simplicity of use, expansion of the target audience, as well as the availability of watching other similar videos; all this makes this tool more interesting from the scientific point of view. In the article, a comparative analysis was carried out between Instagram Reels and Tik Tok social site, whci are demanded competitors.

PROBLEMS OF FINANCIAL MANAGEMENT OF THE TAX SYSTEM IN ARMENIA

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Key Words : financial management, tax system, market economy, tax policy, state revenues

Introduction. Roosevelt, the 32nd President of the United States, acknowledging the truth of the well-known words belonging to the co-author of the US Constitution and President Franklin that in this word nothing is certain except death and taxes, added: "Compared to taxes, death is relatively less painful" [Harutyunyan et al., 10]. The tax system is one of the key elements of a market economy. It is the main tool of the state to influence the economic development, determining the priorities of economic and social development. At the same time, the tax system is a complicated and complex, a dynamically developing social formation, which is formed under different economic, political and social conditions. That is why it is very important that the tax system of the Republic of Armenia complies with international standards, being adapted to the public needs of our country, reducing the shadow economy, which will help to improve the business environment, become more competitive among the Eurasian Economic Union member states. Therefore, the problems of the effective financial management of the RA tax system are vital for the development of our economy and the solution of these problems is one of the most important goals of the RA Government, as it helps to the tax system to reach the target results put by the State Revenue Committee of the Republic of Armenia, which aim to have such a tax system which complies with the corresponding international standards and leads to the economic development, economic growth and business development in the country.

Methodology. The theoretical, informational and methodological basis for the scientific article were the reforms taking place in the RA tax system, the RA Tax Code, the RA budget legislation, the laws regulating tax relations, the studies conducted in the field of tax system management and reforms, the RA Government decisions, the scientific works of different authors, which allowed to study the institutional framework of tax system management and identify the peculiarities of financial management. The methods of comparisons, combinations, analysis and statistics were used. in the article.

Literature review. In a market economy, like any country, the Republic of Armenia applies tax policy as a kind of regulator of influence on the negative market phenomena, therefore, taxes and the entire tax system become a powerful tool for managing the economy. Various theoretical, practical and methodological issues in the

field of tax reforms and an effective tax system formation in the Republic of Armenia were covered by V. Harutyunyan, A. Markosyan and others, and a number of issues related to financial management have been studied by foreign authors: I. Blank, E. Shokhin, E. Stoyanov, V. Kovalev and others. The tax system plays a vital role in the development of the economy of our country, regulating various problems and ensuring economic progress, and the creation of an effective tax system balancing national, corporate and personal economic interests has always been the cornerstone of the RA tax policy. This, of course, presupposes the development and implementation of such an effective tax policy, which will allow for free competition, promote investment activity, sustainable economic growth, as well as enhance the business process. In other words, the set of mentioned processes is the ultimate goal of financial management, the consistent and systematic implementation of which will ensure the efficiency and importance of the financial management toolkit used in the RA tax system. The financial management of the tax system of the Republic of Armenia, being a special direction in the field of management, involves a comprehensive study of the bases for the implementation of this function, both from a methodological and practical point of view.

Scientific novelty. The scientific novelty of the article lies in the development of a methodology for assessing the effectiveness of the financial management of the RA tax system, based on the features of the RA tax policy and the proposal of practical solutions aimed at improving the financial management of the RA tax system. In order to determine the dynamics of improving the financial management of the RA tax system and the directions for improvement, the methodological base for the formation of the organizational-administrative structures of the tax system in the conditions of modern Armenia was supplemented and refined by the authors. In contrast to the mechanical management methods used in the practice of managing the finances of the tax system, the authors propose a financial management system based on organic, more efficient management methods. Taking into account the problems hindering the development of the tax system, the authors tried to assess the effectiveness of financial management in the tax system of the Republic of Armenia, conduct a detailed analysis of the financial situation of the tax system, identify existing problems and develop structures to overcome them, which will build on both existing achievements in the field and on successful experience in the application and features of the system.

Analysis. The tax system of each state reflects the peculiarities of economic development. Management is typical to all the spheres of human activity and all the stages of a social production. There are different definitions of the term "management". In the most general form, management is the formation of a purposeful process of any activity or purposeful influence of the subject of management on the object of management [Kovalev et al., 10]. And financial management is a purposeful impact of the finan-

cial system on financial relations in order to develop and implement a certain financial policy [Dolganova et al., 47]. In general, finance can be considered as an art and science of money management [Mnatsakanyan & Sahakyan, 5], and the ultimate goal of financial management is to develop a specific financial policy, the full mobilization of the financial resources of the state and their effective use in accordance with the current problems the state is facing at the moment. In Armenia, as in all countries, the direct management of public finances is carried out only in that part of public finances, which is regulated by financial legislation through the highest legislative bodies. This refers to the approval of the state budget and the report on its execution, the introduction or elimination of certain types of taxes, the approval of the maximum amount of the public debt, etc. Financial management addresses the following issues [Dolganova et al, 48]:

1) formation of the material base necessary for the activities of the state and for the socio-economic development;

2) efficient and targeted use of public financial resources;

3) control over the efficient and targeted use of financial resources.

During the reforms of the financial system in the Republic of Armenia, special attention is paid to the creation and further improvement of an effective tax system. In order to form and develop market relations in our country, it is necessary to carry out such radical reforms, that cover the fiscal, financial, banking, social, structural, monetary and other systems of the economy. In this case it is necessary to accept as the main orientation the fact that the satisfaction of new requirements in a market economy is fundamentally different from the existing requirements in a centralized management system. The solution of these problems is becoming more pronounced, especially in countries with economies in transition, where the imperfection of the legislative framework, the high level of the shadow economy, the lack of financial resources, the less professional level of the public administration system and the presence of other important circumstances create serious difficulties for the development of the country's economy. The presence e of the mentioned circumstances in itself creates the need for fundamental reforms in the tax system, as well as in the economic system of the country as a whole due to free economic relations, which is also due to the need for structural reforms in various industries and sectors of the economy. Therefore, the complexity of reforming the tax system, and hence its financial management, is more important for those countries in which there were no established traditions of fiscal policy before. And those countries which used to have a centralized planned economy now have a wide choice of tax systems used in Western countries [Kisileva & Chepurin, 87]. To justify this, the development of new legislation has been compared to the invention of the bicycle. [Thuronyi, 1996, 12]. The mission of the tax authority of the Republic of Armenia is to ensure the revenues of the RA state budget controlled by the tax authority through the full and equal application of the tax legislation and the effective use of

available resources [Tax Service Mission]. In the process of implementing the mission of the tax authority within the mentioned frameworks, it is necessary to create such bases for financial management, that will ensure systemic development, while at the same time keeping the economic and financial risks within a manageable range. In this sense, the financial management of the tax system of the Republic of Armenia can be considered as a set of processes for controlling the financing, accounting and budgetary execution of the tax authority, which is directly affected by the chosen strategy of the State Revenue Committee (SRC) of the Republic of Armenia as a tax authority, as well as the economic and political decisions made. Financing or budgeting with financial resources ensures the financial management of the system, and accurate and comprehensive accounting is the basis for reliable reporting, which determines the effectiveness of external and internal controls. And the main goal of the financial management of the tax system is the financing, acquisition and management of assets necessary for the implementation of the tasks of the RA tax authority, which is divided into two stages:

1. asset management or other management of existing financial resources;
2. management of liabilities or other attraction of necessary financial resources.

As part of financial resources management (asset management), financial management performs the following tasks:

- formation of an effective asset structure,
- optimal use of working capital,
- ensuring a balanced ratio of financial resources and commodity value.

Attracting the necessary financial resources (liability management) refers both to the formation of sources of financial resources, and to the creation of mechanisms that ensure the maximum return on one unit of capital expended. Thus, studying the methods adopted and applied in the world for assessing the effectiveness of financial management, it can be stated that the effectiveness of financial management of the RA tax system is also characterized by the ratio of results and costs, but the results here are much more diverse and only their quantitative assessment is not always possible. Therefore, drawing up a new system for evaluating the effectiveness of management of liabilities in the tax system of the Republic of Armenia involves considering a complex of both quantitative and qualitative indicators.

The study of financial management activities of organizations operating in other spheres of the RA economic system shows that the financial management toolkit for organizations seeking to make a profit are more developed and diverse. This circumstance can be explained by the fact that organizations, pursuing the goal of making a profit, are trying to constantly improve the mechanisms for the efficient use of resources. And for the subjects of the state system, including the tax authority, there is

no longer a problem of profit maximization, and government bodies are usually content with existing structures, annually relying on traditional approaches when planning the budget and usually showing little flexibility to change. Entrepreneurial organizations are characterized by initiative, freedom of innovation, which is often imposed by the market itself. This also served as the basis for the fact that organizations used different methodologies for analyzing budget performance and evaluating financial performance. We believe that revealing the edges of the financial management of these organizations in the tax system of the Republic of Armenia can significantly change the already outdated approaches and increase the management efficiency. In fact, the idea of introducing an entrepreneurial ideology into the basis of public administration is not new. Back in 1887, Woodrow Wilson, in his article "The Doctrine of Management", stated that the field of management is a field of business, and the goal of the management doctrine is to base executive methods on stable principles [Wilson, 197-222.]. Therefore, we challenge the introduction of business management ideology into the financial management of the tax system of the Republic of Armenia, at the same time ensuring the creation and further improvement of an effective tax system that exclusively balances national, corporate and personal economic interests.

The need for reforms in the financial management of the tax system of the Republic of Armenia is quite obvious, since this is, in fact, the process of forming monetary funds and managing financial resources to solve the tactical tasks of the tax authority and achieve strategic goals. At the same time, it will contribute to highly efficient budget deficit management, debt restructuring, economically justified bankruptcy of insolvent taxpayers, reducing the overall tax burden, extending the principles of subsidiary obligations to the entire horizontal-vertical fiscal hierarchy, etc. After all, they can be achieved if there are theoretical- methodological practical foundations for a higher level of financial management of the tax system, and since the issues related to the financial management of the tax authority are little studied, therefore, the need to achieve a higher level of financial management led to the choice of this article.

Conclusion. Although about thirty years have passed since the formation of the tax system in the Republic of Armenia, there are still a number of factors hindering the full implementation of the tasks assigned to this system. The current situation confirms the position that the right to manage the tax system of the Republic of Armenia, dispose of property and exercise effective tax administration does not in itself guarantee the possibility of their full implementation. It is mainly due to:

1. the implementation of the powers of the RA tax authority at a not so high level of financial bases;
2. the high dependence on the state budget;

3. the absolute absence of deductions from the collected revenues to the tax authority (the extra-budgetary fund of the State Revenue Committee of the Republic of Armenia, which was in force until 01.01.2020).

In this regard, it is extremely important to ensure the sources and volumes of appropriate financial resources, determined by the budgetary legislation of the Republic of Armenia, for the full implementation of the powers vested in the tax authority. The solution of the above-mentioned problems cannot be complete if the tax authority does not carry out effective financial management. After all, the problems faced by the tax system of the Republic of Armenia are constantly changing, and the latter, regardless of the amount of financial resources at its disposal, constantly faces the problem of effectively managing limited financial resources. As a result, there is no feedback between the decisions made, the process of their implementation and the development of new solutions, which in turn causes problems in terms of whether effective financial management is implemented in the tax system of the Republic of Armenia or not. The practical implementation of the new principles of financial management of the tax system is quite complicated and requires a radical revision of the entire management philosophy, changes in the psychology of employees improving their skills, motivation, growth of personal potential, etc. Effective financial management is a necessary prerequisite for ensuring quality services provided by the RA State Revenue Committee to the population and is aimed at creating such financial management frameworks that will ensure the continuous development of the RA tax system, at the same time preventing the emergence of various risks. Moreover, the solution of problems related to financial management implies the peculiarities of the state regulation of the economy of the Republic of Armenia and the formation and development of the business environment in it. Thus, summarizing the author's article, we come to the conclusion that taking into account the fact that the tax authority and taxpayers in Armenia have to some extent adapted to the current conditions, it is recommended not to radically change the current financial management system of the tax system, but its evolutionary transformation, eeliminating the existing inadequacies and shortcomings in the tax administration, for the final creation of a fair and efficient tax system in the Republic of Armenia. Ultimately, managing finances means, to a greater or lesser extent, managing all the material and consciously-spiritual forces of people [Kovalev and others, p. 3].

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Problems of financial management of the tax system in Armenia

Key words. financial management, tax system, budget resources, tax authority, tax policy.

The article is dedicated to the identification of problems related to the financial management of the RA tax system, suggesting solutions. The article identifies and presents the existing problems of financial management of the tax system of our country and ways to solve them. In the context of the tax system management, the main approaches to financial management are studied and the possibilities of their practical application at the present stage of the economic development of the Republic of Armenia are proposed. Approaches have been developed to improve the financial management process and increase the efficiency of the use of budgetary funds allocated to the tax authority. The article pays special attention to the implementation of an effective tax policy, which is very necessary in all economic systems, the effectiveness of which is determined by the fact that as a way of doing business, how they can correctly solve the problem of unlimited needs with limited resources, the methods of solving which may be different in different economic systems. The article also examines the fact that the financial management of the tax system of the Republic of Armenia is an important area of methodological, practical, scientific activities and research, and is one of the key parts of the general theory and practice of management. It is also based on fundamental knowledge of political, economic, legal and other sciences, enriched with modern domestic and world practice. The process of redistribution of financial resources between and within different entities of the financial system is always aimed at achieving certain goals, therefore, it cannot be carried out elementarily, and, accordingly, includes the organization of a certain management scheme. Therefore, revealing the theoretical-methodological problems of the financial management of the tax system of the Republic of Armenia is of key importance for the development of the economy, the effective implementation of which is becoming increasingly important, especially in the context of changing market conditions, economic and business environment, as well as in emergency situations.

POSSIBILITY OF COORDINATION OF MONETARY AND FISCAL POLICIES IN EEU: KYRGYZSTAN CASE

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Key words. high technological sector , fiscal policy , monetary policy, inflation , EEA, sanctions, innovation, econometric model, Kyrgyzstan

Introduction. The issue of monetary and fiscal policy coordination is not only important for Armenia, but other member states of the Eurasian Economic Union are also in the center of their attention. The need for such coordination is more than urgent, because the West has imposed quite painful economic sanctions on two member states of the Union. The latter indirectly attack other EU member states. Sanctions imposed on high-tech industries are particularly disturbing. As a result of them, the entry of the newest technologies to Russia and Belarus is prohibited, which will certainly deal a tangible blow to the common innovative agenda of the Eurasian Economic Union. Under these conditions, other member economies should be able to bypass the sanctions and weaken their impact on the innovation system of the Union. Within the framework of the conducted research, it was shown for Kyrgyzstan (based on a similar study conducted for RA) that as a result of the implementation of certain instruments of fiscal and monetary policy, when the task was to ensure the minimum level of inflation and the maximum level of gross output of the high-tech industry, it is possible to obtain policies coordination indicators. Why was the economy of Kyrgyzstan chosen? Let's note that the economy of other EEU member states and RA are not very comparable. In particular, the Russian Federation and Kazakhstan have access to the sea and a fairly high level of population. Both countries have tangible fuel and energy reserves. There are many sanctions against Russia and Belarus. All these factors significantly deviate the main parameters of monetary and fiscal policy coordination. Armenia and Kyrgyzstan are landlocked, both are high mountain countries. There are no sanctions on the two economies. Both Armenia and Kyrgyzstan are not at peace with their neighbors. In this case, to a certain extent, the economies of our countries can be compared with greater probability than others. First of all, in Kyrgyzstan, the dynamics of such indicators as the gross output of the high-tech sector, inflation, money supply M0, government expenditures and the dollar/som exchange rate were studied. The analysis of the latter is based on the quarters of 2017-2022. In the next step, econometric models describing monetary and fiscal policies were considered. With their help, the game model of coordination of fiscal and monetary policies was created. As a result of the partial

solution of the latter, tactics were singled out, which led to certain optimal levels of performance indicators. The obtained results are summarized in the conclusion.

Methodology. Two main goals have been set for the Kyrgyz economy: to maximize the volume of high-tech gross output, as well as to ensure the lowest level of inflation as much as possible. Certain factors affect the achievement of each of the set goals. In particular, the level of public expenditure and the level of inflation were selected as factors influencing the high-tech gross product. On the other hand, factors affecting inflation in the country were considered the mass of money M0 and the level of the dollar/SOM exchange rate. All the above indicators of both the monetary sector and the fiscal sector were included at the quarterly levels of 2017-2022. The dynamics of all indicators were analyzed using graphs. Comparisons were made. Econometric models describing the proposed relationships were presented as payoff functions of the corresponding policies of the game model [Krešimir, 2017, 77-82]. In accordance with the goals set within the framework of the presented game: minimum inflation and maximum gross output volumes of the high-tech sector, a partial solution was considered, and Nash equilibria were given in pure and mixed strategies [Kremlev, 2016, 111-115]. All this was attempted to provide appropriate fiscal and monetary policy instruments within certain levels of government spending and money M0.

Literature review. Economists, analysts and experts have paid great attention to the problems of coordination of monetary and fiscal policies in neighboring countries. In order to describe and highlight them, the researchers made many analyses, in the center of which were the various aspects of monetary and fiscal policy coordination. Bosniak K. was of great importance for the conducted analysis and Tunio P. "Game theory in the analysis of Monetary and Fiscal policy on the example of Republic of Croatia", where the game situation of coordination of fiscal and monetary policies is given on the example of Croatia. In addition, in the work, the gains of each player, the Central Bank and the government, in the case of applying different strategies, are obtained from econometric models describing monetary and fiscal policies. In this research, one more important circumstance should be paid attention to. While formulating the goals of the fiscal policy, it is noted that they may differ from country to country and they may refer to different socio-economic indicators [Krešimir, 2017, 77-82]. Researchers M. Voskanyan and L. Paronyan in their "Coordination of fiscal and monetary regulation in Armenia. Finance: The analysis entitled "Theory and Practice". In the latter, the game situation of policy coordination is approached in three main directions, which mainly refer to the mutual dependence of monetary and fiscal policy implementers. As a result, different types of games are obtained, which require different approaches to solving. In the analysis, one of the goals of the fiscal policy is the need to minimize the budget deficit [Voskanyan, 2020, 105-118]. The basis for the selection of factors in the

monetary policy model of the conducted research was the joint "Monetary policy of EAEU member states" of the Eurasian Bank and the Eurasian Economic Commission. the current situation and opportunities for coordination" report [Joint report of the Eurasian Economic Commission and the Eurasian Development Bank, 2017, 73-74], where it is noted that the most influencing factors on inflation in Kyrgyzstan are the exchange rate and changes in the dram base. At the same time, it is noted that the effectiveness of the agreed monetary policy of the EEU member states significantly depends on the implemented fiscal policy [EEC & EUDB, 2017, 129-131].

Scientific novelty. One of the most important tasks of this research is to study the experience of countries comparable to the RA economy from the point of view of monetary and fiscal policy coordination. Of particular interest are the EEU member states, one of which is Kyrgyzstan. Regarding the latter, econometric models describing monetary and fiscal policies were obtained, which at the same time are profit functions of the game matrix. Thanks to performed calculations, results were obtained that testify to the possibility of certain local solutions for the coordination of monetary and fiscal policy.

Analysis. Suppose the goal of the Kyrgyz government is to maximize the gross output of the high-tech industry, and the Central Bank of the country has decided to ensure minimum inflation. These two goals are influenced by various factors of fiscal policy. In particular, the money supply M0 and government spending. Before moving on to the econometric models corresponding to the main goals, let's consider the dynamics of the volume of gross output of the High-tech industry .

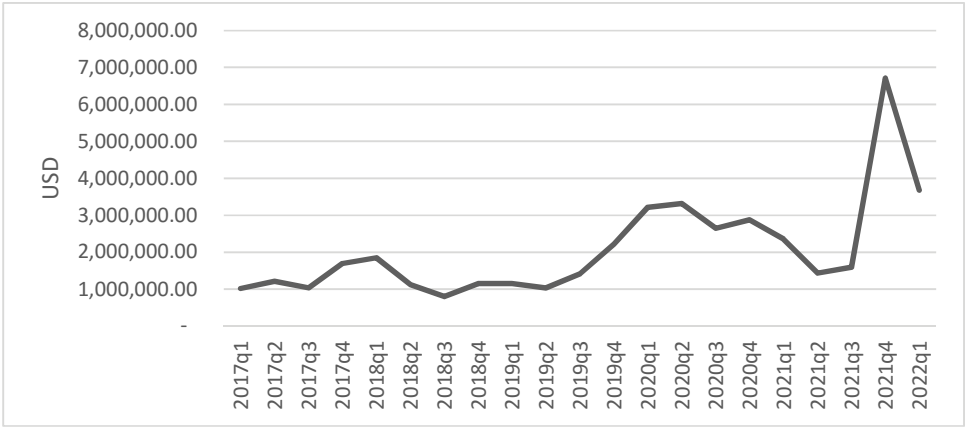

Figure 1 . The dynamics of the gross output of the high-tech industry in Kyrgyzstan in the quarters of 2017-2022 (Source: own calculations)

Below the threshold of 3 million US dollars until the 4th quarter of 2019 . In the second quarter of 2020, the volume of high-tech gross output was established at the level

of 3.3 million US dollars. Then a sharp decline is observed. In the 4th quarter of 2021, the gross output of the high-tech industry reaches its maximum level of 6.7 million USD. In the first quarter of 2022, the volume of the gross output of the high-tech industry was 3.7 million USD. The components of the high-tech industry of Kyrgyzstan are the pharmaceutical industry and the production of computers, electronic and optical products [Industry, eurasiancommission.org].The dynamics of inflation in Kyrgyzstan in the quarters of 2017-2022 was as follows :

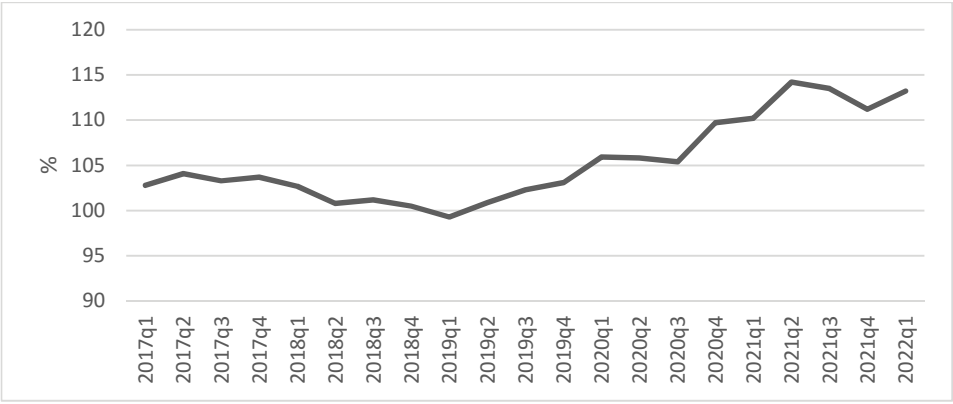

Figure 2. Inflation dynamics in Kyrgyzstan in the quarters of 2017-2022 (Source:Prices (eurasiancommission.org))

In the observed period until the 4th quarter of 2019, inflation in Kyrgyzstan was below 3% . Then, an acceleration of inflation is observed . In the Ist quarter of 2020, it was 5.9%, in the first quarter of 2021, exceeded 10%, and in the first quarter of 2022, the inflation rate was recorded at the level of 13.2%. One of the instruments of monetary policy is the mass of money M0, the dynamics of which in Kyrgyzstan was as follows :

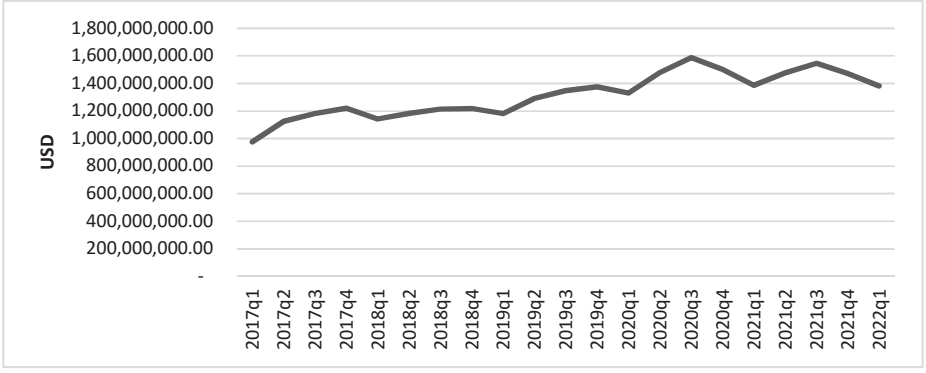

Figure 3 : The dynamics of the mass of money M0 in Kyrgyzstan in the quarters of 2017-2022 (Source: Monetary Statistics (eurasiancommission.org))

The minimum level of the mass of money M0 was observed in the first quarter of 2017: 977.2 million US dollars, and the maximum level was recorded in the third quarter of 2020: 1.6 billion US dollars. In the first quarter of 2022, the level of the M0 mass of money reached the level of 1.4 billion US dollars. One of the key instruments of the fiscal policy are state expenditures, the dynamics of which volumes were as follows :

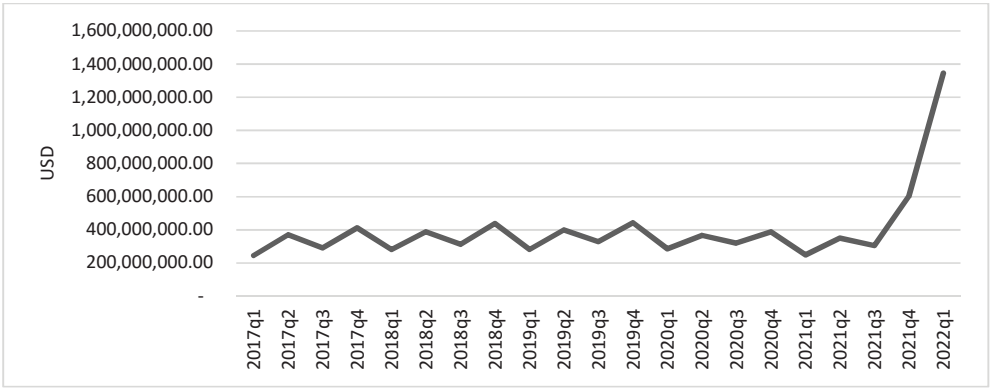

Figure 4 . The dynamics of public expenditure volumes in Kyrgyzstan in the quarters of 2017-2022 (Source: National Accounts (eurasiancommission.org))

According to statistical data, the level of public spending until the third quarter of 2021 was below 450 million US dollars, and already from the first quarter of 2021, the volume of public spending exceeded 600 million US dollars. In the first quarter of 2022, the volumes of state expenditures amounted to 1.3 billion US dollars. Kyrgyzstan is a largely importing country, whose economy is dependent on exchange rate fluctuations. In particular, let's consider the dynamics of the som/US dollar exchange rate .

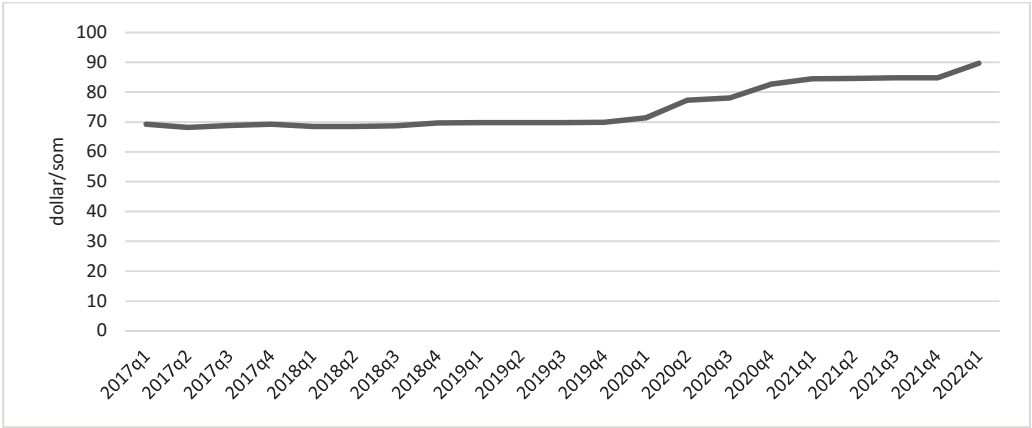

Figure 5 . The dynamics of the dollar/som exchange rate in Kyrgyzstan in the quarters of 2017-2022 (Source : Monetary Statistics (eurasiancommission.org))

Statistics show that until the 4th quarter of 2019, the value of 1 dollar in Kyrgyzstan fluctuated around 69 soms. However, already in the first quarter of 2020, 1 US dollar was already worth 71.4 soms. Then there is a further increase in the value of the dollar. In particular, in the first quarter of 2022, they give 89.7 soms for 1 US dollar.

Modeling. Next, let's examine a game situation in which monetary and fiscal policies are combined. On the basis of the goals described above, the game's winning functions-econometric models can be formed. In particular, suppose that the following econometric models represent the profit functions of monetary and fiscal policy implementation [Eliseeva,2021, 36-38]:

$$INF_t = \alpha_0 + \alpha_1 \cdot M0_t + \alpha_2 \cdot EXR_t + \varepsilon_t$$

and:

$$HT_t = \beta_0 + \beta_1 \cdot INF_t + \beta_2 \cdot G_t + \mu_t$$

where

$INF_t -$ is the inflation rate in the t quarter,

$HT_t -$ is the level of gross output of the high-tech sector in the t-th quarter,

$\mathrm{EXR_t} -$ is the exchange rate (dollar/som) in the t quarter,

$M0_t -$ is the level of the volume of money mass M0 in the t-th quarter,

$G_t -$ is the volume of government spending in the t-th year,

$\alpha_0, \alpha_1, \alpha_2$ и $\beta_0, \beta_1, \beta_2 -$ are the unknown parameters of the model,

ε_t *and* μ_t –are the random errors of the corresponding models in the t-th quarter,

t –is the index of the quarter. Moreover $t = \overline{2017{:}1,2022{:}1}$.

We are particularly interested in the model α_1 and β_2 the coefficients representing, respectively, the effect of one of the monetary policy instruments, the change in the volume of the money supply M0, on inflation, and the effect of one of the fiscal policy instruments, government spending, on the change in the volume of the gross output of the high-tech sector, respectively.

Before estimating the above two econometric models, the variables were logarithmized. The problems of stationarity [Magnus, 2004, 276-285] and multicollinearity of the series [Verbek, 2008, 146-148] were considered. The serieses were not stationary. Non-stationary series were made stationary with the help of second and even third order differences. In order to take into account the seasonality in the model, dummy variables describing the 4 quarters were also introduced [Eliseeva, 2021, 91-103]. In order to choose the optimal model, the models were evaluated with different specifications [Babeshko, 2006, 246-249]. As the main evaluated models, those that have the highest possible quality and meet a number of statistical criteria were selected. The models were estimated using the least squares method. The final estimated models are given with the following specification :

$$d(d(\widehat{lnINF_t})) = \underbrace{0{,}003}_{(0.5084)} + \underbrace{0{,}14}_{(0{,}0214)} \cdot d(d(lnM0_{t-3})) - \underbrace{0{,}69}_{(0.0003)} \cdot d(d(lnEXR_{t-1}))$$ *and:*

$$d(d(\widehat{lnHT_t})) = \underbrace{0.41}_{(0.0418)} - \underbrace{29.01}_{(0.0245)} \cdot d(d(lnINF_{t-5})) - \underbrace{0.48}_{(0.0062)} \cdot d(d(d(lnG_{t-2}))) + \underbrace{1.4}_{(0.0080)} \cdot q3$$

where

$d(d(\widehat{lnINF_t}))$ −is the predicted level of inflation in the t observation case in the logarithmic state and the second order difference, $d(d(\widehat{lnHT_t}))$ −is the predicted level of the high-tech sector gross output volume in the t observation case in the logarithmic state and the second order difference.

$d(d(lnM0_{t-3}))$ − is the level of the money supply M0 in t-3 in the logarithmic state and with double differences,

$d(d(lnEXR_{t-1}))$ −is the level of the exchange rate in t-1 in the logarithmic state and with double differences,

$q3$ −is the dummy variable describing the third quarter,

$d(d(lnINF_{t-5}))$-is the logarithmic and double difference index of inflation in t-5, in the logarithmic state and with double differences,

$d(d(d(lnG_{t-2})))$ −is the government expenditure volume in t-2 in the logarithmic state with a triple difference.

As a result of the evaluation of the profit function-econometric model for monetary and fiscal policies, high-quality models were obtained, and the estimated coefficients of the models are significant. Turning to the coefficients that interest us, we should note that a 1% increase in the volume of money mass M0 three quarters ago, other things being equal, leads to an average increase in inflation by 0.14% in a given year . On the other hand, a 1% increase in government spending two quarters ago, other things being equal, leads to a 0.48% increase in the level of high-tech manufacturing gross output in a given year. Using the obtained results, we will get the game matrix [Krešimir, 2017, 77-82] if, as a result of fiscal and monetary policy, the government expenditures and the volume of money mass M0 increase by 1%, 3%, 6% and 9% .

Table 1 . The game matrix of coordination of monetary and fiscal policies

		Fiscal:			
		1%	3%	6%	9%
Currency:	1%	(111.4 , 6.73)	(111.4 , 6.80)	(111.4 , 6.90)	(111.4 , 6.99)
	3%	(111 . 7,6.73)	(111 . 7,6.80)	(111 . 7,6.90)	(111 . 7,6.99)
	6%	(112 . 13,6.73)	(112 . 13, 6.80)	(112 . 13, 6.90)	(112 . 13, 6.99)
	9%	(112 . 6,6.73)	(112 . 6,6.80)	(112 . 6,6.90)	(112.6 , 6.99)

From the matrix, we can see that minimum inflation and maximum levels of gross output of high-tech production are ensured only when the volume of money mass M0 increases by 1%, and government expenditures by 9%. With this strategy, inflation is 111.4%, and the volume of gross output of high-tech production is 6.99 million USD.

Conclusion. Based on the research done on certain coordination of monetary and fiscal policies for Armenia and China, the same methodology was applied to explore possible options for coordination of the above policies in Kyrgyzstan. In the analysis, the goals of the government and the monetary authority were set, respectively, ensuring the maximum volume of high-tech gross output and the minimum levels of inflation. In accordance with these goals, a range of factors were considered: government spending and the mass of money M0, which affect the set goals. Regarding all presented indicators, a dynamic analysis was carried out on a quarterly basis for 2017-2022, within the framework of which the maximum and minimum levels of each indicator during the considered period, as well as the directions of changes in the indicators, became clear. Based on the results of the analysis, the econometric models corresponding to the monetary and fiscal policies were built, which describe the effects of various monetary and fiscal policy instruments on the indicators corresponding to the main goals. Before evaluating the econometric models, consider a number of issues related to the stationarity of the indicators included in the models, possible seasonality issues, etc. The models were evaluated with different specifications, but in the end, the version was chosen, in which case the qualitative features of the models are higher. The models were estimated by the method of least squares and the following results were obtained :

1. money supply M0 three quarters ago, other things being equal, leads to an average 0.14% increase in inflation in a given year.

2. A 1% increase in government spending two quarters ago, ceteris paribus, leads to a 0.48% increase in the level of high-tech manufacturing gross output in a given year.

Based on the obtained models, the game matrix of coordination of fiscal and monetary policies was obtained. As a result of observing the latter, it became clear that under the conditions of the mentioned partial situation, it is possible to reach minimum inflation and maximum levels of high-tech product volumes, when the volume of money mass M0 increases by 1%, and state expenditures by 9%. With this strategy, inflation is 111.4%, and the volume of gross output of high-tech production is 6.99 million USD.

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Possibility of coordination of monetary and fiscal policies in EEU: Kyrgyzstan Case

Key words: high technological sector, fiscal policy , monetary policy, inflation , EEA, sanctions, innovation, econometric model, Kyrgyzstan

Integration processes continue in the EEU. They move in different directions, increasing the rate of circulation of goods, people and capital within the Union. In the developments taking place in the Union, special attention should be paid to innovative processes, which are influenced by many factors of internal and external politics. In general, the modernization of the EEU economy as a result of the use of advanced technologies of the time is a very important agenda that should be pursued in all member states. In this context, this study refers to the Kyrgyz economy, within the framework of which the possibilities of coordinating monetary and fiscal policies in the country were studied in terms of achieving two main goals: the maximum gross output of the high-tech industry and the minimum levels of inflation. Based on the above objectives, the dynamics of fiscal and monetary policy instruments and a number of other economic indicators were considered in the research. Based on it, two econometric models were proposed, which were the winning functions of the proposed game model. After estimating the above models, the components of the game matrix were calculated. As a result of the observation of the matrix game, the partial possibilities of coordination of fiscal and monetary policies were shown.

THE IMPACT OF INNOVATION IN MILITARY INDUSTRIAL COMPLEX

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Key words: innovation, military industrial complex, national innovation system, defense industrial base, military expenditure.

Introduction. The high innovation potential of the military-industrial complex can become a source of technology for the civilian industry. In the context of the diversification of the military-industrial complex, the development of an effective technology transfer can become one of the key elements in building a competitive economy. The article contains a diagram of the mechanism for the innovative technology development and transfer between the military and civilian sectors. On the basis of this method, it is possible to build effective schemes for technology transfer and exchange and joint work of the military and civilian industries. It also considers the military, technological and political drivers that have led to these technologies being sought from commercial companies for military use. It then considers the recent engagement of the major innovation systems in activities for the military sector. The review is based on open source information as available in official government reports and data, conference reports, academic literature, and specialist and ordinary news items. Finally, it considers what these developments imply for the dynamics of the arms industry and the relationships within the Innovation System and the military industrial complex (MIC).

Methodology. For the processing and application of information necessary for the research work dialectic, scientific research, as well as analytical and comparative methods have been used. Methods of comparative analysis is used particularly to compare world military expenditures by regions and the share of world military expenditure of the 14 countries with the highest spending in 2021 related to innovation activity, as well as other methods used in economic analysis. We have arranged meetings for exchanging ideas, organized group discussions. In the framework of our research we attempted to use methods of collecting empirical data, as well as the data published by the SIPRI statistical service.

Literature review. In the decade and a half that followed Eisenhower`s address, during and immediately after the Vietnam War, the phrase "military-industrial complex" (MIC) enjoyed considerable currency. The number of books published on the subject peaked in the early 1970s. See, for example, (Herbert et al.,1970); (Melman, 1970); (Lens, 1971); (Rice, 1971); (Pursell Jr., ed. 1972); (Sarkesian,

1972); (Rosen, 1973). For a concise, much more recent overview of the subject, see (Roland, 2001). During the Cold War, the defence industry took on a particular structure that continues to influence developments now. The national government was the main customer and regulated exports and determined its size and structure. This monopsonistic structure of the market led to an emphasis on performance rather than cost of the products (high-technology military systems). Risk was borne by government, which often financed R&D and, in some cases, provided investment in capital and infrastructure. Elaborate rules and regulations on contracts, were developed to compensate for the absence of any form of competitive market and to assure public accountability. This all meant that close relations developed between contractors, the procurement executive and the military, notably what is termed the 'revolving door' in whichmilitary and civil servants move to defence contractors they had dealings with and staff from defense contractors move into the bureaucracy. These characteristics tended to favor those firms who specialize in defense work, as they knewtheir way around the red tape, had useful contacts and became experts at negotiating contractswith government. These were different skills to those needed in commercial markets. Firms used strategies such as 'buy ins', where they understated the risk or cost to win initial contracts, with a view to making up the losses later, with the inevitable changes that allowed renegotiationof contracts or additional payments. Defence companies became experts at getting contracts out of government and these skills and the structure of the market meant that there were both barriers to entry and barriers to exit. This led to the Cold War DIB showing remarkable stabilityin terms of its composition of main contractors. Monopsony in the defense market also helped to create near-monopolies for certain companies particularly in smaller countries. Outside of the US, there was a prevalence of companies that were national monopolies or close to it. Anycompetition was going to come from foreign firms, but governments tended to protect nationalcompanies, wishing to maintain a national DIB. Much of the work on the MIC sees a negativeimpact of vested interests as a fairly clear and constant feature of the Cold War. The argumentis that in the absence of a 'hot war' between the two superpowers to test the strength of the adversary, it was possible to overemphasize and exaggerate threats. These developments then justified high levels of military spending and allowed inefficiencies to develop (Dunne & Sköns, 2010, 286-287). World military spending peaked in the late 1980s, then declined by roughly one-third during the subsequent decade, first as a result of improving East-West relations and then with the endof the Cold War. The international arms trade dropped by a half between the 1982 all-time highand the 1995 trough, then fluctuated somewhat until it began to increase consistently in 2003 (The SIPRI Arms Transfers Database). These changes had a direct impact on the demand for the products of the MIC and the environment in which they operated, calling into question theability of even the major countries to maintain a comprehensive domestic defence industrial base. Governments

found it harder to justify previous levels of support for the industry and 'competitive procurement policies aimed at value for money were introduced in a number of countries' (Dunne & Sköns, 2010, 289-290). In addition to the changes in the level of demand for arms, new technologies enabled new typesof warfare and changed the nature of demand. Communication and control technologies became increasingly important in the theatre of military operations. Network-centred warfare, the use of satellites, communications equipment and multi-node networks changed the nature of demand. This was part of the Revolution in Military Affairs (RMA), a term used to emphasize the way that improvements in information technology, precision targeting and smartmunitions created the possibility of a new form of warfare, network-centred warfare. It also changed the nature of military technology, with increased importance of software and ICT andan increase in their share of costs in the production of weapons systems. The internet came toplay an important role in the development of communications, but it also provided a further area of potential security threats. Uncertainty about the enemy and the growth of 'homeland security' added new types of demand, making communications and surveillance technologies increasingly important (Boulanin 2017, 33-36; Smith 2009, 132-138). In addition, the growth of peacekeeping roles around the world, created somewhat different military systems and personnel requirements (Dunne et al 2006, 394). Another major development that introduced some new faces was the significant expansion of the military services industry from the end of the Cold War. This resulted from the outsourcing of functions that once were provided by military forces or defence ministries to private companies and was expanded greatly during the war in Iraq (Singer 2003, 21; Wulf, 2005, 11-13). This led to a significant change in both the structure of the DIB, with new companies, such as KBR, previously owned by Halliburton, becoming a major DoD contractor for its provision of construction in conflict zones (Briody, 2004, 199) and in the nature of the MIC, as companies providing military services are often engaged directly in conflict zones. Their interests are different and more problematic than the vested interests of military goods-producing companies, whose products are also in high demand during peacetime (Perlo-Freeman & Sköns 2008, 13). These developments all led to a defense industrial base that was looking rather different to theone inherited from the Cold War. In the US it was still dominated by a few main contractors that had merged and made acquisitions to retain their position. In other countries there were limited cross country mergers, but there was some restructuring and companies that survived remained dependent on national governments and their support for arms exports. There was change but also continuity, as Dunne et al (2020) argue. Over the last generation, a variety of newer studies has continued to enrich our understanding of the long-run development of military–industrial and innovation relations. (Garry Weir, 1991, 107-109). Military have also affected the development of new technologies. Of all the scholars working on questions

related to the MIC, historians of technology have been especially successful in creating a rich sophisticated body of work. At its best, this work has managed to document the ways in which the military has indeed altered the course of technological development, without overlooking the equally important contributions of individuals and companies in the private sector (Christophe, 2007, p.84).

Scientific novelty. The research paper has a number of conclusions serving theoretical foundation for solutions of practical problems. Particularly, it considers how the developments in national innovation systems and new technologies imply for the military expenditures and the relationships within the innovation sector and Military Industrial Complex. At present it is difficult to predict what is likely to happen or how this will affect the MIC. The established defense producers may fight back, both groups may stick to their specialisms, mergers may take place, or the new guys on the block may come to dominate defense production. In the framework of our research we discovered that, new developments in technologies, the internationalization of production and supply chains, the growth in the use of civil components, and the significant expansion of the military services area, all had significant impacts on the size and structure of the arms industry and countries must find effective combinations between them to increase the level of economic efficiency

Analysis. Since the mid-2010s, there have been developments in defence policy that have aimed to increase the engagement of innovation companies in military-related activities. This represents a significant change in procurement policy and could have a significant impact on the arms industry, an industry that has already seen considerable change, with the end of the Cold War and changes in the international security environment. It also potentially has profound implications for the relationship between the arms industry, the government and the military.

The first shock to the industry came when world military expenditures began to fall in the late 1980s and continued on a downward trend during the first post-Cold War decade. At the same time, the fixed costs of R&D for major systems continued to grow, both for platforms and for the infrastructure (e.g. satellites, strategic air assets) and the information-based systems needed to support network-centered warfare (Dunne and Sköns, 2010, 286-287). Changes in technology, with increasing importance of electronics and of information and communications technology (ICT) in military technology, resulted in an increased need for enabling technology in weapon systems. This led to a major restructuring of the arms industry and in the relations between it, the government and the military. Arms contractors changed, becoming systems integrators, outsourcing nationally and internationally, spinning in civil technologies and components, rather than spinning off innovations for the civil sector. These processes resulted in a reduced number of dominating companies but of much larger size, and

increased reliance on foreign components. However, the traditional defence producers, specializing on the military market remained dominant, partly through takeovers to acquire expertise in new areas. There is little evidence to suggest that the links between the industry, the military, government and the legislature weakened. Rather, it would still seem that it is a political rather than economic logic that controls the international arms market. There has been change, but also a remarkable degree of continuity. (Dunne & Sköns, 2010, 288). In 2021 world military expenditure surpassed the two trillion US dollar mark for the first time, reaching $2113 billion. Global spending in 2021 was 0.7 per cent higher than in 2020 and 12 per cent higher than in 2012 (see figure 1). The economic effects of the Covid-19 pandemic have not ended the continuous upward trend in world military expenditure seen since 2015. As a result of the strong economic recovery across the globe in 2021, world military spending as a share of world gross domestic product (GDP)—the global military burden—reached 2.2 per cent, down from 2.3 per cent in 2020. Average military spending as a share of government expenditure in 2021 remained the same as in 2020, at 5.9 per cent. This Fact Sheet presents regional and national military expenditure data for 2021 and highlights trends over the decade 2012–21. The data comes from the updated SIPRI Military Expenditure Database, which provides military spending data by country for the years 1949–2021.

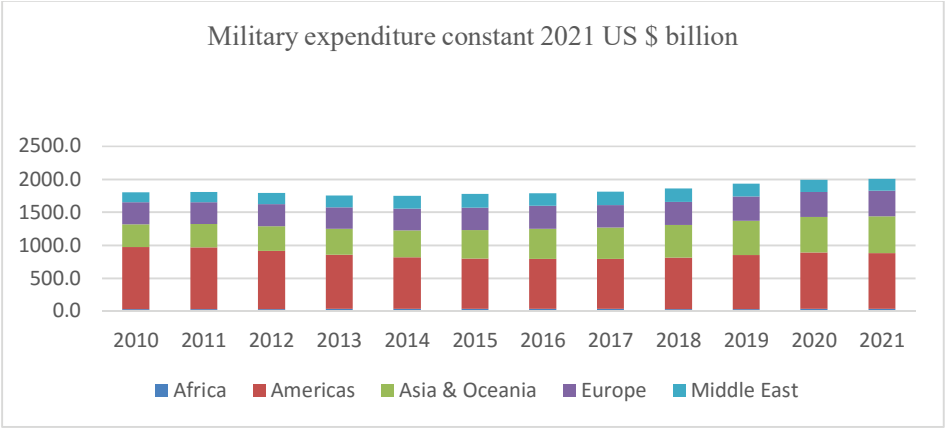

Figure 1. World military expenditure, by region, 2010-2021

Source: SIPRI Military Expenditure Database

Military spending by the top 15 countries reached $1717 billion in 2021, accounting for 81 per cent of global military expenditure. The United States (accounting for 38 per cent of world military spending in 2021) and China (14 per cent) remained by far the two largest spenders (see figure 2). There were, however, some notable changes in ranking among the top 15 between 2020 and 2021. The United Kingdom and France each moved up two ranks, becoming the fourth and sixth largest spenders in 2021, respec- tively.

After a 17 per cent drop in its military spending, Saudi Arabia fell from fourth largest spender in 2020 to eighth largest in 2021. Iran increased its military spending by 11 per cent, making it the 14th largest military spender in 2021. This is the first time in 20 years that Iran has ranked among the top 15 military spenders.

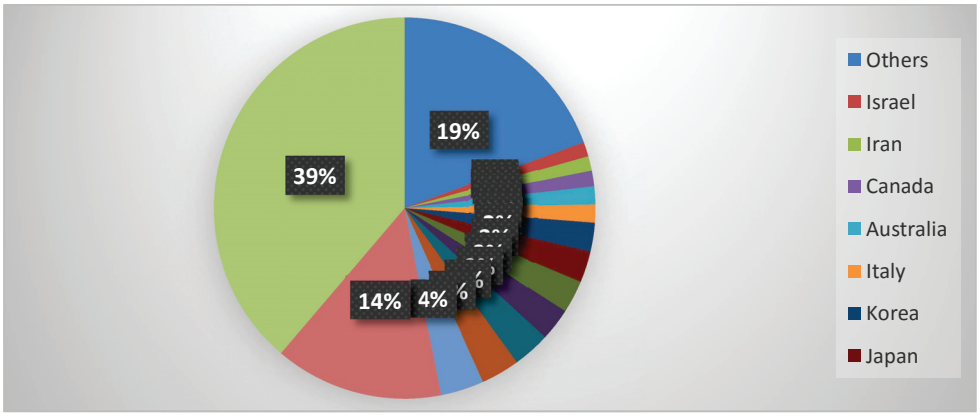

Figure 2. The share of world military expenditure of the 14 countries with the highest spending in 2021

US military spending totaled $ 801 billion in 2021. While this was a nominal increase of 2.9 per cent compared with 2020, it represented a decrease of 1.4 per cent in real terms. The difference can be attributed to the USA's rising rate of inflation. For example, US funding for military research and develop- ment (R&D) increased in nominal terms in 2021, but adjusting this for inflation gives a real-terms decrease of 1.2 per cent from 2020. Nevertheless, the US budget for R&D has grown by 24 per cent in real terms since 2012. In contrast, US funding for arms procurement shrank by 6.4 per cent between 2012 and 2021, and by 5.4 per cent between 2020 and 2021. The USA's continued heavy investment in R&D (combined with the cut in procurement funding) seems to indicate that it is currently prioritizing the development of new technologies over large-scale spending on legacy systems. Nuclear-related spending was among the military budget items that saw the largest increase in 2021, which reflects the USA's planned overhaul and modernization of its nuclear arsenal. China, the world`s second largest spender, allocated an estimated $293 billion to its military in 2021, an increase of 4.7 per cent from 2020 and 72 per cent from 2012. China's military spending has grown for 27 consecutive years, which is the longest uninter- rupted sequence of increases by any country in the SIPRI Military Expenditure Database. As China`s GDP grew by an estimated 8.4 per cent in 2021, its military burden dropped by 0.1 percentage points, to 1.7 per cent of GDP-the same share as in 2012.China`s military budget for 2021 marked the first year of its 14th Five-Year Plan (FYP), which runs until 2025. The new FYP aims to deepen military–civil fusion by sup- porting military and civil science and technology collaboration in areas such as aerospace,

maritime and emerging technologies. India's military expenditure of $76.6 billion in 2021 was the third highest in the world. Its spending was up by 0.9 per cent from 2020 and by 33 per cent from 2012. Amid ongoing tensions and border disputes with China and Pakistan that occasionally spill over into armed clashes, India has prioritized the modernization of its armed forces and self-reliance in arms production. In a drive to strengthen the indigenous arms industry, 64 per cent of capital outlays in the 2021 Indian military budget were earmarked for acquisitions of domestically produced arms.

The UK's military expenditure totalled $68.4 billion in 2021, up by 3.0 per cent from 2020 and by 3.7 per cent from 2012. This was the fourth consecutive year of growth. The UK's military burden was 2.2 per cent of GDP in 2021 and was therefore above the North Atlantic Treaty Organiza- tion (NATO) target of 2 per cent. In 2021 the British Government published a new policy that, among other things, aims to increase the Ministry of Defence's budget by $33.0 billion over four years. The additional spending is meant to fund R&D and a new Space Command, sustain nuclear deterrence, and support the modernization of the Royal Air Force and Royal Navy. Russian military expenditure grew for the third consecutive year in 2021. Russia's spending rose by 2.9 per cent, to reach $65.9 billion (or 4.1 per cent of its GDP), buoyed by high oil and gas prices. The recent upward trend in Russian military spending followed a period of decline, which came in the wake of Western sanctions over Russia's annexation of Crimea in 2014 and a sharp drop in energy prices in 2015. The 'national defense' budget line, which accounts for three-quarters of SIPRI's estimate of total Russian military spending and includes funding for operational costs as well as arms procurement, was revised upwards over the course of the year. From an initial value of $42.3 billion in December 2020, the budget line rose to $48.4 billion by the end of 2021—an increase of 14 per cent over the year, which probably mostly went towards additional operational costs. In late 2021 Russia amassed troops along the Ukrainian border, which preceded its invasion of Ukraine in February 2022.

Conclusion. This paper has considered the changes taking place in the MIC, with the increased involvement of innovation systems. Context was provided by considering the developments that had taken place in the MIC since the end of the Cold War, identifying earlier technology changes and how the industry and state engaged with them. New developments in technologies, providing the foundations for the so called Revolution in Military Affairs, as well as the internationalisation of production and supply chains, the growth in the use of civil components, and the significant expansion of the military services area, all had significant impacts on the size and structure of the arms industry. The present developments, with a potentially high involvement of commercial tech companies, may have a more significant impact on the MIC.

At present it is difficult to predict what is likely to happen or how this will affect the MIC. The established defence producers may fight back, both groups may stick to

their specialisms, mergers may take place, or the new guys on the block may come to dominate defense production. The growth in the defense budget and support for exports reduced pressure on the established firms, but that may well change in the future. In terms of MIC dynamics, the recognition by the DoD of the need to access not only technologies from the commercial companies but also their expertise and advice has resulted in the appointment of leading figures from commercial tech to vital roles in DoD advisory boards and recruitment of tech company staff in arms procurement. What is striking is the speed with which the larger tech companies have embraced the non standard methods of working within the MIC, with behind the scenes activity, intensive lobbying and movement of staff between the tech companies and the DoD. Interestingly, the 'revolving door' between the DoD seems to have gone from being seen as a concern, reflecting cronyism in the MIC, to a useful way of engaging the tech companies into the procurement systems, so it is no surprise that established arms firms and some DoD officials are calling foul.

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The impact of innovation in military industrial complex

Key words: Innovation, Military Industrial Complex, National Innovation System, Defense Industrial Base, Military Expenditure

This article considers the changes that have been taking place and what they might mean for the future, focusing on developments in the world, recognizing that these are often the precursors of change in the international arms industry. Specifically, it raises the question of whether recent developments in defense policy and arms acquisitions, mean that the arms industry is undergoing another phase of structural and relational change. Then we provide background and context, outlining the main characteristics of the MIC focusing on post-Cold War developments. The next section considers the changing approaches to military technology and the arms procurement system and the drivers behind these changes. We discovered that the military and technological drivers led to latest technologies being sought from commercial companies for military use. Then we discovered the recent engagement of the major innovation systems in activities for the military sector. We found out that these developments imply for the dynamics of the world`s military expenditures and the relationships within the Innovation System.

THE IMPACT OF EXTERNAL FACTORS ON THE SENSITIVITY OF THE MAIN MONETARY POLICY INDICATORS. EVIDENCE FROM VAR ANALYSIS.

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Key words: monetary policy, external factors, shock, inflation, output gap

Introduction. The literature about small open economies shows that their aggregate supply, aggregate demand, and therefore economic activity and price movements mainly depend on the dynamics of large economies [Krznar I. et al., 2010]. As a small open economy, Armenia is also exposed to global shocks directly, or indirectly through the impact of those shocks on its major trading partners. From the descriptive statistics of the time series of inflation and output gap in Armenia, it becomes clear that both indicators have volatile behavior in the short run [Levonyan, 2022]. In order to reveal the causes of this fluctuations, the impulses of inflation, exchange rate and output gap to the shocks of external factors were analyzed in this article, and revealed the transmission mechanisms, through which these shocks are transmitted to domestic economy.

Methodology. To assess the impact of external shocks on the main monetary policy indicators of Armenia, 3 vector autoregressive models were constructed, which represent the impact of the macroeconomic shocks of Russia, Eurozone countries and USA. The data is collected from IMF and Armenian CB statistics. Observations include quarterly data from 2003 to 2021. The variables included in the models are:

$$Y_t = \begin{bmatrix} D(\log(oilprice))_t \\ US\_output\_gap_t \\ D(US\_inflation)_t \\ US\_rates_t \\ D(log(ReerUSD)_t \\ output\_gap_t \\ y\_y\_core\_inflation_t \\ d(log(reer))_t \end{bmatrix}, Y_t = \begin{bmatrix} D(\log(oilprice))_t \\ EU\_output\_gap_t \\ D(EU\_inflation)_t \\ EU\_rates_t \\ D(log(ReerEUR)_t \\ output\_gap_t \\ y\_y\_core\_inflation_t \\ d(log(reer))_t \end{bmatrix}, Y_t = \begin{bmatrix} D(\log(oilprice))_t \\ RUS\_output\_gap_t \\ D(RUS\_inflation)_t \\ RUS\_rates_t \\ D(log(ReerRUB)_t \\ output\_gap_t \\ y\_y\_core\_inflation_t \\ d(log(reer))_t \end{bmatrix} \quad (1)$$

where: $oilprice$ is the world oil prices,

US_output_gap, EU_output_gap, RUS_output_gap are the output gaps of the USA, Euro zone countries and the Russian Federation respectively.

$US\_inflation$, $EU\_inflation$, $RUS\_inflation$ are the inflation of the USA, Eurozone countries and the Russian Federation.

US_rates, EU_rates, RUS_rates are the interest rates of the US Federal Reserve, European Central Bank, Russian Central Bank,

$ReerUSD$, $ReerEUR$, $ReerRUB$ are real effective exchange rate of dollar, euro, ruble,

$output\_gap$- Armenia's output gap, $y\_y\_core\_inflation$ core inflation in Armenia,

$reer$ - is the real effective exchange rate of the dram.

To ensure the stationarity, the time series of real effective exchange rate, world oil prices are represented in logarithmic differences, the series of the partner countries' inflation is presented in the form of the first difference. The rest series are stationary. Since internal factors of Armenia cannot have any impact on external factors, therefore, for the correct identification of the model, the principle of block exogeneity was added, as proposed by Cushman and Zha [Cushman D., Zha T., 1997], the meaning of which is that 0 restrictions are placed in both the simultaneous and the lagged relationship matrices, which excludes the inverse impact of internal factors on external block. The model is recursive, and the identification scheme corresponds to the Cholesky decomposition, for which the matrix of variables' simultaneous relationship has the following form.

$$AY_t = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ A_{21} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ A_{31} & A_{32} & 1 & 0 & 0 & 0 & 0 & 0 \\ A_{41} & A_{51} & A_{43} & 1 & 0 & 0 & 0 & 0 \\ A_{51} & A_{52} & A_{53} & A_{54} & 1 & 0 & 0 & 0 \\ A_{61} & A_{62} & A_{63} & A_{64} & A_{65} & 1 & 0 & 0 \\ A_{71} & A_{72} & A_{73} & A_{74} & A_{75} & A_{76} & 1 & 0 \\ A_{81} & A_{82} & A_{83} & A_{84} & A_{85} & A_{86} & A_{87} & 1 \end{pmatrix} \begin{pmatrix} D(\log(Crudeoil)) \\ US\_output\_gap_{\ t} \\ US\_inflation_t \\ US\_rates_t \\ D(log(ReerUSD)_t \\ output\_gap_t \\ y\_y\_core\_inflation_t \\ d(log(reer))_t \end{pmatrix} \quad (2)$$

Literature review. The literature concerned to identifying the sources of macroeconomic fluctuations in developing countries, seeking to differentiate the respective contributions of internal and external shocks to business cycles point out that external shocks often play a greater role than internal ones. The latter are usually considered as global output shocks, terms of trade (or world commodity prices) and global interest rates shocks, and, in some cases, other exogenous shocks such as natural disasters or changes in investors' risk expectations changes [Barrot et al., 2018]. In such analyses, two blocks are distinguished in the model: exogenous (external variables) and endogenous (internal variables), and a restriction is introduced in the model such that internal variables can not affect the external block. This approach was used in many analyses: [Kim & Roubini, 2000], [Dungey & Pagan, 2000], [Zaidi et al., 2010]. Taking into account the global economy's growing level of integration, it is a primary importance to analyze the impact of international developments on small open economies. In order to conduct an effective policy in such countries, it is also important to analyze the transmission mechanisms through which the impacts of these developments can be transmitted to domestic economy [Belhedi M. et al., 2015]. Dependence on external

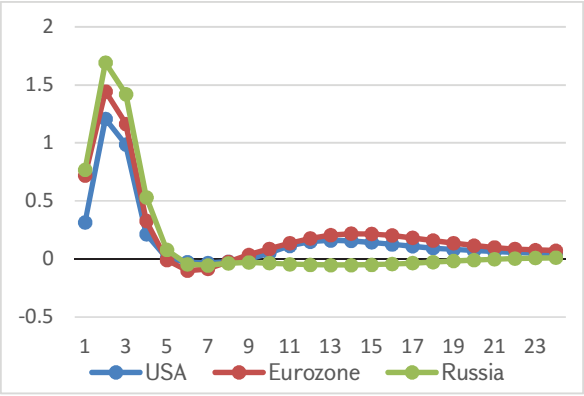
shocks for small open economies can be explained by several circumstances. Developing countries have weaker "shock absorbers", which can be distinguished as financial markets to diversify macroeconomic risk and stabilization policies to counter aggregate shocks [Loayza et al., 2007]. Another channel for counteractting macroeconomic volatility, particularly inflation volatility, is trade openness. According to Romer, there is a negative relationship between trade openness and inflation. Countries with greater trade openness correspond to a lower level of inflation and in these countries the Phillips curve is steeper [Romer, 1993]. Moreover, based on this hypothesis, empirical analyzes show that there is also a negative relationship between trade openness and inflation volatility [Bowdler & Malik, 2017].

Scientific novelty. Based on estimation of vector autoregressive models (VAR), the main external factors affecting inflation, output gap and exchange rate volatility in Armenia were identified. Analysis revealed that the domestic variables are highly sensitive to external shocks. Domestic variables are affected not only by global supply and demand shocks, but also by counterpart countries' real effective exchange rate and interest rate shocks. The possible transmission mechanisms of the above-mentioned shocks on the Armenian economy have been formed.

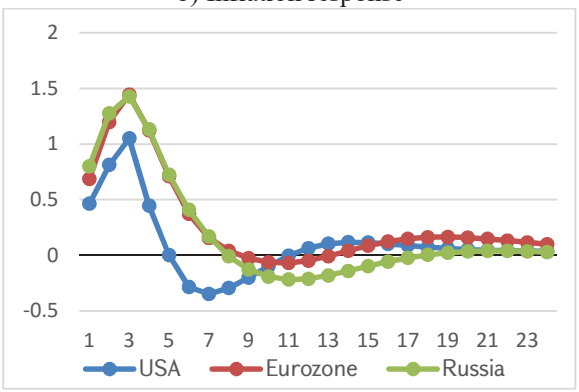
Analysis. To examine the results of the VAR analysis, the impulse-response functions of 3 internal variables, namely output gap, core inflation, and exchange rate to a standard deviation shock of external factors are considered. The response functions of VAR models are combined for better illustrating the difference in shocks transmitted from partner countries. Figure 1 shows the response of domestic variables to a shock to world oil prices. As can be seen from the obtained results, the responses of internal variables in 3 estimated models are similar, which can be considered as a measure of the model's quality.

Figure 1. Response of Domestic Variables to oil price shock

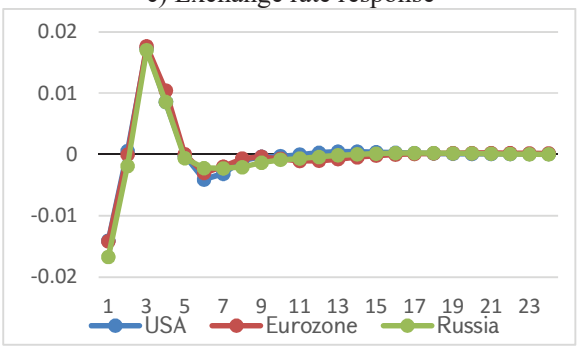
a) Output response



b) Inflation response



c) Exchange rate response



Source: author's calculations

Results show that one-unit standard deviation shock to the oil price leads to acceleration of both inflation and output. Since Armenia is an oil importing country, the output response may seem contradictory, but this reaction may have several explanations. The first is that the positive shock of oil prices leads to a sharp increase in output of the Russian Federation, and the Russian Federation is the main trading partner of Armenia, the increase in the gross income of which can be transmitted to the Armenian domestic output with several channels, namely through increase in exports, in remittances, the state debt and other ways. The second explanation is that ores and metals have huge share in Armenia's exports, the prices of which have a positive correlation with oil prices. To clarify the above-mentioned thesis, a linear regression model was estimated, which shows the positive relationship between the price of oil and non-oil commodities[1].

$$Commodity_t = \alpha_1 + \alpha_2 Oil_t + \varepsilon_t, \qquad t = \overline{2006Q1,2021Q4}, \qquad (3)$$

[1] Data collected from Federal reserve's statistics https://fred.stlouisfed.org/series/PNFUELINDEXQ

Table 1. Results of the estimated model

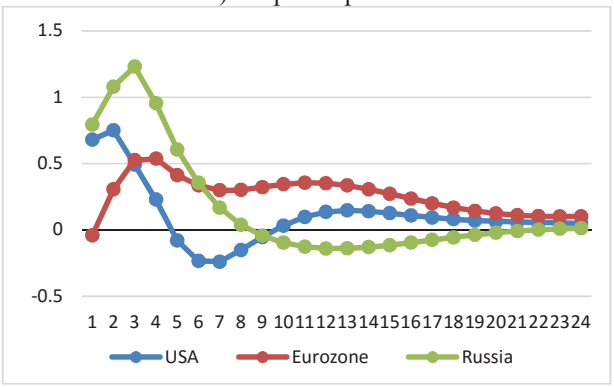
Dependent Variable: D(LOG(COMMODITY))				
Method: Least Squares				
Sample (adjusted): 2006Q1 2021Q4				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(OIL))	0.256516	0.031322	8.189757	0.0000
C	0.009954	0.005382	1.849418	0.0392
R-squared	0.519648	Mean dependent var		0.011245
Adjusted R-squared	0.511901	S.D. dependent var		0.061607
S.E. of regression	0.043041	Akaike info criterion		-3.422568
Sum squared resid	0.114858	Schwarz criterion		-3.355103
Log likelihood	111.5222	Hannan-Quinn criter.		-3.395990
F-statistic	67.07211	Durbin-Watson stat		1.798914
Prob(F-statistic)	0.000000			

Source: author's calculations

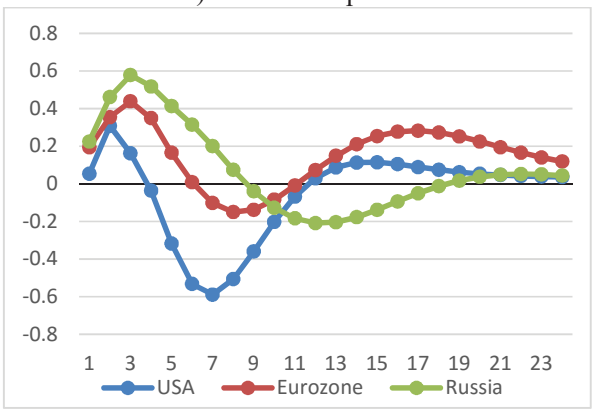
The obtained results show that there is a clear positive relationship between variables, due to which the positive shock of oil prices leads to an increase in prices of Armenia's mining export, which in turn leads to the positive response of output. Since oil-based products are an important component of CPI, the first-stage effect of higher oil prices is a sudden increase in prices due to rising production costs. [Galesi & Marco, 2009]. A positive oil price shock in Armenia leads to a significant accelerative response of inflation, which reaches its maximum growth in the 3rd quarter, after which the stabilization process begins. The exchange rate falls sharply because of the oil price shock, which is explained by the fact that in case of higher oil prices, it is necessary to buy a larger amount of foreign currency, which leads to an increase in the demand for it and, therefore, dram depreciation. However, starting from the 2nd quarter, dram starts to appreciate, due to the fact that oil prices and real effective exchange rate of dollar have a negative relationship, due to which dram can appreciate against the dollar.

Figure 2. The response of domestic variables to a shock of output gap of partner countries

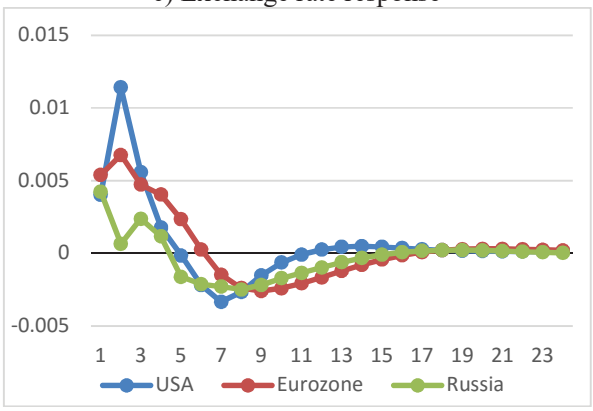
a) Output response



b) Inflation response



c) Exchange rate response

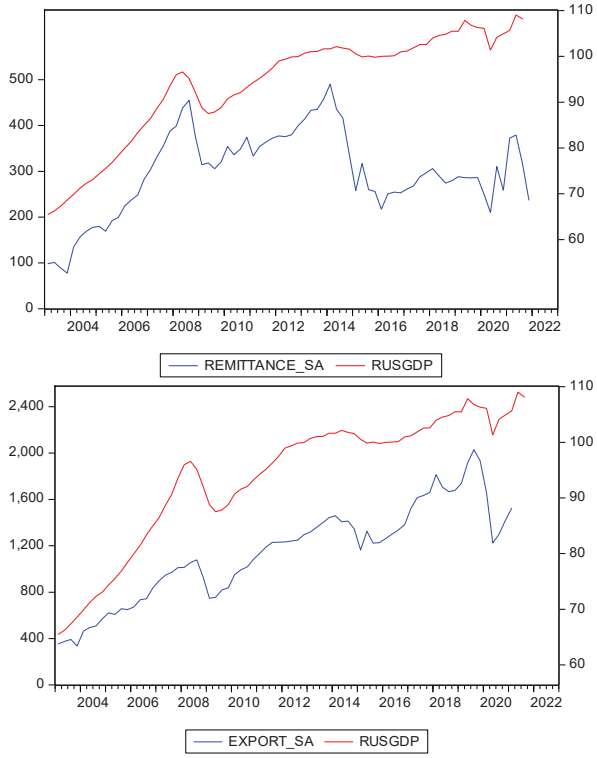


Source: author's calculations

As it becomes clear from the obtained results, all domestic variables are sensitive to the output shocks of partner countries. The response of inflation, output and exchange rate is positive, but the magnitude and duration of the impact are different depending on the considered country's shock. The positive output shock of the Russian Federation leads to a positive reaction of output gap and inflation in Armenia, which has the greatest impact on the domestic variables compared to the observed countries. As a result of the shock, both output and inflation reach their maximum in the 3rd quarter, after which the stabilization process begins, and the positive shock vanishes from the 9th quarter. In case of Europe and USA, these effects are also significant and lead to the acceleration of inflation and output gap in Armenia.

The exchange rate starts to appreciate because of the observed shocks, which can be explained by the fact that output growth in the partner country through the increase of imports, remittances, foreign direct investments, tourism leads to the stimulation of demand for the national currency, which leads to the appreciation of dram.

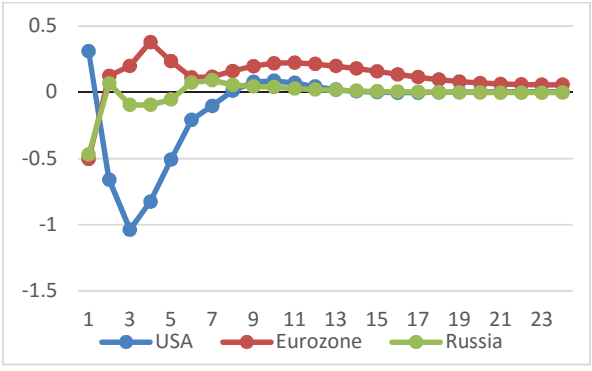
Figure 3. The relationship between remittances and exports with the output growth of RF



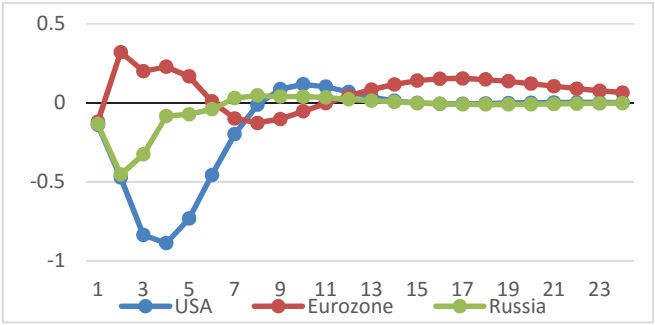
Source: author's calculations based on data of Statistical Committee of RA and IMF

As an example, in figure 3 is shown the relationship between RF's output growth and the volume of exports and remittances of Armenia. It is noticeable that remittances and export volumes in Armenia have a positive correlation with the real output growth of Russia, due to which the positive shock of Russian output gap is positively transmitted to the Armenian economy.

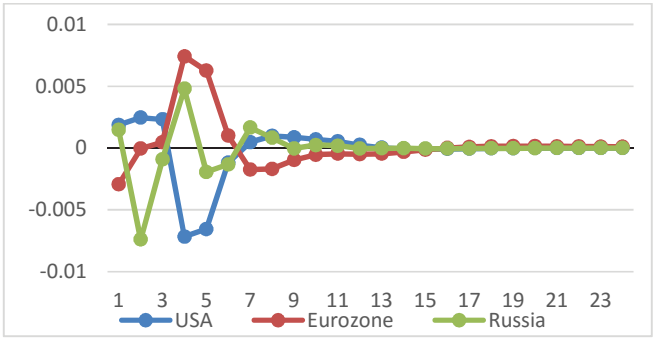
a) Output response



b) Inflation response



c) Exchange rate response



Source: author's calculations

Figure 4 shows the response of domestic variables to a unit standard deviation shock of the real effective exchange rates of the dollar, euro, and ruble. The response functions seem quite different from each other. Figure 4. Response of Domestic Variables to a shock in the Real Effective Exchange Rate of Partner Countries. Even though GDP has a negative response to ruble appreciation, the shock almost completely fades after first quarter. The appreciation of the dollar leads to a decline in output and inflation rates. This interaction can be explained by the income effect [Druck M.P., Magud M.N., 2015]. As the dollar appreciates, prices for commodities tend to fall, and weaker commodity prices suppress domestic demand by reducing real incomes. The empirical analysis also supports this view, since it is noticeable that along with the appreciation of the dollar, the oil prices decrease, the decrease of which has a negative effect on the output and inflation rates of the Republic of Armenia. It is noticeable that starting from the 3rd quarter, the euro shock leads to dram appreciation, and the dollar shock leads to depreciation. In both cases, the shocks fade in the 7th quarter. The main reason for this interaction is that dollar and euro have a negative linear relationship, which means that appreciation of dollar is accompanied by depreciation of euro and vice versa. The results of the correlation analysis document that the positive effect of the euro's shock on output

and inflation is due to euro's depreciation is a cause or a consequence of the appreciation of the dollar, which has significant impact on the Armenian economy.

Table 2. The correlation between dollar and euro real effective exchange rates

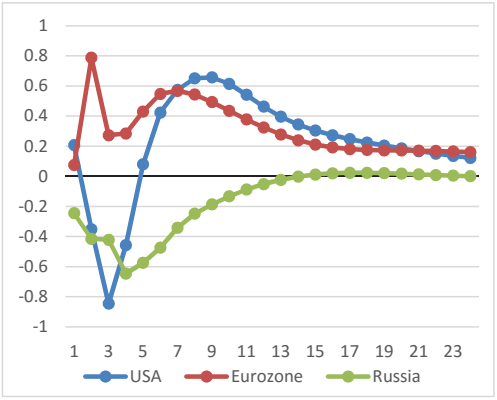
Covariance Analysis: Ordinary
Sample: 2003Q1 2021Q4
Included observations: 76

Correlation Probability	REER_EUR	REER_US
REER_EUR	1.000000 -----	
REER_US	-0.288167 (0.0116)	1.000000 -----

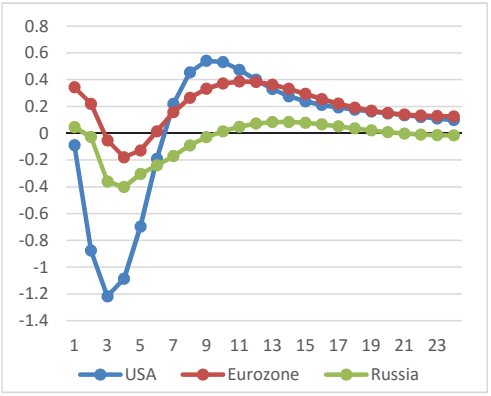
Source: author's calculations

Figure 6. The responses of domestic variables to a shock in partner countries' interest rates

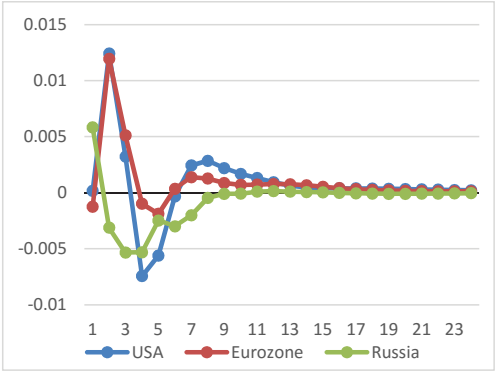
a) Output response



b) Inflation response



c) Exchange rate response



Source: author's calculations

Figure 6 shows the response of domestic variables to the monetary policy (interest rate) shock of partner countries. Domestic output is negatively affected by the monetary policy shocks of the Russian Federation and the USA, and inflation is mostly affected by the increase in the interest rate of the US Federal Reserve.

Some analyzes document the important role of US monetary policy for developing countries. According to the analysis of the International Monetary Fund [Arora & Cerisola, 2000], US interest rates lead to a decrease in real GDP and domestic demand among developing countries. There is a significant difference in the macroeconomic impact between countries with a negative and positive trade balance, with countries with a negative trade balance experiencing a much greater negative impact. A reduction in capital inflows, an increase in the cost of servicing the dollar public debt, as well as the risk of taking new, more expensive debt contribute to such effect [Calvo G. et al., 2001].

Conclusions. Summarizing the results obtained from the empirical analysis, the following conclusions can be drawn.

- global shocks have a major contribution of the small open economies' macroeconomic volatility. In most cases, inflation and output volatility is much more sensitive to external shocks, rather than internal.
- world oil price shocks have strongest impact on volatility of domestic macro-economic performance. Higher oil prices lead to higher output and inflation. The main channels through which these effects transmit to Armenian economy is the increase of main trading partners' income and increase in Armenian mining export prices.
- As a result of a positive shock of the partner countries' (group of countries) output gap, domestic variables react positively. The strongest impact on output and inflation is Russian output shock. This effect is mainly transferred to the Armenian economy by increasing the volume of remittances and exports.
- Dollar appreciation leads to a reduction of output and inflation rates. This interaction can be explained by the income effect. As the dollar appreciates, world commodity prices tend to fall, which in turn suppress domestic demand through lower real incomes.
- Dram's real effective exchange rate response analysis show that starting from the 3rd quarter, the euro shock leads to dram appreciation, and the dollar shock leads to depreciation. In both cases, the shocks fade in the 7th quarter. The main reason for this interaction is that the dollar and the euro have a negative correlation, which means that an appreciation of the dollar is accompanied by a depreciation of the euro and vice versa.
- Empirical analyzes show that US interest rates lead to Armenian output and inflation slowdown, which is in accordance with the literature related to the US monetary policy shocks to developing countries. It is noticeable, that among considered

trading countries, US monetary policy shock have the most significant impact on domestic macroeconomic stability.

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Anahit MKRTCHYAN, Suren LEVONYAN

The impact of external factors on the sensitivity of the main monetary indicators. Evidence from var analysis

Keywords: monetary policy, external factors, shock, inflation, output gap

The macroeconomic instability of a small open economy creates impediments for effective policy making and stabile economic growth of the country. Armenia also suffer from a problem of macroeconomic volatility. The article aims to analyze the causes of this fluctuations, for which three vector autoregressive models were constructed and estimated, which show the impact of partner countries' macroeconomic shocks to inflation, output, and real effective exchange rate of Armenia. The article also refers to the possible channels through which these shocks can be transmitted to the domestic economy. The results show that the macroeconomic fluctuations of Armenia is more sensitive to the shocks of the Russian world oil prices, Federation's output, the interest rate of the US Federal Reserve and dollar's real effective exchange rate.

THE ROLE OF THE TAX SYSTEM IN THE STATE REGULATION OF THE ECONOMY

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Key words: tax revenue, taxation objectives, tax policy, source of financing, government expenditure

Introduction. Since ancient times, the economic category "tax" has played a special role in human life and in the regulation of the state. It is closely related to the preservation of the state, the maintenance of its structures and public spheres, the protection of certain classes of society, as well as social development.

In the modern world, the role of the state's participation is becoming more and more important in the regulation of the economy [Kirakosyan & Harutyunyan, 2014, 7]. The state is the main actor in the socio-economic life of the country, because in the conditions of any economy, each state is not only the promoter of the creation and implementation of business entities, but also regulator of economic relations. In order to achieve this goal, the state uses the tax instruments of macroeconomic regulation, through which the unity and completeness of the implemented policy is ensured by the tax system.

Methodology. The methodological basis for the scientific article was the analysis made on the basis of scientific articles regulating tax relations, which allowed us to study and analyze the objectives of taxation of modern state finances, to understand the meaning of taxes, and also helped to highlight their role in the implementation of state functions and financing of state expenses.

Literature review. At present, the forms of taxation around the world are different in developed and developing countries. In particular, developed countries, unlike developing countries, collect taxes based on their national output and they are mainly focused on income taxation, and on the contrary, the taxation system in developing countries emphasizes commercial and consumption taxes. Moreover, developed countries actually collect much higher tax revenues than developing countries, largely due to differences in the adequacy and effectiveness of tax collection mechanisms. [Esteban Ortiz-Ospina & Max Roser, 2016, 1]

The historical evolution of state revenues shows that taxes have played an important role in the development process of states. We can state that the main purpose of taxation is to increase state revenues in order to finance state expenditures. The latter

is not the only purpose of taxation. In other words, tax policy pursues certain goals that are not related to revenue generation.

Scientific novelty. The work refers to the study of the role of the tax system in the state regulation of the economy. The scientific article presents the objectives of modern state finance taxation, the importance of taxes from the point of view of economic justice and human rights, as well as the role of taxes in the implementation of state functions and the financing of state expenses.

Analysis. For the analysis of the article, let's study the objectives of modern state finance taxation, which are the following[1]:

1) economic development,
2) full employment,
3) price stability,
4) control of cyclic fluctuations,
5) reduction of balance of payments difficulties,
6) non-revenue purpose.

Economic development. The economic development of any country is largely determined by the growth of capital formation, which is the main driving force of economic development. Governments use tax revenues to increase public and private investment. Through proper tax planning, the ratio of savings to national income can be increased. The process of capital accumulation can be smoothen by raising existing tax rates or imposing new taxes.

One of the important elements of economic development is the increase in the ratio of savings to income, which can be effectively increased through tax policy. However, it is necessary to show proper caution in relation to investments. If financial resources or investments are directed to inefficient sectors of the economy, economic development may be jeopardized if the norms of the latter are increased. Thus, the tax policy should be applied in such a way that investments are made in the productive sectors of the economy.

Full employment. Since the level of employment depends on effective demand, a country that wants to achieve full employment must reduce the tax rate. As a result, the disposable income will increase and the demand for goods and services will increase. The latter will stimulate investments that will lead to increased income and employment through a multiplier mechanism.

[1] https://www.economicsdiscussion.net/government/taxation/taxation-objectives-top-6-objectives-of-taxation-discussed/17450

Price stability. Taxation can be used to ensure price stability, which is the short-term goal of taxation. Taxes are seen as an effective way to control inflation. By increasing the rate of direct taxes, private expenditure can be controlled, as a result of which the pressure on the product market decreases. But indirect taxes on goods fuel inflationary trends. On the one hand, high prices of goods hinder consumption, on the other hand, they stimulate savings. The opposite effect will occur when taxes fall during deflation.

Control of cyclical fluctuations. Controlling cyclical fluctuations-boom and bust periods-is another goal of taxation. During a crisis, taxes are reduced and during a boom, taxes are increased in such a way that cyclical fluctuations are mitigated.

Reduction of balance of payments difficulties. Taxes and customs duties are used to control imports of certain goods in order to reduce the intensity of balance of payments difficulties and stimulate domestic production of import substitution goods.

Non-revenue purpose. Another purpose of additional or non-revenue taxation is to reduce income and wealth inequality. It can be implemented by taxing the rich at a higher rate than the poor or by introducing a progressive taxation system.

Summarizing the purposes of taxation, we can come to the conclusion that taxation has always been and remains the main tool of economic policy in the modern world, because it is one of the main types of activity of all states and is a necessary condition for everything that states do[1].

Thus, governments collect taxes and fees from their citizens and businesses as a means of increasing revenue, which is then used to meet their budgetary needs. It includes the financing of state and public projects and the creation of a favorable business environment for economic growth in the country[2].

Taxes play a vital role in financing public expenditure on basic social services such as education, health and social security. Effective public expenditure that meets the needs of the people requires the collection of sufficient tax revenues. Experience has shown that tax structures, no matter how brilliant they may be in theory, may have limited effectiveness if they carry out their activities inefficiently or corruptly.

Studying and analyzing the role of the tax system in the state regulation of the economy, we can come to the conclusion that without taxes governments would not be able to meet the demands of their societies. Taxes are very important because governments collect this money and use it to finance social projects. In particular:

[1] https://www.annualreviews.org/doi/10.1146/annurev-polisci-052615-025442
[2] https://richardkleincpa.com/importance-of-taxes/

- Without taxes, government investments in the healthcare sector would not be possible. Taxes are used to finance medical services such as social health care, medical research, social security, etc.
- Governments attach great importance to the development of human capital, and education occupies a central place in this process. The money from the taxes is directed to the financing, supply and maintenance of the state education system.
- Governance is the most important component of smooth management of country's affairs. Good governance ensures that the collected revenue is used in a way that benefits the citizens of the country. These amounts are also used for paying the salaries of civil servants, police officers and others.

Other important sectors are infrastructure development, transport, housing construction, etc. In addition to social projects, governments also use the money collected from taxes to fund areas that are important to the well-being of their citizens, such as security, scientific research, environmental protection, etc. Part of the revenue is used to finance projects such as pensions, unemployment benefits, child care benefits, etc.

At the same time, taxes can affect the economic growth of the country. Taxes mainly contribute to the country's gross domestic product. Thanks to this investment, taxes help stimulate economic growth, which in turn has an impact on living standards, job creation, and other factors.

The government also uses taxes as a deterrent to undesirable activities such as alcohol consumption, tobacco use, etc. To achieve this goal, the latter impose high excise taxes on these products and raise the price of these products so that people buy or sell less of them.

To flourish the business, there also must be good infrastructure in the country, such as roads, electricity, etc. The latter are created by governments or with their close participation. Governments direct part of the tax revenues to the development of these infrastructures and in turn contribute to the economic activity of the country.

As a result, we can note that the main types of public expenditures are: financing of public administration bodies, implementation of purchases in the private sector of the economy, providing support to individual sectors and branches of the economy, financing of social insurance and social assistance programs, public debt service [Bostanjyan, 2017, 85].

Conclusion. In other words, we can say that taxes help to raise the standard of living in the country. The higher the standard of living, the higher the level of consumption. Businesses thrive when there is a market for their products and services. With a higher standard of living, business will also be supported by a higher level of

domestic consumption. It is therefore important that citizens strive to pay taxes and realize that it is more than just paying money to the government.

Thus, we can conclude that the collection of taxes and duties is the main means of obtaining public revenue for countries, which allows to finance investments in human capital, infrastructure and provide services to citizens and businesses.

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The role of the tax system in the state regulation of the economy

Key words: tax revenue, taxation objectives, tax policy, source of financing, public expenditure.

The article is devoted to the study of the role of the tax system in the state regulation of the economy. The goals of taxation of modern state finances, the importance of taxes from the point of view of economic justice and human rights were studied and analyzed, as well as their role in the implementation of state functions and the financing of public expenditures was highlighted. As a result of the analysis in the article, we came to the conclusion that without taxes, governments would not be able to meet the demands of their societies, because they collect taxes and direct them to finance state and public projects and create a favorable business environment for economic growth in the country. At the same time, we can note that the collection of taxes and duties is the main means of obtaining public revenue for countries, which allows to finance investments in human capital, infrastructure and provide services to citizens and enterprises.

PROSPECTS OF REGIONAL ECONOMIC INTEGRATION FOR ARTSAKH CONSIDERING THE OPPORTUNITIES PROVIDED TO ARMENIA

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Key words: regional economic integration, Artsakh, competition, Armenia, economic growth

Introduction. The low level of export diversification and dependence on mineral exports and exports, production of low-value-added products are still obstacles to further economic growth. According to the commodity export concentration index, where values range from zero (diversified) to one (concentrated), exports from Armenia (0.27) are among the most concentrated in the WESC subregion (0.27), compared to exports from the Republic of Moldova (0.19) and Belarus (0.18). with nature. In terms of diversification index, Armenia's exports exceed only Azerbaijan (0.83) (UNCTADstat, 2020b). The main commodities exported in 2018 were copper ore (24.3 percent), gold (12.1 percent), iron alloys (6.9 percent), rolled tobacco (9.3 percent), and alcoholic beverages (6.8 percent), which accounted for more than half of goods exports. The remaining sectors were divided into different groups (HS4) such as textiles, plant products and machinery (ECO, 2020). These products are the most representative of Armenia's identified comparative advantages. According to the 2019 Industrial Competitiveness Index (ICI), which measures industrial potential and impact on the global market, Armenia ranked 103rd among 150 countries in the world, behind Georgia (96), Belarus (47) and Ukraine (69) (UNIDO, 2019). Moreover, according to the Global Competitiveness Index (GCI), Armenia ranked 70th among 140 countries in the world in 2018, improving its position compared to the previous year (72nd place). The country's competitive positions are also determined by the levels of development of the labor market (33rd), product market (39th), skills (55th) and ICT (56th) (WEF, 2019).

Methodology and literature review. Improvements are possible in the mentioned indicators, but, in general, they cannot approach the level of indicators of developed countries for the simple reason that Armenia (naturally also Artsakh) was left out of regional integration programs and processes during the years of independence. The objective reasons are the blockade, the limitation of the consumer market, the continuous nature of war operations, and the subjective factors are the continuous efforts of Azerbaijan, Turkey and their partners to exclude Armenia from regional programs [Ishkhanyan, 2006], and the constant anti-propaganda against Armenia in international structures and the negative impact of the unfavorable environment and the country's reputation and rating. factors.

As for the real foundations of finding a niche in the region and integrating, we need to look at the competitive advantages of Armenia and Artsakh. In this sense, in

addition to high technologies, agricultural products, jewelry and diamond making, and the possibility of prospective development of scientific branches of the economy, Armenia and Artsakh can certainly play a serious role in the arena of regional energy cooperation. In this sense, the results of 2021 are very controversial both for the management of economic risks and improving competitiveness, as well as for the energy industry of the South Caucasus. Due to the problems related to the construction of power transmission lines in Armenia, another increase in the electricity tariff is expected, Azerbaijan continues to lose its position in the Turkish gas market, and the Georgian government faces an international trial with the Russian Inter RAO energy company. Will Yerevan, Baku and Tbilisi be able to solve the accumulated problems in the energy sector and what are the prospects for "green energy" in the Caucasus? It is obvious that the energy sector of the South Caucasus today is exposed to many risks, which are mainly related to the dynamically changing regional geopolitical architecture. After the 44-day Karabakh war, the rethinking of key communication corridors and infrastructure projects does not bypass the energy sector either, both in terms of the external energy strategies of the countries of the region and their internal market policies. Although each of the South Caucasus countries has fundamentally different energy systems, regional and, more broadly, macro-regional (Caspian-Caucasian, Black Sea regions) processes inevitably create common risks and challenges for all. They are mainly related to the problem of unblocking communications in the region, with the formation of both transport and energy (mainly electric power) corridors. Based on the observed processes and trends, some predictions can also be made about the energy development of each of the countries in the region in 2022 [Davtyan, 2022].

Analysis. In Georgia, for example, the consumption of electricity continues to grow, and this, perhaps, will be the main impetus for the energy development of the republic in the coming years [Georgia, 2021]. High demand will cause the need to find new infrastructural solutions, develop production capacities and diversify external energy communications. Today, electricity consumption in Georgia is more than 12 billion kWh per year, the lion's share of which is produced in its own plants, mainly in hydroelectric plants. However, along with this, the import of electricity is also increasing. Only in January-November 2021, it was 1.8 billion kWh. This trend is likely to be observed in 2022, which is mainly due to the lack of production capacity in the country. According to forecasts, in 2030, electricity consumption in Georgia will amount to 22 billion kWh. This means that even today Tbilisi needs to increase its capabilities. However, there are some crisis tendencies that cannot be overcome in the short term. First of all, we are talking about the reduction of construction works on the construction of the Namakhvan hydroelectric power station on the Rioni River in Western Georgia. As a result of prolonged protests in the streets of Tbilisi, Kutaisi and some other Georgian cities, the investor (Turkish ENKA) announced its withdrawal from the

project, thereby depriving Georgia of 433 MW of capacity (which was supposed to be... the plant) and $800 million in investment. The main risk associated with the implementation of the project is that Georgia, which strives for energy self-sufficiency, will have to increase imports in the coming years. The first signs of it are already visible. Today, the main suppliers of electricity to Georgia are Russia (more than 1 billion kWh), Turkey (more than 100 million kWh) and Azerbaijan (more than 500 million kWh). Most likely, this alignment will continue in the coming year as well. With a growing deficit, Georgia will inevitably seek to increase its capacity, but unlike the Namakhvan hydroelectric plant, it is not as environmentally risky and politically decisive. In particular, we are talking about the very real prospect of building 10 hydroelectric power plants with a total capacity of up to 30 MW in 2022. As for external energy communications, next year, with the support of the EU and the World Bank, Tbilisi plans to start a feasibility study for laying a power transmission line along the bottom of the Black Sea to Romania. The power of the line will be 1000 MW, and the length will be 1195 km. The power transmission line will allow Georgia and Europe to take advantage of export opportunities and import electricity at an hourly rate. By the way, in the spring of 2022, for the introduction of a new market model, it is planned to start an energy exchange in Georgia, which will make it possible to take another step in the direction of energy integration with the EU. In 2022, the entire "energy discourse" of Georgia will be red-lined by the Georgian government's trial with the Russian company Inter RAO (manages the two Georgian hydropower plants "Khrami-1" and "Khrami-2", as well as the company "Telasi", which forms 75% of the electricity grid. In November 2021, the Stockholm arbitration ordered the government of Georgia to pay the company $80 million in connection with the regulator's decision to review the methodology for calculating electricity tariffs, which does not provide for a guarantee of compensation for damages caused by the devaluation of the lari. The government of Georgia decided to appeal the arbitration decision. which is quite a long and complex process. Finally, in 2022, Georgia is expected to start the construction of the country's first underground gas storage (UGS) station, which will significantly improve energy security. With the support of the German Reconstruction Credit Bank (KFW), the project will become the backbone of Georgia's gas transportation industry.

Azerbaijan continues to calculate its revenues from the 1994 oil "deal of the century". In the period 2001-2021, the revenues from the operation of the Azeri-Cherag-Guneshli mine group amounted to more than 150 billion dollars. Baku predicts that in 2022 the operation of the mine will bring about 5 billion dollars, taking into account the production limits set by OPEC +. In this regard, it should be noted that in 2022, oil production in Azerbaijan will increase by 80 thousand barrels per day (b/d), reaching 830 thousand barrels per day. And at the end of 2021, oil production in Azerbaijan increased by 20 thousand barrels per day, reaching the level of 750 thousand barrels per

day. Considering the sharp decline in 2020 and the gradual stabilization this year, the figure is quite good. However, the problem still remains in the international oil prices, which, although at a high level, are quite volatile and show hypersensitivity to various external factors. Of course, the price of $70-$80 per barrel observed in recent months is generally beneficial to Baku, considering that the price of oil was set at $40 per barrel in the state budget of Azerbaijan. However, taking into account the statements of the Azerbaijani authorities about the implementation of multibillion-dollar investments in Karabakh, they consider the stable barrel as the main prerequisite. At the same time, it is obvious that today the concepts of "oil" and "stability" are diametrically opposed. Azerbaijan is well aware of this, so at the level of the country's top management, theses are sometimes heard about diversifying the economy, increasing the share of the non-oil component in it. In general, however, based on the forecasts of international analytical centers and corporations, it can be stated that no serious shocks should be expected in the oil sector of Azerbaijan in 2022. the price of oil will remain above 60 dollars. Everything is not so optimistic in the gas sector. Here, Baku continues to lose ground in its main sales market, Turkey. After the sharp increase in supplies and in 2018-2019. Starting from 2020, Azerbaijan gradually loses its position in the Turkish market to Russia. In the first 9 months of 2021, Gazprom exported 20.3 billion cubic meters of gas to Turkey, which is 153% more than in 2020. At the same time, gas supplies from Azerbaijan to Turkey decreased by 20%. This trend will continue in 2022 as well, which is mainly due to the synchronization of the policies of Moscow and Ankara in the South Caucasus.

As for the European gas market, the share of Azerbaijani gas here can be 2-2.5% at best, taking into account the growing consumption in Europe (about 400 billion cubic meters in 2020) and the real gas supply possibilities of the Trans-Anatolian and Trans-Adriatic gas pipelines. (up to 11 billion cubic meters). In 2022, gas swap supplies between Turkmenistan, Azerbaijan and Iran will continue. According to the agreement reached in November 2021, between 1.5 and 2 billion cubic meters of gas will be sent annually from Turkmenistan to Azerbaijan through Iran, which was another step towards deepening the energy dialogue between the Caspian countries, especially between Iran and Azerbaijan, whose relations are in a deep crisis. were at the beginning of last year. However, overcoming it allowed the countries to reach a new level of cooperation, which today is expressed both in the fields of energy and transport. In this regard, it is necessary to emphasize the intentions of the parties to start synchronizing their power systems with the creation of the Iran-Azerbaijan-Russia power corridor already in 2022. In fact, we will witness the reformatting of the regional part of the North-South energy corridor, with the involvement of Azerbaijan in it and the reduction of the role of Armenia, which was once considered a beneficiary of the project.

As for Armenia, the country remains in a state of post-war shock, which affects its main economic indicators, including the energy sector. Already in February 2022, an increase in the electricity tariff by an average of 4.7 drams ($0.01) is expected, which is a serious burden for both the population and the entire economy of the country. Taking into account that the last increase in tariffs was carried out in February 2021, the next increase can definitely be considered a manifestation of deep crisis tendencies, which will be preserved in the coming years. The increase in tariffs is a consequence of the failure of the construction project of the 3rd Iran-Armenia power transmission line, which is meant to significantly increase the export of electricity from Armenia to Iran and thereby increase the efficiency of operation. of the 5th power unit of Hrazdan CHP, one of the country's largest energy facilities, owned by "Gazprom Armenia" CJSC. Today, the Armenian authorities announced plans to complete the construction of the transmission line by the end of 2023, while earlier this summer they announced the commissioning of the line by the end of 2021. Such a shift in time points to deep geo-economic transformations in the region. As a result, taking into account the accumulated debts of the owner for the operation of the 5th power unit ($100 million), the RA government decided to pay the company $31.7 million annually to ensure 9% profitability, according to The "gas agreements" of December Considering the limited export, as well as the low level of electricity consumption in the country, it is obvious that such a decision could not affect the tariff policy. Thus, in 2022, Armenia will become the leader among the countries of the South Caucasus with the increase in electricity, as well as gas and water tariffs. In 2022, the process of liberalization of Armenia's electricity market will also begin, which is both promising and dangerous, considering the current crisis trends in Armenia's energy sector. Liberalization will create a competitive environment in the market, open opportunities for new companies, so-called electricity traders, which can theoretically contribute to lowering tariffs in the future. On the other hand, the new market model also implies the liberalization of foreign trade in electricity. In other words, the same traders will be able to import cheaper electricity to the Armenian market, say, from Georgia. The risk lies in the fact that Armenia, being a country with excess electricity capacity, is initially focused on exports. It is precisely because of problems related to exports that today the country is facing the problem of a constant increase in customs duties. Of course, the liberalization of the electricity market is the main requirement for integration into the EAEU common electricity market in 2025. Today, however, liberalization has not been fully implemented in any member country of the Union, it is often of a formal nature, and the countries themselves often take a patronizing position. It is expected that in 2022 the government together with Rosatom will make a final decision regarding the future development scenario of "peaceful atom" in Armenia. The main problem remains to determine the capacity of the nuclear power unit. Judging by the latest statement of the

head of Rosatom, Alexey Likhachev, the new block will be built in conjunction with the project to create a copper smelter in southern Armenia. Whether it means building a modular power unit (low power: 50-100 MW) is difficult to say today. One thing is obvious. abandoning the construction of a traditional capacity (400 MW+) block will significantly reduce Armenia's strategic status as the only country developing atomic energy in the region. Renewable energy will become an important direction of Armenia's energy development in 2022. It is expected that the design and research works for the construction of a number of solar power plants (NPP) will begin next year. In particular, we are talking about the 200 MW Aig-1 SPP project (the investor is the UAE Masdar company), the 202 MW Gegharkunik RESP (the investor is the Spanish Acciona company) and a number of others. All these contracts fit into the government's energy development plan until 2040, according to which the share of solar power plants in the electricity production structure of Armenia should be increased to 15 percent by 2030. To do this, it is necessary to build a capacity of 1000 MW. of power. However, the security risks on the Armenian-Azerbaijani border, as a result of which a number of renewable energy projects have already been paralyzed, cause some skepticism about the prospects of "green energy" development in Armenia. In general, although energy is a competitive and promising branch for Armenia, including in terms of playing an important role in regional integration processes, we should not expect dynamic development of the energy sector in Armenia, both in 2022 and in the next few years. All resources available in the system should be directed to overcoming the crisis, increasing the efficiency of the system, promoting exports and reducing tariffs. The coronavirus epidemic and related economic restrictions, the slow recovery of national economies, the war in Karabakh, the formation of a new system of geopolitical interests in the region and a number of other deep processes have created many challenges and risks for energy. Security and energy development of South Caucasus countries. 2022 will be a key year for the South Caucasus republics to understand their place and role in the region in connection with the review of their energy interests. As last year, in 2022 there will be more problems than positive trends in the energy systems of the countries of the region, which is mainly due to political processes. The influence of the political component on the economic and, in particular, energy processes of the South Caucasus will inevitably increase, calling into question the prospects of sustainable energy development in the region.

Thus, although the prospects for the external economic integration of Artsakh with the opportunities provided to Armenia in the region are theoretically optimistic both in terms of the export of agricultural products and products from their processing, tourism, mining products and electricity, in reality there are not a few economic, professional, political and other problems that counterbalance the prospects of integration. :

When analyzing the prospects of Artsakh's external economic integration with the opportunities provided to Armenia in the region, it is important to note that, despite the commonalities and similarities in both economies, in the case of Armenia, there are certain advantages and privileges of participation in trade regimes, which are absent in the case of Artsakh's possible participation in integration processes and even economic development. In particular, Armenia benefits from a unified or preferential regime for exporting goods to EAEU countries and importing from third countries, and zero regime from member countries. For example, in the case of importing goods from EAEU countries, after the actual customs clearance, the value added tax paid in the EAEU country is returned to the Armenian businessman, which creates attractive conditions not only for export, but also for import and, in general, investments. On the other hand, there are unequal conditions for investments and business between entrepreneurs in Armenia and Artsakh. This is exacerbated by the fact that after the 44-day war, Artsakh has somewhat lost its business appeal due to the unfinished war and the many risks that arise from it. All this forces to search for new ways in order to manage risks and increase the competitiveness of the economy in Artsakh. We believe that among them, the tax system plays a key role, and more precisely, the development and application of a reasoned and justified package of tax benefits. According to Artsakh experts, in order to restore the destroyed economy as a result of the military operations unleashed by Azerbaijan against the Republic of Artsakh on September 27, 2020, and to settle the many problems faced by taxpayers, the following tax privileges are important in Artsakh:

• postpone the deadlines for submitting tax calculations, writing off tax accounts, paying taxes and other mandatory fees,

• to exempt the goods supplied by taxpayers with the donation of a number of state institutions from value added tax, excise tax and trade tax,

• to exempt the commercial organizations and individual entrepreneurs who have actual activities in the communities that came under the control of Azerbaijan as a result of war operations, from the obligation to submit calculations and reports,

• to set the profit tax rate for the banking, mining, energy and telecommunications sectors at 18 percent starting from the reporting year, and later reduce the rate for the telecommunications and energy sectors to 10 percent,

• 2020-2022 to exempt from the payment of profit tax the taxpayers carrying out activities taxed at the rate of 10 percent of profit tax, with the exception of taxpayers carrying out activities in the fields of energy and telecommunications. After the end of the grace period, it is proposed to set the profit tax rate at 5 percent. In a similar way, it is offered to individual entrepreneurs in 2020-2022. to exempt income from business activities from payment of income tax[1].

[1] https://minfin-nkr.am/tax.nk.am

• to reduce the rate of income tax withheld from natural persons employed under a civil law contract, by setting it at 15 percent in 2021, 14 percent in 2022, and 13 percent in 2023.

• set the income tax at 3 percent from the wages of hired workers and income equal to it for taxpayers engaged exclusively in the production of agricultural products,

• until 2026 on January 1, exempt from value added tax the sale of agricultural products produced in the Republic of Kazakhstan, the mechanized works performed during the cultivation of agricultural crops and perennial plantations, transactions for the supply of irrigation water, transactions for the sale of apartments in multi-apartment buildings under construction in the territory of the Republic of Kazakhstan,

• for a period of three years, exempt taxpayers from paying fixed and license fees, except for gas filling facilities,

• to set the trade tax rate to 2 percent of sales turnover from January 2021, and 3 percent in 2022,

• to extend the share of participation of the state and citizens in terms of cumulative allocations for a period of one year, maintaining the rates of 2.5 and 7.5 percent, respectively, and in 2022 to gradually increase the social contribution rate from January to 3.5 percent, from 2023 to 5 percent[1],

• exempt taxpayers with debts of up to 10 million drams from debts, penalties and fines as of October 1, 2020 [Barseghyan, 2022, 279-281].

Conclusion. Naturally, the reforms taking place in the tax field reduce the tax revenues of the state budget, but such steps are necessary in the post-war situation.

First, this is an important prerequisite for the gradual recovery of the destroyed economy, and then the problems of employment and income of the population are solved. To some extent, the state prevents the population's exodus abroad. It is not possible to immediately restore the lost, especially the human, but the material losses and the problems caused by tax payers as a result of the settlement of the problems and the formation of a more effective tax field for business.

1. To release 6277 taxpayers from obligations in the amount of 6 billion 883 million drams,

2. 91 taxpayers have signed schedules for the gradual repayment of obligations, with which it is planned to grant a privilege in the amount of 910 million drams in case of repayment of debts in the amount of 5 billion 239 million drams.

3. In the framework of the provision of state support to resident non-state organizations and individual entrepreneurs of the Republic of Artsakh in the amount of income tax calculated and paid in terms of salary and other payments equal to it, state support in the amount of 930.6 million drams was provided to 1126 beneficiaries for the months of January-April.

[1] https://www.tax.nk.am/

4. as a result of the reduction of the income tax rate by 5 percentage points, taking into account the increase in the amount of stamp duties, the incomes of 34,000 employees and persons working under civil law contracts increased by more than 1 billion 500 million drams in the period of January-June[1].

5. From March 15, a new control point was launched, according to the data recorded by it, in the 2nd quarter, commodity values in the amount of 29.7 billion drams were imported into the territory of Azerbaijan, and commodity values in the amount of 15.3 billion drams were exported[2].

2021 During the months of January-August, 18,449.6 million drams of tax revenues and duties were transferred to the state budget of Armenia, exceeding the planned figure of 12,500.0 million drams by 47.6 percent or 5,949.6 million drams. Collected revenues in 2020 compared to the same period, 16,519.3 million drams were collected less than 47.2 percent.

14,235.4 million drams or 77.2 percent of the amount of tax revenues and duties entered into the state budget were provided by large tax payers.

Among the 300 largest taxpayers of the Republic, during the second half of last year, they paid more than 9 billion 61 million AMD in taxes, duties and other mandatory payments to the state budget.

The first three big taxpayers are "Base Metals", "Karabakh Telecom" and "Artsakhbank" CJSCs.

At the same time, it is important to pay attention to the fact that as a result of war operations, the financial indicators have significantly worsened, in particular, the volumes of loans and deposits of commercial banks have decreased. According to operational data presented by commercial banks (branches) operating in the USA in 2021. As of May 1, loans provided to legal entities and individuals amounted to 141,788.2 million drams, compared to the same period last year, the indicator decreased by 31.4 percent, compared to the previous month, the indicator increased by 0.3 percent. Loans provided in foreign currency made up 54.0 percent of the total, decreased by 6.6 percent compared to the same period last year. 2021 As of April 1, the attracted deposits amounted to 128,085.9 million drams, compared to the same period last year, the index decreased by 2.0 percent, and compared to the previous month, it increased by 5.8 percent[3].

[1] http://www.stat-nkr.am/
[2] http://www.stat-nkr.am/
[3] http://www.stat-nkr.am/

In the total volume of deposits, 73.0 percent were time deposits of banks, 22.2 percent were demand deposits, and 4.8 percent were target deposits[1].

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Prospects of regional economic integration for Artsakh considering the opportunities provided to Armenia

Key words: regional economic integration, Artsakh, competition, Armenia, economic growth

After joining the World Trade Organization (WTO) in 2003, Armenia further opened its market for trade, which, however, is still limited by high transport costs due to the country's geographical location and partially closed borders. Trade of goods passes mainly through the territory of Georgia. In 2015, Armenia joined the Eurasian Economic Union (EEU), which provides member countries with unhindered access to the Armenian, Russian, Belarusian, Kazakh and Kyrgyz markets. Since June 2018, the country has signed a number of bilateral and multilateral trade agreements, including with Georgia and Japan, as well as the Comprehensive and Enhanced Partnership Agreement with the United States and the EU (EU, 2020). For a small country, the volume of exports and imports of goods and services is large, accounting for 91.3 percent of GDP in 2018 (World Bank, 2020c), and exports of goods and services accounted for 38.5 percent of GDP.

[1]https://ejc.am/hy/article/323