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Section 1. Marketing

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BRAND RECOGNITION AS ONE OF THE MAJOR GOALS IN THE BRAND MANAGEMENT

Abstract. Brand recall and brand recognition are analyzed as the parts of brand awareness. The importance of brand recognition in brand management strategy is defined. Practical marketing cases and useful proposals are described in the article.

Keywords: brand-management, brand awareness, recognition, recall, diagnostic parameters, brand identity.

Nowadays we are faced with increased variety of business cases, when companies cut their marketing budgets greatly and implement new more strong rules for justifying such expenses. It's like a continuous and widespread CFO/CEO's business decision, when the necessity of such expenses is not proven as vital one. The reason is simply to understand: in the world of rapidly developing technologies, high competition level among existing products (especially in FMCG sector) and changes in the consumers' decision-making process, brand-managers have to path a complicated way to gain consumer's choice for the brand. And for sure, there are always a lot of risks that the marketing strategy, which is proposed by managers, cannot gain the desired goals and the great budget will be spent with weak KPIs. That's why the effective branding creation becomes one of the most important and influential thing in the brand management strategy. It's not just the key factor of ROI (return on investment), but also it's a guarantee that company won't spend the money for competitors' favor (as a result of the weak brand activities) or even for the whole category promotion. Thus the main goal in effective brand strategy building is to make the brand recognizable.

This way the brand identity communications should be the brand anchors, that need to be dropped into consumers' minds. As a result, brand-managers want the consumers:

- to perceive the brand communication;
- to recognize the trade-mark;
- to understand/feel the product's advantages;
- to find the product on shelf faster than competitors' one.

In scientific marketing literature the most common approach to describe brand awareness is – the responsibility of the target audience to find out or remember a company/brand at the time of making the choice or just before purchasing the product [1, 352]. It can be measured in percentage as the proportion of the audience who is familiar with the product of the company and can identify the brand within the product category. Brand awareness is an important thing for maintaining product competitiveness and its long-term growth. Thus, brand awareness commonly consists of two components – brand recognition and brand recall.

According to classic scientific approach brand recognition is how quickly a consumer recognizes and discriminates the brand when any of its elements is shown, e.g., logo, slogan [2, 220]. Brand recognition relates to consumers' ability to confirm prior exposure to the brand when given the brand as a cue. In other words, brand recognition requires that consumers correctly discriminate the brand as having been seen or heard previously [3, 3].

Brand recall is the ability of the consumer to remember the brand of the company at the time of need [1, 352]. Brand recall is defined as the mental reproduction of some target item experienced or learned earlier [4, 95]. This way brand recall is used to be an extent to which consumers remember advertising and other messages that were sent about a brand, so it reflects the potential to recover a brand from the consumer's memory when given the product category and buying scenario as a signal. [5, 85].

But to discover the question, which component of brand awareness has more influence for decision-making process, we should understand that there is no single answer. Anyway there is a great variety of places and situations, which impact the consumers' decision-making process. If the brand's target audience is deciding to buy a brand from the list of available alternatives, then brand recognition should be the goal of the marketing strategy. For example, a consumer directly decides "what to buy?" by looking over a store shelf in supermarket or surfing the digital-shelf in the e-com store. Another example – consumer is selecting "Which beer to order?" based on a specific menu list in the restaurant.

On the other hand, if the target audience usually makes the purchase decision when the need arises far from the place of purchase and does not see the brand elements, then the purpose of the marketing strategy should be defined as the ability to remember the brand (brand recall). For example, when the consumer is ill, he tries to remember the medicine brands that are able to eliminate existing symptoms. Or at the moment of the desire to go to a restaurant the consumer goes through the names of establishments that he has remembered.

In our opinion, in the era of digitalization and great variety of effective customized/in-stores promotions, modern consumer is rather curious about the brand he choices. So the brand recognition may play major role in brand awareness, especially taking into consideration the fact of on-line and modern-trade stores' brand promos continuous integration. Moreover, there are investigations that proves brand recognition requires a lower level of strength of memory than it does for the recall [6, 83]. Different studies have also shown that people usually choose things that are familiar to them (Behe, Huddleston, Hall Khachatryan & Campbell, 2017; Coates et al., 2006; Hoyer & Brown, 1990; Mcdonald & Sharp, 2000), also in the cases where they have only seen the things but are not aware of them (Bornstein, 1989 & Zajonic, 1968) [2, 221]. According to the recognition heuristic (Goldstein & Gigerenzer, 2002), choosing an answer in a situation where the correct answer is not known people will choose the option that they recognize from a previous experience over the unrecognized option (Barreda, Bilgihan, Nusair & Okumus, 2015) [2, 221]. Both are techniques to test the memory of the consumers for measuring the level of awareness he/she has for the brand or the product; where recall is indirect while recognition is a direct technique [2, 221]. People believe that the recognized option is more secure. So brand recognition becomes much more powerful instrument in consumer's decision-making process as it gives more opportunities for managers to develop the brands. On the other hand, it warns to be careful with any changes they want to implement.

To understand the recognition importance in brand management, let's analyze some practical brand cases. Nowadays popular marketing trend is premium products creation (to get higher margin within the exceptional package design). So brand-managers extend the exclusive product line to make it more "premium" with the popular idea to change

the logo – for example, current blue logo for gold or silver one. In the case these managers think that consumers save full pictures in their memories and use it to distinguish brands, such concept is going to be doomed. The main reason is that there are some diagnostic parameters (color, brand image, logo etc.) in each brand identity, that have the major role in brand recognition [7, 103]. And if they are changed, the impact will be rather negative. Only if the brand identity elements are not distinguished as brand diagnostic parameters, so they don't have a great influence for the brand, consumers will recognize the product even if some brand identity elements were changed. Good example of diagnostic parameter, that can play huge role in the brand recognition process, is color for some brands: Coca-Cola (red color), Milka (purple color), Vanish (pink color) etc. This way color change for such brands can cause many risks. Unfortunately, there are many cases when such things were done, one of them – Tropicana (orange juice) relaunch in 2009. The relaunch of this product consisted of the packaging design (images, lid, logo) update (picture 1) accompanied with huge promo campaign for several million EURs. Some features of this relaunch were: the orange juice as product wasn't changed, key brand messages and product name remained the same, new package had more modern design and this was confirmed by previous marketing investigations. But the result was shocking one – Tropicana has faced with the sales loses for 30 mln EURs just in 2 months after this relaunch campaign start [7, 103].

So these new package products were immediately withdrawn from the sales turnover. The problem is simply to identify with our approach called – diagnostic parameters theory. The thing is that stakeholders, who created/approved such relaunch, were not familiar with the key Tropicana identity elements that directly influence for brand recognition: the orange with straw was replaced with glass, the font was significantly changed as well as all other elements' locations. So the diagnostic parameters were suffered from the changes and as result, automatic brand recognition (which is supported by peripheral view) was declined.

Picture 1. Tropicana package relaunch

Brand managers can avoid such bad cases with the correct analyzing the product diagnostics parameters in their brand awareness. The easiest and cheapest thing that can be done – to change some brand identity elements and to test it for brand recognition impact. Other useful test was proposed by Phil Barden: to identify the key diagnostic parameters of the major competitors in category by proposing consumers to take some goods (from typical supermarket shelf) immediately and name the product purpose/flavor [7, 106].

As conclusion, we can state that to build effective brand, great attention should be paid to its recognition. Because consumers perceive the products usually with peripheral view, which makes the picture of shelf blurred one. So managers have to use significant and useful signals, that can be dropped into consumers' minds for long-term period to make the brand recognizable. Furthermore, while updating or relaunching of brand, the key point is not "how many elements", but "which elements" will be changed; brand-managers have to know the product's diagnostic parameters and avoid brand recognition decline because of their change. The

assessment of brand recognition is an essential part of brand management. Having the knowledge about current brand recognition level, managers can create an effective promo strategy, identify communication purpose and manage the marketing budget with low risks.

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Section 2. Mathematical and instrumental methods of economics

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FINANCIAL WORRIES OVER MEDICAL COST AMONG ADULTS IN2017

Abstract:

Aim: This study aims to 1) examine the predictors of adults' financial worries over medical cost in 2017 2) build a predictive model for adults' financial worries over medical costusing artificial neural network and compare its performance to logistic regression model.

Method: The National Health Interview Survey (NHIS) in 2017 was used. All the eligible participants were randomly assigned into 2 groups: training sample and testing sample. Two models were built using training sample: artificial neural network and logistic regression. Receiver operating characteristic (ROC) were calculated and compared for these two models for their discrimination capability.

Results: About 26.4% of 26031 Adults had Financial worries over medical cost, about 28.2% among the female and 24.3% among the male.

According to the logistic regression, the male was 19.6% less likely than the female to have financial worries over medical cost. The non-Hispanic adults were 55.2% less likely to have financial worries over medical cost than Hispanic adults. Married people were 12.3% less worried. White were 10.7% less worried and Black population were 31.8% more worried. Compared to residents in Northeast, people in Midwest (12.0%), South (28.0%) and West (11.0%) were more worried about the medical cost. Compared to people who were not employed but looking, people who were employed (29.4%) or not employed and not looking (46.5%) were less worried. According to this neural network, the most important predictors was age, sex, working status and race.

For training sample, the ROC was 0.61 for the Logistic regression and 0.67 for the artificial neural network. In testing sample, the ROC was 0.60 for the Logistic regression and 0.65 for the artificial neural network.

Conclusions: In this study, we identified sseveral important predictors for parents' financial worries over medical cost in 2017 e.g., age, gender, race and working status. The findings can help identify people at higher risk of having the financial worries over medical cost.

Keywords: finance, medical cost, America, Logistic Regression.

1. Introduction: Administrative costs, drug costs, defensive medicine, expensive mix of treatment and other components which makes medical costs a heavy burden over people's shoulders.

According to the most recent data available from the Centers for Medicare and Medicaid Services (CMS), "the average American spent $9,596 on healthcare" in 2012, which was "up significantly from $7,700 in 2007."It was also more than twice the per capita average of other developed nations, but still, in 2015, experts predicted continued sharp increases: "Health care spending per person is expected to surpass $10,000 in 2016 and then march steadily higher to $14,944 in 2023" (electronic source – Here Are Americans' Top Financial Concerns) [1–4].

American adults' biggest financial worry is the inability to pay the medical costs in the event of a serious illness or accident, reports Gallup in new survey data. A majority (54%) of the more than 1,000 US adults surveyed said they're either very (30%) or moderately (24%) worried about this [5–8].

This study aims to 1) examine the predictors of adults' financial worries over medical cost in 2017; 2) build a predictive model for adults' financial worries over medical cost using artificial neural network and compare its performance to logistic regression model.

2. Data and Methods:

Data:

The National Health Interview Survey (NHIS) is the principal source of information on the health of the civilian noninstitutionalized population of the United States and is one of the major data collection programs of the National Center for Health Statistics (NCHS) which is part of the Centers for Disease Control and Prevention (CDC).

The National Health Interview Survey (NHIS) Data 2017 was used in this study.

Models:

We used logistic regression models to calculate the predicted risk. Logistic regression is a part of a category of statistical models called generalized linear models, and it allows one to predict a discrete outcome from a set of variables that may be continuous, discrete, dichotomous, or a combination of these. Typically, the dependent variable is dichotomous and the independent variables are either categorical or continuous.

The logistic regression model can be expressed with the formula:

$$\ln\left(\frac{P}{P-1}\right) = \beta_0 + \beta_1 \cdot X_1 + \beta_2 \cdot X_2 + ... + \beta_n \cdot X_n$$

A package called "neuralnet" in R was used to conduct neural network analysis. The package neuralnet focuses on multi-layer perceptrons (MLP, Bishop, 1995), which are well applicable when modeling functional relationships.

Variables:

The outcome variable is percentage of how worried are you right now about not having enough money for Medical Cost? (ASIRETR)

Table 1.– Variables used in this study

SEX	1: male 2: female
ORIGIN_I	Hispanic Ethnicity: 1: yes; 2: no
RACRECI3	1: White 2: Black 3: Asian 4: All other race groups*
AGE_P	Age <18 years old 0–17
Region	1 Northeast 2 Midwest 3 South 4 West

3. Results

About 26.4% of 26031 Adults had financial worries over Medical Cost, about 28.2% among the female and 24.3% among the male.

Basically, a corrgram is a graphical representation of the cells of a matrix of correlations. The idea is to display the pattern of correlationsin terms of their signs

and magnitudes using visual thinning and correlation-based variable ordering. Moreover, the cells of the matrix can be shaded or colored to show the correlation value. The positive correlations are shown in blue, while the negative correlationsare shown in red; the darker the hue, the greater the magnitude of the correlation.

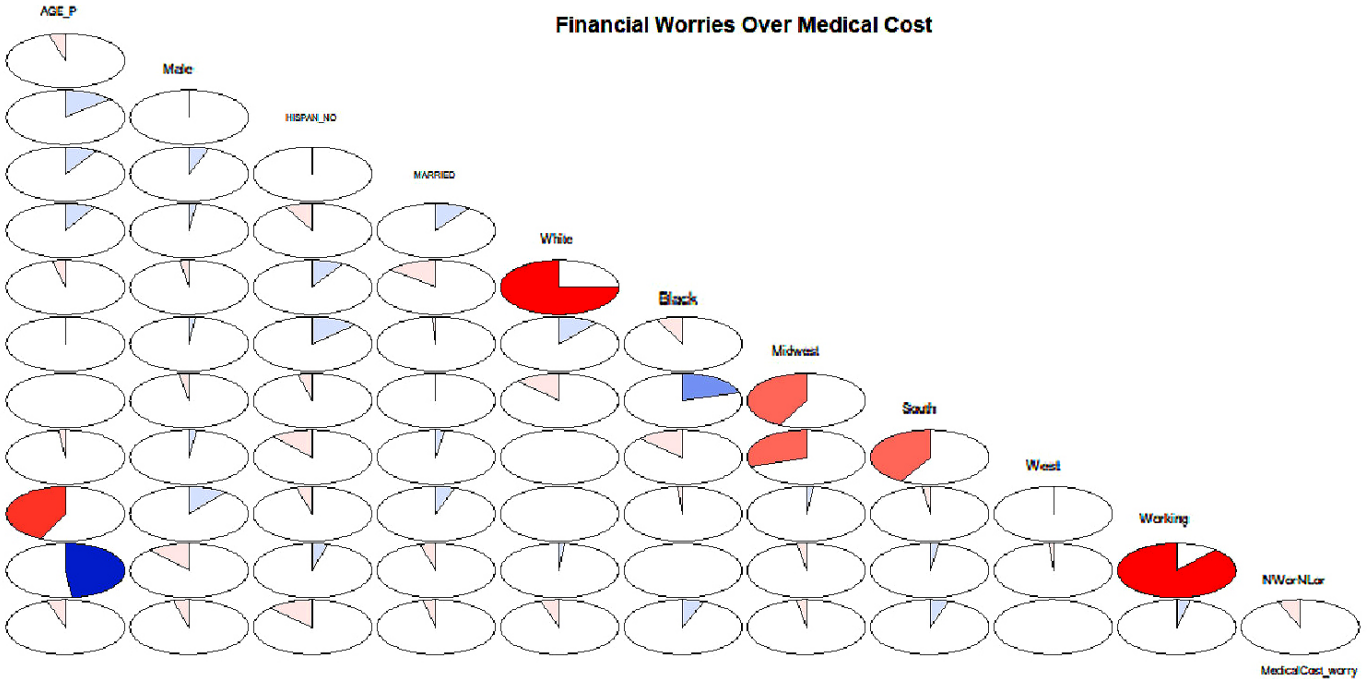


Figure 1. Matrix of correlations between variables

Table 2.– Logistic Regression for Having Financial worries over Medical Cost

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	0.156	0.097	1.600	0.110	
AGE_P	0.000	0.001	0.107	0.915	
Male	–0.219	0.029	–7.519	0.000	***
HISPAN_NO	–0.802	0.041	–19.613	0.000	***
MARRIED	–0.131	0.029	–4.456	0.000	***
White	–0.113	0.056	–2.017	0.044	*
Black	0.276	0.068	4.075	0.000	***
Midwest	0.113	0.048	2.377	0.017	*
South	0.247	0.044	5.635	0.000	***
West	0.104	0.048	2.167	0.030	*
Working	–0.348	0.058	–6.025	0.000	***
NWorNLor	–0.625	0.062	–10.128	0.000	***

According to the logistic regression, the male was 19.6% less likely than the female to have financial worries over medical cost. The non-Hispanic adults were 55.2% less likely to have financial worries over medical cost than Hispanic adults. Married people were 12.3% less worried. White were 10.7% less worried and Black population were 31.8% more worried. Compared to residents in Northeast, people in Midwest (12.0%), South (28.0%) and West (11.0%) were more worried about the medical cost. Compared to people who were not employed but looking, people who were employed (29.4%) or not employed and not looking (46.5%) were less worried.

Table 2 a. – Odds Ratio and Risk Increase Based on the Logistic Regression

	Estimate	Odds Ratio	Risk Increase
(Intercept)	0.156	116.9%	16.9%
AGE_P	0.000	100.0%	0.0%
Male	–0.219	80.4%	–19.6%
HISPAN_NO	–0.802	44.8%	–55.2%
MARRIED	–0.131	87.7%	–12.3%
White	–0.113	89.3%	–10.7%
Black	0.276	131.8%	31.8%
Midwest	0.113	112.0%	12.0%
South	0.247	128.0%	28.0%
West	0.104	111.0%	11.0%
Working	–0.348	70.6%	–29.4%
NWorNLor	–0.625	53.5%	–46.5%

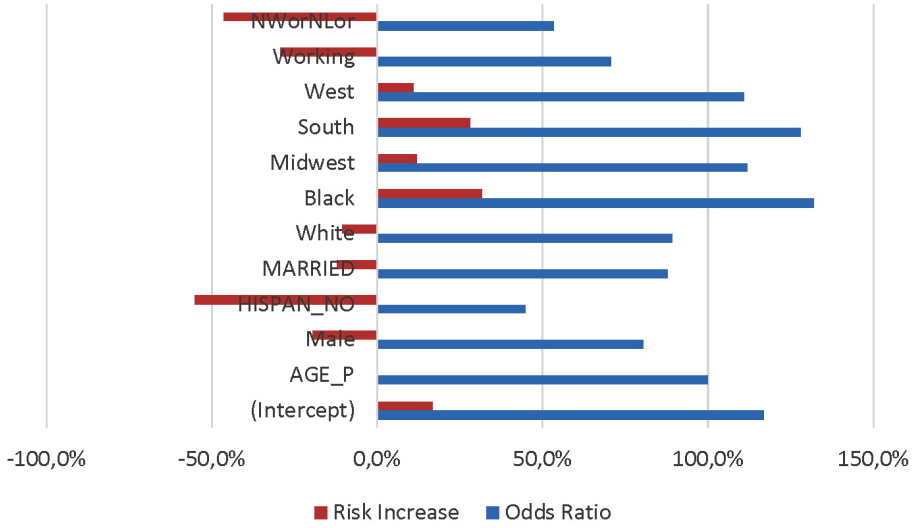


Figure 2. Artificial Neural Network in training sample

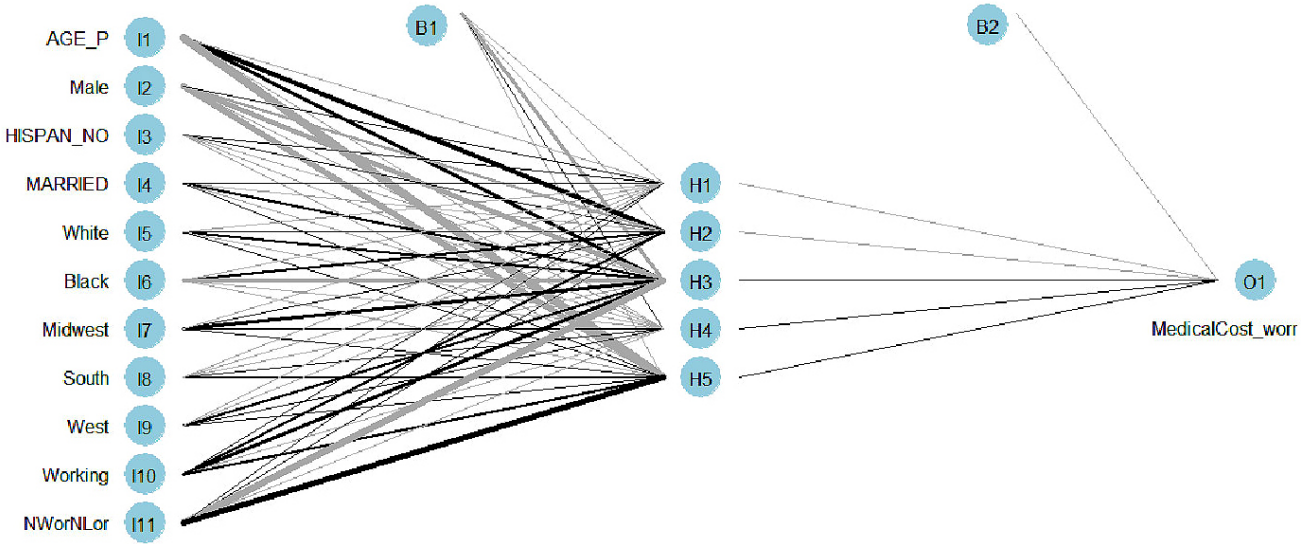
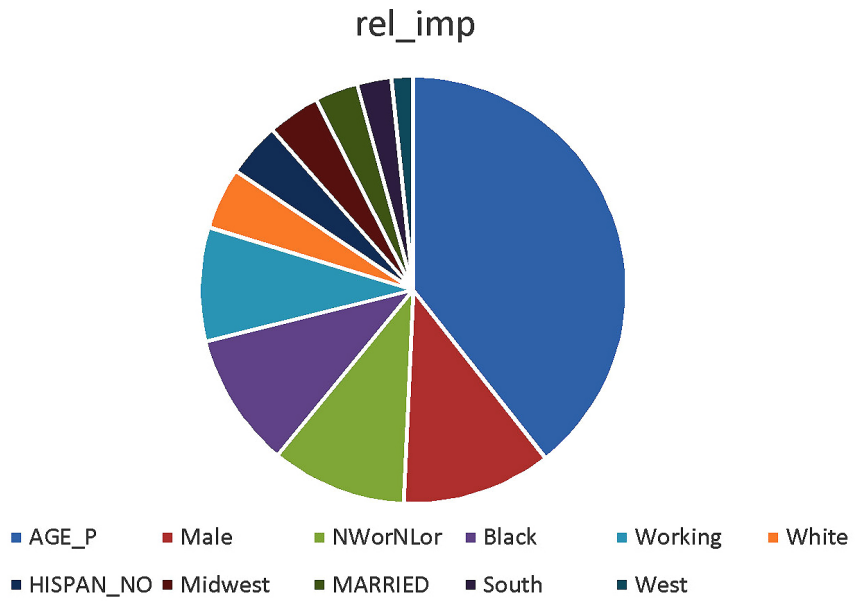


Figure 3. Variable Importance in Artificial Neural Network

In above plot, line thickness represents weight magnitude and line color weight sign (black = positive, grey = negative). The net is essentially a black box so we cannot say that much about the fitting, the weights and the model. Suffice to say that the training algorithm has converged and therefore the model is ready to be used.

According to this neural network, the most important predictors were age, sex, working status and race.



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For training sample, the ROC was 0.61 for the Logistic regression and 0.67 for the artificial neural network. In testing sample, the ROC was 0.60 for the Logistic regression and 0.65 for the artificial neural network.

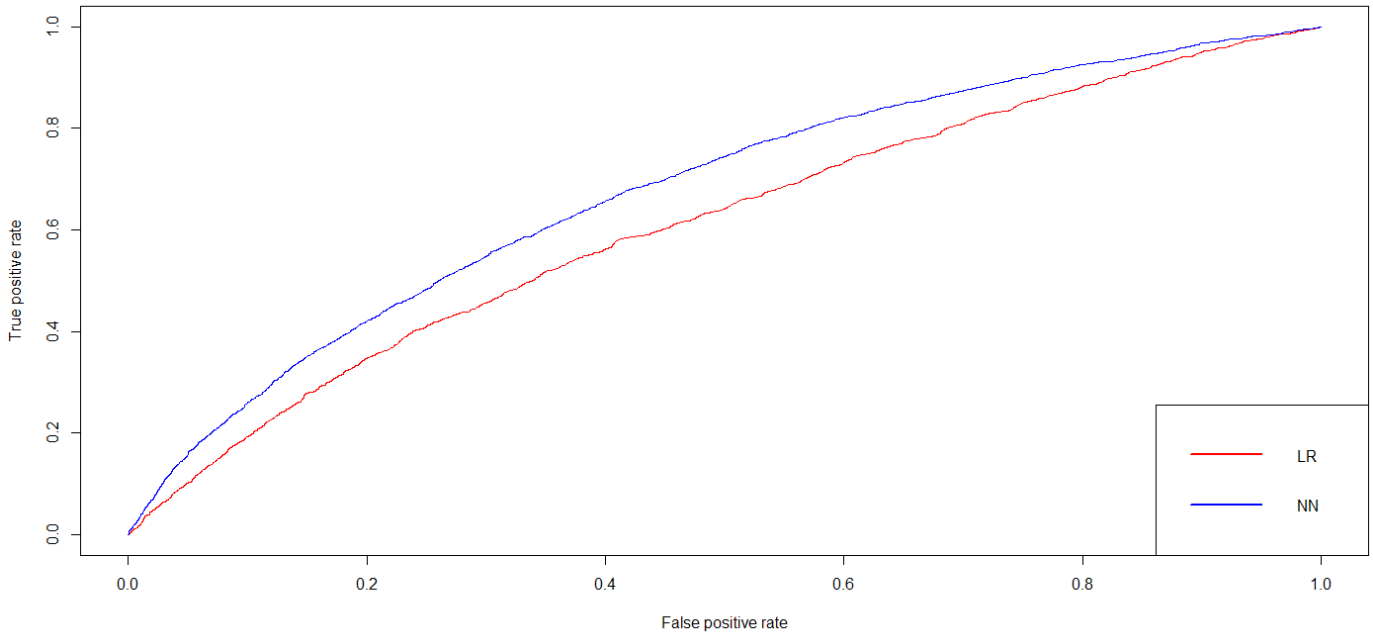

Figure 4. ROC in training sample for Logistic Regression (Red) vs Neural Network (Blue)

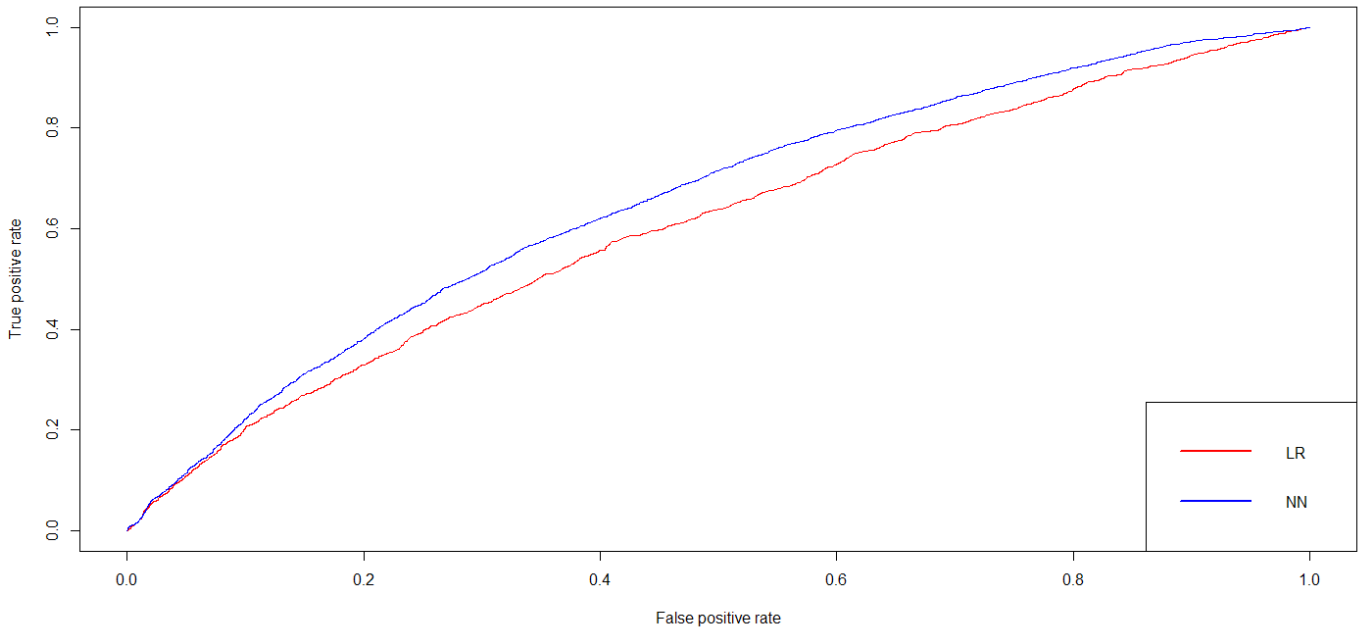

Figure 5. ROC in testing sample for Logistic Regression (Red) vs Neural Network (Blue)

4. Discussion

This study aimed to 1) examine the predictors of adults' financial worries over Medical Cost in 2017; 2) build a predictive model for adults' financial worries over Medical Cost using artificial neural network and compare its performance to logistic regression model.

About 26.4% of 26031 Adults had Financial worries over Medical Cost, about 28.2% among the female and 24.3% among the male.

According to the logistic regression, the male was 19.6% less likely than the female to have financial worries over medical cost. The non-Hispanic adults were 55.2% less likely to have financial worries over medical cost than Hispanic adults. Married people were 12.3% less worried. White were 10.7% less worried and Black population were 31.8% more worried. Compared to residents in Northeast, people in Midwest (12.0%), South (28.0%) and West (11.0%) were more worried about the medical cost. Compared to people who were not employed but looking, people who were employed (29.4%) or not employed and not looking (46.5%) were less worried. According to this neural network, the most important predictors was age, sex, working status and race.

For training sample, the ROC was 0.61 for the Logistic regression and 0.67 for the artificial neural network. In testing sample, the ROC was 0.60 for the Logistic regression and 0.65 for the artificial neural network.

There are limitations in this study. For example, we did not include the health conditions in this study when examing the factors of the financial worries of the medical cost. Health status could be a important factor for this topic and should be included in the future analysis when feasible.

In this study, we identified several important predictors for parents' financial worries over medical Cost in 2017 e.g., age, gender, race and working status. We built a predictive model using artificial neural network as well as logistic regression to provide a tool for early detection.

This research can provide the base for further research as how medical cost affects people and how to deal with high medical cost.

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Sectioin 3. Managemen

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THE APPLYING OF INTERNET OF THINGS (IOT) IN BUIDING E-GOVERNMENT OF ESTONIA AND LESSONS FOR VIETNAM

Abstract. Building the e-government plays an important role in the interaction between the Government and the citizen, and creates favorable conditions for citizen to exercise their democratic rights and participate in state management. IoT application in buiding e-government is interested by many countries in the world, especially Estonia is the country that with 99% of online public services and having many successes in construction and operation e-government. In Vietnam, building the e-government is interested in by the Party and the State to better serve the citizen, towards the openness and transparency of state management agencies' activities on the network. Despite certain achievements in the development of e-government, the implementation has not been as effective as expected. Vietnam is currently at an average level in the ranking table of development Indicators of the United Nations for e-government. Based on the experience of Estonia, the article offers lessons suitable to Vietnam's context on the application of IoT in building e-government. The paper is part of the research results of the topic "Construction technology map and technological innovation roadmap in developing and applying IoT in Vietnam", code: ĐM.40.DA/19.

Keywords: IoT application, E-government.

1. Overview of research

E-government is an inevitable trend the development of public administration of nations. E-government will change the mode of production and supply of public services to better serve the citizen. Building an e-government depends heavily on the

development speed of technology, technological infrastructure, national culture and technology, and high quality human resources to be able to effectively exploit and use the policies of government.

Up to now, there are many different views on e-government. According to the World Bank (2002), e-government means a systematic use of information technology by government agencies to make relationships with citizens, businesses and social organizations. Thereby transactions of government agencies with citizens and organizations will be improved, contributed to reducing corruption, enhanced publicity, convenience, reduce costs, and contribute to economic growth. The Organization for Economic Co-operation and Development argues that [16], e-government refers to the use of new government communication technology to perform various government functions, in which the internet brings about changes in government structure and mode of operation. And United Nations [18] shown that, e-government is the government that exploits the Internet and web features worldwide to provide information and services to people and others in society.

In addition to internet and web applications, e-government also includes other information technology applications such as electronic databases, networks, automated services, multimedia, personal identification technology [14]. E-government is the continuous optimization of service delivery, election participation and management by changing internal and external relationships through technology of Internet and new means [13]. Developing the e-government and maintaining this system requires the cooperation of both internal and external stakeholders, such as leaders at all levels, heads of agencies, information technology professionals and personnel operators, citizens and businesses [7].

Although there are different concepts, but it can be understood that e-government is application of information and communication technology for government agencies to innovate, work more effectively, and transparently, providing better information and services to citizens, businesses and organizations; At the same time, it creates more favorable conditions for people to exercise their democratic rights in participating in the state management. E-government consists of main three entities: citizens, government and business. The interactions between the three entities include: Relationship between government and citizens (G2C – Governmnet to Citizens), government and Business (G2B- Governmnent to Business), relations between government agencies (G2G- Government to Government).

E-government has many differences compared to traditional government. For the traditional government, the internal administrative process of state agencies is manual, laborious, time consuming. People cannot contact the government, state administrative agencies outside office hours, cannot be anywhere outside the headquarters of state agencies. People cannot register for a business license, make a birth certificate for their children or pay registration tax 24/24, 7/7 days and anywhere. E-government can overcome the above limitations of traditional government. In addition, the automation of administrative procedures of e-government allows processing procedures much faster, more compact, and simpler. Not only that, the information provided to people is also full, accurate, easy and more transparent.

Thus, building e-government and applying IoT in building e-government is an inevitable trend. However, the building depends on the conditions of resources and development level of each country, but they have the following general conditions [4, 11–20]: Building a solid information infrastructure on the basis of developing electronic data centers and computer networks with super hightway Infomation; universalizing the IT culture among the people, creating a premise to form a knowledge society; develop new business methods based on information technology; retrain the labor force and create new occupations and jobs; restructuring the system of state management agencies such as apparatuses, personnel, computerizing in order to

increase the operational efficiency of government agencies.

2. Research method

In order to have the lesson for Vietnam on the application of IoT in building e-government, the research team inherited published studies related to IoT, relating to building and operating the e-government in general and at the Estonia in particular; At the same time, refering to the information from website (https://e-estonia.com/) to better understand the current situation and solutions to build e-government in Estonia.

For more information, the research team conducted discussions and interviews with some employees and managers in Estonian businesses and academy such as the Company of Levikom, Proekspert Company, Cityntel Company, 1oT Company, Estonian Electronic Showroom, Mobilab Company, ReachU Company, and Electronic Government Academy – EGA. The results of the interviews were summarized, analyzed to clarify the assessments of IoT applications in building Estonia's e-government.

3. Research results

3.1. Building the e-government of Estonia

Estonia has encountered difficulties after separating from the Soviet Union, but until now, has become the focus of technology development and software development as well as being at the forefront of educational policy. According to Joseph M. Ellis (2018), Estonia is a model of e-government. It was built to support the government's work in a more efficient, sustainable, democratic and transparent manner. The foundation of this model is a national database that allows people to solve everything from paying taxes to voting. Each person will be issued an electronic identification card with a digital identifier. As a result, they can carry out any electronic transaction from paying taxes to paying bus tickets anywhere and anytime.

According to Hannes Astok [12], the process of building e-government has been going on since the 1990s, with the philosophy "Information technology is the future of the country". The Government has drastic and exemplary guidance from the highest level of leadership. Specifically, the Prime Minister of Estonia has always been the direct leader and decision maker of information technology application policies and building the country's e-government. As for the Ministers and gencies will direct the application of information technology, building e-government of the Ministry and the agency under their responsibility. In addition, Estonia has built a national public service portal (https://www.eesti.ee) to provide up to 99% of essential services (1,500 online services) to citizens, businesses and establish citizen registration management system, authentication system via electronic citizen code (eID), authentication via phone number (MobileID). Having to 99% of Estonian citizens have been granted a unique identification number (eID), and an electronic ID card with a digital signature to conduct transactions with state agencies, currently have about 14,000 accesses per day at https://www.eesti.ee.

To facilitate interaction between the government and the people, Estonia has applied IoT, building an X-Road platform to connect information systems and databases of state agencies. This system allows linking between different information systems. To date, about 1,000 agencies and organizations have connected to X-Road. Each information system has its own database but all are connected via X-Road and for information security, all data sent from X-Road is encrypted and digitally signed. All messages sent in the system are signed. The digital signatures are certified by X-Road central authority. All incoming messages are recorded and time stamped. Central agency X-Road provides time stamping services. The recipient of the message can then demonstrate with the help of the central agency X-Road. The system has been operating since 2001 with more than 2000 connected electronic services, more than 900 registered organizations and databases, more than 350 million transactions in a year.

The results of interviews and surveys at some Estonian companies and e-government showroom

(1/2020) show that: The success of building e-government by having of intelligent infrastructure and secure services ecosystems, with IoT connectivity solutions in various fields such as e-identify, security and safety, health care, e-government, mobile services, business business and finance, education, and etc, specifically:

– E-identify includes ID-card, mobile-ID, smart-ID, e-Residency services: 99% of Estonians have identity cards, 91.6% use the internet regularly, more than 700 million electronic signatures, and every citizen can provide electronic signatures to identify and use electrical services safely.

– Security and safety: Estonia is a country that uses blockchain technology at the national level to ensure the integrity of data stored in government databases and protect data against threats network security. In addition, Estonia has developed an electronic law system (e-Law), an electronic judicial system (e-Justice) and an electronic police system (e-Police).

– Health care: Estonia's health care system has been revolutionized by electronic solutions, 99% of data on health and prescription are digitized, and there are about 2.3 million queries of Doctors every month, 100% using electronic bills in healthcare. Patients, doctors, health facilities, and governments all benefit from electronic health services. Estonian citizens who have ever had a medical exam have an electronic health record online. Health information is determined by an electronic identification code that is highly confidential and accessible to authorized individuals and organizations.

– E-government: Estonia has 99% of public services available online 24/7. By the safe, convenient and flexible digital ecosystem, Estonia has reached a level of transparency in governance and building trust in the digital society. Therefore, Estonia has saved more than 844 years of annual working time and became a favorable environment, actively supporting businesses and entrepreneurs.

– Business and finance: Modern electronic solutions make setting up and running a business in Estonia quick and easy. Solutions such as e-signatures, e-tax, e-banking, e-business registration, or online public records have reduced bureaucracy to a minimum and created a favorable environment for operations production and business activities.

– Education: Estonia every citizen has the training and knowledge necessary to access modern digital infrastructure for using future. Estonia has completed its education information system since 2005; it is a database that collects all information related to education such as educational institutions, students, teachers, lecturers, graduation documents, learning materials and curriculum.

In addition, Estonia has built an information system for government meetings (e-Cabinet) to monitor, manage meetings, research, process electronic documents and records online to serve the government and the system of policy consultation (e-Consultation). Draft documents and policies after being consulted by related subjects via e-consultation will be sent to e-Cabinet for ministers to study, absorb and direct editing. These systems help reduce the time and paperwork for government meetings; support inter-ministerial policy consultations, consult citizens on draft legislative documents or draft policies. The priority resource for annual economic transformation and e-government in Estonia is an investment budget of 1.4% of the government's cost.

3.2. Building Vietnam's e-government

Since the 2000s, Vietnam has always attached importance to the development and application of information technology in operations of state management agencies, which is a driving force contributing to national renewal, industrialization and modernization. In 2014, Vietnam issued Resolution No.36-NQ/TW of the Politburo on promoting the application and development of information technology to meet the requirements of sustainable development and international integration. The Resolution has set specific targets by 2020 "to effectively implement the administrative reform program, closely linked to the development of e-Government and to provide high-

level online public services and in many sectors". In 2015, the Government issued Resolution 36a/NQ-CP on e-Government in order to promote the development of e-government, improve the quality and performance of state agencies to serve the people and businesses better. In 2019, the Government of Vietnam continues to promulgate Resolution No. 17/NQ-CP on a number of key tasks and solutions for e-government development in the 2019–2020 periods, with a vision to 2025.

Vietnam has early awareness of the importance of e-government, and has set certain targes. The Ministry of Information and Communications [4] has targeted, that by 2020, up to 30% of citizens' information will be automatically entered into online forms, 50% of online public services will be processed by electronic records, people do not need to the state agencies to carry out administrative procedures but do online at home. However, the implementation of e-government has not achieved the desired results despite certain improvements [6, 3–5], Vietnam's position in the United Nations e-government development Index is still at an average level. According to the United Nations [18], in 2014, 2016 and 2018, Vietnam's e-government development index has continuously increased, from 0.47 in 2014 to 0.51 in 2016 and above 0.59 in 2018, bringing Vietnam from 99 (2014) to 89 (2016) and continuing to rise to 88/193 countries, ranked 6/11 among ASEAN countries.

The above limitations are due to slow deployment, connectivity, integration of data sharing systems, integrated platforms, IoT connectivity, and electronic data sharing in unfinished ministries, branches and localities. Some important national databases in building e-government are still slow to implement, leading to the sharing of unrealized information systems, affecting e-government deployment. The handling, exchange, sending and receiving of electronic documents internally and among state agencies has not yet been effective, ocument management and operating systems of a number of different ministries, branches and localities. Along with that, the online public service is designed sporadically, is not friendly, the process of handling administrative procedures has not guaranteed the science, investment from budget for use of information systems and IoT in association with administrative reforms is limited, no meeting the need to modernize the administration, and not strong enough to create leverage to improve the governance efficiency of the government.

4. Conclusions and recommendations

Each country has measures to build e-government in accordance with its resources. On the basis of the achievements achieved in buiding e-government of Estonia; along with the current situation, the desire to build an e-government with IoT applications of Vietnam can draw some lessons and recommendations for Vietnam on building e-government as follow:

Firstly, enhance the role and responsibility of the leader in building e-government. This shows the determination to build the e-government of the entire political system, especially the Vietnam's Prime Minister as the chairman of the National Committee on E-Government. Building an e-government contributes to promoting the people's mastery, contributes to the transparency of the national administration, and improving the governance capacity of the government, creating a premise for access to 4.0 revolution and digital economy. Accordingly, in addition to the responsibilities of the head, the tasks of implementing e-government will be evaluated in association with the individual responsibilities of the heads of each ministry, sector and locality, measured through a set of indicators evaluate efficiency, measure the quality of e-government construction results. In order to achieve the set goals, it is necessary to have the high determination of the entire political system to create a new way of operating to promoting the development and application of IoT in building e-government, thereby promoting socio-economic development.

Secondly, complete and update the e-government portal (http://egov.chinhphu.vn/), enhance

the interaction between the government and the people through this portal. Along with that is the completion of institutional improvement for the development of e-government. It is therefore necessary to develop a policy on data sharing, about protecting personal data, on electronic authentication, on the reporting regime among State administrative agencies. It is necessary to study and propose the elaboration of the e-Government Law and guiding documents to ensure the legal corridor for developing e-government based on open data, application of IoT technologies, towards a digital society.

Thirdly, to build and perfect national foundations, especially national databases on population, business, education, health, science and technology. In order to ensure the efficient use of these national databases, it is necessary to build an IoT integration platform, to share data between central and local information systems; electronic system of sending and receiving electronic documents; electronic identification authentication system; link between the Government's specialized digital signature authentication systems and public digital signatures. Especially, National payment gateway to ensure smooth data and information among government levels.

Fourth, continue to accelerate the implementation of Resolution No. 17/NQ-CP of Vietnam's governmen on a number of tasks and key solutions for e-government development to 2025, with the task of building the foundation technology platform to develop e-government as with the trend of e-government development in the world. Accordingly, it is necessary to complete the update of Vietnam's e-government architecture framework, to supplement the reference model of shared information systems and national databases. Announced and updated annually through the integration of ministerial level e-government architecture, provincial e-government architecture, shared information systems architecture and facilities national database, and ensuring that in line with the context of the fourth industrial revolution.

In addition, it is necessary to mobilize resources both financially and humanly to build e-government, along with training a contingent of civil servants and officials with skills working in the Iot environment, step by step developing IT infrastructure, speeding up the information provision from plicies, legislation of state to people and businesses through the Internet.

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DO WOMEN LEADERS IMPROVE FIRM PERFORMANCE?

Abstract. This paper reviews previous studies, data, and theories on the impact of women leaders on firm performances. Studies were done in different countries in various industries. While there is no unanimous conclusion, the studies show that at least women leadership doesn't hurt company performances, and under circumstances do lead to better business results. Factors such as the characteristics of the industry, the balance of gender on board, capability, and social or company norms play indispensable roles in the potential impact of women leadership. Women leaders who are well-qualified and welcomed by both the firm and the country will benefit their company more than those who are not. In addition, reaching a threshold of the percentage of women leaders is critical for them to have an impact on firm performance. Besides firm performance, women leadership also has a positive impact on a firm's credit rating and its overall risks, which are also important aspects of the firm's overall performance.

Keywords: women leadership, company performance, gender balance, board diversity.

I. Introduction

Gender roles have evolved as human society advances. Early in history, although with some exceptions, women were generally determined to be responsible for baking, cleaning, making marriage more exciting, bearing children-all domestic affairs. Today, the perception of the role of women is completely different from the single-story told centuries ago. After countless protests, compromises, and sacrifices, women finally gained the recognition of "real citizen" with equal rights, freedoms, and opportunities to those of men. In fact, the change of the gender roles is about more than giving opportunities to individual women; more importantly, it is about giving the society a new way to communicate and develop. According to a recent study, women overscore men on 17 of the 19 key leadership capabilities that distinguish outstanding leaders from average ones, including "take initiatives" and "bold leadership", qualities that are usually expected to be found in men (Zenger [17]). However, although assessment showing women are as capable as men, they are less confident than men in assessing themselves (Zenger [17]). Women are intrinsically different from men, and women leaders are different from men leaders. As women are given more education opportunities and career options, many women leaders advanced to the top of the pyramids of many organizations, including corporates and government agencies. Even though proportionally still a very low percent of the top positions have been occupied by women, it is becoming a strong trend. A controversial question is to ask whether women leadership really impacts a firm's performance. Previous studies show no concrete conclusions and do not agree with one another. This paper surveys the literature on women leadership and firm performance and explores the key factors toward successful women leadership.

II. Methodology

Seventeen papers in the literature were compared for their conclusion of whether women leadership leads to better performance, and also for the factors

they used. Results varied even for those who considered the same factors. For example, there were two opposite hypotheses on the effect of gender balance on board on firm performance; although no consensus was reached, more tended to conclude that a company must reach a gender-balanced board to a certain extent for it to have a noticeable change in performance. For papers that considered the capability of women, all of them suggested that the capability of female leaders had a rather strong impact on firm performance. However, when it comes to social norms and company characteristics, results could be more biased. Although the researchers considered comparing the effect under different circumstances and extents, they conducted studies in companies and countries that welcomed female leaders. As a result, more data are needed to make a more inclusive conclusion.

III. Results

Of the analyzed papers, seven found a positive impact on the company performance, while five found no clear impact and three found the impact variable depending on the specific scenario.

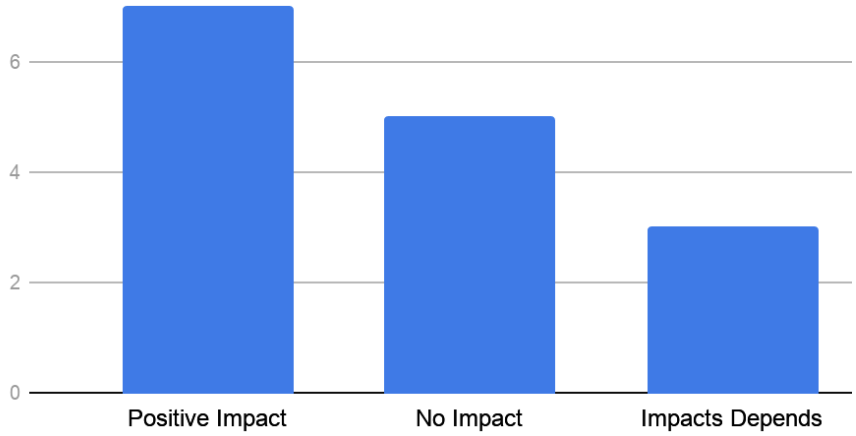

Figure 1. Number of Papers by Their Findings on Impact of Women Leadership

The following four key factors were considered by the researchers to have influence on how women leaders would impact a firm's performance: 1) balance of gender on board; 2) company policies and characteristics of the company; 3) social norms and cultural background, and; 4) capability of women. There are two more aspects studied by fewer researchers: women leaders' impact on credit rating and firm risk. These are impacts on the company but are not directly related to firm performance. However, these positive impacts might have long-term positive impacts on companies.

Table 1.– Key Factors Used in the Papers

Factors	Papers Using This Factor…			
	Total	Positive Impact	No Impact	It depends
Balance of Gender	5	3	0	2
Company Characteristics	5	4	1	0
Capability	5	2	3	0
Social Norms and Cultural Background	3	1	1	1

Papers that were reviewed showed some similarities in their results. Although with limitations, researchers stated their limitations after giving their data and made hypotheses considering those varying conditions. While greater capability and better firm performance have a very strong correlation, female impact on firm performance could still vary case by case given that female acceptance levels and industry types.

IV. Key Findings

A. Certain Proportion of Females Must be Met to Make a Difference

Some researchers examined factors and limitations in their studies and concluded that gender balance on board was a key factor influencing a firm's performance. However, there are different theories on this factor, and each is supported by different research.

Christiansen [1] concluded that women have a significant positive impact on a firm's performance that exchanging one male member of senior management for a female member would result in a 3–8 percent increase in profitability, and bringing gender balance in the senior team would be associated with 7–11 basis points higher Return on Assets (ROA). The researchers take the size of the board into account and find that the growth pattern is applicable to companies regardless of their types or sizes. In addition, the marginal effect of adding one female member to the current board is also a shared pattern.

Furthermore, most people who considered the balance of gender as a factor did not agree that one single woman was capable of making a difference. Linda-Eling Lee et al. [7] drew a different conclusion that for women to make a difference, more than three women are needed to result in an increase in firm profits. While analysis suggests that balanced gender composition may have the highest correlation with firm performance, researchers did further research on how gender-balanced a firm needed to be in order to improve its performance. Joecks [4] defined that 30% of females as a "critical mass" to positively affect a firm's performance.

Richard [12] studied possible outcomes under three different levels of gender diversity and proposed 1) homogeneous groups may not thrive in an environment requiring speed decision and competitive behaviors. 2) it may yield a positive effect as the diversity in management reached a moderate level, and 3) as diversity level exceeds a moderate level, cognitive biasing and communication problems may result in increasing conflicts.

The theory that having enough amount of women leaders in management would result in increased firm performance was agreed by many experts, but further research explained possible consequences under different conditions. In Is Gender Diversity Profitable? Evidence from a Global Survey (Marcus Noland, 2016), Noland finds that women leadership has a positive correlation with a firm's performance, but he concludes that this increase in performance is not a consequence solely influenced by women in top management. In fact, creating a pipeline of female managers has a greater effect than simply getting females to the very top, and having a high gender diversity throughout the industry will stronger this effect.

B. High Demand for Creativity and Company Acceptance Increase the Impact

Company policies and the type of industry is another factor many considered when addressing the female impact on firm performance. When discussing the impact of women leaders on a company, we have to consider the current situation for women in the workplace. While there is no consensus on the female impact on company performance, almost no one debates over the fact that women are less likely to be promoted to the same position although having the same capabilities as men. As a result, before analyzing the impact of women on companies, some did research on the effect of barriers for women in the workplace and effects on companies of such barriers.

In Christiansen's research (2016), women leadership on senior boards has a significantly positive influence on a firm's performance. He points out, however, this effect could vary and should be stronger if the industry hires more women employees and the industry itself has a greater demand for creativity and critical thinking.

Studying the effect of women's leadership on 153 banks in the U.S., Richard [12] concludes that women leadership has a marginal effect on a firm's performance, and banks that focus on innovation benefit from homogeneous management groups and highly heterogeneous management groups. Richard finds

only marginal effect in banks in America, while Krishnan [6] studies Fortune 1000 firms and concluded that women leadership has a direct positive effect on firm performance overall in all industries in the world.

Kotiranta discusses a possible factor influencing firm performance after suggesting an overall positive relationship between women leadership and firm performance: a complex connection between the company's multi-dimensionality and its performance. She suggested that only a sufficiently tolerable and flexible organization would be able to benefit from the diversity on board. In addition, Kotiranta introduced the term "glass ceiling" which suggests that the possibilities of women to move up in an organization above a certain hierarchical level are hindered by gender discrimination. Since women are generally harder to move up into the management level, they have to have exceptional leadership skills to be promoted. Glass ceiling strongly limits a firm's ability to hire capable leaders and as a result restricts a firm's economic growth. However, breaking this glass ceiling is very beneficial to businesses. In an early study, Chusmir and Durand [2], considering the barriers for women to be promoted, concludes that a 12 percent productivity gain could be achieved among female employees by reducing barriers to advancement.

In summary, those industries that are more flexible and require more creativity would benefit more from gender diversity.

C. Social Acceptance of Female Leaders Helps their Positive Effect

Reguera-Alvarado [11] reported her findings on women leadership by examining the relation between board gender diversity and economic results in Spain, which was the second country in the world to legally require gender diversity at the management level. Her findings suggested that women leadership, in this case, the mandatory laws, resulted in an efficient framework and overall economic growth.

Dale-Olsen [3] found different results while studying companies in Norway, a country that had a tradition of using quotas and whose female citizens had a high average education level. However, he found the effect of women on board on firm performance not significant and concluded that such a conclusion could not be drawn for other countries because of possible different policies and traditions.

In An Institutional Approach to Gender Diversity and Firm Performance [17], Zhang brought up a new factor: social acceptance of gender diversity. The finding suggests that the more normatively accepted gender diversity is in a country or industry, the more it benefits a company.

D. Capable Women Leaders Result in Positive Effect

According to Women In Management And Firm Financial Performance: An Exploratory Study (Charles B. Shrader, [13]), women are generally better at supporting relationships and generating ideas and innovation. Shrader's conclusion is that utilizing high percentages of females at all managerial levels benefits companies, especially large companies.

Smith [14] found that women leadership has an ambiguous effect on firm performance among 2500 Danish companies. However, she suspected that the effect depends on not the gender, but the individual women leaders themselves. Positive effects are mainly related to female managers with a university degree while those who do not have a university degree have a smaller, more insignificant effect on the companies. In addition, when comparing individual women leaders, Smith found that leaders who were selected by the staff bring profits to the company, while others who typically have family ties to the company owners were not as capable and as a result did not have a positive effect on firm performance.

Unite [15] also found no clear connection between female leadership and firm performance in his research and concluded that female leaders generally have the same managerial skills with male leaders and thus gives no material effect on firm performance.

In contrast, Kotiranta proposed a different theory after explaining the term "glass ceiling." According to her, since the glass ceiling makes it harder for women

to reach the same position as men, the female leaders who were promoted were in fact more capable. In such situations, female leaders are more capable than male leaders, benefiting the company more.

In Women on Boards and Firm Performance, Mijntje Lückerath-Rovers [8] finds no clear relation between women leadership and firm performance. However, he proposed that companies that hire women leaders merely based on capabilities would benefit more than those who consider other factors.

V. Other Impacts of Female Leaders on Companies

Even though in some cases, women leadership did not show direct impact on company performance, they do have other impacts on a company. These impacts, although lacking sufficient evidence, are potential factors that may improve company performance in the long run.

Women leadership may promote better corporate credit rating

According to Does Gender Diversity Make a Difference in the Boardroom? (Vikram K. Nanda, [9]), gender diversity – women on board – has a positive association with several factors that potentially influence a company's performance. It is found that the proportion of independent female directors has a significant positive impact on credit rating. Following associations are found: 1) the positive association between the proportion of female directors and the change in pension value is driven by non-corporate female directors; 2) directors with more frequent board meeting attendance will have a greater effect on board decisions; a positive association between independent female directors and pension compensation is driven by attentive female directors; 3) positive association between female directors and pension compensation is driven by compensation committee female directors.

Gender Diversity on Board Lowers Firm Risk

Yang [16] discussed the effect of gender diversity in the boardroom on firm risk and found that the firms that are affected by the Norwegian gender-balancing quota score lower in terms of performance but are characterized by less risk – which might positively affect firms' long-term success and survival. However, a low risk might be seen as positive or not as optimal depending on various perspectives. As a result, the effect of women on board regarding risk remains unclear in the long run.

VI. Conclusion

There is no definite answer to the question of whether women leadership has a positive impact on the companies' performance. Many researchers agree that women leadership could bring positive impact, while some studies found no definitive positive correlation. The hypothesis was that women's impact may not have directly shown on company performance, but in other aspects also benefits the company. Furthermore, the relation between women leadership and company performance is non-linear. Overall, females bring much more than merely gender diversity but diversity in thinking, communication, and working methods. Female leaders will have a significant positive impact if a country has a history of hiring a high percentage of both female employees and female leaders, hires enough amount of female leaders so their voices could be heard, and make sure the leaders have the capability and managerial skills. Ultimately, while the answer to whether women leaders improve firm performance remains unclear, it is worthwhile for companies to employ women leaders not just for general equality but also for potential economic benefits.

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ANTI-CRISIS STRATEGIES APPLICATIONS FOR COMPANY INTERNAL CONTROL IN HEALTHCARE SECTOR AND PHARMACEUTICAL INDUSTRY

Abstract. The internal control is organized on means of the managing subject in healthcare sector and pharmaceutical industry under the decision of a management for management and accounting efficiency. The purpose of this article is to present and systematize anti-crisis management strategies applications for company internal control as well as results demonstrating the most frequently implemented anti-crisis measures in large healthcare and pharmaceutical companies.

Keywords: anti-crisis strategies, internal control, healthcare companies.

Introduction

Product development errors, dosage errors, impurities, adverse events, counterfeits, etc. result in crises that are specific to healthcare sector and the pharmaceutical industry. Serious regulatory violations, unexpected government restrictions, loss of resources, lesser operational control, and dependence on a contract manufacturer's resources are some drivers specific to pharmaceutical industry.

A crisis can have serious negative impacts on an organization's public relations, integrity, reputation, and stakeholders. Reputation and stakeholders' confidence in products are two essential elements for a company's survival. These are more critical for pharmaceutical companies, since their loss can result in regulatory and legal problems. Any event with negative impact on public relations or that erodes end-user's confidence in products can have an unfavorable effect on market share, revenue, and business. Anti-Crisis management in any industry operation becomes more complex because of the involvement of multiple organizations separated not only by distance but also by business philosophies and cultures, in the case of overseas industry.

Several factors contributing to crises can be classified under two major categories: Controllable and Uncontrollable. Fast pace, judgment errors, human behavior, failures to understand cultural differences and miscommunication are some of the controllable factors that can cause crises.

Uncontrollable factors include natural disasters, political unrest, social upheaval, terrorism and wars. Natural disasters such as earthquake, tsunami and fire, which used to occur rarely, have occurred with accelerated frequency of late. Similarly, political unrest and social upheaval have become regular occurrences. These factors have to be considered during preparation of a crisis management plan. Expansion of the

operative field due to globalization may be contributing to such increased experiences. This factor is more serious due to the complexity arising from multiple parties involved in pharmaceutical industry.

Categories of Crisis and strategies, internal control of anti-crisis management Crises can be categorized as Controllable and Uncontrollable. Sudden and Smoldering are the categories based on prior knowledge. These are general categories of crisis and can be applied to any business or organization. There are some crises that are specific to pharmaceutical industry or to industry organizations. Crises resulting from impurities (product development), sourcing (regulatory changes drying up resources), supply (disruption of shipping routes), manufacturing (accidents) and unexpected post-marketing adverse events are some examples of pharmaceutical industry specific crisis.

Crisis management is as important as, if not more than, recognizing and understanding a crisis. The negative impact of a crisis of any magnitude can be so swift and destructive that very little time is left for managing it. The best way to manage a crisis is to be prepared for it well in advance. Since one cannot predict when a crisis will hit, the phrase "well in advance" gains additional importance in crisis management. Being prepared means having a conceptual understanding of possible crises of various types and having an infrastructure to handle them. It means all stakeholders understand their roles and responsibilities and are in a position to step to the plate when needed. This is challenging in pharmaceutical contract manufacturing and industry, where the operation spreads beyond the organizational boundaries and authority.

Internal control systems and types of internal control

Internal control systems have become organic elements of the operation of health care company. The manager's control duties have become unquestionable in the course of the last century. However, in a health care company it is not only the manager that performs control activities. The owner, the authorities, the employees and middle management staff also perform control during their work. Thus, in order to understand the functioning of organized internal control systems within companies, we must delimit them by means of definitions, and we reach the internal control system's operational framework conforming to COSO, as a result of numerous junction points.

It is necessary to work hard to ensure continuous monitoring of internal controls, in order to ensure that there are real controls and that they are working properly in order to achieve the following objectives:

- Maintaining the assets from theft, embezzlement and misuse.
- Ensure the use of the organization's resources efficiently and effectively without waste.
- Achieve efficiency and effectiveness of the operational processes.
- Reliability of financial reporting.
- Compliance with applicable laws and regulations.

Components of the Internal Control System:

1. Internal control system consists of five core components:
2. Control environment,
3. Risk Assessment,
4. Control Activities,
5. Information and Communication and Follow-up or Monitoring.

Types of Internal Control are the following:

- Accounting Control;
- Administrative Control.

Accounting control represents a set of measures aimed at protecting assets and ensuring the reliability of the financial statements and ensures its preparation in accordance with the by-laws, laws and regulations. It is attached to procedures and methods of accounting that are aimed at maintaining assets to verify the accuracy of the accounting data used in accounting records, tracking the necessary procedures to provide correct and accurate financial information that can be relied on by the entity for the purposes of planning and making the necessary

decision to achieve the company's goals, such as preventing waste and misuse of company resources, this is done by working on providing financial and accounting system which is designed in an appropriate manner that can monitor, follow- up, and protect the resources, property and assets of the company, and to ensure its existence, and that their use is conducted in an appropriate manner without exceeding policies, laws and regulations of the company, in addition to a system concerning with inventory matters and yearly settlements that are performed at the end of the fiscal period, and the obligation to prepare reports, analytical sheets, and the periodic and regular reviews of the monthly audit, in order to conduct compatibility between what is actually existing and what has been recorded in the books, as well as the process of performing periodic documentary audit and provide an adequate accounting system, internal check and internal audit, financial control and technical audit help for quickly and easily detect any existing error in the records.

Administrative control includes the organizational chart, methods and procedures that specialize in productivity sufficiency and commitment to policies and set administrative decisions. These procedures are linked indirectly with the financial aspects, accounting records; this control involves the study of time and movement, the use of statistical methods and preparation of personnel training programs and quality control. It includes the necessary procedures to ensure that the company's property, human and material resources are used efficiently and effectively and thereby help to achieve goals in the lowest possible cost, adjust the waste and misuse of these resources, and to verify the extent of commitment of the company and all its employees to apply policies, laws and regulations related to the statutes of the company and domestic legislations governing its operations and activities. This is achieved by working on the precise and clear definition of the main objectives to be achieved at the general level of the company, in addition to the sub – goals that should be achieved by the different departments within the organization, in order to achieve the overall objectives, and to match the objectives to be achieved with the company 's capabilities, and work periodically by a mechanism involving all aspects of the company's own activity through conducting studies and estimated budgets include (expected sales and production needed to cover these expected sales, expenses and revenues) that will contribute to identify deviations and their causes and take appropriate solutions. In addition to the development of a system that includes policies, procedures and regulations to be followed and abide by, which covers all processes and aspects of the company, including incentives for employees, policies for the sale and purchase of materials, products and services pricing and production process, procedures and rules for the implementation of financial policies in the project in a way that helps to increase control over all activities and aspects of the company, allowing the achievement of objectives in a more efficient and effective manner.

Conclusions

The results of the research regarding the taken anti-crisis measures show two dominant types of strategies. In most enterprises one of the forms of reactive activities was focused on. This resulted in the creation of more transparent procedures and the reduction of broadly understood costs. It can also be said that companies applied the strategy of organizing activities. Considering the divisions of the various anti-crisis strategies regarding causes and adaptations, a company takes actions that emerge based primarily on one factor: consolidation.

Essentially, pharmaceutical businesses focus on: the product, its redefinition, improving quality management, information systems, and efforts focusing on the core business. The taken measures relate not only to coping with the crisis, but also development. Considering the different typologies of anti-crisis measures, the implemented solutions comprised both restructuring as well as growth.

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Section 4. World economy

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INVESTMENT IN HIGHWAY CONSTRUCTION IN KYRGYZSTAN UNDER THE "ONE BELT AND ONE ROAD" INITIATIVE

Abstract. As one of the key countries in the "one belt and one road" infrastructure construction, the development level of transportation infrastructure in Kyrgyzstan is related to the interconnection of "one belt and one road". Therefore, Chinese enterprises' participation in highway construction in Kyrgyzstan not only helps to promote the development of their transport infrastructure, but also facilitates the construction of "one belt and one road" construction. Based on the analysis of the investment environment of highway construction in Kyrgyzstan, this paper points out the precautions for Chinese enterprises to invest in highway construction in Kyrgyzstan, which will be beneficial for Chinese enterprises to make steady progress in the process of "going out".

Keywords: China, Kyrgyzstan, highway construction, investment, one belt and road.

ABBREVIATIONS:

BRI	Belt and Road Initiative
CAREC	Central Asia Regional Economic Cooperation Program
CHY	Chinese yuan
FDI	Foreign direct investments
USD	US dollar

Introduction

Since September 2013, when President Xi Jinping put forward the proposal to build the Silk Road Economic Belt in Kyrgyzstan, the construction of "one belt and one road" has been upgraded to China's all-round opening up strategy in the new era. Central Asian countries such as Kyrgyzstan are the core area of the Silk Road Economic Belt Construction, and have important geopolitical and geopolitical economic strategic positions. China has a wide range of interests in Central Asia. In the meantime China has established a multi-level strategic partnership of cooperation with Kyrgyzstan and other Central Asian countries. With the advance of the "one belt and one way" initiative, the scope and depth of Sino

Kyrgyzstan cooperation have been increasing. China has become the largest source of foreign investment in Kyrgyzstan. In this context, this paper focuses on the strategies of Chinese enterprises participating in the construction of Kyrgyzstan's highways, which has important practical significance for deepening the economic cooperation and development between China and Kyrgyzstan.

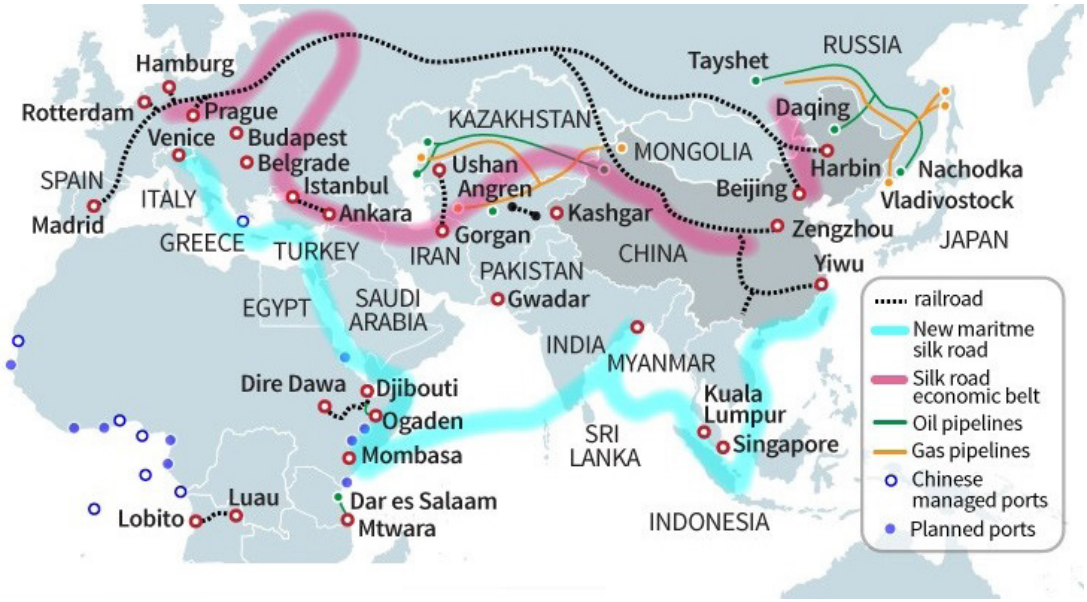

Figure1. Infrastructure projects being planned and undertaken as of December 2015 in China's Belt and Road initiative

2. Literature review

2.1 Investment. Definition

Investing is putting money to work to start or expand a project, or to purchase an asset, or interest where those funds are then put to work, with the goal to income and increased value over time. The term "investment" can refer to any mechanism used for generating future income. In the financial sense, this includes the purchase of bonds, stocks or real estate property among several others. Additionally, a constructed building or other facility used to produce goods can be seen as an investment. The production of goods required to produce other goods may also be seen as investing.

For Kyrgyzstan, China is one of the most important economic partners. There are 397 Chinese enterprises in Kyrgyzstan and another 170 joint Kyrgyz-Chinese enterprises. Tax revenues from large enterprises with Chinese investments in 2018 amounted to 3.8 billion soms (showing an increase of 20% compared to 2017). However, Sino-Kyrgyz economic cooperation has its pitfalls.

China is the largest investor in the Kyrgyz economy: in 2018, the share of China amounted to 43.1% of the total investment received and amounted to $245.6 million. According to the American Enterprise Institute (AEI), the amount of accumulated Chinese investment in Kyrgyzstan in 2005–2019 years amounted to $4.73 billion. For a small-sized Kyrgyz economy, this is a significant amount. However, according to the press service of the Government of Kyrgyzstan, Chinese investments in 2018 decreased by 19% compared to the previous year.

3. Methodology and data

3.1. Methodology

In this paper will address the following issues: Road projects, Foreign direct investments, understanding China's Belt and Road Initiative, key BRI-Related ongoing activities in Kyrgyzstan, environmental analysis of highway investment in Kyrgyzstan, evaluation of investment environment of Kyrgyzstan's highway. For data, the author used questionnaires, interviews, and independent re-

search in order to gather also resources and mediums used data collection such as official news articles and other relevant information.

3.1.1 Road projects

With a total value of US $1,128 million are aimed at improvement of transport communications within Kyrgyzstan in the north-south direction and east – west. At the same time, these projects are components of the so-called CAREC corridors that are designed to improve transport links within the Asia and connect the region with China, South and West Asia, Europe. Road Bishkek – Naryn – Torugart is part of the corridor 1c, alternative North – South road connects corridors 1 and 3, and the Osh – Sarytash – Irkeshtam and Osh – Batken – Isfana roads enter nyat in corridor 2. These roads are considered as strategic for the country. Bishkek-Naryn – Torugart and Osh – Sarytash – Irkeshtam are the main roads connecting the Kyrgyzstan with China; the North – South alternative road will become the second road connecting northern and southern parts of Kyrgyzstan, separated by mountains; Osh – Batken – Isfana Road built to bypass Uzbek and Tajik enclaves and create opportunities for unhindered traffic between the Batken region and the rest of Kyrgyzstan.

A promising area of cooperation was the laying and modernization of roads in Kyrgyzstan. Kyrgyzstan is the transshipment base of Chinese trade in Central Asia, and it is for this reason that China is most active in shaping the modern logistics and transport infrastructure in the republic. By 2019, China has provided Kyrgyzstan with loans worth about $1.69 billion for transport projects. Beijing has already implemented such major infrastructure projects as the rehabilitation of the Bishkek – Naryn – Torugart road connecting Kyrgyzstan with China (total investment is $ 600 million) and the construction of the North – South highway.

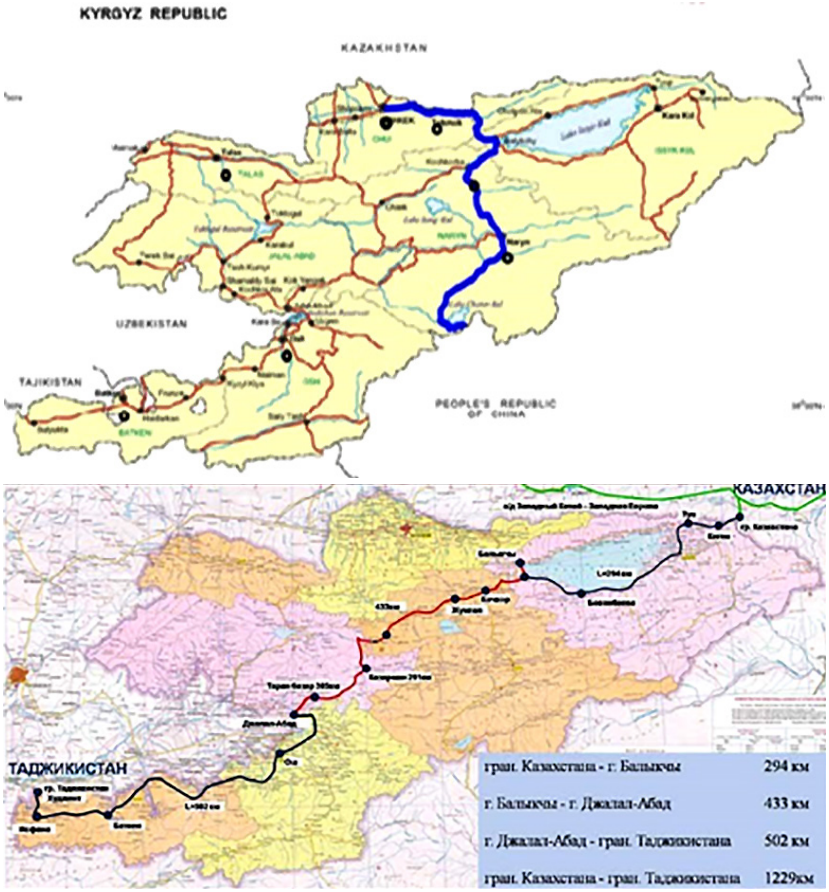

Figure 2. BRI-related automobile road projects in Kyrgyzstan

In January 2016, during the visit of the then Prime Minister of Kyrgyzstan Temir Sariev to China, priorities for bilateral cooperation were identified. Two of the three main priorities were related to transport infrastructure: the construction of the China – Kyrgyzstan – Uzbekistan railway (KKUZhD) and the ring road around Lake Issyk-Kul. If the ring road around the lake is partially rehabilitated, the KKUZHD project has not yet been agreed.

Figure 3. The construction of the China – Kyrgyzstan – Uzbekistan railway KKUZhD

Previously, Beijing presented its version of the railway construction project with a Kyrgyz section of 268 km, while the Kyrgyz project was 112 km longer. The Kyrgyz side explained this by the fact that the road would go around the mountains. So you do not need to build additional tunnels, which will significantly reduce costs. The second Chinese construction option did not suit Bishkek with the gauge of the railway tracks adopted in the PRC (1435 mm), since in Kyrgyzstan, like in Uzbekistan (the third participant in the project), a gauge of 1520 mm wide is used

3.2. Questionnaire

As we can see in figure 4, the key of Chinese investment sectors are geological explorations, the mining industry and the production of refined petroleum products.

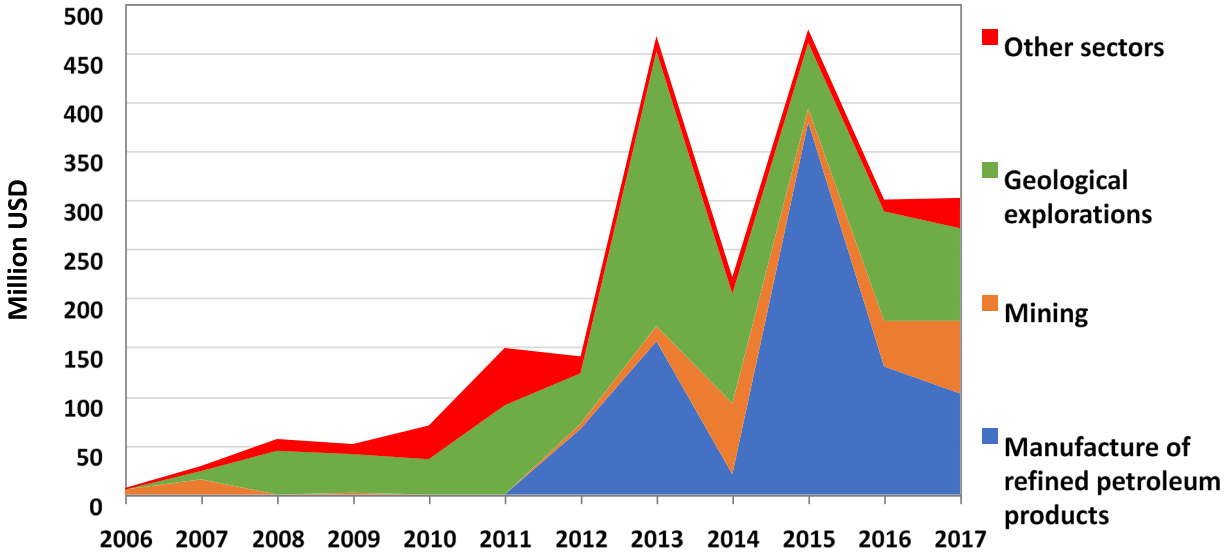

Figure 4. Chinese FDI by sector

3.3 Foreign Direct Investments

Since 2012, China has become the largest source of foreign direct investments into the economy of Kyrgyzstan (Figure 5); for 2006–2017, the cumulative gross of Chinese FDI inflow was equal to USD2.3 billion. For this period, Chinese FDI constituted 25–50% of total FDI to Kyrgyzstan, which is equivalent to 2–7% of the country's GDP.

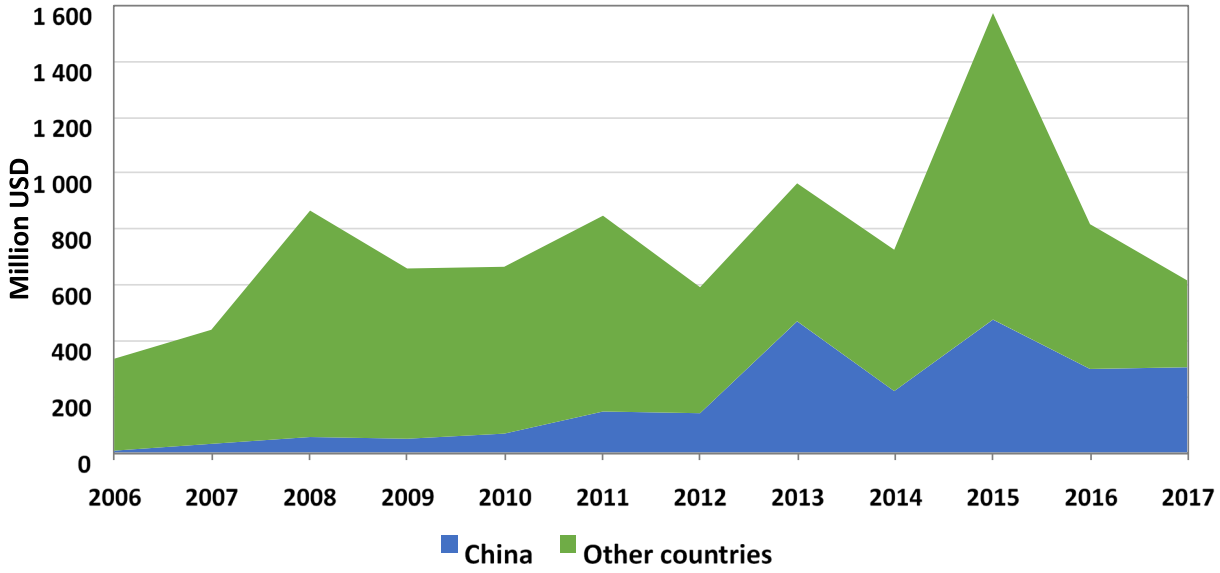

Figure 5. Gross inflow of FDI from China and other countries

3.4 Interview

Via social media messages was conducted a survey, the survey was conducted among the common people of Kyrgyzstan and they gave their opinion about Chinese investment in Kyrgyzstan.

Here are the questions and they answers:

Table 1.

Does Chinese investments improve Kyrgyzstan's economy		**What do you feel about Chinese investments in Kyrgyzstan**		**Does Kyrgyzstan has advantages from Chinese investments**	
Yes	No	Positively	Negatively	Pros	Cons
61%	**39%**	**65%**	**35%**	**61%**	**39%**

4. Understanding China's Belt and Road Initiative Background of Chinese enterprises' participation in Kyrgyz highway investment

The Belt and Road refers to the Silk Road Economic Belt and the maritime Silk Road in twenty-first Century. It is an initiative made by Chinese President Xi Jinping when he visited Central Asia and Southeast Asian countries in September 2013 and October. The "one belt and one way" initiative is based on the idea and initiative of the cooperation between the state and the region, and is promoted by the joint efforts of all countries to realize the economic development of the developing countries and the improvement of people's living standards. At present, more and more countries are actively responding to and participating in the construction and development of the "one belt and one road". China and Kyrgyzstan are adjacent in landscape, have a long history of exchanges, and have good cooperative relations.

4.1 BRI-related investments on the roads in Kyrgyzstan

Recently, the Chinese government has supported the implementation of several major infrastructure projects in Kyrgyzstan. Almost all projects in this list was financed through soft loans. Total amount loans

for the projects shown in the table are 2.1 billion US dollars; if to add grants and the cost of the project "resources in exchange for investments" to this amount, then the total cost of infrastructure projects funded by China in Kyrgyzstan, will reach 2.2 billion US dollars. Road projects with a total value of US $1,128 million are aimed at improvement of transport communications within Kyrgyzstan in the north-south direction and east – west. At the same time, these projects are components of the so-called

CAREC corridors that are designed to improve transport links within the Asia and connect the region with China, South and West Asia, Europe.

4.2 Environmental analysis of highway investment in Kyrgyzstan

Kyrgyzstan is located in Central Asia, covering an area of 199900 square kilometers. Neighboring countries include China, Kazakhstan, Uzbekistan and Tajikistan. It is a typical landlocked country. Kyrgyzstan is adjacent to the mountains and waters of Xinjiang in China. It is the only way to communicate between China and Central Asia. Kyrgyzstan is an important neighboring country of China. The area along the way is from Kyrgyzstan to the central part of the Asian continent to Europe. Therefore, Kyrgyzstan's position in the initiative of China is very important.

4.3 Evaluation of investment environment of Kyrgyzstan's highway

Over the years, the Chinese and Kyrgyz governments have reached cooperation agreements in various aspects, and the two governments have made a lot of efforts and contributions to the smooth investment of Chinese enterprises in Kyrgyzstan. However, there are still some deficiencies in Kyrgyzstan's investment environment, and Chinese enterprises do face some difficulties and deficiencies worthy of attention. For example, Kyrgyzstan's labor force of suitable age is insufficient, the financial system is not perfect, Chinese enterprises do not know enough about the market of Kyrgyzstan. On the other hand, the laws and regulations on foreign investment in Kyrgyzstan are still lacking, and the investment of Chinese enterprises in Kyrgyzstan is too single.

Conclusion

After the initiative was put forward, the scope and depth of Sino Kyrgyzstan cooperation continued to expand. With the development of Kyrgyzstan's economy, the demand for transportation in Kyrgyzstan is increasing gradually every year, but the current infrastructure is still very inadequate. On the one hand, the existing transportation facilities in Kyrgyzstan, such as roads, railways and airports, are in disrepair and in urgent need of maintenance. On the other hand, Kyrgyzstan needs to expand roads and railways and build corresponding supporting infrastructure. However, since there are risks in investment, through the evaluation of Kyrgyzstan's highway construction investment environment, the paper also lists the precautions of Chinese enterprises in Kyrgyzstan's highway construction investment, and emphasize that while seizing opportunities, Chinese enterprises also need to carefully consider and timely pay attention to relevant information in the whole process of investment, so as to minimize the possibility and risk of investment failure, Ensure the smooth implementation and completion of the investment.

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PRELIMINARY RESEARCH ON THE ISSUES OF ATTRACTING CHINESE INVESTMENTS TO RUSSIA'S FAR EAST INFRASTRUCTURE

Abstract. Sino-Russian relations are an important factor in the development of the Far East region of Russia. This study analyses the current situation of investments in the Far East region of Russia, what share of investments account for China and why infrastructure is important for the development of the region, especially the transport sector. Issues of attracting investments to the region and possible recommendations are also reviewed.

Keywords: Russia, Far East, China, infrastructure, investment, FDI

1. Introduction

The development of Russia's Far East has been a top priority since 2013 making efforts to qualitatively improve the living environment and business climate to get away from the image of a problem region, and lagging periphery of Russia that is losing its population. "Now we see the future of the Far East as it is one of the key centers of social and economy development of Russia, the place that should be effectively integrated into rapidly developing Asia Pacific region Expanding economic freedom and providing investors with the best conditions for doing business is our top priority" stated Vladimir Putin [1].

A number of successful investment projects have been implemented in the Far East of Russia, but the pace of investment growth is still insufficient to implement the potential of the region. In order to effectively integrate, modern cross-border and developed infrastructure is necessary.

In this paper the author tries to analyze the importance of investments in the infrastructure sector, obstacles and issues in attracting these investments and discusses why China is a favored investor.

2. Literature review

2.1 Foreign direct investment. Definition

The International Monetary Fund defines foreign direct investment (FDI) as "a category of international investment that reflects the objective of a resident in one economy obtaining a lasting interest in an enterprise resident in another economy. The lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise, and a significant degree of influence by the investor on the management of the enterprise" [2].

2.2 The Far East of Russia. General information

The Far Eastern Federal District (FEFD) is the largest of 8 federal districts in Russia, comprising 11 federal

subjects, equaling to a territory of 6,952,600 km^2 and making up 40.6% of Russia's territory. Yet, being the least populated district with only 8,188,600 people, amounting to 5,6% of Russia's population. The gross regional product (GRP) equals to 43805 billion rubles which is 5.8% of GRP of the Russian Federation [3].

Numerous unique logistic opportunities, as well as proximity of the global market of Asia-Pacific Region (APR) countries (55% of the world's population), significantly increase the investment attractiveness of the region. The region has the largest reserve of mineral resources in the country and the Far Eastern basin holds third place in Russia judging by the freight turnover of marine transport, which equals to about 25% of the total Russian freight turnover. Those are only some of many factors appealing to investors [4; 5].

Since December 2014, infrastructure support and institutional systems for implementing investment projects had been created, some of which include tax and administrative benefits of Advanced Special Economic Zones (ASEZ) and Free Port of Vladivostok (FPV) regimes [3].

Among the 11 federal subjects, "Primorye is one of the most desirable locations for conducting business in the Far East. The territory has a significant proportion of the ASEZ and FPV residents in the macro-region, largely due to its favorable geographical position, accessibility to sea, air and land transport as well as its strong scientific and technological potential" as stated by the Director of Primorye ASEZ Management Vasily Bolshakov [6].

All of the above mentioned, make the Far East region of Russia a favorable and pleasant region to invest in. Although there are still many issues to why the Far Eastern Federal district isn't receiving the needed amount of investments.

2.3 Review of studies conducted on similar subjects

Below are examples of scientific works, the subject of which is similar to the subject of this article.

In 2017, Li Xiaolong discussed the strategies and prospects of Chinese investment in the construction industry of Russia through "One Belt One Road" initiative. In the author's opinion, the strategy and the presence of the Asian Infrastructure Investment Bank in Russia can solve the financing gap in the development of Russia's infrastructure and indirectly improve the domestic investment environment, as well as help reduce unemployment in Russia and will enable the introduction of advanced technologies, without influencing Russia's leadership in Central Asia. The author highlights, that China has sufficient capital and technology for long-term and stable investment in infrastructure construction [7].

Based on *Qin Dong's paper in 2018*, some of the key reasons why the Far East doesn't have more major Chinese investment projects implemented are:

- The richest region of China is the South where much more financial resources are concentrated, but it is also the furthest from the Far East of Russia;
- In 2014, due to a huge amount of debt on provincial and municipal levels resulting from ill-conceived, inefficient and high-risk investments, Chinese investment policy has become more cautious;
- From the point of view of Chinese investors, the problem of bureaucracy and administrative inefficiency is very acute in Russia;
- A large number of Chinese businessmen often complain about the inconsistency and variability of legal acts established by the Russian authorities;
- The low amount of population in FEFD implies a limited market and low domestic demand.

In order to attract more major investments from China, the author concludes that central and local authorities should actively improve the investment environment, accelerate the construction of infrastructure, implement policies of preferences and spread information on the development of the Far East to a broader range [8].

In 2019, Dhananjay S. in his article addresses the rise of Chinese domination in Central Asia and on

the other hand, Russia's struggle to maintain its influence. Conflicting territorial claims between China and Russia in the Russian Far East (RFE) and the possibility of them arising if China increases its impact in the RFE are also discussed. The author concludes that there are possibilities of India becoming a strategic partner of Russia, while weakening Chinese influence. In Dhananjay S.'s opinion, Russia and China have diverging interests which may become more apparent in the future. Thus, Russia should use the politico-economic opportunity to improve relations with the West [9].

In 2019, Hirofumi A. conducted a preliminary assessment on the performance of ASEZ and the FPV. The author states a number of facts revealed during his assessment, namely that the number of residents is higher in FPV than in ASEZ; there is a big difference among ASEZ's in terms of the registered residents' quantity. In addition, the author did not find any evidence to confirm that both ASEZ and FPV successfully promote the export-oriented manufacturing industry, that the government anticipated while preparing the two instruments. Although, the research revealed the enthusiasm to develop various service businesses and statistics of total number of residents demonstrate positive dynamics, which altogether suggests promising prospects [10].

In 2019, Ma Yujun and Denis V. Suslov's paper highlighted urban infrastructure (being number one), local energy and high technologies as promising sectors of the FEFD economy for Chinese investors. The authors concluded, that to maintain close economic relations, not only on the basis of trade partnerships, it is important to further improve the institutional regimes on both sides of the border, which is currently being implemented: by the continuation of the construction of ASEZs in the Russian Far East and the implementation of the Free Trade Zone Plan in Heilongjiang Province, China [11].

The authors of the above-mentioned works analyze the influence and situation of Chinese investments in Russia and the Far East, as well as identify some problems and recommend some proposals to solve them.

In this paper, data was summarized and applied using different methods of collection, then reviewed immediately for the years 2017–2019. While there has been much research recently on Chinese investment in Russia and the Far East in general, few researches have taken into consideration the issues of attracting investments aimed at infrastructure and why these investments are in acute need in the FEFD. This work will try to identify and fill gaps in related research fields.

3. Methodology and Data

3.1 Methodology

In order to have a better understanding of the topic, this paper will address the overall importance, issues and recommendations for overcoming identified problems of attracting Chinese infrastructure investments to the Far East region of Russia. Secondary data, as well as qualitative and quantitative approaches, were used to research and analyze these issues. Official scientific journals, government reports, official statistics, financial sources, analytical reviews, official journal articles and other sources were used to obtain secondary data, the purpose of which is to research and analyze the existing information. The secondary data was collected in English, Russian and Chinese languages. The author conducted an analysis for 2014–2020 years.

Using various approaches for collecting data, the main objectives pursued by the author were to:

1. Study the general situation of FDI in the Far East region;

2. Identify the demand and understand the importance for infrastructure investments in the Far East region;

3. Determine the current state of Chinese FDI to the Far East region;

4. Study the measures of implementation;

5. Analyze what factors affect China's investment in the Far East infrastructure.

3.2 Data collection

The data are collected through well-known Internet resources such as The Ministry for the Development of the Russian Far East, Far East Development Corporation, Far East Investment And Export Agency, Information Analytical Agency "East of Russia", InfraONE Research, The Roscongress Foundation, Ministry of Finance of the Russian Federation, Russian Federal State Statistics Service, National Bureau of Statistics of China, World Economic Forum, UNCTAD and other information sources based on specialized journals, scientific articles, expert opinions, etc.

4. Data analysis

4.1 General situation of investment in the Far East of Russia

According to research conducted by InfraONE Research agency, the FEFD receives the lowest share of investments among other federal subjects and receives almost no subsidies for creating infrastructure [13].

The region's economy remains the penultimate in the country, even with the appearance of 2 new subjects in the district. According to the results of "The Socio-economic situation of federal subjects of Russia 2018 rating", the average value of the integral index of the subjects in the FEFD was 32.13 points, which is lower than the average value among all 85 regions. At the same time, in 2018, the integral index increased in all FEFD's subjects. This situation only increases the demand for investments, especially in infrastructure [12].

In 2018, the district received only 9.22 billion rubles for capital investments in state property, where compared to Crimea, the amount was 58.8 billion rubles. In the same year, the FDI was at a minimum level during an eight-year period, amounting to $5.5 billion in nominal terms. As seen on Figure 1, their share of all incoming Russian investments was $140.4 billion which is only 3.9%, reaching the level of the years 2013 and 2011, where the FDI was lowest. The highest peak of FDI in the FEFD during the eight years in monetary terms and as a share of total Russian FDI was in 2016 and equaled to 8.4% or $11.6 billion.

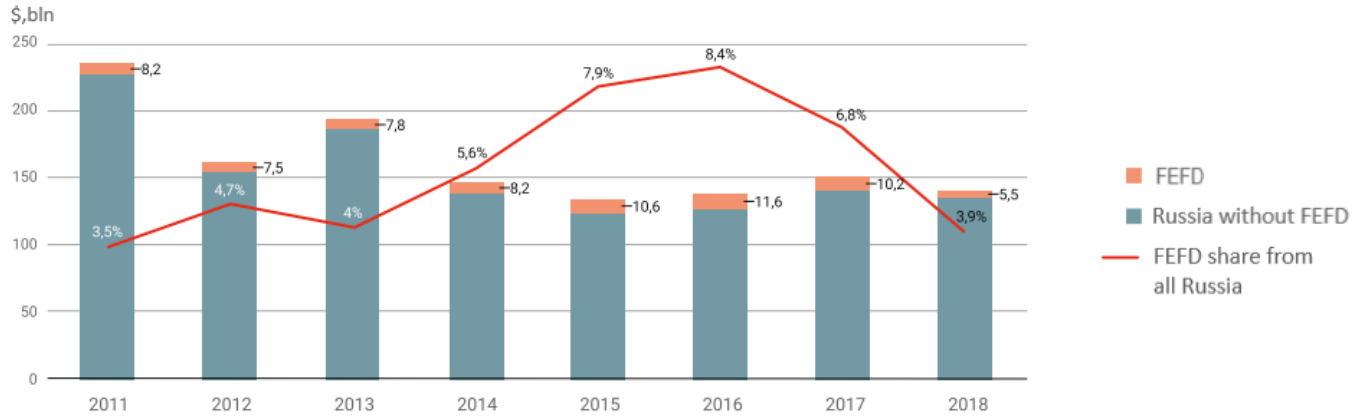

Figure 1. Incoming FDI of Russia and the Far East's share [13]

According to the Central Bank, from 2009 to 2018, foreign investors invested $69.9 billion in the Far East. In the vast majority of cases, they buy a share in equity, where equity financing amounts to 93.8% or $72.5 billion, and the remaining 6.2% accounts for debt instruments. Infrastructure investments account for the minimum amount of foreign investment. Over ten years, only $89 million fell into construction from abroad and in 2018 the outflow of capital of construction companies amounted to $12 million in the region [13].

4.2 Importance and demand for infrastructure investments in the Far East of Russia

The Far East, according to "The spatial development strategy of the Russian Federation for the period

until 2025", is a priority geostrategic territory which is significant for the development, territorial integrity and security of the country. Russia's eastern territories have always been and still remain the principal storehouse of Russia, where the bulk of mineral resources are concentrated, from rare metals to the necessities of oil and natural gas. The majority of marine resources are caught in the eastern seas, while Far Eastern forests provide the majority of the country's timber. A colossal volume of exports and imports pass through Far-Eastern ports to Asia-Pacific countries.

Therefore, the proximity of the world's most developed economies is another factor influencing the Far East's significance for Russia [14] and although FEFD plays the role of a transit region, if compared, it is still in the shadow of its rapidly growing neighbors such as China, Japan and South Korea. These factors don't allow the region's significant potential to be used at its fullest extent [4].

The region's support requires large resources – financial, human, technological. As a large territory with a low population density, harsh climate and a low starting level of infrastructure development it also needs to be approached with specific management.

According to research done by InfraONE Research, Figure 2 shows the FEFD infrastructural development against the all-Russian level. To calculate the figure, the company assessed the state of the transport, energy, utilities, social and telecommunications infrastructure of the regions. That is, those industries that are present in all regions of the Federation without exception and which affect the development of the economy and the standard of living of people.

Currently, the FEFD's indexes are very close to the average index, however the share of the investments of the Far Eastern regions in all-Russian investment expenditures is less than 8%. The Far East dominates only in the social field, where the average district index is 5.68 against the Russian average index of 5.42, yet that seems to be a formality, as for a number of the region's subjects it was caused by the out-migration in 2018, rather than the development of new infrastructure.

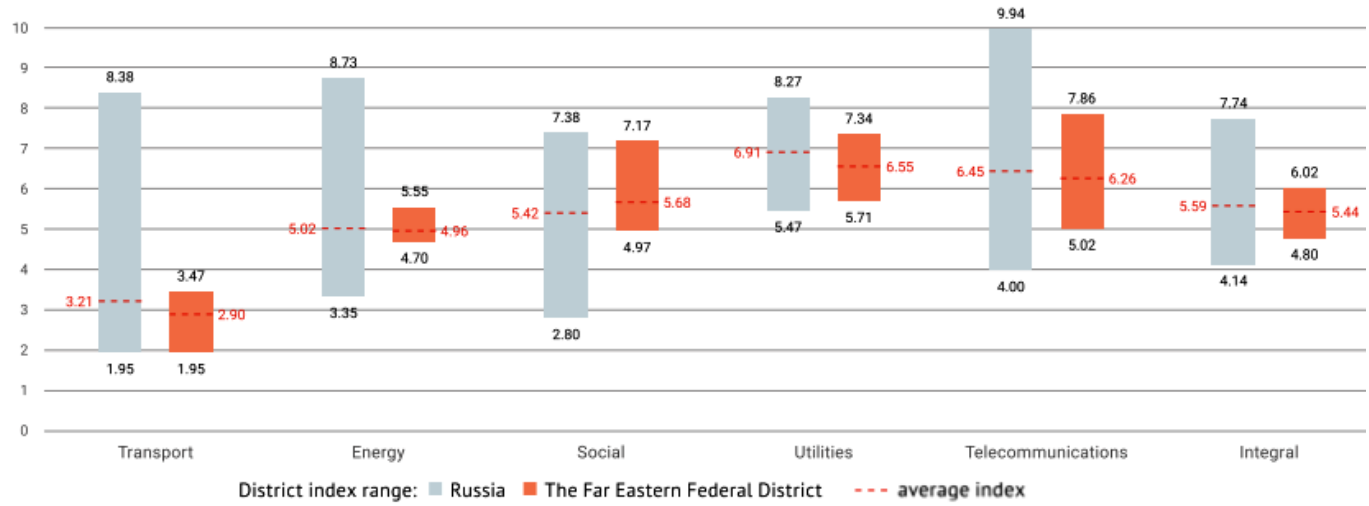

Figure 2. Comparison of sectoral and integral infrastructure development indices of Russia overall and the Far East, 2019 [13]

Below, (Table 1) composed by the author based on research calculations submitted by InfraONE Research, shows that in 2019 the infrastructure development integral indexes for all FEFD's 11 federal subjects have decreased compared to 2018, denoting that the region doesn't have sufficient resources to support and develop infrastructure. To note, throughout Russia, Dagestan has the lowest integral index of 4.14 and Moscow the highest of 7.74.

Moreover, the estimated amount of regional budget expenses for 2020 is not enough to meet the minimum investment requirements, which mostly should be increased by 2 times, although some by 4 and others as much as 6 times, if being compared with the expenses in 2020. Such a big difference in amounts only proves, once again that the region needs to attract investments from outside for normal functioning, satisfying the needs and infrastructure development in the FEFD.

Table 1. – The infrastructure development index of the Far East Federal District's federal subjects and their minimum additional needs, 2019 [13]

Federal subject	Infrastructure development integral index among all Russian regions	Integral index in comparison with 2018 "+" increased / "–" decreased	Regional budget infrastructural expenses in 2018, RUB bln	Forecast of regional budget infrastructural expenses for 2020, RUB bln	Minimum additional need, RUB bln
Chukotka Autonomous Area	6.02	–0.12	3.4	3.7	3.9
Sakhalin Region	5.81	–0.11	26.3	32.4	16
Magadan Region	5.81	–0.23	0.9	2.3	9.4
Kamchatka Territory	5.78	–0.24	8	8.7	5.6
Khabarovsk Territory	5.73	–0.11	18.8	18	24.2
Primorye Territory	5.45	–0.21	8.7	11.2	37.8
Amur Region	5.29	–0.23	4.5	5.4	13.1
Jewish Autonomous Region	5.24	–0.14	0.5	1	6.2
Trans-Baikal Territory	5.11	–0.09	3.6	4.8	16.5
Buryatia	4.84	–0.22	6.4	7.4	7.4
Yakutia	4.80	–0.02	12.4	17.6	40.1

The least developed infrastructure sector in the FEFD is transport, with a development index that increased the gap between the rest of Russia to 2.90 in 2018 (Figure 2), compared to 2.99 in 2017. This indicator is worse than that of all other federal subjects in Russia.

Figure 3 shows that transport infrastructure is developed below the Russian average level in a total number of 8 federal subjects out of 11.

The fact that the Far East's proximity to the APR opens up additional opportunities for increasing exports to APR countries, which have a certain demand for products from the EAEU, only supports the importance of developing transport infrastructure in the region. In reality, the Far East receives almost no subsidies for creating infrastructure. In 2018, the district received only 9.22 billion rubles for capital investments in state property, where for example, Crimea received 58.8 billion rubles. Although the government is trying to independently provide subsidies, they are still not enough [13].

As a main element in "The Federal budget for 2019 and for the planned period 2020 and 2021", the Ministry of Finance of The Russian Federation issued

a Comprehensive Plan for the modernization and expansion of the main infrastructure, and prioritize the state policy in the field of transport in 2019–2021 by accelerating and high-quality development of transport infrastructure. The transport implementation part of the Comprehensive Plan will contribute to an increase in the "Transport Infrastructure Quality Index" by 15.5% over 6 years, compared to 2017 [15]. Nonetheless, since Russia plans to invest about 6.3% of annual GDP in the infrastructure plan and spend about 1% annually, in total equating to the level of developed countries, the majority of investments in projects that are already included in the comprehensive plan and have a geographic reference will fall on the Central Federal District, where as the FEFD so far will receive expenses of only 168 billion rubles, which is no more than 3% and 3rd lowest amount compared with other federal subjects, meaning the quality of infrastructure will still be significantly lagging in the region.

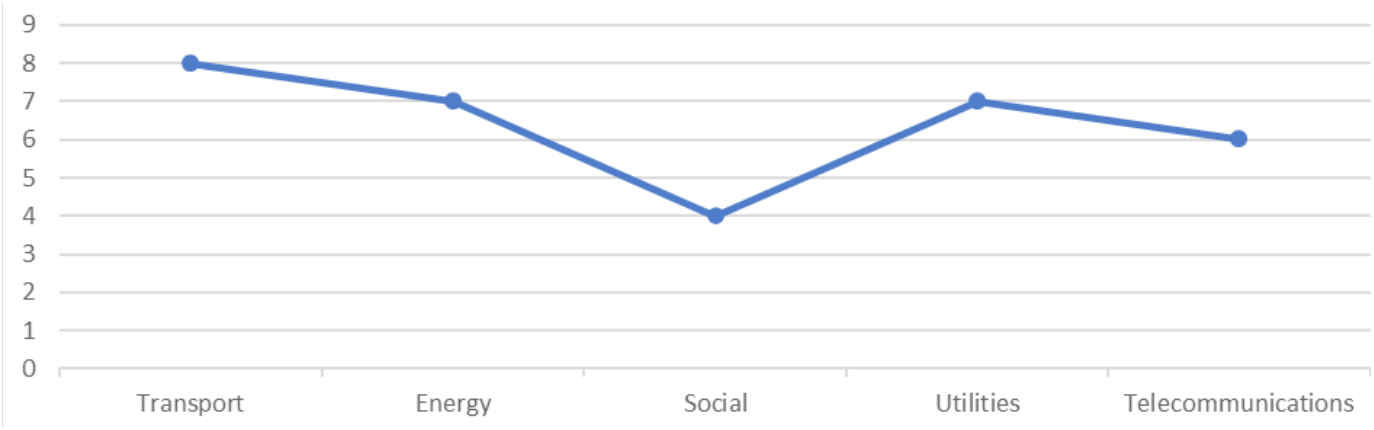

Figure 3. Quantity of federal subjects in the Far East Federal district and types of infrastructure developed below Russian average level [13]

The minimum additional infrastructure demand for the Far East in 2019–2021 is about 150–180 billion rubles, or about 5–6% of the needs of all of Russia, according to InfraONE Research. After 2021, the minimum need for the FEFD is likely to grow by 12–15% annually, and for development the district will need 350–355 billion rubles of investments by 2022 [13].

4.3 Chinese investments in the Russian Far East

China is considered a very important strategic partner of Russia and is one of the founding states of the Asian Bank for Infrastructure Investment and the 21st Century Silk Road global economic belt. The current development stage of investment cooperation between Russia and China is characterized by a fast growth rate in quantitative and qualitative terms and is supported by the leadership of the two countries [16].

Without the creation of basic infrastructure, the economic development of the FEFD will be impossible. Russia's FEFD as China's neighbor with 4300 km of common borders, is located on the logistic territory between the two countries, so transport interchanges are very important. Without transport infrastructure it is impossible to fully utilize the opportunities for cooperation in the region.

China ranks 28th overall among 141 counties in the Global Competitiveness Report, and is by far the best performer among the BRICS economies, respectively 15 places ahead of the Russian Federation. China's infrastructure performance ranks 36th compared to Russia's at 50th [17]. Chinese outward investments in 2017–2018 equaled to 130 billion dollars, yielding to Japan in first place and followed by France [18]. Thus, becoming one of the most significant players in the international investment market, proves China is a desirable investor in the FEFD having advantages in financial, technical, human and other resources.

Even though China is the largest investor in the region among other countries, as stated in October

2019 by the Far East Investment and Export Agency (FEIEA) investment director, it prefers to keep its distance. 49 projects are being implemented with the participation of investors from China with a total volume of $2.7 billion in the ASEZ's and the FPV, and another 40 investment projects worth more than $23 billion are under preparation. The share of investments is 59.1% of the total number of foreign projects in the Special Economic Zones (SEZ) [19]. Thus, the overall volume of FDI from China is growing rather slowly and is subject to volatility, Russia's share in China's FDI rarely exceeded 1%, in 2017 it equaled to 0.08% with China's total FDI outflow of $158 billion, and in the first half of 2019 amounted to 0.15% with China's total FDI outflow of $125 billion [20].

"All these large projects need appropriate transport and other infrastructure – roads, energy, related industries, etc. We also suggest that Chinese companies consider participating in large infrastructure projects already underway" a representative of the FEIEA stressed [19].

In the course of a study by IPT Group, according to market participants, natural resources and the degree of infrastructure development are the main factors of attractiveness of the Russian market for Chinese investors [21]. This is confirmed in practice, where in 2017 investments were focused on natural resources and the creation of transport infrastructure [22]; 14 projects in the FEFD in 2019–2020, launched or with negotiations underway, are in the transport infrastructure sector.

According to InfraONE Research, investments in the infrastructure of the FEFD in the next 2–3 years are expected to grow by no more than 15%, which was explained by the lack of high-quality projects and the inactivity of local authorities in an attempt to attract money from abroad. It is assumed, that the potential of China's investments in Russian infrastructure for the next two years is 315–385 billion rubles, even taking into account the shortage of quality projects, and the Far East will claim only a quarter of this money [13].

4.4 Measures implemented to attract investments to the FEFD

Attracting APR's investments to the FEFD is a difficult task that cannot be addressed without offering some preferences to foreign investors. Such preferential regimes improve the attractiveness of the Russian Far East for foreign investors [14]. Therefore, the Federal Government implemented policy mechanisms to develop the Far Eastern economy by attracting investments. Below, the author has listed all measures implemented, which in his opinion are indicative of positive affect.

Preferential regimes of FEFD improve the attractiveness of the Russian Far East for foreign investors, where the up to date declared investments on behalf of these investors amount to RUB217.7 bn (or 7.5% of the total volume of the investment portfolio). Companies from China, Japan and South Korea express great interest in working in the Far East. Investors are putting money into the manufacturing, agriculture, construction and service sectors [14].

On 29 December 2014, the President of Russia Vladimir Putin signed the law "On Advanced Special Economic Zones" and in 2015 the Free Port of Vladivostok was introduced. Prior to this moment, in the entire history of modern Russia, the state had never provided any special conditions for developing any of its territories. The ASEZ preferential regime is becoming the main instrument for increasing the flow of investment into the region's economy. The institutions supporting economic development in the Russian Far East, along with relevant authorities, are constantly searching for new residents [5]. Currently, 83 companies among the ASEZ and FPV residents, about 6% of the total, have foreign participation

The Eastern Economic Forum (EEF), was established in 2015 to support the economic development of Russia's Far East and to expand international cooperation in the Asia-Pacific region, is held annually in Vladivostok.

The Far East Development Corporation (FEDC) is a management company that exercises all state

authority within the ASEZ, and FPV. According to the survey results, 55–56% of residents consider the FEDC's work to be excellent, while the corporation's average evaluation score is 4.4 [14].

The Far East Investment and Export Agency (FEIEA) is one of the development institutions of the Far East, whose tasks are to attract new investors to the FEFD [19].

The draft National Program for the Development of the Far East until 2025 was presented by the Ministry for the Development of the Russian Far East and Arctic in September 2019. As planned, this document should not intersect with national projects and the Comprehensive Plan, which means that the Far Eastern regions have a chance to get additional funds for the economy, social sphere and infrastructure.

International development banks seem to have become more interested in Russia infrastructure projects. Among them are the Eurasian Development Bank (EDB), the BRICS New Development Bank (NDB), the International Investment Bank (IIB) and the Asian Infrastructure Investment Bank (AIIB). The number of projects in which these organizations participated and have been launched in the region is several times higher than in previous years [13].

5. Discussion and conclusion

5.1 Limitations

The main aim of the paper was to analyze the issues and factors of attracting Chinese investments to the Far East region of Russia. Although the study conducted a thorough survey, the study has potential limitations. It is expected that these points will help future researchers to avoid facing the same shortcomings. The first was that prior research studies that are relevant to this research topic were limited. The second limitation concerns information assessment derived from certain statistic bases. Further investigation is required in order to properly assess the factors and their impact. Therefore, the empirical results reported herein should be considered in the light of some limitations.

5.2 Discussion

During the study, with the above-mentioned statistics derived from official registries, several issues and factors regarding the attraction of Chinese infrastructure investments to the FEFD were identified. The following are some discussions on these issues.

Certain unattractive characteristics of the region such as large territory together with low population density, penultimate economy in the country, requirement of additional financial, human and technological resources, harsh climate and low infrastructure development certainly do not make an attractive region for investors at first glance.

Problems associated with the institutional climate in Russia still arise, even though SEZ were created in the region and other measures have been implemented, the legislation needs improvement.

Sanctions are a major problem for Russia, as they increase uncertainty and political risks, and also significantly affect the country's economy due to changes in the exchange rate and interest rates, as well as capital outflows, all of which doesn't help attract investments to the country, let alone to the less developed Far East.

Quite possibly, previous territorial disputes between China and Russia in the Russian Far East may be a factor of China maintaining a distance, as investments imply having a long-term influence by the investor, which may not be the best situation to be in, if issues concerning the territories arise again.

Even though China holds the biggest share of investments in the region, has the largest number of projects underway and implemented among other country investors, during the last 4 years, the overall quantity of investments in the country has dropped, but nevertheless the number of investment projects has still been increasing in the FEFD.

The percentage of infrastructure investments account for a minimum of FDI in the FEFD, the author assumes, possibly because construction projects are more difficult to implement and require a much longer time period to implement, meaning profit is also

postponed. Therefore, other investment opportunities are considered more attractive.

There may be other factors, which should be a topic for further investigation and discussion.

5.3 Conclusion

The author in this paper has tried to analyze the issues of attracting Chinese infrastructure investments to the Far East region of Russia. In summary, although the Federal Government is creating a reputation for a special territory in the Far East, the issued Comprehensive Plan for the development of main infrastructure for FEFD will provide so far no more than 3%. This means that the FEFD infrastructure is in the background for the federal authorities in broad terms. Therefore, FDI is needed since the government cannot support the needs of the region. That is where China comes into the picture, being a very attractive investor for Russia and the number one accounting for FDI in the FEFD.

Although the traditional cooperation in the field of energy and infrastructure remain one of the important elements in the relations between both countries, infrastructure is the least favorable choice of all FDI in the region. These investments are not enough to improve the overall infrastructure state in the region. Therefore, one of the most important instruments for attracting investments to the Far East is infrastructure support of projects however, such support is issued in limited quantities and under certain conditions by the government, along with other numerous disadvantages.

Joint conferences in all areas and at all levels with knowledge on legislation, and how investors may benefit from the region's potential and development concerning infrastructure investments, those which clearly increase the overall development and attractiveness of the region, may benefit for minimizing several factors, which do not allow a steady growth of FDI in the infrastructure segment. Other than that, since it would be important to increase the flow of FDI, it cannot be done without the federal support.

However, the government nonetheless continues to increase the relevance of the region's development in state documents and introduce various measures, mechanisms and institutions and carry out activities, the future of the Far Eastern Federal District looks promising in terms of developing infrastructure, improving the quality and standard of living, business conditions and climate and the amount of foreign investments, including those from China.

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CHINA-KAZAKHSTAN ECONOMIC COOPERATION AND "ONE BELT, ONE ROAD" INITIATIVE

Abstract. China and Kazakhstan are long-term partners, which economic relations have reached a new level of strategic partnership. The "One Belt, One Road" initiative brings new opportunities and challenges for the development of bilateral economic interactions and for the entire Central Asia region. The author made an original analysis of the main components of economic cooperation between the two countries, including energy cooperation, current trade infrastructure and identifying the prospects for implementation of the "One Belt, One Road" initiative.

Keywords: China, Kazakhstan, energy cooperation, trade, international economy, transportation, "One Belt, One Road".

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КИТАЙСКО-КАЗАХСТАНСКОЕ ЭКОНОМИЧЕСКОЕ СОТРУДНИЧЕСТВО И ИНИЦИАТИВА «ОДИН ПОЯС, ОДИН ПУТЬ»

Аннотация. Китай и Казахстан являются долгосрочными партнерами, экономические отношения которых вышли на новый уровень стратегического партнерства. Инициатива «Один Пояс, Один Путь» открывает новые возможности и вызовы, как для развития двустороннего экономического взаимодействия, так и для всего региона Центральной Азии. Автором статьи проведен оригинальный анализ основных составляющих экономического сотрудничества между двумя странами, включая энергетическое сотрудничество, текущую торговую инфраструктуру и выявление перспектив от воплощения инициативы «Один пояс, Один Путь».

Ключевые слова: Китай, Казахстан, энергетическое сотрудничество, торговля, международная экономика, транспортация, «Один Пояс, Один Путь».

China and Kazakhstan have maintained close economic and trade cooperation for a long time. Up to now, China has become Kazakhstan's second largest export market and largest source of import, while Kazakhstan is China's first trade partner in Central Asia and the first foreign investment target country in Eurasia. In recent years, though the total trade volume between China and Kazakhstan has declined, the complementarity of geo-economy, resources, technology and cooperation between the two countries is still very significant, which will provide a huge space for the continuous development of bilateral trade in future.

At present, China attaches great importance to Kazakhstan from many sides; Kazakhstan has become a key factor in Beijing's overall Central Asia policy. The cooperation between Kazakhstan and China is very diverse and in-depth, which is largely owing to geographical factors, needs of mutual economic partnership and high-level political cooperation, i.e. cooperation in the field of strategic partnership. Due to the complexity of bilateral relations, on the one hand, Kazakhstan-China relations are highly stable; on the other hand, they are affected by multi-level factors in bilateral and global forms. The Eurasian Union, world economy crisis, the competition between Russia and the West, and the threat of terrorism; all of these factors have an impact on the complexity of Kazakhstan-China cooperation.

The new territory for further cooperation is the "One Belt, One Road" initiative (OBOR). OBOR, or Silk Road Economic Belt project, was jointly created and adopted by China's president Xi Jinping, in order to strengthen further economic ties between Eurasian countries. The new economic corridor includes more than 30 countries, spanning Eurasia from the Pacific to the Baltic. In other words, it covers an area of three billion people. China's Silk Road Economic Belt initiative marks the strengthening of China's diplomacy to Central Asia and brings new opportunities to Kazakhstan. China plans to develop a number of political and economic opportunities under the three themes of political cooperation, international trade and investment through the Silk Road Economic Belt Project.

Kazakhstan and China are developing transportation infrastructure and increasing transit and logistics capabilities. Therefore, it is possible to implement some Kazakh projects through the Silk Road regional project, together with Kazakhstan's "Nurly Zhol" plan. "Nurly Zhol" is 9 billion USD domestic stimulus plan to develop and modernize roads, railways, ports, IT infrastructure, and education and civil services in Kazakhstan over 2014–2019. Multiplier effect from the infrastructure spending includes contribution to GDP of 1.18% in 2017 and up to 4.1% in 2019. The program is expected to create 405,000 new jobs over the full course of implementation [1–9]. For that reason, Kazakhstan and China continue to strengthen cooperation in various fields. The platform for this relationship has developed over the years of independence and has accumulated serious potential for stability. Even now, in the context of the crisis in international relations and the trade barriers of the Eurasian Union, it has not had a negative impact. On the contrary, it has brought positive impetus to the development of this relationship. That's why China attaches great importance to Kazakhstan, which has become a key factor in Beijing's overall Central Asian policy.

Among all the factors affecting China-Kazakhstan relations, geographical location is definitely the most obvious, but at the same time, for many reasons, it is still one of the most in-depth and influential factors. First of all, the whole Central Asia region is related to China's national interests. It is significant that China's foreign policy has a clear geographical priority, which means the countries bordering with China are the most important countries in the development of relations. This is understandable pragmatism: there is a belt of friendly countries around the borders of any country, which makes it possible to maintain stability without participating in border conflicts. As one of the major trading countries, China's interest in it is unique. Kazakhstan is one of the important countries in Central Asia, and plays a special role in this regard, especially in the development of border trade, the establishment of special zones, such as the International Center for cross-border cooperation "Horgos" (ICBC "Horgos"), and investment in joint infrastructure such as roads and railways. But most importantly, Beijing's peaceful geopolitical interests on the western border have created a favorable background for Kazakhstan-China political relations.

Kazakhstan is rich in natural resources, especially in mineral resources. Many energy and mineral reserves accounts for a high proportion of global reserves, such as tungsten over 50% (for the country), uranium 25% (8.1 of global), chrome ore 23%, lead 19% (2.3 for

global), zinc 13% (5.0 for global), copper and iron 10% (world ranking 11). See (Table 1) [1–7] for specific reserves ranking. In addition, Kazakhstan's oil and natural gas reserves are very rich, country ranked 17th place in oil production worldwide. According to the data released by the Kazakhstan Statistic Committee, at present, Kazakhstan's oil recoverable reserves are 40 × 108 t and natural gas recoverable reserves are 3 × 1012 m^3. However, as a major energy producer, its consumption capacity is extremely limited. According to BP world energy statistics yearbook 2017, Kazakhstan consumed 19.2% of its oil production and 67.3% of its natural gas production in 2016 [1–5]. There is no domestic demand for uranium resources, that is, more than half of the oil and gas resources and all uranium resources are used for export (see Table 2).

Table 1.– Global Ranking of Kazakhstan mineral reserves Source: Statistics Committee, USGS mineral commodity report in 2016, Kazgeology, Samruk-Kazyna

Kazakhstan's Major Mineral Reserves

Mineral	Reserves, 000 tons	% of global	World ranking
Iron ore	2,500,000	1.5%	11
Uranium	373	8.1%	4
Zinc	11,000	5.0%	6
Lead	2,000	2.3%	8
Silver	53	9.3%	6

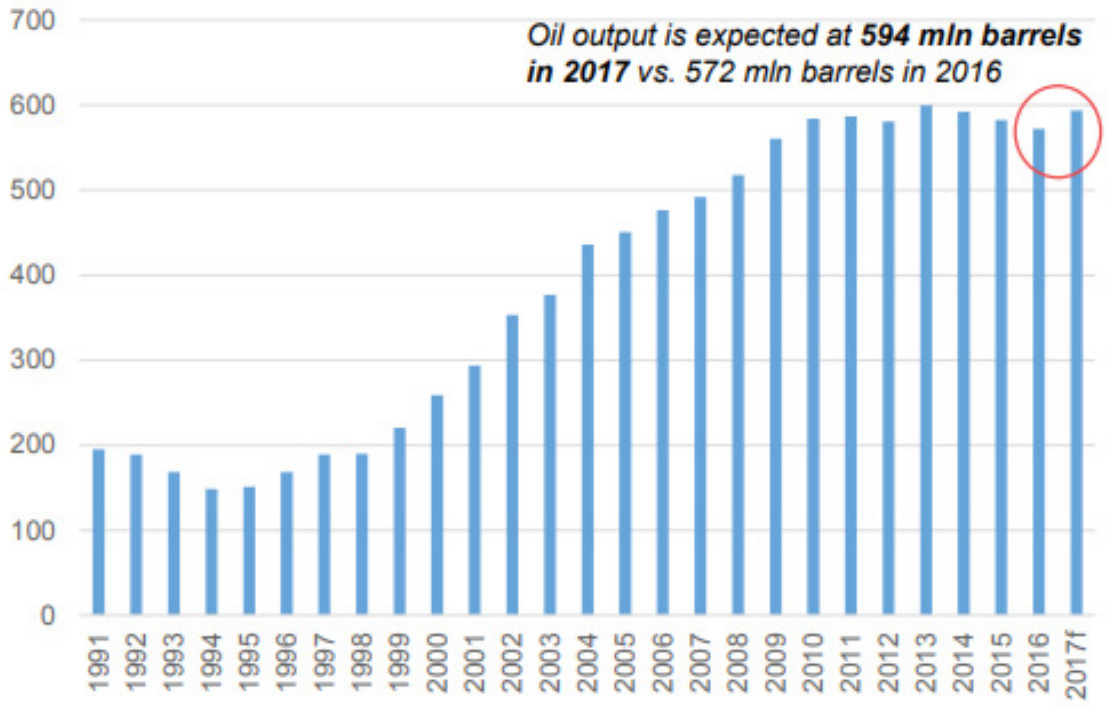

Figure 1. Kazakhstan's Oil Production, million barrels (1991–2017)
Source: Statistics Committee, Kazenergy, IHS Energy

According to (Table 2), since 1991, Kazakhstan more than tripled its oil output to 572 million barrels (78 million tons) per year in 2016, driven by Tengiz and Karachaganak. Oil production was lower in 2015–2016 in response to lower oil prices, natural decline in some mature fields and decrease of drilling activity given maintenance works at some fields.

Starting from CNPC's successful bid for Aktobe oilfield development project in 1997, China's capital and technology began to enter Kazakhstan market. At present, China's three major oil companies and several private oil and gas enterprises have carried out project cooperation with Kazakhstan in oil and gas business, such as Petro-Kazakstan (PK) project, Aidan MUNAI (ADM) project, Kuatamlonmuani (KAM) project, etc. Now "One Belt, One Road" initiative is combining with previous successful 20 years energy cooperation between China and Kazakhstan, and is emerging as a model of mutual benefit and win-win strategy for the two countries.

At the founding meeting of the China Kazakhstan Entrepreneurs Committee (2013), President Xi Jinping pointed out that pragmatic cooperation between China and Kazakhstan was fruitful and created many "first rank" achievements [2–2]. China is Kazakhstan's largest trade partner and Kazakhstan is China's largest investment object in the CIS region. China Kazakhstan crude oil pipeline is China's first land-based transnational crude oil pipeline, and there are numerous successful examples of cooperation between the two countries. These cooperation achievements have not only brought tangible benefits to the Chinese and Kazakh people, but also provided unremitting impulse for the sustained development of the comprehensive strategic partnership between the two countries. In his speech, President Nazarbayev pointed out that Kazakhstan-China oil and gas cooperation, especially the Kazakhstan-China crude oil pipeline and Kazakhstan-China natural gas pipeline, are the concrete embodiment of the "Silk Road Economic Belt" and the achievements witnessed by the two heads of state [3].

At present, the total mileage of the railway trunk line in Kazakhstan is 15.100 km, with a density of 5.53 km/km^2 (23–38 km/km^2 in most CIS countries). Among them, more than 5000 kilometers (35% of the total length) are double track lines, and more than 4100 kilometers are electrified lines, accounting for 27% of the total length (60% in Azerbaijan, 45% in Russia, and 100% in Armenia and Georgia), consist of 6700 km of station line and special line. In terms of the distribution of railway network in the whole territory, the total length of railways in the Southern and Eastern regions exceeds 4000 kilometers, accounting for 27.5% of the total length of the country, 3900 kilometers in the Western region, accounting for 26.9% of the total length, and 6300 kilometers in the central and Northern regions, accounting for 43.5% of the total length [4].

In December 2011, the 2001 train opened in China and 3602 train opened in Kazakhstan passed through the junction of China-Kazakhstan railway, heading to the opposite station, which marks the opening of China-Kazakhstan Khorgos Atenkori railway port. This is the second international railway channel opened to Central Asia, West Asia and Europe in China after the new Eurasian Continental Bridge between Lianyungang, Alashankou, Almaty, Kazakhstan and Rotterdam, the Netherlands, has been put into operation for 20 years. The railway connecting with Kazakhstan railway in China this time is Jingyihuo (Jinghe Yining Horgos) railway. Jingyihuo starts from Jinghe station of Lanzhou Xinjiang Railway in the East and ends at Horgos station of China Kazakhstan border port in the west, with a total length of 292 km; the railway from Getken to Atenkori is in Kazakhstan, with a total length of 293 km [4].

It can be seen that both Kazakhstan and China have made progress in terms of actual road construction and relevant agreements. In December 2011, Kazakhstan's "Getken-Horgos" railway was successfully connected. The railway transportation mileage between China and Central Asian countries was shortened by 550 kilometers, which is helpful to

improve Kazakhstan's transport capacity, promote the development of related industries, bring huge economic benefits to the regions along the railway, and promotes and expand Kazakhstan's economic ties with China and Southeast Asian countries. According to the prediction of relevant departments, the freight volume of the trunk line is planned to reach 25 million tons in 2020 [4].

Support of the road maintenance: this support is usually effective in maintaining traffic handling performance of the Almaty-Astana corridor section. This has helped to reduce the overall average travel time between Almaty and Astana (1220 km) from 30–40 hours to about 16 hours. To fulfill this plan, road maintenance equipment purchased through the project has generally performed well and is in normal use. Initially, there were problems due to the lack of local spare parts suppliers for some equipment. However, these problems are solved by increasing the stock of spare parts obtained from foreign suppliers. "One Belt, One Road" initiative, "Nurly Zhol" and other projects confirm that Kazakhstan is the key to trade and transport links between Eurasia and China. The OBOR and its transcendence are unique due to their location, vast land and energy reserves. It is not only the object of geopolitical interests of China, Russia and the West, but also the subject of geopolitical interests. The case of Kazakhstan shows that the formation and success of OBOR depends to a great extent on internal factors, rather than external factors. Bilateral trade volume between China and Kazakhstan has increased substantially since 2009, but it has declined significantly since 2013–2016, but rebounded to the bottom and increased rapidly the next year. At present, although China has become Kazakhstan's second largest trading partner, the two countries show strong asymmetry in trade products, trade mode, settlement currency and other aspects. Moreover, the import and export trade between China and Kazakhstan fell significantly in 2013–2016, and the trade ties between them are still not close enough, mainly as follows:

1) Kazakhstan maintains a continuous relationship with China According to the data of Kazakhstan Statistical Commission, it is found that from 1999 to 2017, Kazakhstan maintained a sustained trade surplus with China, which increased from 390 million US dollars in 1999 to 2.319 billion US dollars in 2009. In 2009, Russia Belarus Kazakhstan customs union was established and operated. Because the tariffs in the Union were higher than those before Kazakhstan joined the union, the competitiveness of Chinese goods in Kazakhstan declined, resulting in Kazakhstan's surplus to China in 2010 rising rapidly to 6.16 billion US dollars; in 2011, it reached the highest value, with a surplus of 11.269 billion US dollars; since 2012, China Kazakhstan trade surplus The volume showed a continuous downward trend, from US $8.98 billion in 2012 to US $400 million in 2015, slightly rebounded in 2016, with a surplus of US $550 million; in 2017, the surplus was US $1.09 billion, an increase of 97.6 (see Figure 1) [5].

From 2012 to 2016, the trade surplus decreased year by year, mainly due to the rapid decline of Kazakhstan's exports to China. In 2017, the surplus increased nearly doubled due to the recovery of bilateral trade between China and Kazakhstan. Kazakhstan maintains a long-term surplus with China, which means that China maintains a deficit with Kazakhstan, that is, China's import from Kazakhstan is far greater than its export. It is estimated that from 1999 to 2017, China's import from Kazakhstan accounted for about 67.34% of the total trade between China and Kazakhstan, while China's export to Kazakhstan accounted for only 31.68% of the total trade between China and Kazakhstan in the same period [5]. It can be seen that China maintains a long-term commodity trade deficit with Kazakhstan, which shows that China has a strong import demand for Kazakhstan's products. From the perspective of dependence, China has a high dependence on Kazakhstan's products.

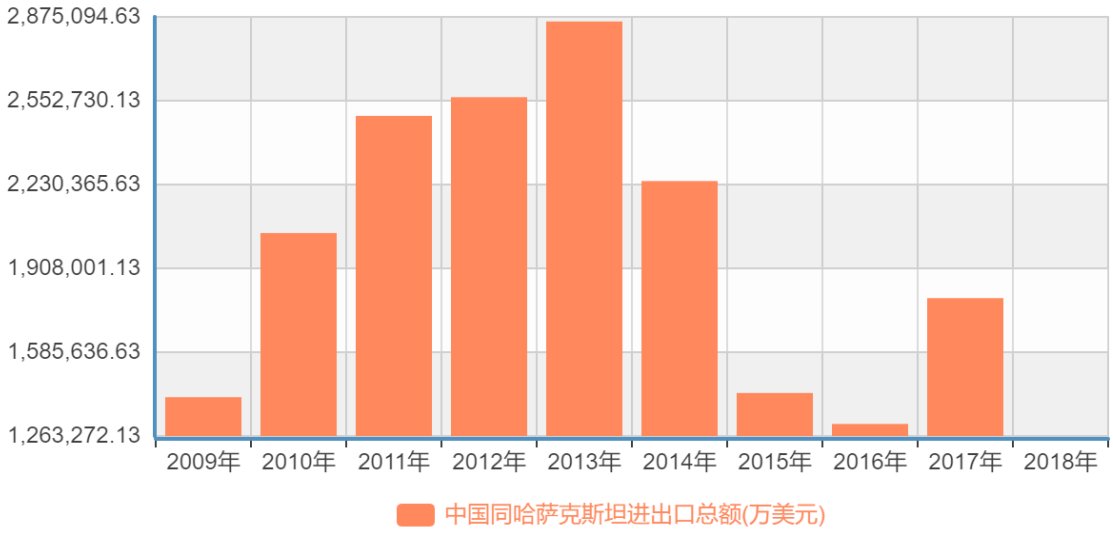

Figure 2. Total import and export volume between China and Kazakhstan (2009–2013), USD Source:Statistic Committee of China, URTL: http://www.npc.gov.cn

2) China's commodity dependence on Kazakhstan is higher than Kazakhstan's dependence on China. In 2017, the main products Kazakhstan exported to China were base metals and products, with an export volume of US $2.38 billion, an increase of 41.2%, and accounting for 41.3% of Kazakhstan's total exports to China. It is the first major category of goods Kazakhstan exports to China. The second largest export volume is mineral products. The export volume to China is US $2.08 billion, up 38.9% year on year, accounting for 35.9% of Kazakhstan's total export volume to China. In addition, exports of chemical products to China amounted to US $1.04 billion, an increase of 24.9%, accounting for 18.0% of Kazakhstan's total exports to China. In 2017, Kazakhstan imported mechanical and electrical products from China, with an import volume of US $2.08 billion, an increase of 30.7%, and accounting for 44.3% of Kazakhstan's total imports from China. Imports of base metals and their products reached US $650 million, an increase of 20.6%, accounting for 13.9% of Kazakhstan's total imports from China. In addition, plastic and rubber imports reached 320 million US dollars, an increase of 18.7%, accounting for 6.7% of Kazakhstan's total imports from China. The three categories of products account for 64.9% of Kazakhstan's total imports from China [5]. China's competitors for the above commodities mainly come from the United States, Italy, Germany, etc.

From the perspective of trade products, China mainly imports primary raw materials such as energy resources from Kazakhstan, especially fuel mineral oil and base metal products, accounting for more than half of the total exports. China's exports to Kazakhstan are mostly concentrated in manufactured products such as mechanical and electrical products and mechanical equipment. Meanwhile, China has provided many light industrial products closely related to the life of Kazakh residents and to the Kazakh market. Obviously, based on their comparative advantages, China and Kazakhstan have formed a trade product pattern, in which China mainly imports energy and resource products from Kazakhstan, while Kazakhstan, with relatively backward manufacturing industry, imports machinery, electronics and light industrial products from China. From the perspective of import substitution, as resources and energy products belong to non renewable resources, the degree of substitution is far less than labor-intensive and capital intensive products; obviously China has a rigid demand for energy and resource products in Kazakhstan.

From the perspective of the added value of trade products, most of the commodities exported by China to Kazakhstan are labor-intensive mechanical and electrical products, textile products, which have low degree of differentiation and high degree of substitution. If Kazakhstan chooses to import similar products with comparative advantages from other countries, it will have a greater impact on China's economic interests. Based on the data at the port of Horgos, the author found that Chinese manufacturers can provide diversified choices of different quality and price for a commodity. However, in order to make more profits, the Central Asian merchants represented by Kazakhstan tend to choose the commodity with lower price, and import some relatively low-quality commodities from China through tourism, shopping and general trade. To some extent, it has damaged the image of Chinese goods, and it has also given the negative influence on people in Kazakhstan who are dissatisfied with China as a producer. China must reveal the possibilities of its market and guide Kazakhstan to properly understand the real situation in the trade between the two countries and objectively judge the image of Chinese goods.

From the perspective of import substitution, as resources and energy products belong to non renewable resources, the degree of substitution is far less than labor-intensive and capital intensive products, obviously China has a rigid demand for energy and resource products in Kazakhstan. On the whole, China's dependence on Kazakhstan is much higher than Kazakhstan's dependence on China. The U. S. dollar is still the main settlement currency, and the Chinese Yuan (RMB) settlement volume is small. At present, Kazakhstan's cross-border trade settlement currency is mainly U.S. dollar. Kazakhstan's national payment has a dollarization mentality, and the RMB settlement volume is very small. The main reasons are as follows: from the perspective of trade products between China and Kazakhstan, China has a rigid demand for Kazakhstan's energy and resource products, so China passively accepts Kazakhstan's settlement in US dollars with more foreign exchange reserves. Due to the high degree of substitutability of Chinese exports to Kazakhstan, Chinese enterprises and Kazakh enterprises are in a passive position when choosing the settlement currency, and the citizens tend to use US dollar cash to settle foreign exchange, which results in most of the trade settlement between Chinese and Kazakh enterprises adopting US dollar. According to the Research Report on the pilot situation of cross-border monetary man guided currency settlement issued by the development research center of the State Council in 2011, the scale of RMB settlement of cross-border trade between China and Central Asia has increased, but the proportion is very small. Taking the settlement scale from 2009 to the end of June 2010 as an example, from the perspective of total amount, the proportion of USD settlement is as high as 95.2%, while that of RMB settlement is less than 0.01% [6].

The mode of trade is still dominated by border trade, and the processing trade accounts for a relatively small proportion. Based on the geographical advantages of Xinjiang, the trade volume between China and Kazakhstan is mainly concentrated there. In 2008, Xinjiang's foreign trade with Kazakhstan accounted for 74.09% of the total trade between China and Kazakhstan, compared with 72.92% in 2009 [6]. Thanks to the operation of Russia Belarus Kazakhstan customs union, the trade transfer effect makes the trade between Xinjiang and Kazakhstan account for 65.79% of the total trade between China and Kazakhstan, and then continues to decline from 49.73% in 2011 to 42.91% in 2013. In 2014, the index continued to rise from 58.72% to 79.9% in 2016, and in 2017, the index dropped to 45.6%. The foreign trade volume between Xinjiang and Kazakhstan accounts for more than 70% of the total trade volume between China and Kazakhstan in most years [6]. On the whole, Xinjiang is still the main bearing area of China Kazakhstan trade. However, from the perspective of the trade mode between Xinjiang and Kazakhstan, the border trade with the lowest cost and flexibility is

the trade mode with the highest proportion between Xinjiang and its neighboring countries.

The basic reason why the border trade and tourism purchase can become the main trade mode between Xinjiang and its neighboring Central Asian countries is that: on the one hand, the manufacturing industry of the neighboring Central Asian countries lags behind and the import cost is urgently needed; China is unable to produce or meet its own domestic demand, and China's diversified products just fill this gap. On the other hand, low cost is also the important factor. The Central Asian governments, represented by Kazakhstan, have set preferential measures for border trade. At the same time, there are grey customs clearance methods such as "charter party tax" and "charter party tax". This kind of grey customs clearance has also become a method to reduce the cost of border trade in disguise, but it more reflects the need of surrounding Central Asian countries to improve their business environment. In the long run, with the gradual establishment of market mechanism in Central Asian countries, the improvement of government governance ability and the change of domestic interest groups, grey customs clearance will inevitably be replaced by normal customs clearance. In the future, with the economic development of the surrounding Central Asian countries, border trade will still occupy a dominant position, which is not only due to the flexible and low cost of border trade, but also closely related to the per capita income and industrial division of labor of the neighboring countries.

In 2016, China's investments into 49 countries along the OBOR initiative amounted to USD14.5 billion [7, 112–117]. Kazakhstan will play a key role in OBOR success, with transit traffic and trade turnover expected to grow in the medium to longer-term. As China's "One Belt, One Road" began to develop, the Chinese foreign trade has been increasing frequently. This has raised the frequency and coverage of China's foreign exchanges. However, there are great differences in cultural and economic trade patterns among countries. Therefore, it is impossible to comply with the convention in the development of foreign trade and culture. It requires relevant talents to have strong abstract thinking skills and logical judgment ability. In the process of foreign exchanges and deepening cooperation, they can put forward some innovative communication strategies and methods, which objectively promote the improvement of China's foreign trade and cultural exchange level.

In the past few years, Kazakhstan has implemented a foreign policy aimed at improving relations with a number of new geopolitical actors, in addition to the common partners such as Russia, which the Central Asian countries used to rely heavily on. Taking advantage of its great potential in the oil and gas industry, Kazakhstan has surpassed all other Central Asian countries in terms of political and economic importance, and has turned its attention to China as an important and strong partner in economic, political and security cooperation.

In recent years, Kazakhstan has become an important player in international relations in Central Asia. International observers have on many occasions highlighted the country's progress. It is undeniable that compared with other countries in the region, Kazakhstan's development level is pretty higher. Purely from the perspective of macro-economy, Kazakhstan's economy is the largest economy in Central Asia, which has been showing a very high level of growth for many years and has recovered very quickly under the impact of the world economic crisis. From a broader perspective, Kazakhstan is the only country in the region listed as a country with a high level of human development, which highlights Kazakhstan's success.

But, therefore, no matter how impressive Kazakhstan's achievements may seem, there is still window for improvement: the country still needs help of its neighbors and is constantly and actively looking for opportunities to consolidate its growth through economic cooperation. This makes China-Kazakhstan relations not only of great significance to the overall situation of trade balance between the two countries, but also, in a broader sense, to the sustainability of

the "One Belt, One Road", "Nurly Zhol" and the overall stability of Central Asia. The political relations between China and Kazakhstan have been successful: since independence, the two countries have settled the old disputes on the common border and established close political ties. Chinese and Kazakh officials often meet to discuss bilateral issues. For Kazakhstan, "developing good neighborly and friendly relations with China is the top priority".

Today, both sides are members of the Shanghai Cooperation Organization and other regional groups committed to promoting political cooperation and security. This requires strong mutual support from the two countries on some of the most important foreign policy objectives: Kazakhstan supports Beijing's foreign policy, OBOR initiative, supports China's official positions in Taiwan and Tibet, and China supports Kazakhstan's accession to the WTO and many joint projects. Bilateral economic relations are also positive and have been strengthening for many years. The main factor for the continuous improvement of trade relations is China's unparalleled willingness and ability to invest. The figures are impressive: in early 2011, for example, Beijing pledged US $1.7 billion in loans to Kazakhstan's state welfare fund, US $5 billion in loans to the local petrochemical industry, and about US $8 billion in purchases of Kazakh uranium [8–34]. China's increased influence in Astana is welcome as it provides opportunities for the country's economic diversification, especially within the perspectives of the "One Belt, One Road" project. For many years, Kazakhstan's trade relations with China have been limited to natural gas and oil exports, but at present, trade is gradually diversifying, which has a positive impact on the economic interconnection between the two countries, especially in the border areas. The improvement of bilateral relations between China and Kazakhstan highlights these developments and may help consolidate the achievements of the largest central Asian republic in the short term.

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THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN THE INTERNATIONAL HOTEL SECTOR

Abstract. The article presents the results of the research on the usage of artificial intelligence technologies in the international hotel sector; identifies the reasons for the development of artificial intelligence in hospitality, the advantages and disadvantages of using; rationalizes the usage of artificial intelligence in combination with human resources.

Keywords: Artificial Intelligence; Hotel Reputation Management; Hotel Revenue Management; robotics; chat bot; hotel sector.

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ПРИМЕНЕНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В МЕЖДУНАРОДНОМ ГОСТИНИЧНОМ СЕКТОРЕ

Аннотация. В статье представлены результаты исследования направлений применения технологий искусственного интеллекта в международном гостиничном секторе; выявлены причины развития искуственного интеллекта в гостеприимстве, преимущества и недостатки использования; сделано заключение о рациональности использования искусственного интеллекта в сочетании с человеческими ресурсами.

Ключевые слова: искусственный интеллект; ревенью-менеджмент; управление репутацией; робототехника; чат-бот; гостиничный сектор.

Искусственный интеллект (далее ИИ) – это область информатики, которая занимается разработкой интеллектуальных компьютерных систем, обладающих возможностями, связанных с человеческим разумом,– понимание языка, обучение, способность рассуждать, решать проблемы [1].

Использование ИИ, в гостиничном секторе обусловлено рядом причин. Во-первых, это связано с общей цифровизацией экономики. Распространения таких технологий, как Интернет, big data, IoE (Internet of Everything), меняет экономическое развитие как на микро-, так и на макроуровне, революционизируя производство и потребление [2]. Ежегодно растет число онлайн-пользователей: в период с 2005–2019 гг. их число увеличилось в 2,5 раза (с 1,6 млрд. до 4,1 млрд. чел.) [3].

Во-вторых, это обусловлено ростом доступности технологий для обычного потребителя. Так, в 2016 г. 12,5% населения США используют в своих домах интеллектуальные технологии (системы «умный дом» и т.д.), а к 2021 г. прогнозируется увеличение данного показателя до 28% [4]. Потенциальные потребители гостиничных услуг, привыкая использовать технологии в домашних условиях, воспринимают их как необходимый атрибут гостиниц. В тоже время, сама гостиницы предпринимает попытки предложить условия, в которых гость будет чувствовать себя максимально комфортно, создавая аналогичный и превосходящий домашней уровень технологического оборудования.

В-третьих, применяя технологий ИИ, предприятия международного гостиничного сектора получает ряд преимуществ в виде оптимизации работы функциональных и операционных отделов. Так, 89% управляющих гостиниц считают, что применение ИИ значительно сокращает операционные расходы, а 86% – считают, что технологии увеличивает удовлетворенность сотрудников, т.к. сотрудники сфокусированы на решении более важных задач [5].

В 2018 г. в мире насчитывается порядка 4998 компаний, занятых в области ИИ, из которых 40% приходится на американские компании, а почти 21% – на китайские [6]. Города-лидеры: Пекин (412), Сан-Франциско (289), Лондон (275), Шанхай (211), Нью-Йорк (188), Шэньчжэнь (122). По данным на 2016 г. доходы рынка ИИ во всем мире составили около 260 млрд. долл. США, и ожидается, что к 2024 г. эта сумма значительно увеличится [7].

Применение технологий ИИ в гостиничном бизнесе характеризуется неравномерным распределением среди гостиничных предприятий, что обусловлено высокими затратами. Основными компаниями-разработчиками технологий ИИ для гостиничного бизнеса являются Google, IBM, Amazon и Facebook, Baidu, Xiaomi, Alibaba, JD и др.

Можно выделить два направления применения ИИ в международной гостиничной практике: оптимизация внешней среды предприятия и внутренней среды предприятия.

С целью оптимизации внутренней среды гостиницы ИИ используется по следующим направлениям: *управление репутацией гостиницы (Hotel Reputation Management), управление выручкой/доходами гостиницы (Hotel Revenue Management), рекрутинг*. Применение ИИ в данных формах связано с его способностью анализировать большие базы данных, выделять значимую информации, находить корреляционные связи между данными и предоставлять готовое решение поставленной задачи. Например, гостиничная сеть AccorHotels инвестировала 5 млн. евро в платформу «Travelsify», которая занимается анализом онлайн-контента на базе ИИ, что позволяет определить потребности гостей и подобрать отель сети AccorHotels согласно их предпочтениям [8].

ИИ открывает огромные возможности перед гостиничными предприятиями по прогнозированию спроса на гостиничные услуги и моделированию шаблонов потребительского поведения. Соответственно, это способствует развитию технологий по управлению выручкой/доходами гостиничного предприятия (Hotel Revenue Management). Программное обеспечение по управлению выручкой/доходами консолидирует и анализирует огромные объемы данных, используя внутренние и внешние источники информации, и определяет оптимальную стоимость номера в данный период времени.

Технологии ИИ нашли применение в оптимизации работы HR-отдела. Так, международная гостиничная сеть Hilton WorldWide внедрила «HireVue» – видеоплатформу, которая позволяет оптимизировать процесс отбора кандидатов. С использованием новой видеоплатформы компания свела процесс рекрутинга, который ранее занимал 6 недель, в одну видео-оценку, которая занимает всего 5 дней [9].

С целью оптимизации внешней среды гостиницы ИИ используется по следующим направлениям: внедрение в деятельность гостиничного предприятия роботов, чат-ботов, голосовых ассистентов, концепции «smart room», технологий бесконтактного входа.

Использование ИИ в индустрии гостеприимства дает преимущества как для гостя, так для гостиничного предприятия. Благодаря применяемым технологиям гость получает большую независимость от персонала отеля; значительную экономию времени; технологии способствуют персонализации услуги и увеличению удовлетворенности гостя.

Основным преимуществом ИИ для гостиничного бизнеса является то, что технологии позволяют оптимизировать большинство процессов в гостинице: оптимизировать менеджмент, мониторинг состояния гостиницы, кадровый состав, функционирование отдельных департаментов гостиницы. Например, применение чат-ботов и голосовых ассистентов позволяет в среднем на 35% сократить загруженность call-центра [5], таким образом, дает возможность сократить careline-специалистов; роботы могут заменить консьержей; возможность удаленной регистрации и системы бесконтактного входа оптимизировать сотрудников отдела приема и размещения гостей; благодаря управлению состоянием номеров с одного сервера, можно оптимизировать потребности инжинирингового отдела до нескольких специалистов.

Несмотря на наличие ряда преимуществ, использование технологий ИИ сопряжено с появлением ряда недостатков.

Индустрия гостеприимства является сферой услуг, где большое значение имеют человеческие отношения и эмоциональная составляющая, в этом плане ИИ значительно проигрывает человеческим ресурсам. Проблема заключается в том, что ИИ работает по заданным алгоритмам, не адаптируется к изменяющимся ситуациям, неспособен распознать настроение гостя – таким образом, гость не получает эмоционального отклика на его запрос.

Возникает вопрос об этической составляющей работы ИИ: способен ли ИИ брать на себя ответственность перед людьми за принятые решения и способен ли совершать свои действия в рамках этических стандартов [10].

Образование больших баз данных, необходимых для работы ИИ, затрагивают проблему конфиденциальности. Речь идет не только об персональной информации, однако и о биометрических данных (отпечатки пальцев, сетчатки глаза и др.). При нарушении работы технологий, персональные данные гостя могут быть украдены или использованы в корыстных целях.

Проблема сбоев наиболее актуальна при работе роботов. Достаточно привести пример негативного опыта полностью роботизированного японского отеля Henn-na Hotel, который после нескольких месяцев работы был закрыт по при-

чине ряда сбоев в работе роботов. Роботы не справлялись со своими обязанностями: распознавали храп человека в номере как запрос; выходили из строя в коридорах; возникали трудности при регистрации;

При использовании чат-ботов и голосовых помощников могут возникать проблемы с самим алгоритмом работы ИИ. При формировании гостем более сложных запросов, учитывая, например, особенности стиля или произношения, многозначность слов, ИИ может некорректно интерпретировать запрос или не распознавать его. В данном случае, гостю необходимо кратко и понятно формировать свой запрос, что не всегда возможно и уместно. Кроме того, технологии нуждаются в постоянном обновлении и ремонте, что также требует дополнительных финансовых и временных ресурсов, а также необходимость привлечения специалистов, которые следили бы за исправностью работы технологии.

При всех опасениях, сложностях разработки и высокой себестоимости технологии ИИ демонстрируют несомненные преимущества их использования: для гостиницы – оптимизация менеджмента, мониторинга состояния гостиницы, рекрутинга, управления затратами, продажами, поставками; для гостя – персонализация предложения, экономия времени, большая самостоятельность и независимость при размещении в гостинице. Наряду с этим, выявленные недостатки (проблема занятости, конфиденциальности, безопасности, эмпатии, сбоев) не позволяют однозначно утверждать о целесообразности повсеместного использовании ИИ в деятельности гостиничного предприятия. Наиболее оптимальный вариант представляет собой использование ИИ в сочетании с человеческим ресурсом. И это объяснимо. С одной стороны, индустрия гостеприимства в целом и гостиничный бизнес в частности целиком и полностью зависят от профессиональных кадров. С другой стороны, ИИ не способен как человек реагировать на непредвиденные обстоятельства, форс-мажор и предпринимать соответствующие решения, действия. Измениться эта формула в пользу ИИ может лишь под влиянием факторов и обстоятельств, в которых человек будет ограничен. Но даже и в этом случае значимость человеческих ресурсов в деятельности гостиничного предприятия будет не менее важна на фоне делегирования некоторых функции роботам и иным технологиям ИИ, используемых в международной гостиничной практике.

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AN ANALYTICAL LOOK AT AUTHOR PREDISPOSITION REGARDING THE US-CHINA TRADE WAR

Abstract. An author's predisposition plays an enormous role in the research papers they compose that summarize and formulate conclusions about our modern world. It is that notion that creates the necessity towards understanding the innate bias each author possesses and the actual truth in what they are saying. Through this study of the US-China trade war, different potential aspects of an author's predisposition were analyzed to determine the correlation between the author's ideas and their biases in their writing. This was done by gathering information on articles they had previously composed and the ones they have currently published in order to gauge trends. Through this, their previous predispositions were analytically applied to their current writing as a way of illuminating correlating factors. These correlating factors were what ultimately revealed how their predispositions may be carried through their writing and what aspects of their research may lead to them holding similar opinions between different publications. The research ultimately conveys that author predisposition does not appear to stem from nationality, but rather finds its roots in the researcher's past works.

Keywords: author's bias on US-China trade war.

I. Introduction

When the trade war between the United States and China broke out, it was difficult for an average person to comprehend the potential impact that it would have on the economies of both countries. International trade involves many macroeconomic factors and policies, and to forecast for any economy's growth is a complex problem that even experts have been struggling to grasp. The whole situation is bewildering, and most people perhaps would just guess which side would be hurt more economically, but have a hard time forming their own opinions. Therefore, it is common to rely on the analysis and opinions of the experts. However, these experts each have their own unique opinions about the trade war's potential impact on both economies, and naturally have a level of "own-opinion-ness." Besides this, since it is a form of war, it would be easy for people, including the experts, to choose a side. This only leads to the potential of more author biases. From the daunting abundance of opinions that already exist in our society about the trade war, it is difficult to discern which opinions are closer to the truth. This study explores whether there is a detectable level of author predisposition in the literature regarding the US-China trade war. By analyzing papers from the experts, a more balanced understanding of the impact of the trade war is also developed. Therefore, the findings of this research could be used as analytically trustworthy to people seeking advice.

II. Literature on predisposition

Essentially, author predisposition is the bias in perception of a topic that one already has before writing a paper. An author's predispositions can de-

rive from an author's background, his or her education, social and/or political views. This can affect a research paper's result in many ways: whether or not the author is supportive of the idea that is being presented in the article may drastically affect the tone and the research itself. Author predisposition can be determined by analyzing his or her background information and also judging past works. Often, authors keep their opinions uniform throughout their writing, and their predisposition can be determined based off of that (Khandelwal [4]). Khandelwal's studies reveal that an author's opinion may arise from the background in which he was brought up in rather than being informed by his experiences throughout his life.

As stated in the Journal of Psychiatry & Neuroscience by Dr. Simon Young (PhD), "conflicts of interest (COI)," otherwise known as an author's predisposition, "exist in every aspect of the production of research journals" (Young [14]). Dr. Young further states that author predisposition occurs when the researchers' "personal interests are in conflict with their professional obligations" (Young [14]). This statement alone reveals the core foundations for this paper's goal of exposing the effects of researcher bias in the US-China tariff war. Essentially, a researcher's previous experiences, upbringing, and current beliefs all carry a substantial power and potential to influence a researcher's opinion. While this researcher may be professionally obligated to write from a neutral standpoint, the researcher's personal interests may alter this obligation in a manner that should not occur professionally, but in reality, it still does.

Author predisposition often means that "someone will profit personally" from the bias that the researcher may apply towards "his or her professional role" (Young [14]). Furthermore, the profit "is not necessarily monetary" (Young [14]). The outstanding effects of the researcher's predisposition could have implications towards "the personal goals of the individual or organization" (Young [14]). As a result of this, an author who researches and writes while having conflicting personal interests will subject the topic they are writing about to an unfair bias. In the research community, people are concerned "that a COI may bias behaviour," making it a crucial tendency that the research community wishes to avoid (Young [14]). Biased researchers publishing their works could do more harm than good by unjustly influencing the opinion of the public and leading them to believe falsified or unsubstantiated information; at a large scale, this could have disastrous effects.

In an experiment conducted by Mahoney to reveal "how researchers' bias can influence their behavior," the experimentees were seen to be "strongly biased against" articles "that reported results that contradicted their own theoretical perspectives" (Young [14]). At face value, his experiment revealed that researcher's fail to comprehend information that contradicts their perspectives. As Mahoney says, the results of this experiment reveal how author predisposition "can have a deleterious effect" as ideas which have already been "contradicted can persist in the literature" (Young [14]). Ultimately, Mahoney's study exposes that an author's predisposition can have a damaging effect on the ideas that persist in the topic they discuss because their opinions may be falsely supported.

In a different study conducted by Cain and Detsky, "experimental evidence … supports the idea that it is difficult to overcome the biases created by the effect of early information on beliefs" (Young [14]). This conclusion reveals that an author's predisposition may be unwavering and unchangeable as a result of the idea being ingrained in their minds since discovering the idea. In another experiment by Dana and Loewenstein relating to the effects of an author's predisposition on their research, "they conclude that self-serving bias prevents individuals from being objective even when they have a motivation to be objective" (Young [14]). As it pertains to their writing, these two studies reveal that an author's predisposition can be detrimental towards the goals of their research. Authors are no longer partial in their

views, leading to research papers with skewed beliefs because these authors fail to address the subject in an objective manner.

In summary, the author predisposition is a particular bias held by the individual prior to engaging in their written work. These particular biases can stem from any aspect of one's life that is significant enough to influence the author's writing. This conflict of interest carries the power of completely altering peoples' interpretation of the work, giving an author predisposition the ability to unfairly influence the opinion of those reading the research. Ultimately, author predisposition can be detrimental towards an objective manner of writing due to the author's inability to be impartial.

III. Methodology

In this research, the two primary aspects of predisposition that were focused on were the author's nationality and opinions in prior research regarding similar focuses and themes. An author's nationality is a key factor, especially in the context of the ongoing US-China tariff war, since it is a direct conflict between the two countries, and the authors from China and the US could especially have a patriotic tendency. The culture and society that one grows up in has a large effect on their beliefs and values, and opinions in previous research from those author's could reveal what opinions they have developed over time.

The papers were categorized by their expressed stance into three groups: 1) the authors predict that the US economy would hurt more by the US-China trade war, or; 2) China would, or; 3) neutral that both countries will hurt about the same. The data is composed of 14 unique reports and research papers from 19 authors, where some papers had coauthors. These papers were selected in a two step process, in which the first step used keywords like "US-China trade-war" and "trade-war effects" to find potential candidate articles, whereas the second step selected papers to have a balanced mixed the type of opinions. Including articles with neutral stance was necessary because they serve as reference levels for comparison of factors that could suggest predisposition. After finding the most popular articles, the final sample was randomly selected from each group of papers. By choosing randomly, there would be less factors in the investigation to account for when determining conclusions based upon the research. If there is a pattern in the distribution of authors' stances and the two aspects of predisposition, I can conclude that there was very likely an effect from predisposition; otherwise, there was no apparent effect from author predisposition.

The author's nationality consisted of an investigation into their country of origin and ethnicity. The opinions in the authors' previous papers and articles were the side of the argument that they appeared to favor based upon the wording of their sentences. The argumentative factors comprised of an analysis of the authors' paper on the US-China trade war and categorized factors, such as key words. By tallying the number of factors that leaned either towards the US or the Chinese economy being hurt more, the author's opinion regarding a potential outcome of the trade war was clear.

Furthermore, key facts and main ideas were compared across the authors. For example, in Peter Coy's article in Bloomberg Business Week titled "Trump's China Tariffs Hit America's Poor and Working Class the Hardest", it is clear from the beginning what his opinion and main focus of his research are. Just in his title, it can be seen that his opinion is that the trade war is hurting the lower-class Americans the most; his paper can instantly be determined to be structured around how the tariffs hit America's lower class the hardest. Upon deeper analysis in his paper, Coy's opinion becomes perfectly clear. He uses words such as "suffers" and "burden" to convey to the reader which country is taking the majority of the impact from the trade war (Coy [2]). Coy also includes a chart within his paper, which illuminates the "tariff burden as a percentage of after-tax income" (Coy [2]). His data demonstrates that the poorest of Americans are taking on the majority of the impact

from the trade-war. The data points Coy used were factors that affected his research, and ultimately his opinion. Therefore, in my analysis, these factors that he utilized were noted as factors that potentially affected his opinion. This process was done for each paper that was analyzed in order to gain an understanding regarding what factors affected the authors opinion how those factors affected the opinion. Through this analysis, information regarding the author's predisposition and factors influencing his opinions were gathered.

In order to determine what the authors' predispositions were, research was conducted into their public demographic data, including their nationality, education, area(s) of expertise, and occupation. These were the four specific characteristics of the authors that were analyzed in this study because the culture that one is raised in and their education can often influence their perspective from a young age. Additionally, their area(s) of expertise could influence how they view certain events. Finally, their occupation could determine the manner in which they perceive the effects of events such as the current U.S-China trade war. This information was put into a table in order to determine if any correlation between data points existed.

IV. Results

Following the gathering of this information, the information that detailed the amount of papers per type of opinion was organized in an excel sheet in order to illustrate how many of each opinion was recorded. As seen in Figure 1 below, seven of papers have the stance that the United States economy will hurt more from the tariff war, three predicting that China will hurt more, while another four took on a neutral stance.

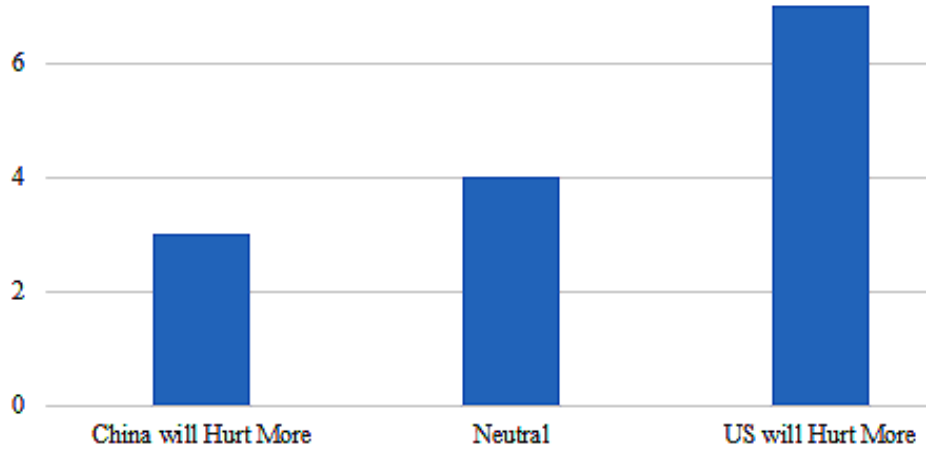

Figure 1. Number of Analyzed Papers by their Expressed Stance

Significant Predisposition through Self-consistent Opinions from Prior Works

The information that was analyzed also illuminated what types of factors affected the author's opinion. Ultimately, the data showed that there was significant predisposition that was consistent with the opinion present in authors' prior works. Table 1 shows authors' stances by their nationality and their opinions expressed in prior works. More than 60% of the authors for each stance shared the same opinions from their prior works, which is strong evidence of author predisposition in the light of self-consistency. It suggests that it was not the author's nationality, but their previous dispositions, that affected their perspectives in their current papers. For example, as seen with Hugo Erken and Bjorn Glesbergen, their bias in their prior works were that China would perform worse, and in their current papers, they also believed that China would perform worse. Furthermore, as seen with Jim Zarolli and Amanda Lee, who respectively believed that the US would perform worse and China would perform worse, carried

these same beliefs into their current research. These authors are just a few of those who were analyzed that displayed the trend of carrying their beliefs from their previous papers into their current work.

Table 1.– Distribution of Predisposition Aspects by Author Stance

Author Stance in Current Work	Nationality			Total Authors With this Opinion	# of Authors with Same Tone Prior Works
	US	Chinese	Other		
US Will Hurt More	5	1	1	7	4
China will Hurt More	2	1	2	5	4
Neutral	1	1	5	7	4

More Balanced Prediction by Key Factors Influencing the US-China Tariff War Outcomes

Now that we know there are biases in each group of papers, a more balanced, thus more realistic, prediction could be reached by comprehensively analyzing and evaluating the key factors used by the authors. (Table 2) below shows the eight important factors considered by the authors of the analyzed papers. One thing that is important to note is that in some papers, the authors included more than one factor that had the potential to influence their opinion, therefore, some authors may have their opinions represented more than once in the table, leading to more counts of authors than there are actual authors who were surveyed. More often than not, the discussion of producers and the import/export business tended to lead to the prediction that the trade war would have a similar effect on both China and the United States. However, despite this seemingly neutral bias, the discussion of the import/export business also prompted 50% of researchers to determine that the United States would be economically worse. On the other hand, when authors discussed currency depreciation and effect on GDP per capita in the future as a result of the trade war, all of the authors that discussed these topics were biased towards China being hurt more economically than the United States. However, there was also the case where a factor would have a fairly even distribution of author opinions. As seen in factor of economic growth rate, there was an equal amount of authors who believed that the U.S or China would be hurt more economically, and only one more author who believed that there was a neutral effect. These findings implicated that when certain factors were discussed, they would more often than not lead to the author being biased in a certain way.

Table 2.– Factors Considered by Type of Stances

	No. of Authors Using the Factor			
	China Will Hurt More	US Will Hurt More	Neutral	Total
Import/Export Business	0	5	5	10
Effect on Producers	0	0	7	7
Economic Growth Rate	1	1	2	4
Country's Ability to Withstand Risky Economic Situations	2	1	0	3
Currency Depreciation	2	0	0	2
Effect on GDP per Capita in the Future	2	0	0	2
Profit Margins	0	1	0	1
Effect on Consumers	0	1	0	1

Overall, some factors tend to lead to a specific opinion more often than others. Factors such as currency depreciation and effect on GDP per capita in the future more often lead to the prediction of "China will hurt more". On the other hand, profit margins and effect on consumers tended to lead to 'US will hurt more". Somewhat surprisingly, the effect on producers more likely leads to the "neutral stance", while one might feel that US would hurt more due to the increased cost of production. Factors such as the import/export business, a country's ability to withstand potentially risky economic situations, and economic growth rate tended to cause authors to have mixed opinions.

V. Conclusion

This study finds that there was not a significant author predisposition from nationality, but there was a strong predisposition due to self-consistency in the habit of the researchers' prior works. Therefore, we need to take a comprehensive view of the potential results of the US-China tariff war. One good way was to analyze the factors in the different papers and apply a more objective evaluation of each factor to arrive at a more reasonable conclusion. That can be a good topic for a future research project.

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Section 5. Finance, money circulation and credit

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BITCOIN EXCHANGE RATE AS A MAJOR MEASURE OF CRYPTO-ECONOMY DEVELOPMENT

Abstract. The opinions of influential experts on the possible course of bitcoin cryptocurrency and prospects in the crypto-economy in general were analyzed. Different points of view on the interpretation of the phenomenon of crypto-economy have been analyzed. The factors that influence the state of the bitcoin exchange rate are subjected to deep analysis. Indicators such as startups, crypto funds, network hashrates, number of cryptocurrencies, number of users and halving are highlighted. It is determined that the bitcoin exchange rate indirectly influences the state of tendencies in the crypto-economy. The author's method of forecasting bitcoin exchange rate has been formed.

Keywords: crypto-economy, bitcoin, hashrate, crypto funds, startup.

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КУРС БИТКОЙНА В КАЧЕСТВЕ ОСНОВНОГО МЕРИЛА РАЗВИТИЯ КРИПТОЭКОНОМИКИ

Аннотация. Подвергнуты анализу мнения авторитетных специалистов о возможном курсе криптовалюты биткойн и перспектив криптоэкономики в целом. Проанализированы различные точки видения к трактовке явления криптоэкономики. Подвергнуто глубокому анализу факторы, которые влияют на состояние курса биткойн. Выделены такие индикаторы, как стартапы, криптофонды, хешрейт сети, количество криптобирж, количество пользователей и халвинг. Определено, что курс биткойна опосредованно влияет на состояние тенденций в криптоэкономике. Сформирован авторськтй метод прогнозирования курса биткойн.

Ключевые слова: криптоэкономика, биткойн, хешрейт, криптофонды, стартап.

Введение. Сегодня термин «криптоэкономика» все еще вызывает сомнения. Некоторые связывает этот срок с отдельным разделом экономики, изучающий процессы, связанные

с криптовалютой, другие же просто отождествляют с абстрактным термином, который используют только для красного словца. Однако, как утверждает основатель сообщества Cryptonet Дмитрий Карпиловский, криптовалюта, а также блокчейн, токены, смарт-контракты – все это производные криптоэкономики.

Анализ научных публикаций. По мнению Карпиловского, криптоэкономика – объединение криптографических инструментов и экономических стимулов, целью которых является создание децентрализованной экосистемы, работает без какого-либо ручного и ультимативного вмешательства извне.

Однако, сравнивая традиционную экономику, которую по словарю Райзберга, называют хозяйственной деятельности общества, а также совокупность отношений, складывающихся в системе производства, распределения, обмена и потребления, главная функция которой заключается в постоянном создании необходимых для жизнедеятельности благ, без которых общество не сможет развиваться. То есть классическая экономика удовлетворяет потребности человека в мире ограниченных ресурсов на протяжении уже нескольких тысяч лет и вышла за пределы отношений купли-продажи. Так, некоторые эксперты и наблюдатели часто утверждают, что криптоэкономика выполняет все те же функции и отличается только поведенческими инстинктами – реакция на любые события происходит гораздо эмоциональнее и кардинальнее через большие разочарования, не свойственные классической экономике [1].

Так, например, когда индустрия приближалась к пику криптовалютного хайпа, известный венчурный инвестор Силиконовой Долины Паркер Томпсон написал в своем твиттере о том, что «Концепция криптоэкономики глупа. Это экономика. Изобретать собственное слово – просто повод игнорировать понятные вещи».

Однако следует рассмотреть и позицию Джоша Старка, соучредителя компании L4, которая занимается проектами на Web.3, который опубликовал статью с разбором понятия криптоэкономики. Так, в своей публикации автором было выделено следующие определения:

Криптоекономика – это прежде всего технология, а не применение макроэкономической и микроэкономической теории для криптовалютних рынков или ICO. Это также не разновидность экономики, а, скорее, область прикладной криптографии, которая учитывает экономические стимулы и экономическую теорию;

Продуктами криптоэкономики является криптовалюта, основанная на публичном блокчейне, который также относится к одному из продуктов новой практической науки;

Криптоэкономика основывается и существует в децентрализованных временных P2P-системах, в которых исключается контроль любой третьей стороны, такой как государство, Центральные банки и правительства;

Криптоэкономические подходы сочетают криптографию и экономику для создания надежных децентрализованных временных сетей развивающихся несмотря на постоянные попытки противников и злоумышленников разрушить сеть;

Криптоекономика, по сути, касается построения вещей и имеет много общего с дизайном механизмов – области математики и экономической теории [2].

Материалы и методы. В ходе написания работы были использованы позиции авторитетных ученых и финансовых экспертов относительно понимания криптоэкономикы, а также трактовка взаимодействия курса биткойн с ее развитием.

Целью данной статьи является определение взаимодействия курса биткойн с развитием криптоэкономикы.

Результаты исследований. На современном этапе развития криптоэкономикы первое на, что обращают внимание – это курс криптовалют. Пока непонятно, хорошо это или плохо. Но можно с уверенностью утверждать, что каждый

рынок проходил эту стадию развития. С привлечением количества пользователей криптовалют, а также участников взаимоотношений в криптоэкономике, курс будет себя вести менее волатильно и индикатор цены не исчезнет, но существенно уменьшит свою важность.

Учитывая этот факт, что курс является основным индикатором, соответственно интенсивность развития и становления крипторынку будет коррелировать с курсом основной криптовалюты. Чтобы лучше прогнозировать и предвидеть циклы наибольшей активности в развитии этого молодого рынка мы в своем исследовании попробуем разработать методы прогнозирования курса биткойн и отразим это на графике интенсивиности развития криптоэкономики. А также попробуем выделить фазы развития криптоэкономики, структурировать их, а также дать им название.

Криптоэкономика развивается с помощью стартапов, какие дают толчок для развития в сферх на уровнях государств и континентов. Поэтому чтобы проанализировать прошедшую корреляцию курса с интенсивностью развития мерилом развития криптоэкономики возьмем ИСО, количество привлеченных инвестиций, количество криптофондов, а также количество криптокомпаний, количество пользователей, мощность майнингових сетей биткойн, а также для точной информации, мощность майнинговои сети второй криптовалюты етериум.

Первое ИСО в истории было размещение токенов Mastercoin в 2013 году. Следующим важным ИСО было сбор средств проекту Etherium. Изучая рынок в начале 2017 года, можно утверждать, что количество ИСО на начало 2017 была меньше 50 проектов. Формат сбора средств был общедоступный каждому пользователю биткойнов или етериум. Сбор средств ИСО длился от двух недель до двух местах. Показатели количества старапов начали резко расти с мая 2017 года и уже летом этого же года при проведении и количество привлечения средств ИСО отличались в сотни раз. Для уточення, ИСО собирали сумму в десять раз большую заявленной, а само время ИСО в некоторых случаях сократился до нескольких секунд.

Чтобы понимать корреляцию с курсом первой криптовалюты вспомним, что цена биткойнов с января по май 2017 выросла с примерно 1000 долл. США до примерно 2500 долл. США, а на конец лета была уже около 5000 долл. США. По окончании 2017 цена зафиксировала все all time hight в районе 20000 долл в зависимости от биржи. Это же и происходило с количеством стартапов, которые выходили на ИСО, а также привлеченными ими средств.

Также для лучшего понимания ситуации с 2017 было запущенного такое же количество фондов чем за три предыдущих. Этот показатель можем назвать инертным то что увеличение криптофондов происходило даже в 2018 году в процессе падения курса биткойн, то есть интенсивность развития криптоэкономики продолжается даже после падения курса в течение еще некоторого времени, рост интенсивности реагирует с опозданием. Это скорее всего объясняется ожиданием роста курса и трактовки падения как коррекции перед новым ростом.

Важным показателем является также хешрейт сети. Существует много споров относительно первичности и вторичности хешрейту и курса биткойн. Однако проанализировав график цены и хешрейту, можем утверждать, что всегда роста цены предшествует рост хештейту, а после падения реагирует не сразу, и еще некоторое время сохраняет свои показатели.

Хешрейт же криптовалюты етериум ведет себя подобно, однако он более чувствителен и волатильный.

Определить точное количество криптокомпаний будет невозможно, поэтому мы возьмем за основу количество криптобирж. По данным источника Coin market cap можем видеть, что на сегодняшний день существует более 200 бирж

и просматривая эти данные в ретроспективе можем заметить, что интенсивная регистрация криптоплощадок для обмена криптовалютой наблюдалась в моменты роста курса [3].

Количество пользователей продуктом является мерилом успешности рынка. Рынок криптовалюты не является исключением. Так как крипторынок не является формализованым, не существует какого-то определенного реестра пользователей, основными индексами для фиксации их увеличения или уменьшения будем считать количество адресов в сетях самых популярных криптовалют, количество транзакций в этих же сетях, а также статистику google trends с упоминанием слова биткойн, криптовалюта, а также названия других самых популярных криптовалют.

Рассматривая все эти индикаторы, которые влияют на развитие криптоэкономики не можем не вспомнить такие, как инфраструктура, которая развивается в пики наибольшей интенсивности, то есть в периоды наибольшего роста курса, но позже является тем фактором, который провоцирует дальнейшее развитие криптоэкономики, формируя так называемый замкнутый круг. Государство и его законы в этом случае является важной частью данной инфраструктуры. На данном этапе государство вступает в дискуссию после увеличения количества криптокопманий и взаимоотношений в криптоэкономике, а в период спада активности на крипторынке решает, что рынок небольшой и он недостойный внимания. Отсутствие же признание государства замедляет процесс развития, но с каждым годом эта тенденция идет на спад и все больше государств признает этот рынок [4].

Курс биткойн не поддается прогнозированию и все попытки его прогнозирования сводятся к простому гаданию. Хотя существуют методы, которые позволяют понимать направление движения курса в среднесрочной перспективе.

Анализируя все факторы, которые могут влиять на курс биткойн, и обладая многолетним практическим опытом торговли у нас сформировался собственный метод, и в этом исследовании мы попробуем его выделить в формуле.

В нашем методе прогнозирования курса мы придаем значения такому событию как халвинг биткойнов. Анализируя график можем утверждать, что рост начинается всегда примерно за месяц до халвинга, а после халивнга на некоторое время останавливается. С каждым циклом роста и падения на графике биткойн можно выделить несколько периодов: период роста, период падения, период аккумуляции, период реакумуляции. Предположим, что период аккумуляции это период, в котором мы находимся сейчас, и он как раз предшествует роста перед халвингом. Исследуя эти периоды, мы предлагаем так называемый мультипликатор биткойнов. Он основывается на сравнении циклов и определении во сколько раз биткойн вырос в текущем цикле по сравнению с предыдущим циклом.

Разницу в количество раз, на сколько количество раз, на которую умножился биткойн была меньше мы назовем переменной X.

Чтобы определить мультипликатор четвертого цикла роста биткойнов применяем следующую формулу:

$$M_4 = M_3 * X_1/X_2$$

где,

M_4 – мультипликатор четвертого цикла;

M_3 – мультипликатор третьего цикла;

X_1 – X второго цикла;

X_2 – X третьего цикла.

Следующим шагом является разработанная формула прогнозирования курса биткойн за мультипликатором:

$$R_n = R_{min4} * M_4,$$

где,

R_n – прогнозируемая цена,

R_{min4} – минимальная цена четвертого цикла,

M_4 – мультипликатор четвертого цикла.

Выводы. Поэтому, считаем, что не существует прямого влияния курса биткойны на развитие

криптоэкономики. Целесообразно сказать, что данное воздействие является опосредованным. Так, как не существует четкой формулы влияния его курса на состояние и развитие тенденций в криптоэкономике. Однако такие индикаторы, как стартапы, криптофонды, хешрейт сети, количество криптобирж, количество пользователей и халвинг, помогут понять направление движения курса биткойн, и поэтому и общую атмосферу в криптоэкономике.

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FORMATION OF TWO-LEVEL FINANCIAL MODEL FOR A MULTI-STOREY HOUSING COMPLEX INVESTMENT PROJECT

Abstract.

Thing. The author of the work reveals the effectiveness of a multi-story building investment project and represents the criteria of debt financing through bond issues. Furthermore, the research includes the analysis of a two-level financial scheme based on the example of a multi-story building project.

Goals. The first objective is the development of a universal financial scheme with the ability to modify the parameters to particular investment projects in the construction sector and apply this scheme in practice. The second objective is to develop an effective alternative to escrow accounts that allows to provide an optimal distribution of financial burdens. Such a measure, eventually, must prevent the trend towards the increasing cost of a real estate per square meter. This action also helps to avoid the extension of the construction and selling period.

Methodology. The methodological framework involves analysis, synthesis and simulation of the cumulative-credit financing scheme.

Results. The investment project has been developed for an existing construction company which was subsequently applied. The project is to simplify the understanding of applying the bond issues for this company by providing them with a detailed the cumulative-credit financing scheme.

Conclusions and Relevance. A multi-story building investment is one of the most perspective directions of Russian estate market development. Previously, the bond issue was described neither as the instrument of debt financing nor as the precise mechanism of the enterprise financing. It created a misunderstanding of the practical use and economical effectiveness of such an instrument. The given article contents the description of the cumulative-credit financing scheme of a multi-story building investment project.

Keywords: a multi-storey housing complex, financing of investment projects, bond issuance, a savings scheme, credit scheme.

1. Bond issuance

1.1 An enterprise issues three series of bonds whereas the value of each bond is 900 million rubles, which covers the total cost of construction. The construction period is 8 years. The repayment of the first series should be carried out within three years; the second – in four years and the third – in five years. Every month the enterprise repays the interest on all the series of bonds: the annual interest rate is 9% thus the monthly share of interest payments is 0.0075.

So that we determine the formula:

$$A = PV \cdot r,$$

Here,

A – annuity – the costs of the bond service; PV – the present value of the series; r – the interest rate. (Pic. 1, Tab. 1)

1.2 We use 50/50 savings and credit scheme for repaying series of bonds. The savings account for the first series is opened for a period of 3 years; at the end of this term, we have 450 million of rubles which is the half of the value of the bond. At the same time, the company borrows 450 million at the annual interest rate of 12% to repay the total value of a series. The constructing company repays the loan during the next 3 years. To complete the savings and credit scheme we repeat the steps described above. (Pic. 2)

Here is the formula to calculate the present value and future value of an annuity:

1. The first savings account calculation:

$$FV_1 = RUB\ 450000000.$$

$$t = 3\ years, r = 0.0075$$

A_H – monthly paymet.

We determine the formula as follows:

$$FV_{PS}^{A} = A \cdot \frac{(1+r)^n - 1}{r},$$

$$r = 0.0075,\ n_1 = 3 \cdot 12 = 36$$

$$FM3(r,n) = \frac{(1+r)^n - 1}{r}$$

$$FM3 = \frac{(1+0.0075)^{36} - 1}{0.0075} = 41.15$$

$$A_{1H} = 450000000 / 41.15 = RUB\ 10935603.$$

2. The second accumulative account calculation:

$$FM3 = \frac{(1+0.0075)^{n} - 1}{0.0075} = 57.52$$

$$A_{2H} = 450000000 / 57.52 = RUB\ 7823366.$$

3. The third accumulative account calculation:

$$FM3 = \frac{(1+0.0075)^{60} - 1}{0.0075} = 75.42$$

$$A_{3H} = RUB\ 5966587.$$

4. The calculation of the credit:

The company takes 450 million rubbles loan

When r=12%

$$PV_3 = RUB\ 450000000.$$

$$T = 3\ years \rightarrow n = 36$$

$$r = 12\% \rightarrow r = 0.01\ \text{(monthly interest)}.$$

We determine the formula as follows:

$$PV_{PS}^{A} = A \cdot \frac{1-(1+r)^{-n}}{r};$$

$$FM4(r,n) = \frac{1-(1+r)^{-n}}{r}$$

Using thes formula, we calculate:

$$FM4 = \frac{1-(1+0.01)^{-36}}{0.01} = 30.11$$

$$A_{3K} = RUB\ 14945201.$$

1.3 The given charts (Pic. 3, Pic. 4, Pic. 5) clearly demonstrate that combined savings and credit scheme optimizes and reduces the financial burden on the constructing company during the term of repayment of the loan. Correlating the repayment burden with the calculated operating income within savings and credit scheme, we can conclude that the implementation of the investment project of a multi-storeyed housing complex is possible because company revenue exceeds bond issuance expenses.

In conclusion, I would like to note that the practice of bond issuance as the source of loan repayment is not widespread in Russia. The proposed financing plan of multi-storeyed housing complex can be an effective alternative to an escrow account.

Summing up, a bonded loan can rapidly generate necessary financial resources for constructing at the outset of the project and application of savings and credit scheme can reduce the financial burden of loan repayment.

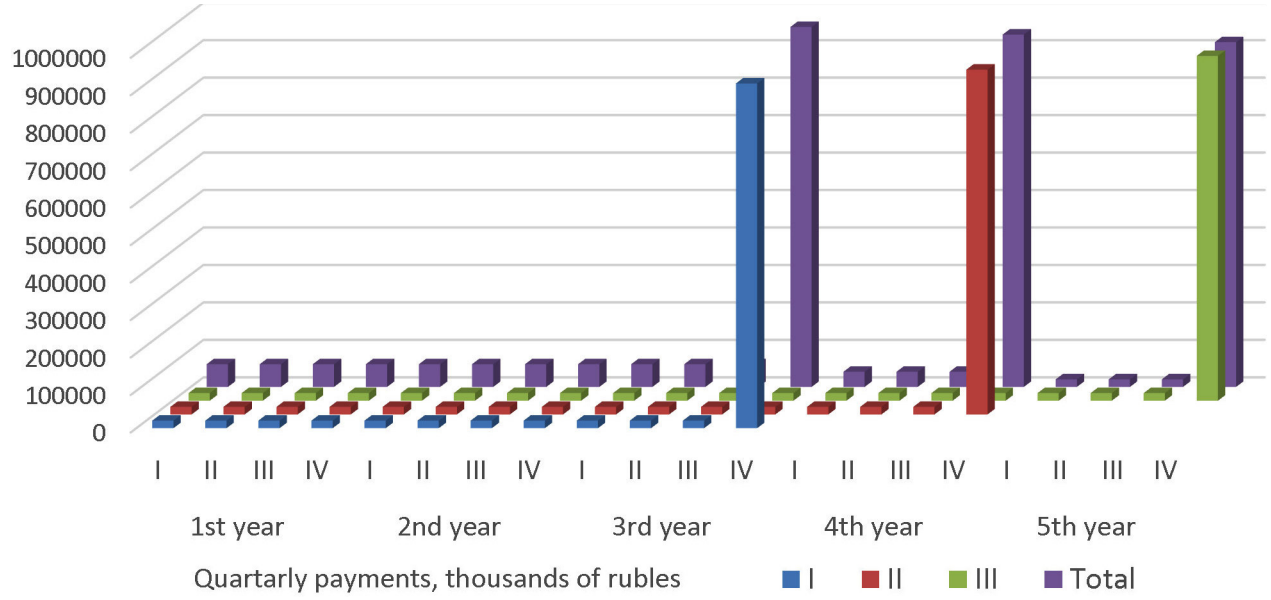

Figure 1. Quarterly schedule of interest payments on bonds

Table 1.– Quarterly schedule of interest payments on bonds, in thousands of rubles

Bond series		I	II	III	Total
the quarterly payment, thousands of rubles	1st year	I	20250	20250	20250	60750
		II	20250	20250	20250	60750
		III	20250	20250	20250	60750
		IV	20250	20250	20250	60750
	2nd year	I	20250	20250	20250	60750
		II	20250	20250	20250	60750
		III	20250	20250	20250	60750
		IV	20250	20250	20250	60750
	3rd year	I	20250	20250	20250	60750
		II	20250	20250	20250	60750
		III	20250	20250	20250	60750
		IV	920250	20250	20250	960750
	4th year	I	0	20250	20250	40500
		II	0	20250	20250	40500
		III	0	20250	20250	40500
		IV	0	920250	20250	940500
	5th year	I	0	0	20250	20250
		II	0	0	20250	20250
		III	0	0	20250	20250
		IV	0	0	920250	920250

Figure 2. Cash flows of the savings and credit scheme

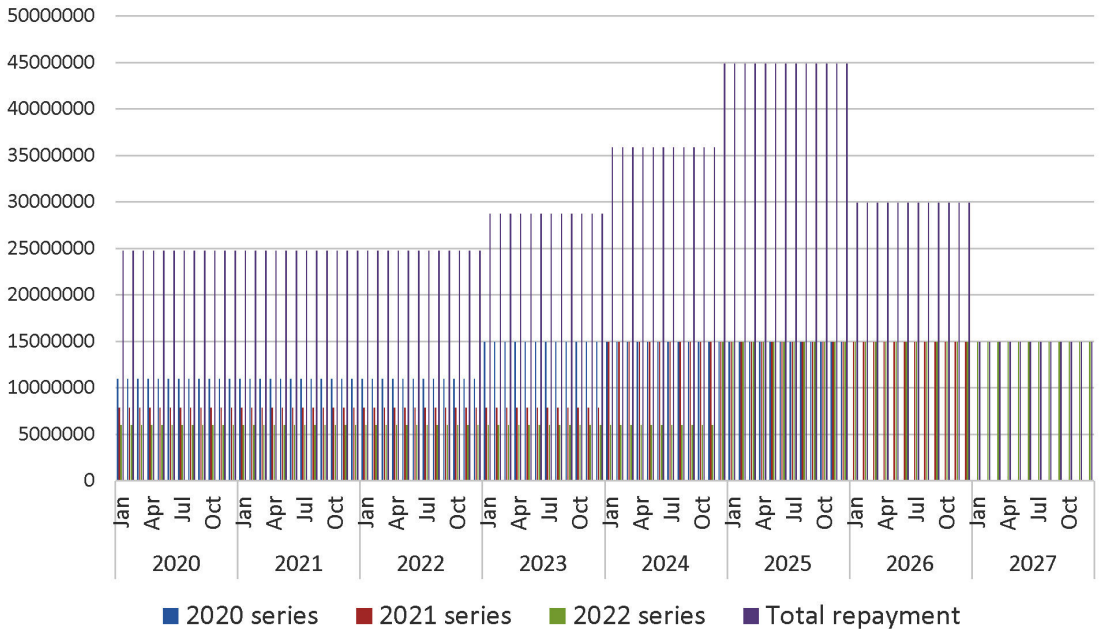

Figure 3. Payment schedule of the savings and credit scheme

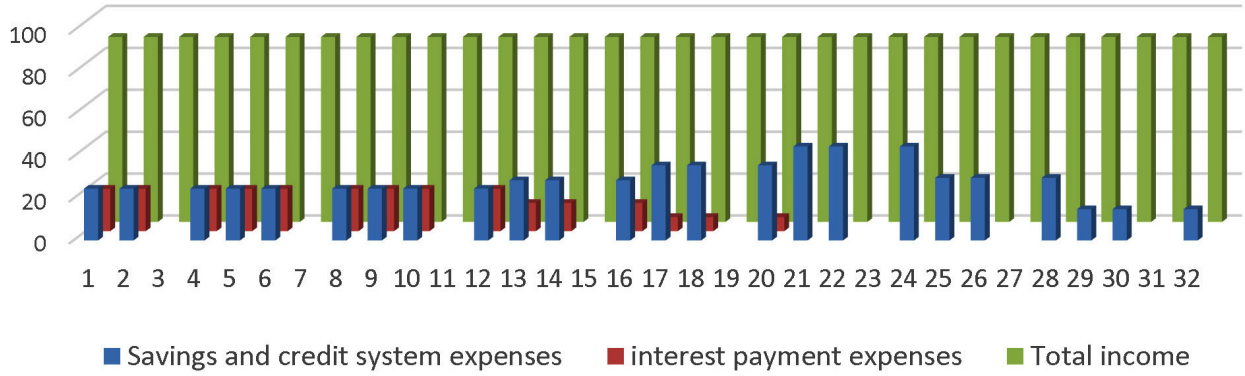

Figure 4. The ratio of income to expenses of bond issuance and savings and credit scheme

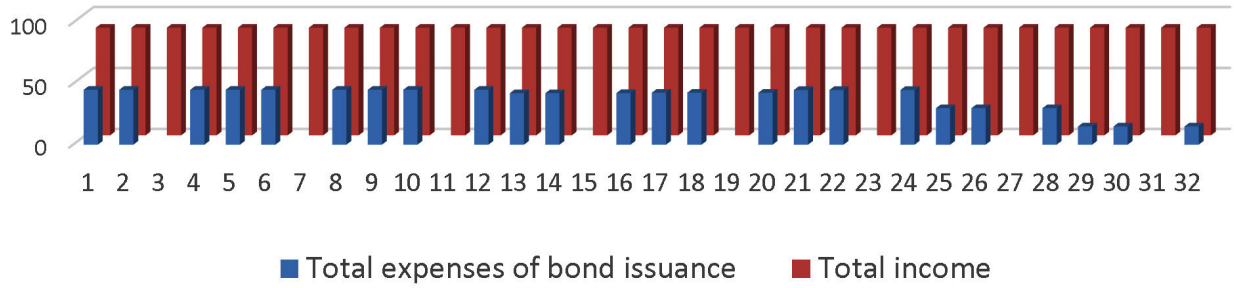

Figure 5. The ratio of total income to overall costs of bond issuance

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Section 6. Economics of demography

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AN INVESTIGATION INTO WHETHER CHINA REACHED LEWIS TURNING POINT EARLIER THAN EXPECTED

Abstract.

Keywords:

Introduction

China's labour market has changed dramatically over the last 30 years. The success of rural reform and Deng Xiaoping's economic reform has led China's economy to transform. One way this transformation can be explained is by the Lewis Dual Sector Model (LDSM). Initially, as most labour was employed on agricultural sector, where the land and capital resources are fixed, the efficiency and relative wages of the agricultural sector decreased as marginal output in the manufacturing sector increased [1]. This further created an economic environment that was suitable for private owner entrepreneurship (POE) to flourish. After rural reforms, the productivity in agriculture sector improved tremendously and produced a great amount of rural labour surplus so much rural labour moved to economic special areas to seek jobs. Also, after Hukou (a registration booklet which contains family ID) reform, there was more opportunity for rural to urban internal migration. This huge supply of rural labour provided the manufacturing sector with a cheap labour force and longer working hours. With this advantage, China's manufacturing goods became so much more competitive in the international market. China's coastal area began to flourish economically. The huge structural changes in China's economy can be explained through the LDSM. However, the model suggests there must be a point where a shortage rural labour occurs and therefore there comes a point, the Lewisian Turning Point (LTP), when the flow of rural labour into urban, manufacturing industry ceases as wages in rural areas rise as a result of a shortage of labour. This essay will analyse whether China and in particular Shanghai passed this point or whether the LTP has not been reached in Shanghai.

There are differing perspectives over whether the LTP has been reached and whether this came earlier than expected. Green [8] and Knight [2] both challenge the view that the LTP arrived due to structural labour shortages whereas Zhang et al [1] use wage rates rather than labour statistics to show the LTP arrived in the early 2010 s.

However, this essay has taken a more localized examination of the LTP effect on the Shanghai labour market. Shanghai is one of the biggest megacities in the world, and it is also the economic capital of China. Shanghai's growth trend can powerfully represent the future growth trend of China. Through the development and growth of Shanghai, human capital, one of the most crucial factors of production is changing. The changes in the labour market of Shanghai, are one of the signals for economists of China's economic structure change and economic growth and so the research question is: ''Did Shanghai reach the Lewisian turning point earlier than expected?"

There is little research on whether Shanghai reached the Lewis Turning Point (LTP) earlier than expected (quoted from professor Tangjun Yuan in Fudan University). It might be very valuable to do a research essay on this topic, since there is a void of information and articles that express this current topic. It is also an attempt to shed light on whether China's economic growth and development has changed because of the movement in the labour market.

Methodology

May to June 2019 – Examination of literature about the Lewis Dual Sector Model and Turning Point.

There is substantial literature on the Lewis Dual sector model [3] but there is scant research on China's Lewisian Turning Point and even less on Shanghai. Therefore, the research undertaken was extremely general, focusing on the Lewis model, labour market and economic growth. This revealed where the data had to be generated to answer the Research Question and also allowed a firm understanding of the required theory. Works read included Rush et al, Lewis, Zhang et al and Das as well as standard Economic text books.

July 2019- Collection of data for labour sector numbers and wages

The secondary data search revealed interesting sectoral employment, wage and occupation information. This provided key data which in conjunction with the theoretical basis to identify trends in the Shanghai labour market. The data was sourced online from a variety of sources including the World Bank Database, Chinese National Database and the Shanghai Databank.

August 2019 – Primary Research

To facilitate a better understanding of Chinese and Shanghai labour market theory a professor at Fudan University, Fang … Was interviewed and she further explained the connection between the movement of labour into different sectors, the wage growth in those sectors and the resulting impact on the economy according to the Lewis Model. She also allowed an understanding of current economic consensus about the Lewis Turning point in Shanghai.

August 2019 – Examination of labour surplus/ shortage data

Once the current academic consensus about the Lewis Turning point was found, the secondary data was analysed to measure how much surplus rural labour is present in China and especially regions surrounding Shanghai compared to the industrial sector. Further wages differentials between sectors was examined. This was the key to answering the research question and ascertaining whether the surplus of labour is still present or whether Shanghai has reached the Lewis Turning point.

Analysis and Evaluation

The theory of LTP states that as the rural labour surplus becomes smaller, rural wages increase. This will lead to a diminishing level of rural to industrial sector migration and therefore the LTP will be reached. For example, as Shanghai develops, the amount of labour in each sector changes, especially the agricultural sector and industrial sector which will experience a decrease in the supply of labour. The shortage of rural labour willing to move into the industrial sector suggests there would be a surge in the wage of rural labour. The decrease in the numbers of labour moving into the industrial sector indicates Shanghai has passed LTP.

Zhang et al agree with this argument. He claims that "As labor became more costly, agricultural production would probably come to depend more heavily on machinery as opposed to human labor. Similarly, the currently competitive, labor-intensive manufacturing sector would have to upgrade into a more capital-dependent and skill-intensive mode of production. These structural changes would then place a higher premium on the education of skilled laborers." Thus, the wages of both rural and industrial sector workers will rise. Zhang claims his empirical data show "a clear rising trend in real wages since 2003. And the acceleration of this rising trend, even in slack seasons, indicates that the era of surplus labor is over". In other words, the LTP has been reached.

This argument is now assessed in the light of the data generated by the study.

International Comparison of the Quantity of Rural Workers

The percentage of rural workers in 7 different developed countries can be used as a reference point to show how much rural labour surplus that China has. If the rural population is a huge proportion of overall population in China compared to other nations, it is likely that China holds a surplus of rural labour.

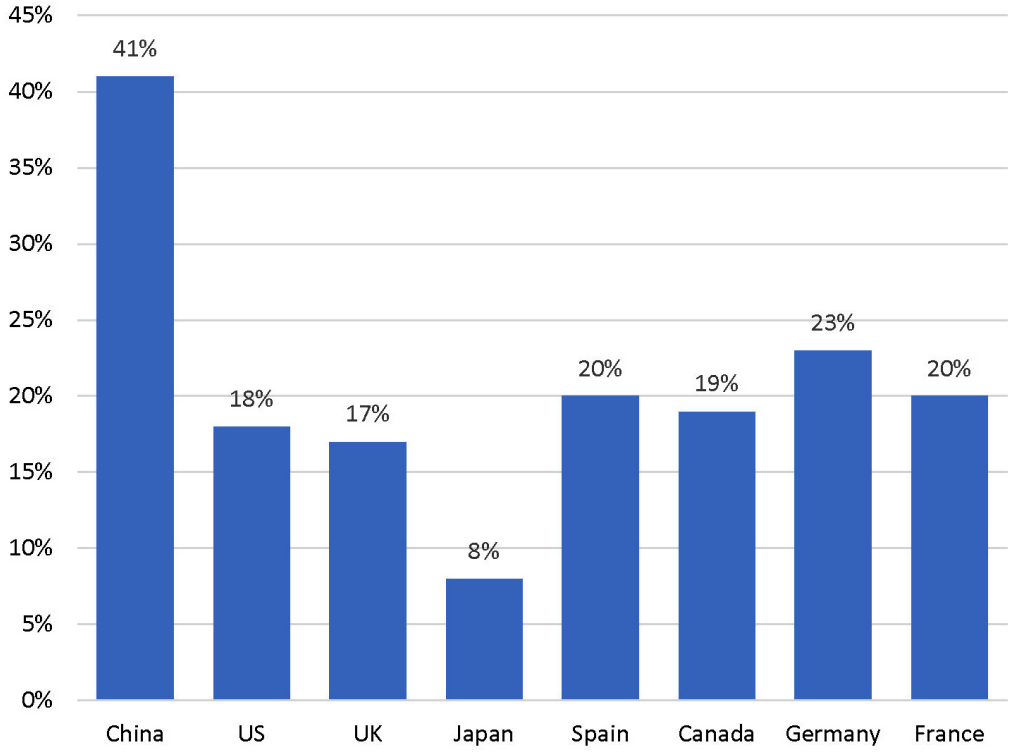

Figure 1. Percentage of rural population in 8 different countries in 2018 [7]

However, if there is also a rising trend in average wage levels for rural labour, the choice of using the proportion rural dwellers in China does not provide a valid data point for the Lewis Turning Point to not have occurred because wage levels, as Zhang points out have risen substantially. This is shown in the graph below.

Figure 2 shows the general trend of wage growth in all three economic sectors in Shanghai. Between 2013 and 2017, wages of labour in industrial sector increase from 50604 rmb to 66149 rmb. The most rapid growth happens in service sector between year 2016 to year 2017. Surprisingly, wages of labour in agriculture sector decreases 251 rmb between 2013 and 2014 but there is an overall upward trend. Analysis of this data supports the argument that the LTP has been reached. The wage of the rural sector has increased, although still less than the industrial sector.

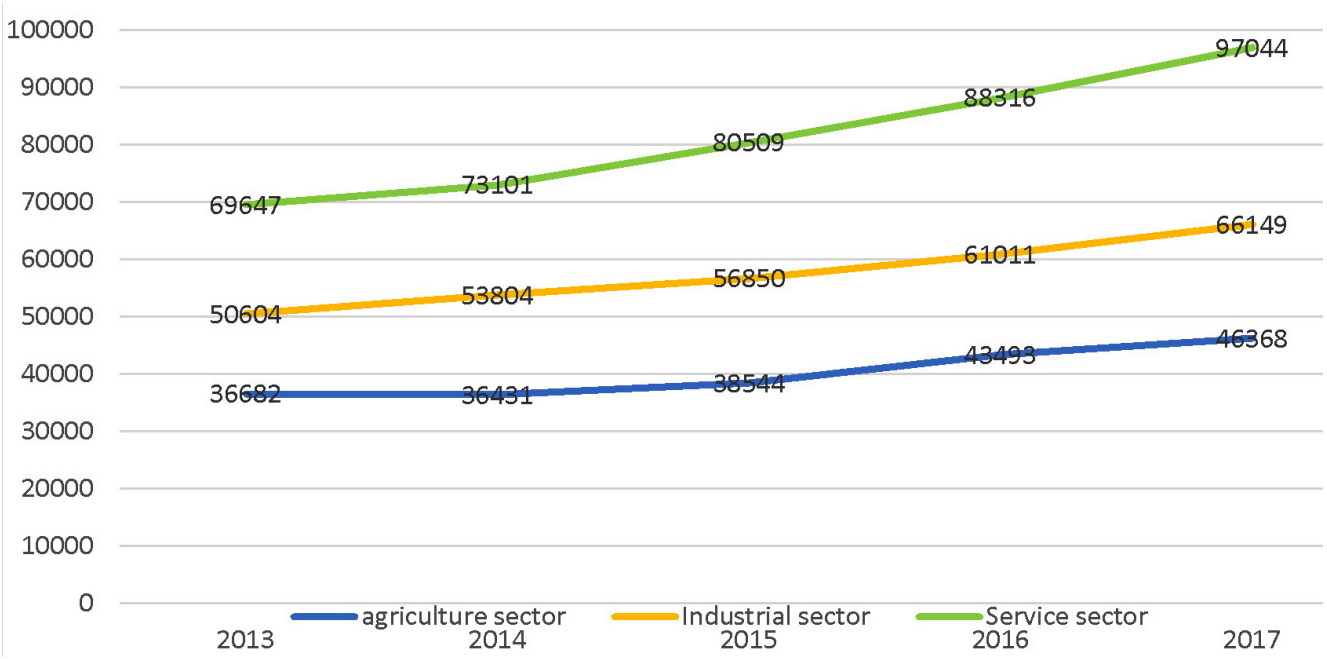

Figure 2. Average wages of labour in all three sector in Shanghai from 2013-2019 (RMB) [9]

There are several reasons why this actually supports the case for diminishing rural surplus: "the cost of living in cities, where most industrial activity occurs, is usually higher than in rural areas" [3]. Also "migrant workers in the industrial sector must bear the psychological cost of separation from their families, higher wages must be offered to compensate them" [6] further the argument that the LTP has been reached can be held up through conceptual analysis of the Lewis Turning Point Model.

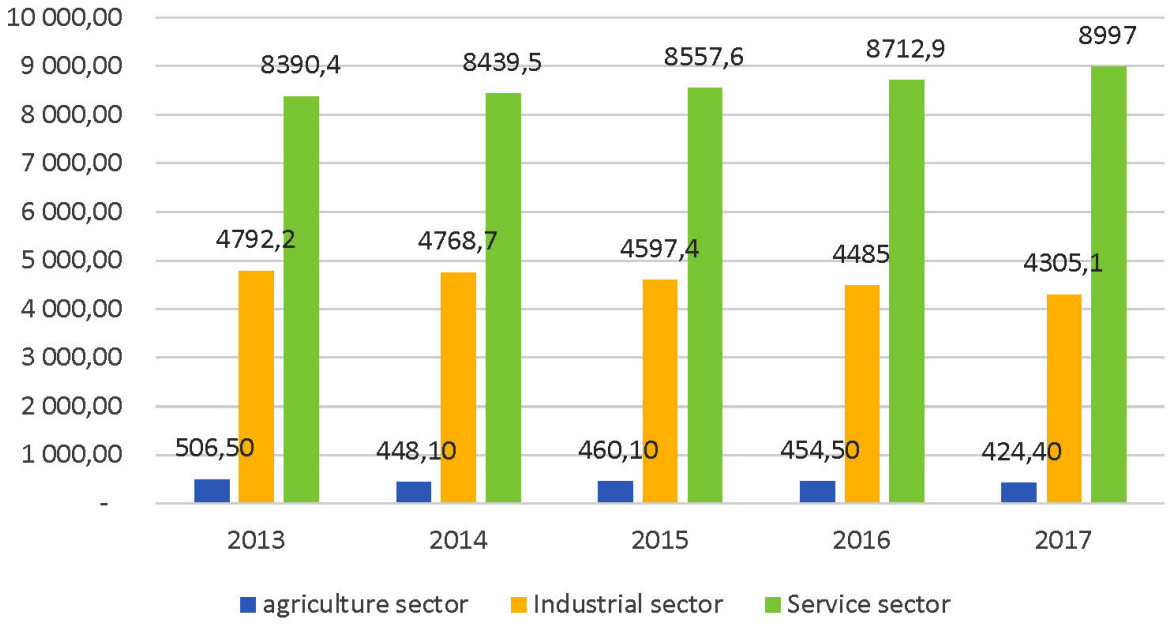

Figure 3. Numbers of labour in all three sectors in Shanghai from 2013-2017 (thousands) [9]

The figure above shows the demand difference and the growth trend of each economic sector. The quantity demanded for labour in service sector is double the quantity demanded for industrial sector, which is as much as nine times the quantity demanded for labour in agriculture sector. As China is transforming into a post-industrial country, the service sector is expected to increase and it is the only one that increased throughout 2013 and 2017 from 8390.4 thousands to 8997 thousands, which is because working in service sector provides labour with a high marginal return. Both of the quantity demanded for labour in industrial sector and agriculture sector decreases, the decrease of labour worked (478.1 thousands) in industrial sector is greater than the decrease of labour worked (82.1 thousands) in agriculture sector, which provides an insight that most of worker in industrial sector is moving to service sector, since the education that they possess helps them with adapting training program in service sector. Figure 2 not only strengthens the idea that China has passed LTP, but also signals the arrival of sector transition between industrial sector and service sector.

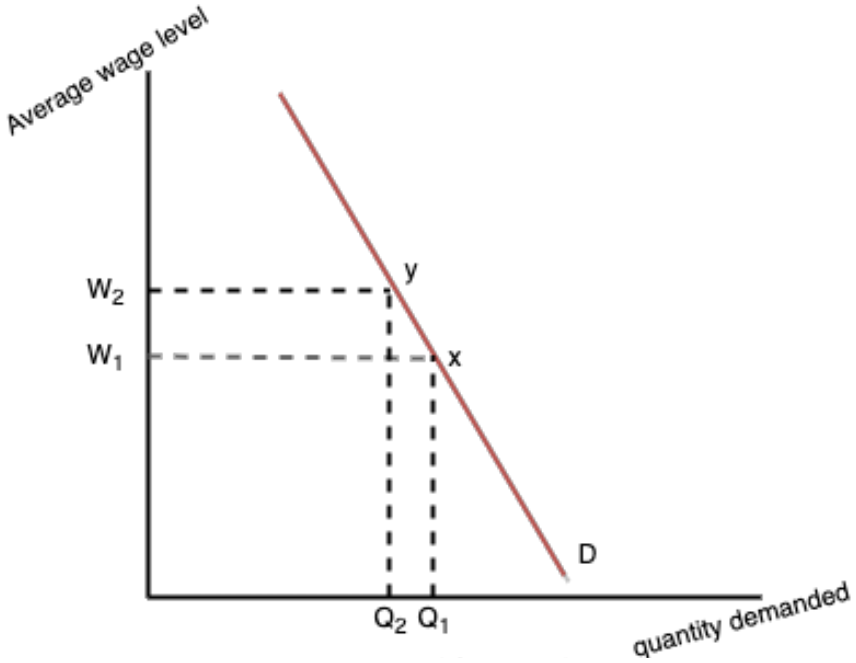

Figure 4. Labour market of Shanghal's agriculture sector

Figure 4 shows the changes in labour market of agriculture sector in Shanghai. From 2013 to 2017, the equilibrium of labour market in agriculture sector moved to a higher level with a lower quantity demanded and higher average wage level, which suggests that the employment in agriculture sector in Shanghai went down and that increased the marginal revenue product, resulting in a wage rise. The changes in agricultural labour market shows the migration of rural labour to other economic sector, but it should not be moving industrial sector, because there is also a decrease numbers of labour in industrial sector in Shanghai, therefore, deduction is that the labour worked agriculture sector are gradually moving to service sector.

Lewisian Model Analysis

Figure 5 Key:

L: total size of the labour force Om: origin in urban sector;

OR: origin in the rural sector;

CD curve: the marginal product of labour in the agriculture sector;

AB curve: the marginal product of labour in the industrial sector.

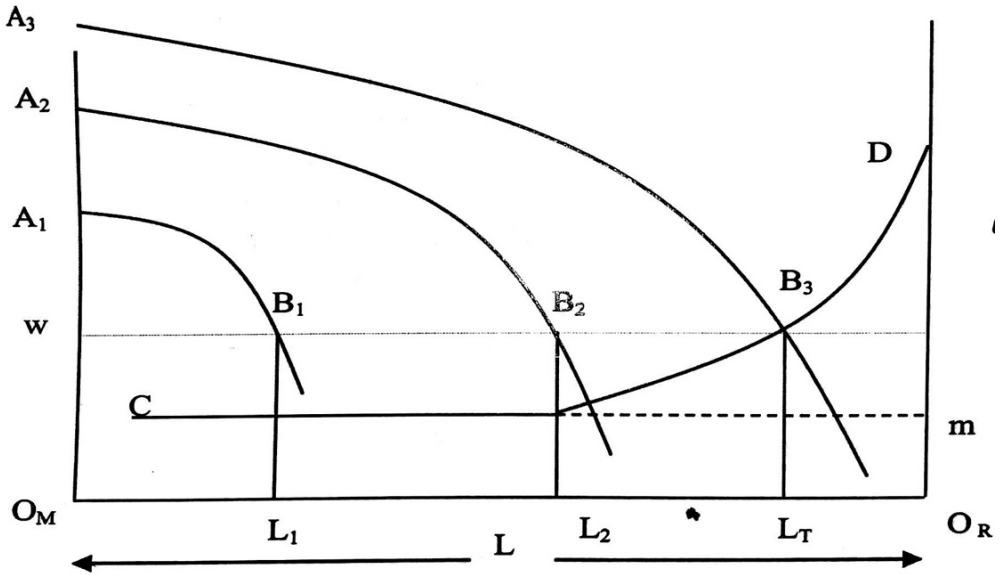

Figure 5. [5]

The curve A1B1 shows the productivity of urban workers. In China this hypothetically may have been during the 1990 s. As the productivity of the urban sector was so much higher than the rural sector, there was a flow of labour into the urban areas. Initially the aount of urban labour is OM L1 and the rural labour OR L1. As there was rural to urban migration during the 1990s through 2000 s, the amount of rural labour reduced to OR L2, while urban labour increased to OM L2. At this point the rural wages start to increase beyond the subsistence wage (m).

There are three stages in the process of economic development. Between point A and B is the first stage, where initial marginal output of labour in urban sector is at A_1B_1. The $_1$. According to this, O_RL_1 represents total urban labour, and O_mL_1 is regard as rural labour force at flat wage level (m). The total stock of capital increases as entrepreneurs reinvest some of their profit in production, which would lead to a higher marginal product of labour eventually and cause a rightward shift in marginal product of urban labour from A_1B_1 to A_2B_2. Since the rural to urban work migrants are only the surplus of labour in rural area, therefore, it has no impact on wage rate. The unlimited rural labour surplus causes both rural labour and urban labour's wage remain at a constant level m and w respectively.

At point B_2, A_2B_2 curve exceeds M, which results in a rise in rural wages. When A_2B_2 shifts rightward to A_3B_3, the urban wage would increase as well. Between B_2 and B_3 is the second stage, where there is only a growth in rural wage. Third stage happens after point B_3, where the entry of economic development causes labour shortage and rising wages for both rural and urban labour. This act as a deterrent for developing country to grow economically. LTP occurs at B_2. A rise in wage level for rural labour is a signal for labour shortage in a national level.

When the data for the wage growth in the rural and urban sectors are analysed one can see that they are both increasing at a similar rate. The rural sector wage growth between 2013 and 2017 is 21% whilst the industrial sector wage growth is 23%. This corresponds to the section of the figure 4 after B3. Thus, the conceptual framework produced by Lewis and the data found from the Chinese databases both confirm the arrival of the LTP.

Analysis of Das and Zhang's theories in light of current data

The assumption is that all the rural surplus labour would be working in the industrial sector, because

there is no point in migrating from an agriculture sector to a different sector due to the consistent wage of the agriculture sector and there is no longer a premium from working in the industrial sector compared to the now relatively skilled, more capital intensive rural sector.

However, Das [4] claims that China has not reached the LTP since the working age population in China has actually begun to shrink so that "the reserve of unemployed and underemployed workers (which is currently in the region of 150m) will fail to around 30m by 2020 and the LTP will be crossed between 2020 and 2025". Further, Das claims that there are government interventions such as the one child policy which have led to the decrease of the surplus spply of labour and that any further government policy response that increases fertility rates will be largely peripheral and ultimately the "combined implications of demographics, labour developments and policies suggest China will be experiencing the LTP later than Zhang argued – probably between 2020 and 2025.

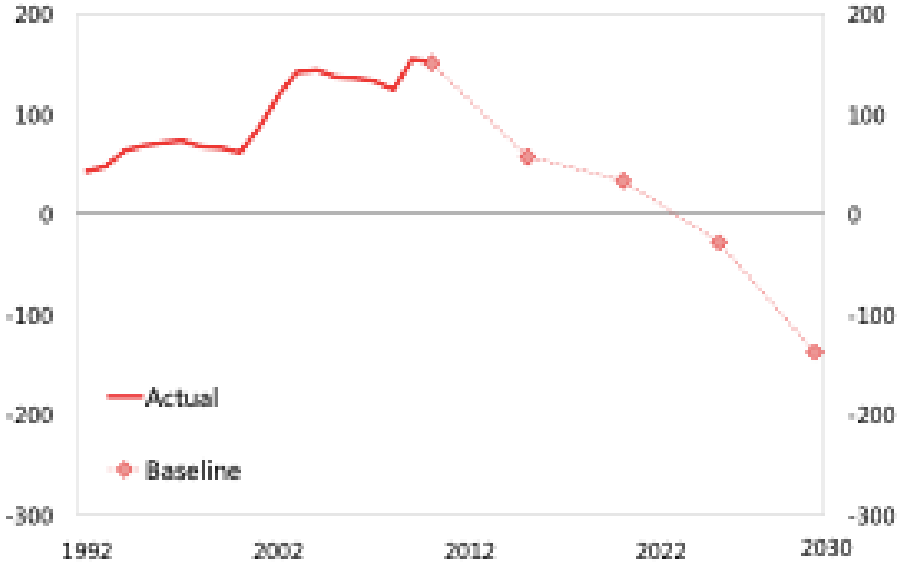

Figure 6. Baseline Scenario: Surplus Labor (In millions) [4]

The graph above explains how China's surplus of labour peaked at 2010 and then is forecast to diminish and become negative at the start of 2023. Although, one needs to evaluate the reliability of this data. For instance, there are a number of policies such as the introduction of the two-child policy which may impact on the reliability of these forecasts. Other policies such as the Northwest reforms and 12th 5 year plan may also diminish the movement of any potential surplus labour. These policy responses may "alter the structure of the economy so that the central forecast of the LTP arrival in 2020–25 may not be so exact.

The above graph shows how the prediction changes with the alteration of market conditions and the impact of economic policies on the surplus labour supply. There are fundamental differences between the analysis of Zhang and Das. Zhang applied his labour force and labour wage data to the Lewis Model which showed that China was on stage 2 by the time of his publication in 2004. Compared to Zhang, Das takes a more demographic focused approach to the examination of the LTP and he finds the LTP would arrive much later than Zhang – 2020–2025. Das claims there is not so much a labour shortage but a shnrkage in the total labour force as a result of policy and demographic changes. He does accept that there may be some room for uncertainty in his predictions, but he clearly maintains that the LTP occurs 20 years later than Zhang's analysis would suggest.

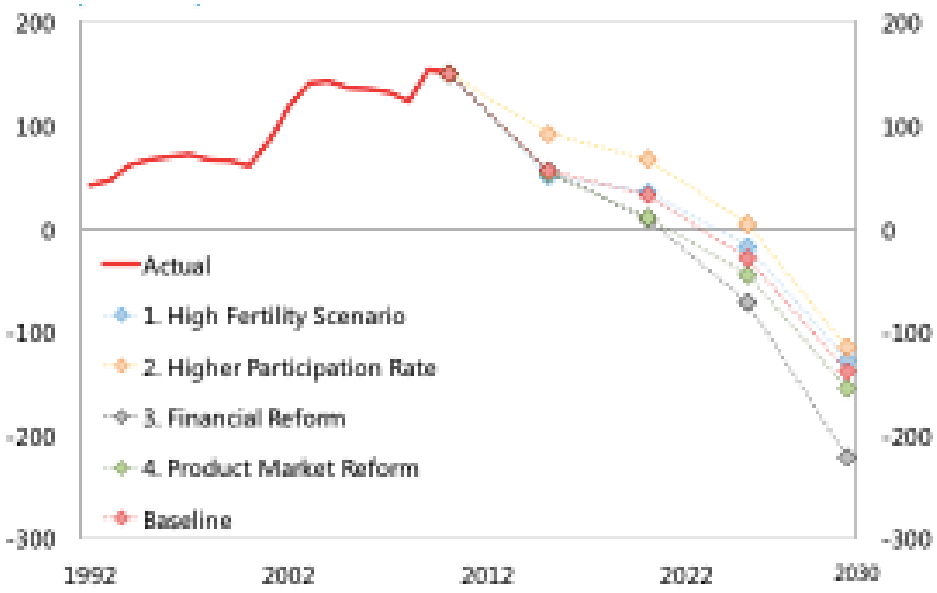

Figure 7. Alternative Scenarios: Surplus Labor (In millions) [4]

Conclusion

Having examined Zhang's and Das' review on whether China has reached LTP, the essay reviewed the analysis and compared the result with their respective point of view. The data that is shown represent a clearer picture of China's position on LTP currently. The data analysis shows a conclusion consistent with proposal that China has long passed LTP and indeed has moved into the 3rd stage of LTP due a variety of social and economic reasons.

Zhang explains in his essay that China has passed LTP because of the disappearance of labour surplus, and he provides the readers with concrete data evidence. However, he overlooks a significant reason behind it, which is how does the overall reward of rural labour migrate to urban area change over time. Throughout time, the wage gap between rural labour and urban labour has narrowed and the wages started to rise at the same rate (figure 2). Therefore, the wage that an urban job offers is not as tempting as before. Also, the Chinese government has started to focus on the development of rural areas, such as the Great Northwest where the most rural labour comes from. The development of the Great Northwest provides more economic opportunities for the local dwellers, as high demand for jobs should push up the average local wages. As a result, the price paid to rural-urban labour is not rewarding enough for labour to leave their home and their family, and this idea can be supported with the data in figure1.

According to Das, China would reach LTP between 2020–2050 with the account of demographic changes and policy changes, but he makes this prediction based on demographic changes on general working age which does not distinguish between rural labour and urban labour, and he does not provide any data on rural wages and urban wages. So, the correlation of his prediction and LTP is very loose, and we should not rely on general data. In the other perspective, the rapid raise in wage in service sector and the parallel growth of wages in both agriculture sector and manufacture sector have proven the arrival of LTP's third stage.

The conclusion of the essay is that Zhang's view – that China reached the LTP in 2004 – is more consistent with the data found by this study. Furthermore, Shanghai would have generated a rural labour surplus from the Great Northwest if the government delayed development of that area or if the two-child policy was established earlier. Then there would still be a massive amount of labour surplus in the Great Northwest which would push down the marginal revenue product

of labour there, to force rural labour to migrate towards coastal cities such as Shanghai. However, this did not happen and the opportunity cost of working in Shanghai with a high cost of living, instead of staying at home with their family and with a cheaper cost of living, is higher than the wages that they receive annually. Therefore, when they are choosing between migrating to the cities or remaining at home to wait for full economic development, it becomes clearer that the latter one has more advantage over the prior one. Overall, Shanghai has reached LTP earlier than expected.

There are a number of unresolved questions that emerged during this study. First the conclusion would be more concrete if there is specific data of numbers of Shanghai's rural labour immigration and their average wage level, and numbers of Shanghai's urban labour and their average wage level, so the result would also be straight forward with less uncertainty. Second, if there is more recent data about change of labour market in Shanghai in 2018, so that it can provide me with a more recent view of Shanghai's labour market, but the Shanghai government only publish the data every two year. Third, I would like to apply labour supply theory to develop more points but there is not data collection for supply of labour in Shanghai.

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Section 7. Population economy

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WAS IMMIGRATION BAD OR GOOD FOR COUNTRY'S ECONOMY IN THE EUROPEAN COUNTRIES?

Abstract

Aim: This study aimed to build a predictive model for Immigration bad or good for country's economy in the European countries.

Method: A public data was used in this study. All the records were randomly assigned into 2 groups: training sample (60%) and testing sample (40%). A linear regression model was built to predict the Immigration bad or good for country's economy in the European countries in 2016 using the training sample and then was applied in the testing sample for performance assessment.

Results: The random sample size is 15544 in the test sample and 15545 in training sample, a total of 31089 records. The average Immigration bad or good for country's economy in the European countries was 5.124 for the full sample, 5.142 in the training sample, and 5.105 in the testing sample.

According to the linear regression, household size, household income, satisfaction, age, male, education level, mother's education level, father's education level, region and being discriminated were significant predictors. People from a bigger household size were less likely to think immigrants good for the economy. Richer people were more likely to think immigrants good for the economy. People who felt satisfied were more likely to think immigrants good for the economy. Younger individuals were more likely to think immigrants good for the economy. Male were more likely to think immigrants good for the economy. People who had bachelor or higher degree or people whose mother and/or father had bachelor or higher degree were more likely to think immigrants good for the economy. Compared to region 4, region 1, 2, 3 were more likely to think immigrants good for the economy.

Multiple R-squared was 0.1023 and the adjusted R-squared was 0.1016. The average mean squared error for the linear model in the testing sample was 5.48. The correlation between the predicted and the observed was 0.33. The min-max accuracy was 0.69.

Conclusions: In this study, we identified important of predictors of Immigration bad or good for country's economy in the European countries, for example, income, age, education, region.

Keywords: Immigration, economy, European Countries, income, age, education region, linear regression.

1. Introduction

Europe's history has been shaped by migration. For centuries, merchants, craftsmen and intellectuals crossed the continent to practice their trades or start new lives. Millions emigrated from Europe, first to the colonies and later to the Americas and the Antipodes. Europe also has a long history of forced migration: from the expulsion of the Jews from Spain to the population shifts in southeast Europe caused by the many wars between the Russian, Austro-Hungarian and Ottoman empires [1].

The economic cost of refugees is a debated issue across the European continent today. Together with security concerns, the economic impact of migration on European economies is the main reason that political movements as well as people having critical visions of the current refugee wave to Europe, put forward in support of their thesis. Recent studies and research, like those cited in the article by the Economist, bring evidence that immigration has a reduced impact on employment and wages, and that if in the short time migrants get more in social benefits than they pay in to tax, with the passing of time their contributions may arise and this is particularly likely to happen with current refugees, as most of them are young and have a long working life ahead of them. Likewise, a report of the Italian Foundation "Leone Moressa" states that in 2014 taxes paid by migrant workers have contributed to bear the cost of over 600.000 pensions received by Italians, playing a role in the sustainability of the pension system in an ageing society [2].

This study aimed to build a predictive model for emotional attachment to Europe in the European countries.

2 Data and Methods:

Data

This dataset is public available for research. The data is available at: https://www.kaggle.com/pascalbliem/european-social-survey-ess-8-ed21–201617

The question of interest in this project is called imbgeco: Immigration bad or good for country's economy (0: bad for the economy, 10: good for economy). It is based on B41 Would you say it is generally bad or good for [country]'s economy that people come to live here from other countries?

hinctnta: Household's total net income, all sources

stflife: How satisfied with life as a whole

regunit: Regional unit

edulvlmb: Mother's highest level of education

edulvlfb: Father's highest level of education

edulvlb: Highest level of education

Age

Male

All the records were randomly assigned into 2 groups: training sample (50%) and testing sample (50%).

R-squared is a statistical measure of how close the data are to the fitted regression line. It is also known as the coefficient of determination, or the coefficient of multiple determination for multiple regression. The definition of R-squared is fairly straight-forward; it is the percentage of the response variable variation that is explained by a linear model. Or:

R-squared = Explained variation / Total variation

R-squared is always between 0 and 100%: 0% indicates that the model explains none of the variability of the response data around its mean. 100% indicates that the model explains all the variability of the response data around its mean.

Mean squared errors (MSE) were calculated and compared between both models. Min-Max Accuracy is defined as mean (min(actual, predicted)/ max(actual, predicted)). The mean absolute percentage error (MAPE), also known as mean absolute percentage deviation (MAPD), is a measure of prediction accuracy of a forecasting method in statistics, for example in trend estimation, also used as a loss function for regression problems in machine learning.

3. Results:

The random sample size is 15544 in the test sample and 15545 in training sample, a total of 31089 records. The average Immigration bad

or good for country's economy in the European countries was 5.124 for the full sample, 5.142 in the training sample, and 5.105 in the testing sample.

Table 1.

	min	Q1	Median	Mean	Q3	Max
Full sample	0.0	4.0	5.0	5.124	7.0	10.0
Training sample	0.0	4.0	5.0	5.142	7.0	10.0
Testing sample	0.0	3.0	5.0	5.105	7.0	10.0

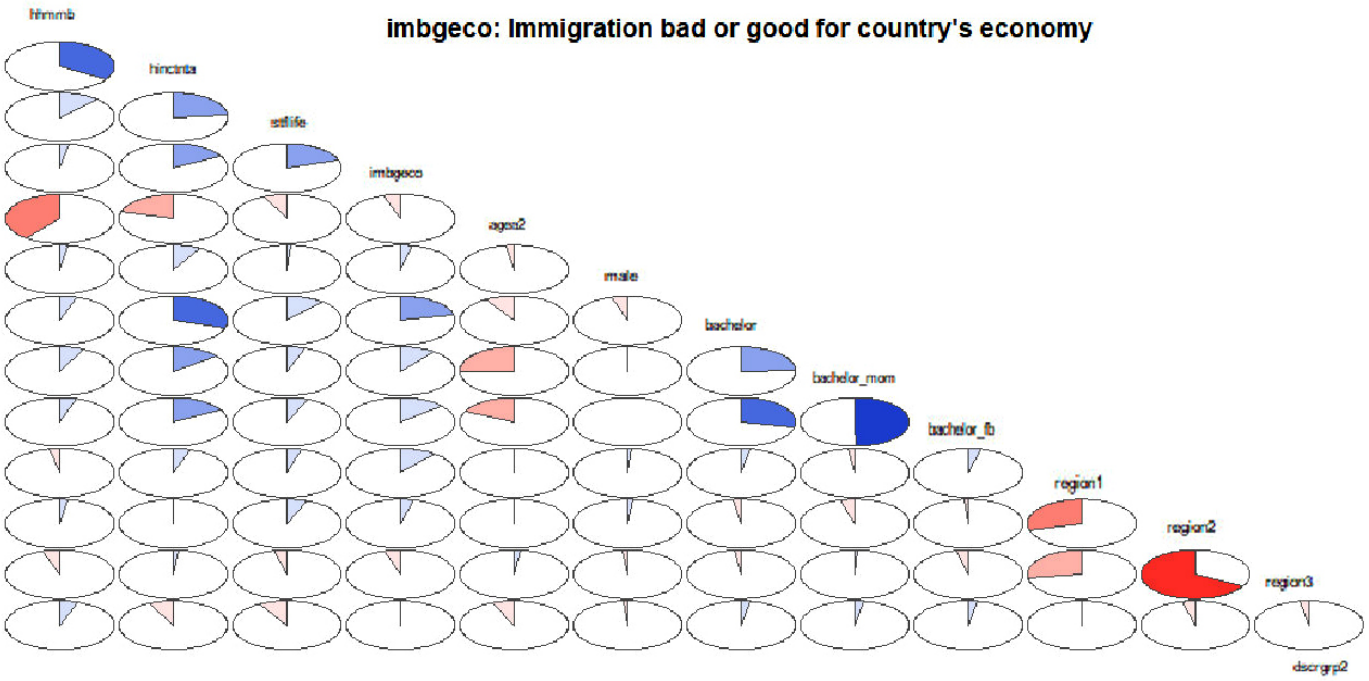

Figure 1. Pearson correlation coefficient across all the variables

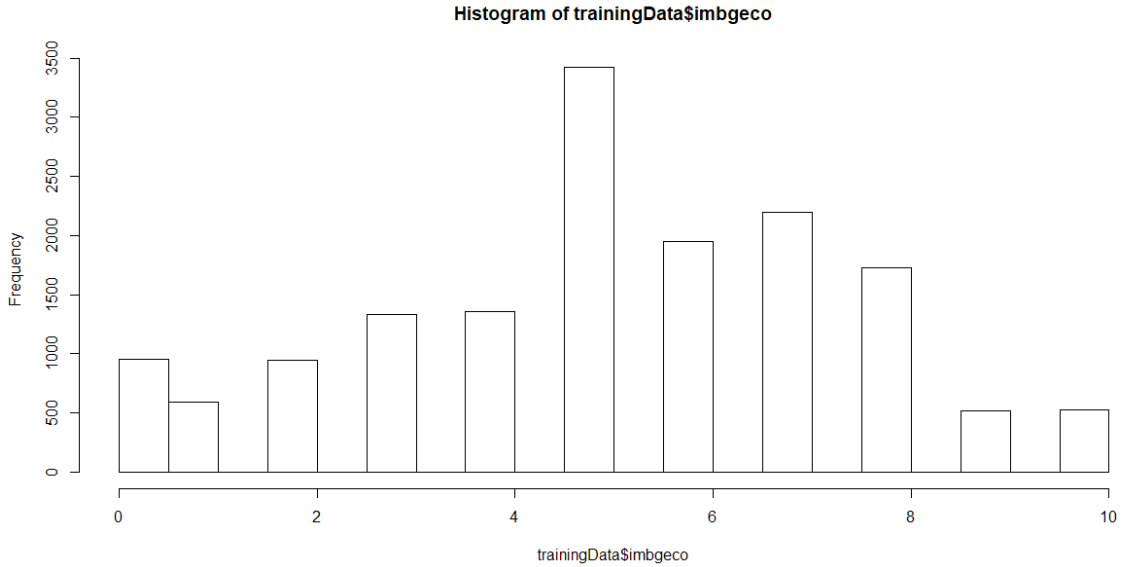

Figure 2. Distribution of Immigration bad or good for country's economy in the European countries in Training Sample

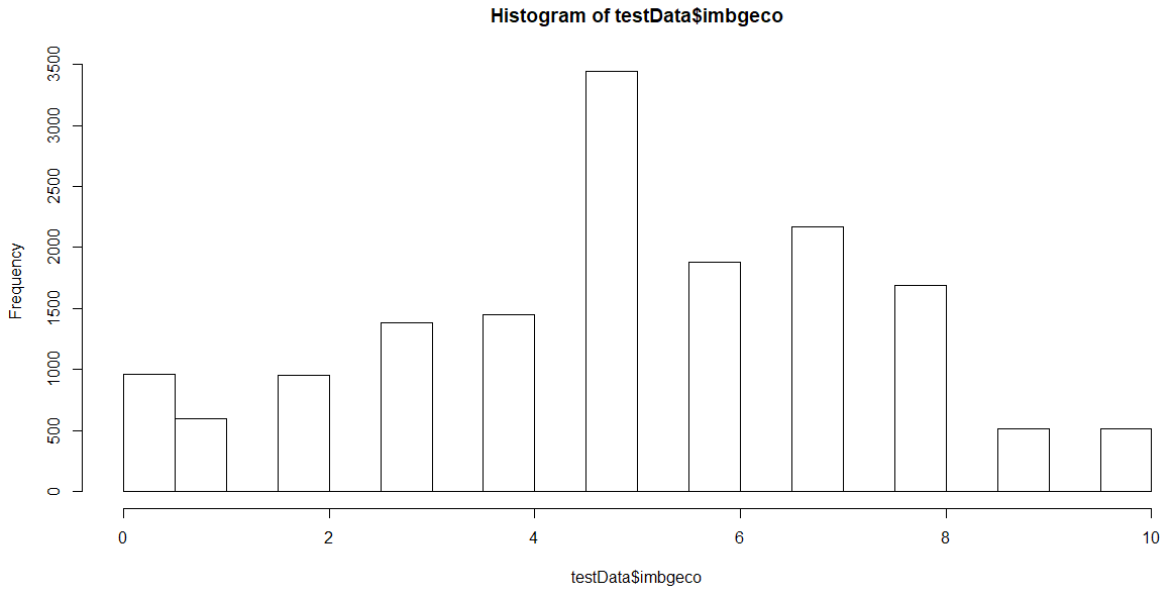

Figure 3. Distribution of Immigration bad or good for country's economy in the European countries in Test Sample

According to the linear regression, household size, household income, satisfaction, age, male, education level, mother's education level, father's education level, region and being discriminated were significant predictors.

People from a bigger household size were less likely to think immigrants good for the economy. Richer people were more likely to think immigrants good for the economy. People who felt satisfied were more likely to think immigrants good for the economy. Younger individuals were more likely to think immigrants good for the economy. Male were more likely to think immigrants good for the economy. People who had bachelor or higher degree or people whose mother and/or father had bachelor or higher degree were more likely to think immigrants good for the economy. Compared to region 4, region 1, 2, 3 were more likely to think immigrants good for the economy.

Table 2.– Linear Regression to Predict Immigration bad or good for country's economy in the European countries

	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**	
(Intercept)	2.673	0.126	21.209	< 2e-16	***
hhmmb	–0.049	0.016	–3.027	0.00248	**
hinctnta	0.051	0.008	6.361	2.07E-10	***
stflife	0.178	0.010	18.531	< 2e-16	***
agea2	–0.002	0.001	–2.068	0.03863	*
male	0.176	0.038	4.617	3.93E-06	***
bachelor	0.906	0.047	19.375	< 2e-16	***
bachelor_mom	0.176	0.071	2.490	0.0128	*
bachelor_fb	0.402	0.064	6.248	4.27E-10	***
region1	1.387	0.087	16.015	< 2e-16	***
region2	0.864	0.071	12.227	< 2e-16	***
region3	0.612	0.071	8.614	< 2e-16	***
dscrgrp2	0.034	0.070	0.482	0.62976	

Multiple R-squared was 0.1023 and the adjusted R-squared was 0.1016. The average mean squared error for the linear model in the testing sample was 5.48. The correlation between the predicted and the observed was 0.33. The min-max accuracy was 0.69.

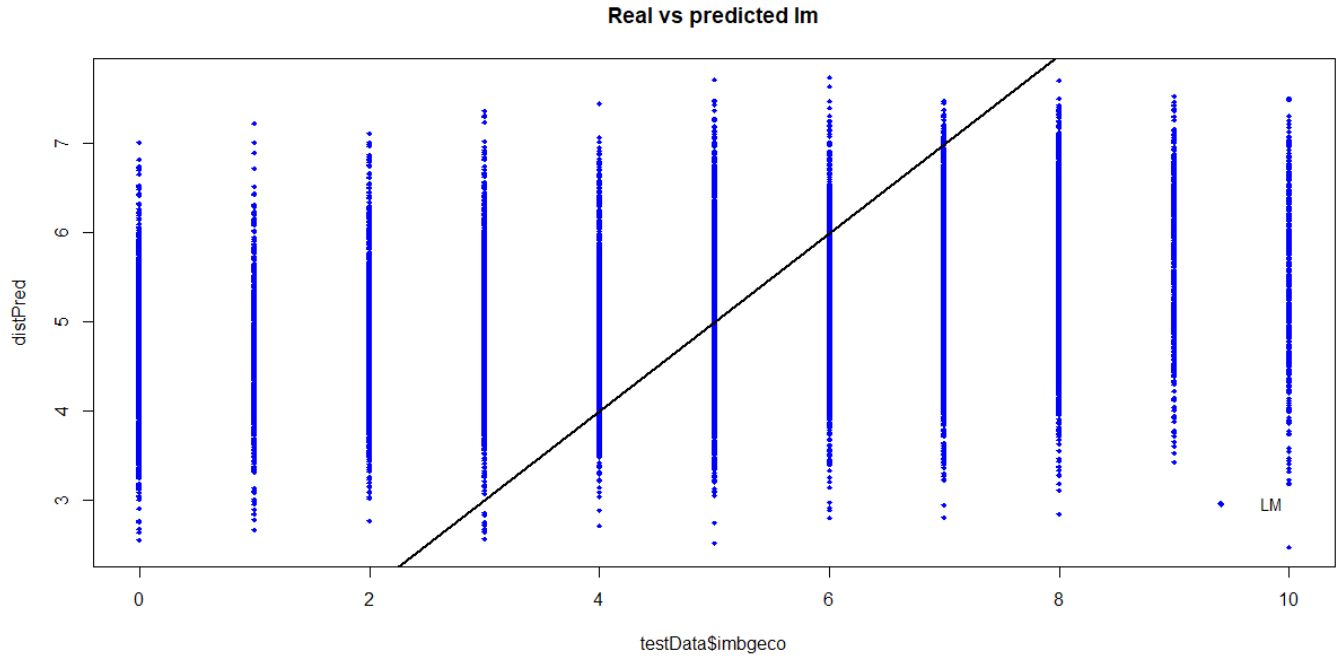

Figure 4. Predicted versus Observed Immigration bad or good for country's economy in the European countries

4. Discussion

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Section 8. Economics, organization and management of enterprises, branches, complexes

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ENERGY METERING DIGITALIZATION IN HOUSING AND UTILITIES SERVICES

Abstract. The article discusses the prerequisites of digitalization of energy metering in Kazakhstan on the example of housing and communal services. The provisions of the Decree of the Government of the Republic of Kazakhstan dated December 31, 2019 No. 1054 on the approval of the State program of housing and communal development "Nurly Zher" for 2020–2025 are considered. Own recommendations are given.

Keywords: digitalization, economy, housing and communal services, energy resources, energy metering.

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ЦИФРОВИЗАЦИИ УЧЕТА ЭНЕРГОРЕСУРСОВ В СФЕРЕ ЖКХ

Аннотация. В статье рассмотрены предпосылки цифровизации учета энергоресурсов Казахстана на примере сферы ЖКХ. Рассмотрены положения Постановления Правительства Респу-

блики Казахстан от 31 декабря 2019 года № 1054 Об утверждении Государственной программы жилищно-коммунального развития «Нұрлы жер» на 2020–2025 годы. Даны собственные рекомендации.

Ключевые слова: цифровизация, экономика, ЖКХ, энергоресурсы, учет энергоресурсов.

Жилищно-коммунальный комплекс представляет собой технически сложное хозяйство, которое требует особого подхода, новых разработок с учетом технологических особенностей каждого объекта и новых технологий. В настоящее время в ЖКХ нашей страны существуют серьезные проблемы, решение которых требуют высокой компетенции управляющего персонала.

Среди множества проблем, требующих решения в ходе выполнения жилищно-коммунальных реформ, особое место занимают достоверность и доступность информации, которая создается, используется и распространяется в жилищно-коммунальном хозяйстве. В первую очередь это сведения о жилищном фонде и жителях, потреблении энергоресурсов, оперативная информация о текущем состоянии объектов ЖКХ, инженерных коммуникаций и т.п. [1]. Успешно решать эти задачи можно только с помощью высокой компетенции административного персонала и на базе передовых информационных технологий.

В Постановлении Правительства Республики Казахстан от 31 декабря 2019 года № 1054 Об утверждении Государственной программы жилищно-коммунального развития «Нұрлы жер» на 2020–2025 годы, указано что нормативно-технические документы в сфере строительства будут актуализироваться на постоянной основе с учетом современных требований к безопасности и качеству жилья, тенденций цифровизации сферы проектирования [2].

Программа предусматривает оснащение многоквартирных жилых домов общедомовыми счетчиками тепла, воды с возможностью передачи данных и автоматизированными (индивидуальными) тепловыми пунктами, которые позволят определить фактическое потребление ресурсов, обеспечить прозрачность и повысить качество оказываемых коммунальными предприятиями услуг, способствует снижению потребления энергоресурсов и поможет проводить энергосберегающие мероприятия, а также обеспечит правильность при расчете тарифов коммунальными предприятиями за потребление энергетических ресурсов.

Возникает резонный вопрос финансирования таких масштабных проектов оснащения приборами, ведь современные комплексные системы учета тепла, воды с возможностью передачи данных стоят немалых денег. Естественно правительство это понимает и согласно данной программы предусматривается государственное финансирование под низкий процент субъектов естественной монополии. Денежные средства на эти цели будут направлены через Казахстанский центр модернизации и развития ЖКХ. Финансирование планируется осуществлять на возвратной основе путем механизма финансового лизинга и выдачи целевого займа сроком на 48 месяцев, со ставкой вознаграждения 4% годовых.

Реформы в сфере ЖКХ в условиях рыночной экономики резко повышает требования к современному, надежному и качественному информационному обеспечению управляющего персонала энергетических компаний и государственных служащих контролирующих сферу ЖКХ. Это обусловлено следующими причинами.

1. В рыночной среде значительно повышается требования к качеству оказываемых услуг, следовательно растет необходимость оперативно решать возникающие проблемы.

2. Постоянно появляются новые технологии, способствующие решению разных прикладных задач снижения потерь, снижения прямых

и косвенных расходов в тарифах и повышения энергоэффективности.

3. Успешная работа энергоснабжающих компаний сферы ЖКХ невозможна без регулярного и оперативного мониторинга всей цепочки поставки энергоресурсов, от генерации до сбора платежей от потребителей.

Таким образом, в условиях рыночных отношений, информация становится важнейшим ресурсом для решения постоянно возникающих задач. А эта информация как раз таки получается с помощью комплексных автоматизированных систем измерения, хранения, сбора, передачи, обработки, структуризации, визуализации и анализа.

Конкретные прикладные технологии используются для автоматизации разных функций: прогнозирования и моделирования потребления энергоресурсов с учетом роста населения, учета потребленных ресурсов, начисления за услуги и приема платежей, управления документооборотом и так далее. В целом в сфере ЖКХ применимы достаточно широкие технологические решения. Например, умные счетчики и датчики, передающие устройства по различным каналам связи, исполнительные устройства подключенные посредством каналов передачи информации к системам мониторинга, могут автоматически формировать архивы потребления и передавать их в программное обеспечение сбора и анализа данных, в котором на основе полученных данных происходит формирование счетов на оплату коммунальных услуг.

Цифровизация процессов учета энергоресурсов позволяет автоматизировать повседневный процесс приема, транспортировки, распределения, потребления энергоресурсов и приема платежей с помощью аппаратных и информационных средств. То есть решать ежедневные задачи поставщика энергоресурсов и распределительной компании. Система предоставляет достоверную информацию для осуществления коммерческих расчетов с поставщиками и потребителями энергоресурсов; данные для выявления как технологических, так и коммерческих потерь, то есть повышения энергоэффективности. Результатом цифровизации учета с одной стороны являются, аналитические отчеты, предназначенные для пользователей различных категорий, с другой – средства интерактивного анализа собранных данных и быстрого построения отчетов пользователями с применением привычных для них понятий предметной области. В конечном счете, вся собранная информация, выработанные с помощью них динамические отчеты предназначены для принятия тактических и стратегических управленческих решений.

Логичным продолжением цифровизации учета, является внедрение технологий искусственного интеллекта для повышения эффективности мониторинга и управления объектами энергетической инфраструктуры. ИИ позволит перейти на модель гибкого предоставления коммунальных услуг – автоматизировать регулирование их подачи в зависимости от различных переменных факторов, с учетом пользовательских сценариев, графиков нагрузок, времени суток, погоды и т.д.

Еще одна технология способная облегчить работу в сфере ЖКХ – создание «цифровых двойников» объектов коммунальной инфраструктуры, «обученных» на архивных данных и соединенных с умными датчиками, установленными на самих объектах [10]. Новая цифровая реальность позволит незамедлительно определять аварии и предаварийные ситуации, а также, какие объекты инфраструктуры требуют ремонта или планово-предупредительных регламентных работ. Это облегчает учет и прогнозирование ремонта, обновления устаревших отрезков сетей снабжения энергоресурсами, выработка инвестиционных и производственных программ.

В дальнейшем мы можем ожидать создание так называемой цифровой диспетчерской, интегрированной с системами аварийно-диспетчерских служб, службами гражданской обороны и чрезвы-

чайных ситуаций – произойдет частичная автоматизация коммуникации с населением.

Существуют ли уже отечественные цифровые платформы управления, которые объединяют информационные потоки от различных энергетических систем?

Наиболее масштабный проект, который призван был стать отраслевой интегрирующей цифровой платформой – это конечно, единая информационная система ЖКХ E-Shanyraq. Однако в силу наличия в системе очевидных функциональных недоработок и технологических просчетов E-Shanyraq так и не стала полноценной, интегрирующей отрасль площадкой.

На региональном уровне существуют множество успешно внедренных платформенных решений в области ЖКХ, реализующих требования стандарта «Нұрлы жер», включающих учет потребления ресурсов и контроль состояния объектов инфраструктуры, централизацию диспетчерской функции, автоматизацию управления капитальным ремонтом, централизацию функций начисления платежей и работы с потребителями и прочее.

Мы предлагаем внедрение комплексного цифрового программного комплекса в ЖКХ городов, которое позволит:

– сделать более прозрачной сбор данных о потреблении энергоресурсов со всех объектов;

– увеличить поступления налоговых отчислений различных субъектов за счет открытости полученных данных об энергопотреблении;

– снизить количество обращений жителей на проблемы получения коммунальных услуг в части управления городским хозяйством;

– предоставить городской администрации достоверную отчетность по всем видам потребленных энергоресурсов социальными и другими объектами;

– снизить очаги напряженности в критических местах в городском хозяйстве, по которым происходит наиболее частое обращение граждан о проблеме, оперативно устранить причины их возникновения;

– высвободить дополнительные средства за счет повышения энергоэффективности социальных объектов.

Настоящая цифровизация подразумевает изменение подходов на весь цикл производства, потребления энергоресурсов и оказания услуг. Необходим полный учет по всей цепочке, причем человек должен быть полностью исключен из процесса сбора данных, их накопления, обработки.

В сфере ЖКХ набирает популярность беспроводные автоматизированные системы, которые позволяют собирать и анализировать данные об объеме потребленных энергоресурсов, измерять и контролировать технологические параметры, выявлять аварийную ситуацию, а также управлять исполнительными механизмами систем в различных точках инженерной инфраструктуры. Масштаб расширения такой системы не ограничен. Различные технологические решения, в основе которых лежит концепция «Интернет вещей» (Internet of Things, IoT) все чаще применяются для решения задач ЖКХ. IoT нужен как для самих вещей (датчики, приборы, исполнительные устройства), так и платформ, управляющих производственными и административными процессами. Рынок Интернета вещей, в связи с этим бурно развивается, причем сразу по нескольким векторам. С достаточно простых изделий, вроде умных приборов учета, постепенно начинается развитие платформ и их взаимная интеграция в комплексы отраслевых и межотраслевых решений. Кроме того, возникают новые технологии, формируются стандарты Интернета вещей, и этот путь будет достаточно долгим.

Умные приборы учета уже давно производятся у нас массово, и их доля будет неуклонно расти. Производство передающих устройств и базовых станций также растет. Вопрос в том, откуда брать комплектующие элементы для производства всех этих устройств: микросхемы – это пока импорт, производство которых налажено в Юго-

Восточной Азии. Справедливости ради нужно сказать, что такие отечественные компании как «Орион Система», «M2M» разрабатывают неплохие и достаточно навороченные платформы для IoT, и здесь мы можем быть вполне конкурентными. Главное, чтобы не произошло зарегулирование этих процессов государством, оно может убить любую конкурентоспособность.

С помощью цифровизации можно уменьшить потери бюджета от неэффективного, нецелевого использования и воровства, но это должно быть выгодно, как это ни парадоксально. Если экономические отношения субъектов рынка строятся на освоении бюджета любой ценой, то есть для «галочки», без достижения существенных результатов, то цифровизация, скорее, мешает. В ЖКХ это проявляется в полной мере, когда руководство отдельных энергетических компаний всячески сопротивляется установке умных счетчиков: технологии IoT практически полностью уничтожают «схемы», которые позволяли воровать деньги и из бюджета, и у населения.

Внедрение цифровизации требует сильной воли инициатора и вовлеченности всех заинтересованных сторон, с учетом достижения конечной цели. Для каждого вида энергоресурсов они могут быть разными. Задача инициаторов проекта цифровизации учета энергоресурсов – определить приоритетные цели для каждого участника рынка и работать над их достижением.

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EXPLORING THE EFFECTIVENESS OF FOREIGN TEACHERS IN ONLINE LANGUAGE COURSES

Abstract. Languages have become an essential skill not only for the students but also for people at almost all ages in China, and many online language programs occurred in the past few years. To make it more attractive, many online programs offer expatriate teachers. The effectiveness of the online expatriate teachers, therefore, becomes an important question. A survey and a poll was used to gather information, and the results showed that using expatriate teachers is helpful, especially in speaking English and promoting a language learning community. However, for younger students who are beginners at a foreign language, expatriate teachers may not be as effective.

Keywords: online class, online expatriate teacher, foreign teacher, language learning online, online education, teaching effectiveness.

I. Introduction

Since learning a foreign language became more and more important to the Chinese people, language-training companies developed online language learning programs. With the flexibility of location and time for online classes, these programs can afford to use a higher percentage of expatriate teachers whose classes are much more expensive than local teachers are. It is natural to wonder whether using expatriate teachers is necessary, especially for online programs. From which perspective can expatriate teachers improve students' language skill effectively? Can every student understand what are the expatriate teachers talking about? How did the companies choose these so-called expatriate teachers, by their language skills or their appearance? After all, these all add up to one question- are expatriate teachers really effective for learning a foreign language online?

II. Literature review

Using expatriate teachers for language classes is not new in China and there have been several reports and papers showing the effect of expatriate teachers, especially in teaching English in China. Gao Fan [2] from Wuhan Institute Of Technology, have illustrated the main advantage of expatriate teachers is that most of them are able to create a harmonious and orderly healthy classroom and they know how to use the simple words to explain a native definition (the example of "student union"). However, he has also showed some disadvantages of expatriate teachers, such as the difficulty of expatriate teachers to understand the study habits of Chinese students, and the difficulty they face when trying to estimate the levels of their students.

In addition, Smith and coauthors [3] studied a language learning program, TESL/TEFL, and found that it was hard for native teachers to create an appropriate language learning community without certain training. Therefore, the question comes to what could an expatriate teacher or a group of expatriate teachers do to an English learning community of non-native speakers of English. An article which was published in the Chinese journal "Foreign Teachers", written by Michelle Moore who lived and taught in China for a long time, showed the advantage of expatriate teachers to students from her perspective. She

found that expatriate teachers were able to influence Chinese English educators, because western teaching methods are more interactive compared to Chinese traditional method. As a result, students could be more motivated [5].

Similarly, *A Chinese Perspective on Expatriate Teachers,* written by George King (pseudonym) who has taught in China and UK for nearly 30 years, has included an interview with a Chinese professor, Wang Wanxin, about his opinion of the expatriate teachers on his campus. "They bring different perspectives and different cultures. Working with them, both the faculty and the students learn to respect differences. " is one of the benefits he has emphasized. As he has mentioned, the difference between cultures makes it possible for students to experience the difference between the customs of different civilizations [4].

As helpful as expatriate teachers can be in the live classes, there has been very little research on their effectiveness in teaching the online classes. This research is one of the earliest attempts in this area.

III. Methodology

There were two parts of collecting data for this research. An online survey was used to collect data from potential customers of all ages, while a one question poll was used to gather opinions from my fellow school mates in No. 14 Secondary School, since we all have expatriate teachers in some classes. The poll simply asked them how effective they felt the expatriate teachers are in general. The online survey was more comprehensive, with three sections of questions targeting different areas of the use of foreign teachers.

The first section of questions collected the demographic information of the respondents, which will help to analyze patterns of attitudes toward expatriate teachers later. Then, the potential improvement that the expatriate teachers could provide is the most important data that I want to collect. Because as a consumer, I would like to find out whether it is worthwhile for me to have a class taught by an expatriate teacher, because they are more expensive than Chinese teachers.

Lastly, what level of students it would work the best to have expatriate teachers. Since in learning a new language could be separate into different levels, students with higher level could understand those expatriate teachers better for sure. By contrast, beginners may cannot understand their teachers as well as advanced learners. So the expatriate teachers might not be so effective to the beginners that students with higher levels. This can be very helpful for online language programs to decide on their marketing strategies.

IV. Results

The poll was sent using the school's internal system and 398 students responded. The online survey was distributed using the most popular social media in China, which is WeChat. 544 people answered the survey. The respondents were mainly students and mid-aged adults, who have the greatest tendency to learn English or other foreign languages, as shown in Table 1. Most of them (63.67%) have had the experience of taking an online course, and about 43% have taken a language-learning course. Comparing the percent of respondents of each age group for all versus those attending online classes, the distribution turned out to be very close. This suggests that online classes are widely accepted across all ages, and it is becoming a popular and common thing. That actually leads to the huge market potential of online classes in China. Of course, there could have been a sampling bias that was implicit to any surveys and is out of the control of this research.

Comparing the distribution of respondents attending online language classes, the distribution is fairly close at both ends, in the 0–15 and 65+ age groups; however, a higher percentage of young people in the 15–30 age group attended language classes than overall, and a lower percentage of adults aged 45–60 took language classes online. This speaks to the specific features of learning a language, which is more time consuming and harder at later ages.

Table 1.– Age Distribution of Respondents

Age Group	All Respondents		Attending Online Class		Attending Online Language Classes	
	Count	Percent	Count	Percent	Count	Percent
0–15	13	2.39%	8	2.31%	8	3.48%
15–30	195	35.85%	144	41.62%	103	44.78%
30–45	170	31.25%	104	30.06%	68	29.57%
45–60	159	29.23%	88	25.43%	51	22.17%
60+	7	1.29%	2	0.58%	0	0%
Total	544	100.00%	346	100.00%	230	100.00%

Expatriate teachers Generally Considered Effective

I could still remember the first time I had an English class taught by an expatriate teacher from Boston, called Robert. His style was completely different from any other I had. He spend more time on activities like discussions and playing games, and let students play a more important role in his class. On the contrary, Chinese teachers prefer to have a fixed structure in teaching English and spend more time on concluding the logic of thinking and the ways to utilize this language as a non-native speaker. In short, the way they teach English is similar to the way of teaching mathematics – there are theorems and principles. In contrast, the Expatriate teachers make the English learning environment more vivid and are very effective to students.

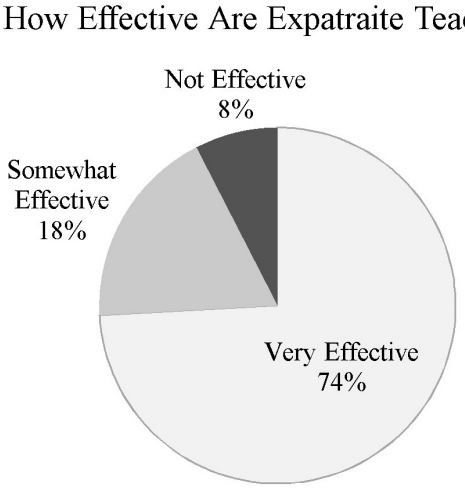

Figure 1. Poll Results on Expatriate Teacher Effectiveness

The one question poll results agreed with my perception. As shown in Figure 1, of the 398 respondents, 74% considered expatriate teachers 'very effective', while only 7.5% thought 'not effective'. This poll was limited only to high school students, therefore may have some bias of being more acceptable to learning new things. The effectiveness of expatriate teachers may be lower if other age groups were include, for example, college students.

Expatriate Teachers Most Effective at Teaching Speaking Skills

The first question to answer is that from which perspective the expatriate teachers can improve students' language skill more effectively. The survey results showed that students regard the foreign teachers most effective at oral skills and native expression (Table 2). As shown in the data, over 70% of the interviewer select the choice "effective" especially in spoken English and native expressions. As we have noticed that in China, training schools mostly focus on vocabularies and grammars, however, according to the research, expatriate teachers are better on practicing speaking skills and folk adages. Another fact is that in most training schools, they have the corporation with expatriate teachers and Chinese teachers. Therefore, separating it into parts in a better way of teaching – Chinese teachers who are better at teaching vocabularies and grammars take this part, by contrast, the expatriate teachers could improve students' efficiency in speaking and communicating.

Expatriate Teachers Not So Effective at Teaching Grammar and Logic Thinking

On the other hand, foreign teachers were regarded as less effective at teaching grammar or logic thinking. That is not to say that they were less logical in thinking, but a mere fact that their habit of thinking may not be the same as the Chinese students, thus creating a gap in the logic thinking perceived. It also confirms with the Chinese traditional way of teaching language, which is emphasizing more on grammar and formula.

Table 2.– Teaching Effectiveness of Expatriate Teachers

	Not At All	Not much	Somewhat	Very	Extremely	Score
Pronunciation, Fluency	0(0%)	4(5.48%)	12(16.44%)	30(41.1%)	27(36.99%)	4.1
expressiveness	0(0%)	4(5.48%)	20(27.4%)	22(30.14%)	27(36.99%)	3.99
vocabulary	0(0%)	3(4.11%)	22(30.14%)	27(36.99%)	21(28.77%)	3.9
grammar	0(0%)	10(13.7%)	22(30.14%)	19(26.03%)	22(30.14%)	3.73
logic thinking	1(1.37%)	4(5.48%)	25(34.25%)	22(30.14%)	21(28.77%)	3.79
total	1(0.27%)	25(6.85%)	101(27.67%)	120(32.88%)	118(32.33%)	3.9

Not Everyone Benefits from Having Expatriate Teachers

As for those beginners who an only able to use basic English in simple communication, it is not appropriate to have a class taught by an expatriate teacher because they cannot understand much. As Table 3 below shows, for the respondents of this survey, only 24% of beginners have expatriate teachers, while the percent of them using expatriate teachers increase as the level of English advances. For advanced speakers, over 64% have had expatriate teachers online. This finding can have great impact on the marketing strategies of the online language programs. For example, they should market such classes with expatriate teachers to the middle or high school students.

Table 3.– Level of Foreign Language and Use of Expatriate Teachers Online

	Beginner		Intermediate		Advanced		Total	
Having Expatriate Teachers Online?	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Yes	18	23.68%	35	48.61%	20	64.52%	73	40.78%
No	58	76.32%	37	51.39%	11	35.48%	106	59.22%
Total	76	100%	72	100%	31	100%	179	100%

V. Conclusion

In conclusion, having expatriate teachers can improve teaching effectiveness under certain circumstances, especially when the students already reached an intermediate level of communication skills. There are some recommendations for students who are willing to take the courses and training schools. For a lower-level beginner, it is unnecessary to have expatriate teachers and it would be a waste of time and money. For the training schools, the best way is to let local teachers teach grammar and vocabulary, and the expatriate teacher take the part of speaking training. This not only increases the efficiency, but also reduces the cost of hiring teachers overall.

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Section 9. Economic security

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HARMONIZATION OF NATIONAL LEGISLATION IN ORDER TO IMPROVE FOREIGN TRADE CONTROL METHODS

Abstract. The paper presents studies on the legal aspects of the application of risk analysis in the Republic of Uzbekistan when releasing imported plant products to the domestic market. The necessity of introducing a unified system of risk analysis in the activities of state control bodies in relation to products of plant origin is considered. The regulatory legal acts of the Republic of Uzbekistan in the field of phytosanitary, containing provisions on risk analysis, are examined. The paper proposes to develop a procedure for the implementation and analysis of phytosanitary risks. In addition, the stages of risk analysis are highlighted, namely risk identification, risk assessment, risk management, risk communication, and risk audit. The need for risk assessment is enshrined at the international level (in the 1994 Agreement on sanitary and phytosanitary measures). The authors pay special attention to the need to separate goods containing genetically modified organisms into separate subheadings of the Commodity Nomenclature of Foreign Economic Activity and to carry out their elaboration taking into account their origin.

Keywords: customs administration, foreign trade turnover, risk management system, foreign economic activity, phytosanitary control, veterinary supervision, electronic customs.

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ГАРМОНИЗАЦИЯ НАЦИОНАЛЬНОГО ЗАКОНОДАТЕЛЬСТВА В ЦЕЛЯХ СОВЕРШЕНСТВОВАНИЯ МЕТОДОВ ВНЕШНЕТОРГОВОГО КОНТРОЛЯ

Аннотация. В работе приведены исследования по вопросам изучения правовых аспектов применения анализа рисков в Республике Узбекистан при выпуске на внутренний рынок импортируемой продукции растительного происхождения. Рассматривается необходимость внедрения единой системы анализа рисков в деятельность государственных органов контроля в отношении товаров растительного происхождения. Исследованы нормативные правовые акты Республики Узбекистан в области фитосанитарии, содержащие положения об анализе рисков. В работе предлагается разработать порядок осуществления и анализа фитосанитарных рисков. Кроме того, освещены этапы анализа риска, а именно идентификация риска, оценка риска, управление риском, информирование о риске, а также аудит риска. Необходимость проведения оценки риска закреплена на международном уровне (в Соглашении о санитарных и фитосанитарных мерах 1994 г.). Авторами особое внимание уделяется необходимости выделения товаров, содержащих ГМО, в отдельные подсубпозиции Товарной номенклатуры внешнеэкономической деятельности и проведения их детализации с учётом происхождения.

Ключевые слова: таможенное администрирование, внешнеторговый оборот, система управления рисками, внешнеэкономическая деятельность, фитосанитарный контроль, ветеринарный надзор, электронная таможня.

Современная международная торгово-политическая обстановка предопределяет существенные корректировки, вносимые в Концепцию развития таможенных органов Республики Узбекистан, рас-

ширяя круг новых критериев обеспечения экономической безопасности государства. Данное утверждение, одновременно предполагает то, что одним из аспектов глобализации международных отношений Республики Узбекистан, является совершенствование деятельности таможенных органов в современных социально-экономических условиях для обеспечения полноты уплаты таможенных платежей, безопасности и качества ввозимых товаров, возврата валютной выручки, эффективного применения таможенных режимов, сокращения продолжительности таможенного оформления. При этом особенную актуальность приобретают направления, связанные с увеличением и улучшением информационно-консультативного обслуживания внешнеэкономической деятельности. Вместе с тем, необходимо учитывать, что управление деятельностью таможенных органов базируется на разработке ключевых показателей эффективности (*Key Performance Indicators)*, реализация которых предусматривает всестороннее достижение экономических целей и внутренней политики Республики Узбекистан. Устойчивое их использование играет важную роль в системе регулирования следующих мероприятий в системе таможенного администрирования, в частности:

- принятие решения в оперативном режиме для оказания практической помощи, при разработке мероприятий по прогнозированию доходов от внешнеэкономической деятельности таможенной службы Республики Узбекистан;
- проведение достоверного анализа деятельности участников внешнеэкономической деятельности (далее ВЭД);
- осуществление единства исполнения требований таможенного законодательства Республики Узбекистан, в том числе проведение правильной классификации товаров согласно Товарной номенклатуры внешнеэкономической деятельности (далее ТНВЭД);
- исключение негативного влияния субъективного фактора при проведении отдельных видов таможенного контроля с целью выявления потенциальных нарушителей законодательства Республики Узбекистан при перемещении через таможенную границу товаров, подконтрольных санитарно-карантинному, фитосанитарному контролю и ветеринарному надзору.

Необходимо отметить, что усложнение и глобализация мировой экономики, ускоренные темпы её развития не могут быть описаны на основе применения только классических методов прогнозирования процессов, основанных на линейной парадигме. Одним из самых существенных вопросов, в данной области, является отсутствие строгого научно-методического подхода по выработке и реализации оптимальных решений, направленных на совершенствование таможенного администрирования с применением соответствующих современных информационных технологий и методов моделирования системы управления по результатам деятельности таможенных органов. Кроме того, основными методами и приёмами экономического анализа, являются традиционные методы, предусматривающие использование аппарата статистического анализа рисков в таможенных процессах [1; 2; 3].

На сегодняшний день, развитие мирового сообщества характеризуется широкомасштабным формированием информационного общества, основанного на участии информационно-коммуникационных технологий во всех сферах отраслей экономики, в том числе и в таможенной инфраструктуре. Важно отметить, что основная стратегическая цель государственной таможенной службы Республики Узбекистан предусматривает упрощение прохождения административных процедур, прозрачность совершения таможенных операций, переход на электронный документооборот, т.е. постепенное формирование оптимизированных механизмов таможенного админи-

стрирования с применением информационных технологий. Такая тенденция, прежде всего, предусматривает совершенствование внешнеторгового контроля в местах пропуска через таможенную границу и упрощение процессов внешнеэкономической деятельности на основании гармонизации национального законодательства с учётом требований международных соглашений в области таможни, санитарии, ветеринарии и карантина на основе международных стандартов [4; 5].

Динамические изменения в системе организации процесса таможенного обеспечения. Как показала практика, на сегодняшний день, в Республике Узбекистан последовательно реализуются меры по либерализации внешнеэкономической деятельности, усилению экспортного потенциала, повышению инвестиционной привлекательности и совершенствованию таможенного администрирования. При этом в целях недопущения возникновения рисков, связанных с причинением вреда жизни и здоровья граждан, имуществу физических или юридических лиц, государственному имуществу, окружающей среде, со стороны государства уделяется особое внимание контролю качества и соответствия ввозимой продукции установленным международным требованиям, в том числе в отношении фитосанитарной безопасности. В этой связи, одним из приоритетных направлений в системе организации процесса таможенного обеспечения, является строгое соблюдение основных принципов Международной конвенции по карантину и защите растений, Конвенции о биологическом разнообразии, положений международных стандартов по фитосанитарным мерам и положений Соглашения ВТО по санитарным и фитосанитарным мерам, а также положений Картахенского протокола по биобезопасности. Это утверждение одновременно предусматривает не только упрощение таможенных процедур для развития бизнеса, но одновременно обеспечивает карантинную, фитосанитарную безопасность Республики Узбекистан и соседних государств, в целом [6, 7, 8, 9, 10]. Реализация данных мероприятий, предусматривает необходимость разработки Единого перечня карантинных объектов и Единых карантинных фитосанитарных требований к подкарантинной продукции ввозимой на территорию Республики Узбекистан, а также продукции, произведённой в подкарантинных фитосанитарных зонах. Данные документы представляют собой базисную основу системы управления фитосанитарными рисками, позволяющими предотвратить ввоз и распространение карантинных вредных объектов при международной торговле. Кроме того, они позволят значительно снизить административные барьеры в торговле и максимально реализовать один из важнейших принципов Соглашения ВТО по санитарным и фитосанитарным мерам – принцип регионализации.

Учитывая вышесказанное, следует отметить, что со стороны Государственной инспекции по карантину растений Республики Узбекистан, в 2019 году был реализован комплекс мер по налаживанию эффективной системы государственных мероприятий в отношении внутреннего и внешнего карантина растений, обеспечивающих надежную охрану территории республики от опасных вредителей, болезный растений, сорняков, а также усилению работы по недопущению их распространения внутри страны. В областях республики были созданы 7 современных стационарных и 10 мобильных лабораторий. Во всех 76 пограничных пунктах срок рассмотрения заявок при импорте сокращен с 30 дней до 3 дней, при экспорте с 10 дней до 1 дня. Получены фитосанитарные разрешения на экспорт по 78 видам фруктов и овощей в 17 зарубежных стран и с 13 зарубежными странами достигнута договоренность по экспорту всех видов сельскохозяйственной продукции растительного происхождения. Вместе с тем, показатели внешнеторгового оборота свидетельствуют о том, что более чем в 80 стран мира было экспортировано 2,1 млн. тонн подкарантинной продукции, из них 1,4 млн. тонн

плодоовощной продукции. Налажено тесное сотрудничество с зарубежными карантинными ведомствами и открыты новые экспортные рынки для продукции из Узбекистана, в числе которых Китай, Индия, Республика Корея, Япония, Вьетнам, США, Великобритания, ОАЭ, Малайзия, Сингапур, Афганистан, Турция, Саудовская Аравия и ряд других государств.

Как свидетельствует мировая практика, модернизация принципов внешней торговли с учётом международного опыта, предусматривает совершенствование национального законодательства в соответствии с международными требованиями. В подтверждении сказанному, является принятие Закон Республики Узбекистан «О присоединении Республики Узбекистан к международной конвенции по карантину и защите растений» от 23 декабря 2019 года (Рим, 6 декабря 1951 года). Наряду с этим, внимание руководства Государственной инспекции по карантину растений инспекции и его территориальных подразделений, было обращено на наличие ряда проблемных вопросов, требующих кардинального решения, среди которых можно отметить:

- необеспеченность системного проведения государственного контроля в целях соблюдения установленных правил и осуществления мероприятий по карантину растений при производстве, заготовке, транспортировке, хранении, переработке, реализации и использовании сельскохозяйственной и другой продукции растительного происхождения;
- недостаточная организация и проведение научных исследований в области карантина, а также последовательное внедрение инноваций в отрасль, проводимых Научным центром карантина растений при Государственной инспекции.

Внедрение системы управления рисками в практике осуществления контроля таможенными органами Республики Узбекистан. В соответствии с рекомендациями Киотской конвенции об упрощении и гармонизации таможенных процедур, а также с положениями Постановления Президента Республики Узбекистан № ПП-3818 от 29 июня 2018 г. «О мерах по дальнейшему упорядочению внешнеэкономической деятельности и совершенствования системы таможенно-тарифного регулирования Республики Узбекистан», установлен порядок, в соответствии с которым на приграничных таможенных постах, таможенными органами при проведении таможенного контроля также осуществляется ветеринарный, фитосанитарный, экологический и санитарно-эпидемиологический контроль. Кроме того, на основании Постановления Кабинета Министров Республики Узбекистан № 912 от 18 ноября 2019 г. «О дальнейшем совершенствовании порядка организации пограничного, таможенного, санитарно-карантинного, фитосанитарного контроля и ветеринарного надзора в пунктах пропуска через государственную границу Республики Узбекистан» от 18 ноября 2019 г., регламентированы основные положения в отношении пропуска на внутренний рынок импортируемой продукции растительного происхождения.

В связи с этим, учитывая международный опыт в области реализации фитосанитарного контроля во взаимосвязи с таможенным контролем, необходимо детально остановиться на изучении приоритетных критериев системы анализа рисков в данном сегменте. Анализ литературы позволил нам выявить наиболее обоснованную точку в отношении этапов данной системы, предусматривающую идентификацию риска, оценку риска, управление риском, информирование о риске. Рассматриваемая форма, также выделяет в качестве самостоятельного этапа – **аудит риска.** Следует отметить, что риски идентифицируются на основании имеющейся аналитической информации. Кроме того, идентификация риска будет проведена успешно только при наличии полной и достоверной информации. При этом перечень

данных должен быть исчерпывающим и, содержать наиболее приоритетные критерии актуальности. На следующем этапе, после идентификации риска, осуществляется оценка риска.

Самым важным моментом является обеспечение соблюдения унификации санитарных, ветеринарных и фитосанитарных мер, которые должны основываться на соответствующей оценке рисков жизни или здоровью человека, животного или растения, с учетом методик оценки риска, разработанных ведущими международными организациями, включая Комиссию «Кодекс Алиментариус», Международное эпизоотическое бюро, а также соответствующими международными и региональными организациями, действующими в рамках Международной конвенции по карантину и защите растений» (три сестры ВТО). При этом, оценка риска может быть предметом спора в Органе по разрешению споров ВТО, поэтому важно проводить оценку риска в соответствии с международными стандартами и требованиями. При этом, учитывая требования международных организаций, согласно ст. 5 СФС Соглашения государства-члены ВТО должны обеспечивать, «чтобы в основу их санитарных или фитосанитарных мер была положена соответствующая обстоятельствам оценка рисков для жизни или здоровья людей, животных или растений, причем осуществляемая *с учетом методов оценки риска, разработанных соответствующими международными организациями*».

Следует отметить, что обязанность компетентных органов следовать международным стандартам при выполнении своих функций закреплена в ряде наднациональных и национальных нормативных правовых актов. Кроме того, для объективности оценка риска должна быть четко разграничена с управлением риском. В ЕС, например, в 2002 г. в указанных целях как орган исключительно по оценке риска в отношении безопасности продуктов питания было создано Европейское агентство по безопасности продуктов питания, который к тому же функционирует независимо от законодательной и исполнительной власти ЕС и государств-членов ЕС. На основании проведенной специалистами оценки риска при наличии достаточной информации компетентные органы государства принимают соответствующие меры. Так, в США при принятии управленческих решений учитывается и мнение общественности. В частности, в Законе США «О защите растений» от 2000 года определяется, что в целях анализа фитосанитарных рисков, связанных с импортом растений и растительной продукции, для общественного обсуждения публикуется уведомление с описанием разрабатываемых процедур и стандартов [11].

Эффективность управления рисками повышается, в том числе, за счет использования информационно-аналитических систем. Не менее важным этапом системы анализа риска, является информирование о риске в режиме on-line, представляющее собой процесс, при котором затрагиваемым и заинтересованным сторонам передается информация и мнения относительно опасностей и рисков, а результаты оценки риска и предлагаемые меры по управлению риском предоставляются лицам, принимающим решения, и заинтересованным сторонам в импортирующей и экспортирующей странах [12, 13]. Процесс инициируется в начале анализа риска и продолжается на всех этапах его проведения. Рассматриваемая форма информирования о риске, должна представлять собой открытый, взаимный, цикличный и транспарентный обмен информацией, который может продолжаться после принятия решения об импорте.

На этапе аудита риска осуществляется контроль и проверка в отношении того, были ли достигнуты предполагаемые результаты по итогам управления риском, насколько эффективно было реализовано управление риском. Логика рассуждения свидетельствует о том, что этап аудита риска направлен на оценку результативности и эффективности процесса управления риском.

Приведённый алгоритм предусматривает логическое построение совершенствования процессов

таможенного оформления и грамотно выстроенная система анализа рисков в фитосанитарной сфере, позволит компетентным органам эффективнее реализовывать государственную экономическую политику в области обеспечения продовольственной безопасности Республики Узбекистан, а также обеспечивать благополучие территории Республики Узбекистан не только в сфере фитосанитарии, но и в области ветеринарии. Кроме того, позволит принимать более обоснованные решения, признаваемые фитосанитарными и санитарно-эпидемиологическими органами других государств, и эффективнее отстаивать интересы Республики Узбекистан на международной арене, в том числе на заседаниях Комитета по санитарным и фитосанитарным мерам ВТО и Органа по разрешению споров ВТО [14; 15].

Важно отметить, что на сегодняшний день, в результате введения таможенного контроля в 4-х коридорах через автоматизированную информационную систему «Управление рисками», время таможенной очистки в экспорте сократилось в 4,5 раза, а импорте в 2 раза. Такие положительные изменения сегодня широко признаются и авторитетными международными организациями. В частности, в отчете Всемирного банка и Международной финансовой корпорации «Ведение бизнеса-2020» Узбекистан занял 69-е место, а по масштабу и эффективности проводимых реформ вошел в «Топ-20» лучших стран-реформаторов в мире.

В настоящее время, в пунктах пропуска через Государственную границу Республики Узбекистан осуществляется 5 видов государственного контроля пограничный, санитарно-эпидемиологический, ветеринарный, фитосанитарный и таможенный. Внутри республики товары дополнительно проходят государственный контроль органов санитарно- эпидемиологического и фитосанитарного контроля, ветеринарного и экологического надзора, таможенного контроля и органов сертификации. Практически каждый из перечисленных контролирующих органов, кроме таможенных органов, имеет перечень товаров, подконтрольных этим органам.Учитывая, что в новой редакции ТНВЭД (версия 2017 г.) включены 11293 товарные позиции, статистические показатели в данном контексте выгладят следующим образом:

- органам ветеринарного контроля подконтрольны 1778 товарных позиций;
- органам фитосанитарного контроля – 1149 товарных позиций;
- органам санитарно-эпидемиологического контроля – 3543 товарных позиций;
- органам экологического надзора – 244 товарных позиций
- органам сертификации – 5452 товарных позиций.

До сегодняшнего дня, контролирующие органы в своей работе использовали электронную систему «Единое окно». Однако имеющаяся система не соответствовала современным требованиям, не выполняло задачи по упрощению процедур, она не ставила обязательства выдачи всех документов, в том числе и документов разрешительного характера, исключительно только через данную систему. Вместе с тем, территориальные структурные подразделения контролирующих органов не полностью были подключены к системе «Единое окно».

На сегодняшний день, согласно предложениям Министерства юстиции, Министерства здравоохранения, Министерства финансов, Государственного таможенного комитета, Государственного комитета ветеринарии и развития животноводства, Государственного комитета по экологии и охране окружающей среды, Агентства «Узстандарт» и Государственной инспекции по карантину растений при Кабинете Министров Республики Узбекистан, с 1 января 2020 года была внедрена на практику таможенная информационная система «Единое окно» (ТИС «Единое окно»), отвечающей критериям Рекомендаций и руководящих принципов по созданию механизма «Единого окна», разработанных Центром

ООН по упрощению торговых процедур и электронным деловым операциям.

Реализация данного механизма позволит перейти от проведения «тотального» фитосанитарного, санитарно-эпидемиологического, ветеринарного, экологического, сертификационного контроля товаров к системе анализа рисков, позволяющей на основе всестороннего анализа, определять объекты фитосанитарного, санитарно-эпидемиологического, ветеринарного, экологического, сертификационного контроля, проводить выборочный фитосанитарный, санитарно-эпидемиологический, ветеринарный, экологический, сертификационный контроль товаров, а также снизить административные барьеры для участников ВЭД. На сегодняшний день, несмотря на серьезные изменения в законодательстве Республики Узбекистан, имеет тот факт, что на практике, контролирующие органы часто дублируют полномочия друг друга по проверке подконтрольных им товаров, так как один и тот же товар, может быть объектом контроля нескольких органов.

В связи с этим, на рис. 1, показаны положительные моменты от внедрения ТИС «Единое окно», касающиеся совершенствования внешнеторговых операций и создания благоприятных условий для развития предпринимательства в Республике Узбекистан.

Учитывая опыт прошлых лет, при таможенном оформлении трудно было получить точную информацию от импортеров в отношении наименования, бренда, моделей товаров, ввозимых в страну. В настоящее время, для получения исчерпывающей информации о наименованиях, марках и моделях товаров было принято Постановление Государственного таможенного комитета Республики Узбекистан «О внесении изменений и дополнений в инструкцию о порядке заполнения грузовой таможенной декларации». На сегодняшний день, в результате изменений в законодательстве Республики Узбекистан, при проведении таможенного оформления товаров, осуществляются следующие мероприятия, в частности:

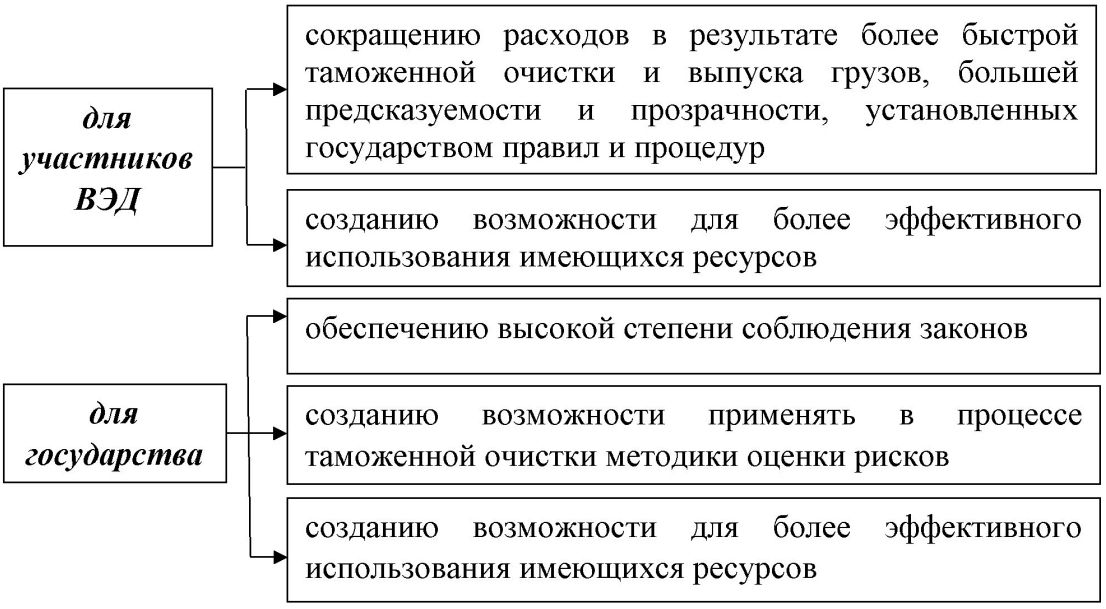
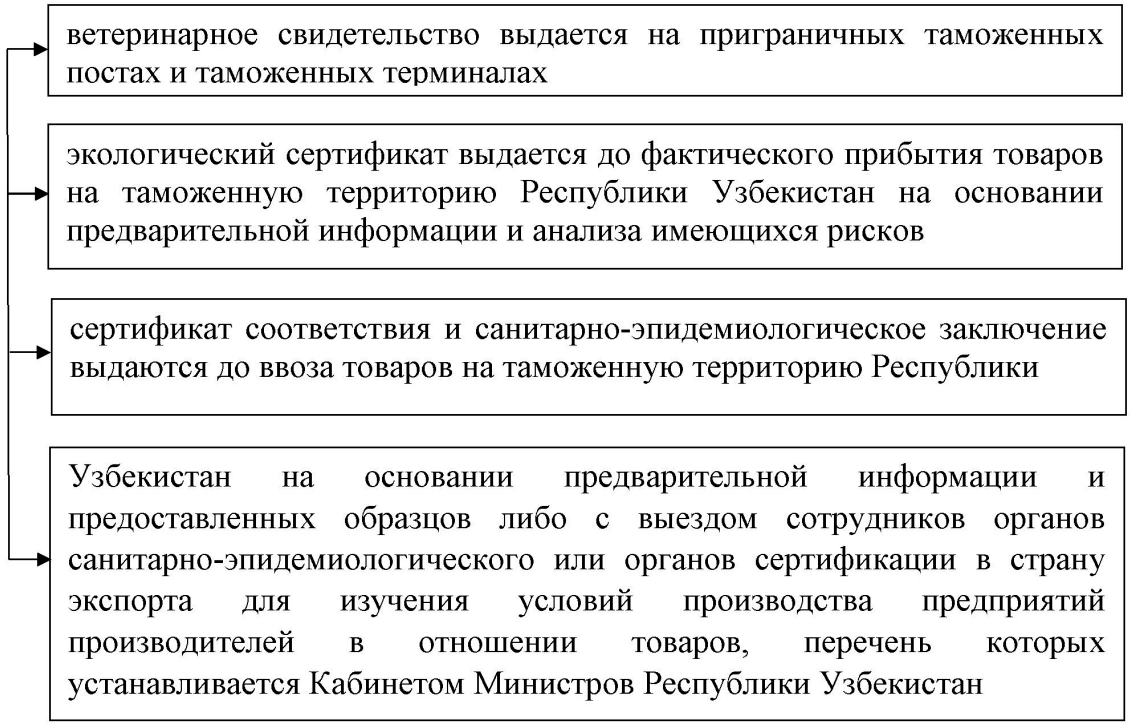


Рисунок 1. Позитивные стороны практического внедрения таможенной информационной системы «Единое окно» в Республике Узбекистан

– в Грузовой таможенной декларации наименование, марка и модель будут введены в обозначенные поля, что позволяет извлекать и анализировать информацию о бренде и модели продукта из обозначенных областей;
– планируется создать интерактивный сервис по импорту товаров, где пользователи смогут получать информацию об их объеме, стоимости и ценах по названию, бренду и модели, что обеспечивает местное производство импортируемых товаров посредством промышленной кооперации [8].

В настоящее время большинство документов разрешительного и иного характера, выдаются контролирующими органами, после прибытия товаров в пункт назначения, то есть на таможенный пост внешнеэкономической деятельности внутри страны, что в итоге приводит к длительным временным затратам (например, заявка на получение сертификата соответствия рассматривается в течение 30 дней) и большим финансовым затратам (до получения всех документов разрешительного и иного характера ввезенный товар на возмездной основе хранится на таможенных складах) для участников ВЭД. Как показано на (рис. 2), в целях совершенствования вопросов таможенного администрирования, и создания благоприятных условиях для участников ВЭД, с 1 марта 2020 года предусмотрена реализация мероприятий, обеспечивающих организацию процесса таможенного обеспечения.



Рисисунок 2. Реализация мероприятий, направленных на создание совершенствование процесса таможенного обеспечения

Следует отметить, что предлагаемый механизм, прежде всего обеспечит сокращение временных и финансовых затрат государства и участников ВЭД, а также позволит более эффективно организовать работу контролирующих органов, что будет способствовать реализации всесторон-

него контролю за ввозом качественных и безопасных товаров. О важности проведения оценки рисков в соответствии с международными стандартами и требованиями свидетельствует практика рассмотрения споров в Органе по разрешению споров ВТО. В силу того что оценка является важным этапом в системе анализа риска при принятии каких-либо решений в отношении ввозимой продукции, представляется необходимым разработать методологическое обеспечение проведения оценки рисков в рамках своей компетенции.

Классификация продуктов, содержащих генно-модифицированные организмы в международной торговле. Развитие системы электронного декларирования и развитие технологии удалённого выпуска, обеспечивает сокращение использования человеческого фактора. Однако следует отметить, что в качестве одной из существенных проблем, имеющих место в области построения информационного пространства системы электронного декларирования и удаления выпуска, является система управления рисками в данной направлении. К выпуску в свободное обращение, государственные таможенные органы Республики Узбекистан выпускают только товары участников внешнеэкономической деятельности низкого уровня риска. Организация эффективного информационного обмена с использованием современных инновационных технологий между государственными органами контроля и таможенными органами будет способствовать снижению издержек и сокращению сроков таможенных, фискальных и иных процедур.

Учитывая вышесказанное, в целях повышения экономической эффективности, пресечения недостоверного декларирования кодов, решения вопросов продовольственной безопасности с учётом международных требований, а также для национальной детализации на основании полученных экспериментальных результатов с применением современных методов биотехнологии, таких как метода полимеразной цепной реакции (ПЦР) с гибридизационно-флуоресцентной детекцией (***маркеры ГМО: терминатор, промотор, маркерные гены***), считаем целесообразным выделить товары, содержащие ГМО, в отдельные подсубпозиции и провести их детализацию с учётом происхождения. Данные разработки по детализации позволят повысить эффективность контрольных мероприятий в ходе проверок ГТД в электронных массивах и на бумажных носителя.

Подсубпозиции, предлагаемые для включения в Товарную номенклатуру внешнеэкономической деятельности Республики Узбекистан:

Группа 01 «Живые животные» 0106 – Живые животные прочие: – насекомые

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0106.90.009.1.	– содержащие ГМ-аналоги	–

Группа 07 «Овощи и некоторые съедобные корнеплоды и клубнеплоды»

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0701	Картофель свежий или охлаждённый	–
0701.10.000.1.	– Семенной, содержащий ГМ–аналоги	–
0701.90.900.1.	– прочий, содержащий ГМ–аналоги	–

070200000 – томаты свежие или охлажденные:

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0702.00.000.8	– содержащие ГМ–аналоги	–

0708 – Бобовые овощи, лущеные или нелущеные, свежие или охлажденные:

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0708.10.000.1.	– горох, содержащие ГМ–аналоги	–
0708.20.000.1	– фасоль, содержащие ГМ–аналоги	–
0708.90.000.1.	– бобовые овощи, содержащие ГМ–аналоги	–

ГРУППА 08 «Съедобные фрукты и орехи; кожура и корки цитрусовых и дынь»
0801 – орехи кокосовые, орехи бразильские и орехи кешью, свежие или сушенные, очищенные от скорлупы или не очищенные, с кожурой или без кожуры:

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0801.19.000.1.	– орехи кокосовые, содержащие ГМ –аналоги	
0801.22.000.1	– орехи бразильские, содержащие ГМ –аналоги	
0801.32.000.1.	– орехи кешью, содержащие ГМ –аналоги	

0805 – цитрусовые плоды свежие или сушёные:

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0805.10.800.1.	–апельсины свежие, содержащие ГМО	–
0805.20.900.1.	– мандарины, содержащие ГМО	–
0805..40.000.1.	– грейпфруты, включая помело, содержащие ГМО	–
0805.50.100.1.	– лимоны и прочие цитрусовые, содержащие ГМО	–

0808 – яблоки, груши, айва, свежие:

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0808.10.100.1.	– яблоки для производства сидра, содержащие ГМО	–
0808.30.100.1.	– груши, содержащие ГМО	–
0808.40.000.1.	– айва, содержащая ГМО	–

0810 – прочие фрукты, свежие:

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
0810.10.000.1.	– земляника и клубника, содержащие ГМО	
0810.20.100.1.	– малина, ежевика, тутовая ягода, прочая, содержащие ГМО	
0810.30.100.1.	– смородина чёрная, белая и красная, крыжовник, содержащие ГМО	
0810.40.100.1.	– клюква, черника и прочие ягоды, содержащие ГМО	
0810.90.750.1.	– прочие, содержащие ГМО	

Группа 16 «Готовые продукты из мяса; алкогольные и безалкогольные напитки и уксус; табак и его заменители» 1601.00.– колбасы и аналогичные продукты из мяса, мясных субпродуктов или крови; готовые пищевые продукты, изготовленные на их основе

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
1601.00.990.1.	– содержащие ГМ–аналоги	–
1602.10.009.1.	– содержащие ГМ–аналоги	–

Группа 30 «Фармацевтическая продукция» 3002 – кровь человеческая; кровь животных, приготовленная для использования в терапевтических, профилактических или диагностических целей; сыворотки иммунные, фракции крови прочие и иммунологические продукты модифицированные или немодифицированные, в том числе, полученные методами биотехнологии; вакцины, токсины, культуры микроорганизмов (кроме дрожжей), и аналогичные продукты:

Код ТНВЭД	Наименование позиции, включаемой в ТНВЭД	Доп. единица измерения
3002.90.900.1.	– культуры микроорганизмов, содержащие ГМО	–

Из вышеприведенного анализа проблем, возникающих в процессе таможенного оформления товаров, с достаточной определенностью можно сказать, что дальнейшее совершенствование таможенного администрирования Республики Узбекистан, будет способствовать повышению эффективности реализации внешнеторговой политики нашего государства за счёт внедрения современных информационно-коммуникационных технологий, а также реализации следующих мероприятий:

1. Для обеспечения безопасности продукции, содержащих ГМО, а также выполнения обязательств, взятых государствами, в случае присоединения к ВТО, необходимо внедрение системы анализа рисков в деятельность государственных органов по вопросам контроля за данного видом продукции.

2. Необходимо разработать порядок реализации мер по управлению рисками, включающего в себя порядок сбора информации с применением информационно-коммуникационных технологий в режиме on-line, представляемой участниками внешнеэкономической деятельности в таможенные органы.

3. Ввести методику оценки фитосанитарных рисков и методов её проведения, связанных с ввозом, вывозом, транзитом, производством, переработкой, хранением и реализацией на территории Республики Узбекистан подкарантинной Государственной инспекции по карантину растений продукции.

4. Разработать алгоритм практического применения научно-обоснованной методологии анализа и управления рисками в пунктах пропуска через государственную границу Республики Узбекистан при реализации таможенных услуг, связанных с оценкой рисков, основанной на четком разграничении оценки риска и управлением риска в отношении продукции, содержащей генно-модифицированные объекты.

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FINANCIAL WORRIES OVER KIDS' COLLEGE EDUCATION AMONG ADULTS IN 2017

Abstract

Aim: This study aims to 1) examine the predictors of parients' financial worries over kids' college education in 2017 2) build a predictive model for parients' financial worries over kids' college education using artificial neural network and compare its performance to logistic regression model.

Method: The National Health Interview Survey (NHIS) in 2017 was used. All the participants who were eligible were randomly assigned into 2 groups: training sample and testing sample. Two models were built using training sample: artificial neural network and logistic regression. Receiver operating characteristic (ROC) were calculated and compared for these two models for their discrimination capability.

Results: About 53% of 9129 Adults had Financial worries over kids' college education, about 56.7% among the female and 48.5% among the male.

According to the logistic regression, the female was more likely than the male to have financial worries over kids' college education. The non-Hispanic adults were less likely to have financial worries over kids' college education than Hispanic adults. The older adults were less likely to have financial worries over kids' college education. Compared to Northeast region, Midwest and South were less likely to have financial worries over kids' college education. Compared to people who were not employed but looking, people who were not employed and not looking were less worried.

According to this neural network, the most important predictors were age, Hispanic or not, working or not and gender.

For training sample, the ROC was 0.59 for the Logistic regression and 0.67 for the artificial neural network. In testing sample, the ROC was 0.60 for the Logistic regression and 0.62 for the artificial neural network.

Conclusions: In this study, we identified several important predictors for parients' financial worries over kids' college education in 2017 e.g., gender, age, region and working status. This provided important information for social works to design and implement measures for depression prevention. We built a predictive model using artificial neural network as well as logistic regression to provide a tool for early detection. As to performance of these two models, logistic and artificial neural network regression had a similar discriminating capability.

Keywords: Financial worries, college education, social work, financial depression prevention.

1. Introduction: The cost of tuition and room-and-board for both public colleges and private ones continued to rise in the 2017–2018 school year, according to the College Board. The average tab at a four-

year in-state public college rose 3.1 percent to $20,770, and the cost at private institutions jumped 3.5 percent to $46,950. Roughly 60 percent of undergraduates between ages 18 and 24 enrolled in a four-year bachelor's degree program that have taken out student loans say they are responsible for covering more than half of the total cost of their education, the survey found [1].

Seven out of 10 college students feel stressed about their personal finances, according to a new national survey. Nearly 60 percent said they worry about having enough money to pay for school, while half are concerned about paying their monthly expenses [2].

More U. S. parents worry about having enough money to pay for their children's college education than other Americans worry about any common financial concerns. The 73% of parents of children younger than 18 who worry about funding college tops the 70% of lower-income Americans who worry about having enough money to pay for medical costs in the event of a serious illness or accident [3].

This study aims to 1) examine the predictors of parients' financial worries over kids' college education in 2017 2) build a predictive model for parients' financial worries over kids' college education using artificial neural network and compare its performance to logistic regression model.

2. Data and Methods:

Data:

The National Health Interview Survey (NHIS) is the principal source of information on the health of the civilian noninstitutionalized population of the United States and is one of the major data collection programs of the National Center for Health Statistics (NCHS) which is part of the Centers for Disease Control and Prevention (CDC).

The National Health Interview Survey (NHIS) Data 2017 was used in this study.

URL: https://www.cdc.gov/nchs/nhis/about_nhis.htm

Models:

We used logistic regression models to calculate the predicted risk. Logistic regression is a part of a category of statistical models called generalized linear models, and it allows one to predict a discrete outcome from a set of variables that may be continuous, discrete, dichotomous, or a combination of these. Typically, the dependent variable is dichotomous and the independent variables are either categorical or continuous.

The logistic regression model can be expressed with the formula:

$$\ln(P/P-1) = \beta 0 + \beta 1*X1 + \beta 2*X2 + \ldots .+ \beta n*Xn$$

A package called "neuralnet" in R was used to conduct neural network analysis. The package neuralnet focuses on multi-layer perceptrons (MLP, Bishop, 1995), which are well applicable when modeling functional relationships.

Variables:

The outcome variable is percentage of How worried are you right now about not having enough money to pay for your children's college? (ASICCOLL)

Table 1.– Variables used in this study

SEX	1: male 2: female
ORIGIN_I	Hispanic Ethnicity: 1: yes; 2: no
RACRECI3	1: White 2: Black 3: Asian 4: All other race groups*
AGE_P	Age <18 years old 0–17
Region	1 Northeast 2 Midwest 3 South 4 West

3. Results

About 53% of 9129 Adults had Financial worries over kids' college education, about 56.7% among the female and 48.5% among the male.

Basically, a corrgram is a graphical representation of the cells of a matrix of correlations. The idea

is to display the pattern of correlations in terms of their signs and magnitudes using visual thinning and correlation-based variable ordering. Moreover, the cells of the matrix can be shaded or colored to show the correlation value. The positive correlations are shown in blue, while the negative correlations are shown in red; the darker the hue, the greater the magnitude of the correlation.

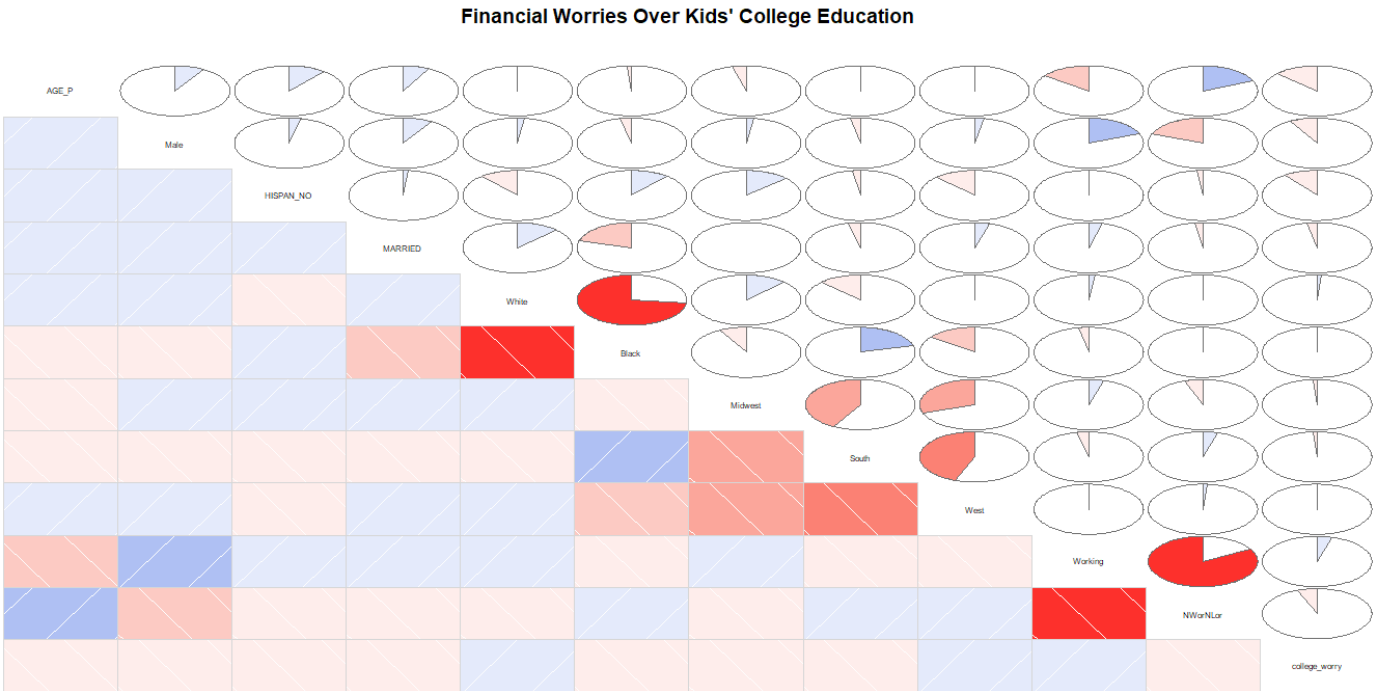

Figure 1. matrix of correlations between variables

According to the logistic regression, the female was more likely than the male to have financial worries over kids' college education. The non-Hispanic adults were less likely to have financial worries over kids' college education than Hispanic adults. The older adults were less likely to have financial worries over kids' college education. Compared to Northeast region, Midwest and South were less likely to have financial worries over kids' college education. Compared to people who were not employed but looking, people who were not employed and not looking were less worried.

Table 2.– Logistic Regression for Having Financial worries over kids' college education

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**	
(Intercept)	1.577	0.151	10.415	< 2e–16	***
AGE_P	–0.017	0.002	–9.866	< 2e–16	***
Male	–0.325	0.044	–7.353	0.000	***
HISPAN_NO	–0.478	0.059	–8.082	0.000	***
MARRIED	–0.059	0.045	–1.316	0.188	
White	0.053	0.077	0.692	0.489	
Black	0.033	0.098	0.334	0.738	
Midwest	–0.159	0.071	–2.235	0.025	*
South	–0.167	0.065	–2.558	0.011	*
West	–0.131	0.071	–1.854	0.064	.
Working	–0.005	0.087	–0.060	0.952	
NWorNLor	–0.276	0.096	–2.877	0.004	**

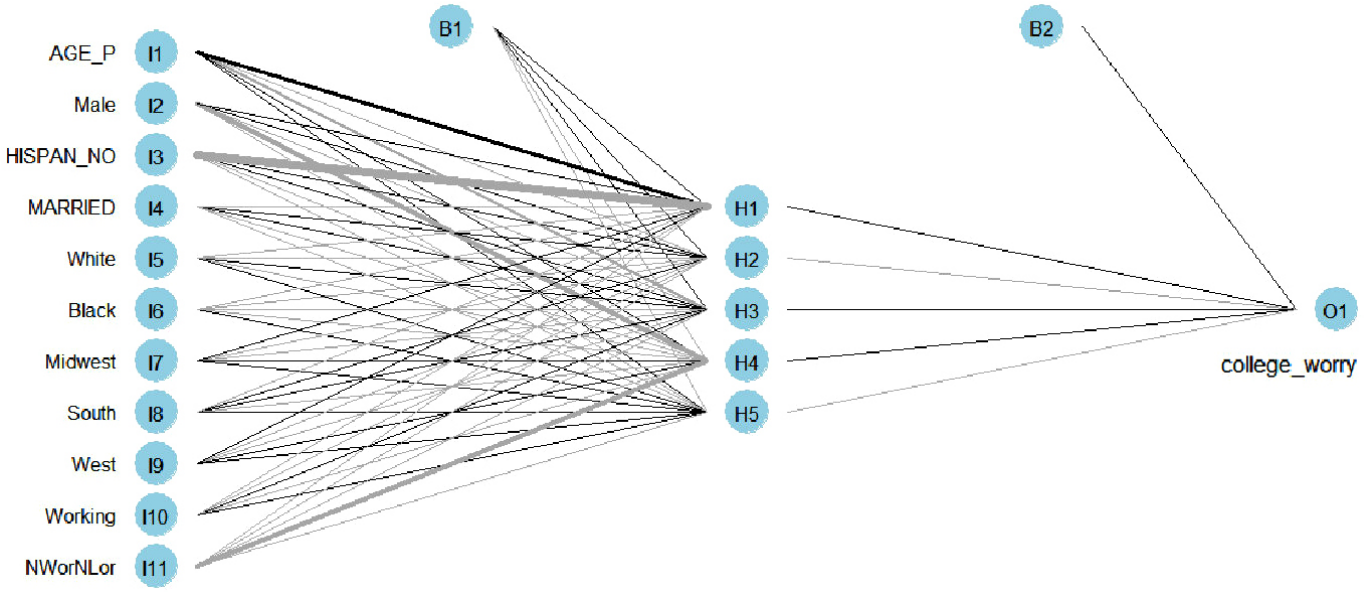

Figure 2. Artificial Neural Network in training sample

In above plot, line thickness represents weight magnitude and line color weight sign (black = positive, grey = negative). The net is essentially a black box so we cannot say that much about the fitting, the weights and the model. Suffice to say that the training algorithm has converged and therefore the model is ready to be used.

According to this neural network, the most important predictors were age, Hispanic or not, working or not and gender. ents and Midwest residents.

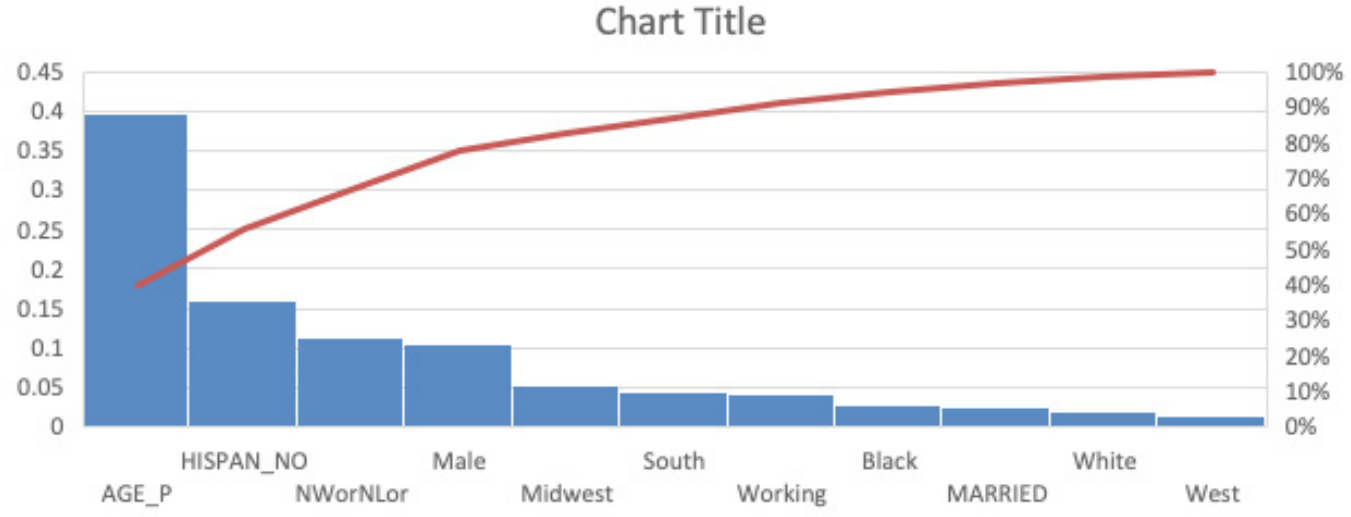

Figure 3. Variable Importance in Artificial Neural Network

For training sample, the ROC was 0.59 for the Logistic regression and 0.67 for the artificial neural network. In testing sample, the ROC was 0.60 for the Logistic regression and 0.62 for the artificial neural network.

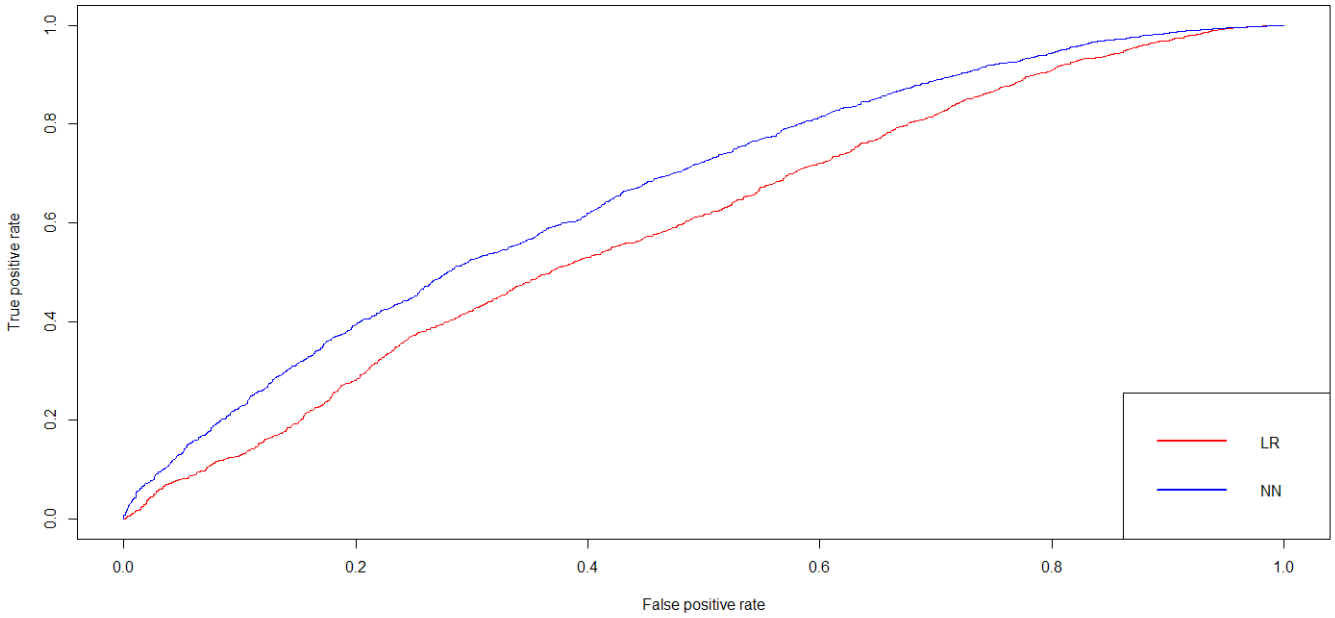

Figure 4. ROC in training sample for Logistic Regression (Red) vs Neural Network (Blue)

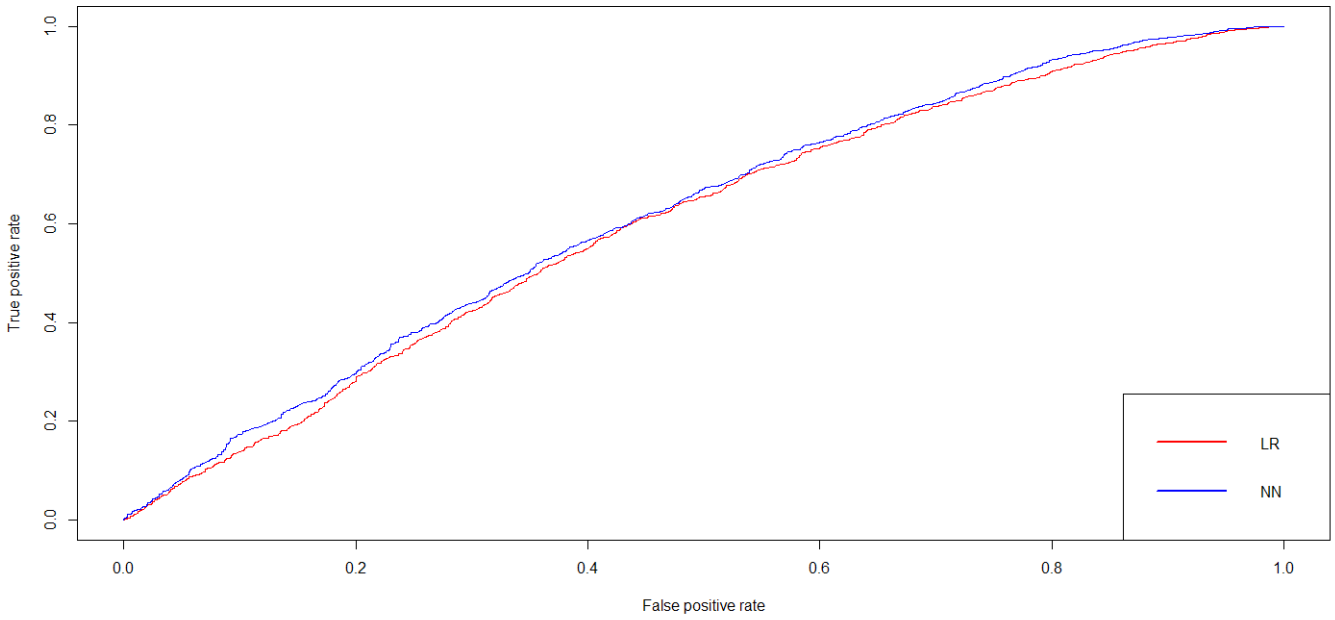

Figure 5. ROC in testing sample for Logistic Regression (Red) vs Neural Network (Blue)

4. Discussion

This study aimd to: 1) examine the predictors of parients' financial worries over kids' college education in 2017; 2) build a predictive model for parients' financial worries over kids' college education using artificial neural network and compare its performance to logistic regression model.

About 53% of 9129 Adults had Financial worries over kids' college education, about 56.7% among the female and 48.5% among the male. According to the

logistic regression, the female was more likely than the male to have financial worries over kids' college education. The non-Hispanic adults were less likely to have financial worries over kids' college education than Hispanic adults. The older adults were less likely to have financial worries over kids' college education. Compared to Northeast region, Midwest and South were less likely to have financial worries over kids' college education. Compared to people who were not employed but looking, people who were not employed and not looking were less worried. According to this neural network, the most important predictors were age, Hispanic or not, working or not and gender.

In this study, we identified several important predictors for parents' financial worries over kids' college education in 2017 e.g., gender, age, region and working status. This provided important information for social works to design and implement measures for depression prevention. We built a predictive model using artificial neural network as well as logistic regression to provide a tool for early detection. As to performance of these two models, logistic and artificial neural network regression had a similar discriminating capability.

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