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**OPENING REMARKS***Editor-in-Chief*

Prof. Dr. Sokol Abazi

**10****Analysis of nonperforming loans:  
Case of Albania**

Xhesika Pjetra, Edmira Cakrani

**28****Assessment of companies' degree of  
informatisation and transition to  
digital business**

Smirnova P.V., Shtrafina E.D.

**45****Evaluating the significance of decisive  
factors affecting customers' reaction  
towards online shopping - Case of Albania**

Gledis Toçila

**60****Heat maps as optimization of marketing  
solutions to increase the informative  
content of the website**

Artemenko E.A., Gavrilova T.V.

**EDITORIAL**

Prof. Assoc. Artur Jaupaj

**EDITORIAL**

PhD. Dorina Guraj

**18****"Stress level" ranking of the  
psychological burden seen from the  
students' self-evaluating optics affecting  
the academic achievements in the  
Covid-19 conditions**Blerta Nazarko, Alfons Harizaj, Klea Çapari,  
Anxhela Baraj**34****Robotics in support of obtaining  
knowledge in computer sciences before  
university studies**

Grigorina Boce, Alma Hyra, Frida Zisko

**57****Organizational behavior and diversity**

Rezart Dibra

**64****Estimating fiscal multipliers for North  
Macedonia: A structural vector error  
correction model**

Arbresh Raveni

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Prof. Dr.  
**Sokol Abazi**  
Editor-in-Chief

It is with great pleasure that I write this editorial to welcome you to the new Issue of CIT Review Journal ISSN: 2523-6962, listed in Ulrichsweb™ & Ulrich's Periodicals Directory, indexed in Citefactor, titled May Issue 2021. The topics covered by this Issue are related to the current trends of research. Original research that uncovers social and psychological effects of COVID-19 is also included.

CIT Review Journal is an international journal that effectively provides a forum for academics, professionals, graduate and undergraduate students, fellows and associates to share the latest developments and advances in knowledge and practice of Economics and Business; Information Technology and Engineering; Humanities. Our interest in promoting high-quality research is clearly reflected in having an established peer reviewing process and a high-profile expert group of Associate Editors and Editorial Board Members.

Hopefully you find this Issue informative and we definitely look forward to receiving your high-quality studies for the next issue of the Journal.

A handwritten signature in black ink, appearing to be 'S. Abazi', written in a cursive style.

**Prof. Dr. Sokol Abazi**  
Editor-in-Chief

# EDITORIAL

## SHAPING THE FUTURE: DIGITAL ECONOMY AND RECENT TECHNOLOGY TRENDS

Author(s): **Assoc. Prof. Dr. Artur Jaupaj**<sup>a</sup>

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The most recent online conference organized by CIT and a number of institutions of higher education on April 23, 2021 brought together researchers and speakers from around the region and beyond. This year's main theme and topics focused on digital economy and recent technology trends as the so-called "digital divide", enhanced by the prolonging pandemic, could undermine the economies of many developing countries like our own unless digitalization and data-driven economic developments are properly and timely addressed.

As such, first and foremost, we all have to professionally engage in and train and educate our students with hands-on skills in the emerging technologies such AI, IoT, Clouding Computing, data analytics, blockchain technologies, and internet-based services, to name a few, as they are shaping not only our future businesses but also our daily lives. To make this point more concrete, let me give a simple example of internet traffic over years published by UN in its 2019 Digital Economy Report:

2002	2007	2017	2022
100 GB per second	2 000 GB per sec.	46 000 GB per sec.	150700 GB per sec.

Obviously, such an amount of data requires "digital intelligence" and competence as "digital divide" is real and threatening the future economic development of many countries.

To quote the same source, "For example, [the United States and China] these two countries account for 75% of all patents related to blockchain technologies, 50 percent of global spending on IoT, and more than 75 per cent of the world market for public cloud computing. And, perhaps most

strikingly, they account for 90 per cent of market capitalization value of the world's 70 largest digital platforms".

Furthermore, the real value and the very definition of digital economy remains ambiguous at best.

Nevertheless, turning data, or the so-called "the new economic resource" into digital intelligence and business opportunities remains the key to success as failure to do so might lead to a serious disadvantage in creating value. Referring to the same report again, "If left unaddressed, the yawning gap between the under-connected and the hyper-digitalized countries will widen further and existing inequalities will be exacerbated".

Here, in fact, lies the importance of this timely held and self-suggestive conference topic, as it undertakes to explore and analyze the "new normal" in line with the latest technology developments, which, even though they had been heralded a long time ago, will have an enormous impact on our future economies and societies for decades to come.

**Prof. Assoc. Artur Jaupaj**  
Dean/Faculty of Economy, CIT

# EDITORIAL

## THE IMPACT OF GLOBALIZATION ON CONSUMER BEHAVIOR

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The key and primary concern in marketing is getting to understand how globalization affects or impacts consumer behavior. Consumer behavior is how people come up with choices on what they need, what they want, or how they will buy them. Understanding consumer behavior in marketing helps to know how a new product may be responded to and the best way to put the product in the market. Consumer behavior eventually leads to consumer culture. Globalization has a major impact on consumer behavior since globalization brings new consumer culture, which is an adaptation to the new ways that globalization comes with. Globalization regarding marketing is the fusing of different economies on a national level through major aspects like trade, capital flows, and through the growth of technology and migration. This Editorial focuses on how globalization has had its impacts on consumer behavior.

### 1. Introduction

Globalization has had its impacts on individuals where it creates new and specific wants, desires. Nations and states have seen the stimulation of globalization in the progression of trade policies. With the coming up and advancement in information technology, foreign brands have come to light through media and communication, which has enhanced the spread of globalization. However, the backbone of globalization is the process of how goods and services and their people flow. Globalization has had a specific influence in its economy where it alters the structure through the consumers. Consumer preferences and consumer culture; where the lifestyle comes with globalization impact, emulation of other countries culture arises, this changes consumer needs and behavior. Through media and communication, the affluent and less affluent are compelled to increase Westernization in developing countries.

### 2. Literature Review

Globalization is extensively defined as the proneness and a mirror that emanates from foreign brands and likeness. Through previous research, it has been noted that consumers incline to and prefer products that come from countries that they have a certain liking and positivity to. This preference, which is seen mostly in developing countries, developing states, or towns, comes from the people trying to copy the people's lifestyle and consumer behavior from developed places.

#### 2.1 Acculturation in Albania

Previous research has shown that the western lifestyle and foreign brands come up as a sign of prestige and diversity, especially among Albania consumers. In terms of image, quality, technological advancement, and originality, foreign brands were much better than Albanian's brands.

Cultural exchange is the process by which some values and lifestyles are passed and intertwined between two or more individuals coming from different areas. The idea of culture is a stem of globalization, which influences consumer behavior, has been studied and researched extensively. Globalization, which has made the world seem like an online village, has enabled various cultures between different people (Batra Et. Al, 2019). Media has spread different cultures and has brought about the being to global culture bringing about the indigenous culture's downgrading. The Albanian market was one of the markets that proved the change of culture to the inclination that goes to a foreign brand. This type of change and assimilation is known as acculturation.

Acculturation, which is caused by globalization, is defined in different studies as getting new information from western culture in the areas and sectors involving lifestyle. Many variables were met to look into consumer acculturation through

many research and discussions on acculturation. These variables included music, language, which is both the mother tongue and the preferred language, sense of clothing, writing, movies, and even the behavior towards parties.

Consumer behavior regarding the effects of globalization has been defined in different researches as a behavior of status. Globalization has brought about conspicuous consumption where consumers would want to publicly show off their possessions or goods to appear unique and special to establish a certain social identity (Cleveland Et. Al, 2016). The possession of certain things that represent a special status can, in characterization, define consumer behavior. In Albania, globalization has brought about a competitive nature, especially in the youth who need to possess certain things in order to feel like they belong to a certain class and status.

Through globalization, the existence of new forms of technological advancement, new types of dressing, new types of food, and even different forms of transport have been seen. In India, the youth have been affected most by the impact of globalization in regards to what they buy and even in the reason why they purchase certain goods (Cleveland Et. Al, 2016). However, even the grown-ups in Albania have faced the changes that impact their choices of goods and services, wherewith modernized roads, for example, it has brought about the need to buy certain cars that fit the status. With certain obvious advancements that come with globalization, buying certain goods and services is influenced in certain directions.

### **2.2 Impacts of the Pandemic on Consumer Behavior**

Globalization on a different level has affected consumer behavior wherein the issue of the ongoing pandemic, the choices by consumers have been limited if not defined. Through globalization, diseases have found ways to spread over long distances with ease and higher speed. Covid-19 is one of these situations where the

virus had its way out of Wuhan because of plane travels and interrelation of the country with the rest of the world through trade and exchange of goods and services (Donthu and Gustafsson, 2020). The impact of Covid-19 through globalization has also impacted consumer behavior in different ways.

Different researches have classified the impacts of globalization on consumer behavior into personal factors, social factors, and psychological factors. In the psychological aspect and notion, the spread of COVID-19 throughout many nations has affected individuals differently where they have had a change in consumer behavior because of adaptation and needs. Consumer behavior is heavily dependent on the attitude of the consumer or buyer. The existence of a pandemic has changed people's attitude towards too much spending, and purchasing habits have been affected. The being of COVID-19 has brought about a level of conscious shopping where most consumers are spending on necessities. Consumers have also been seen to be buying more of local brands. In the bid to keep social distancing and isolation, consumers have also been inclined to shopping online and do not go to the markets like they used to. Lastly, many people have resorted to working from home; this is due to the guidelines to prevent COVID-19 spread.

On personal levels, the coming up of COVID-19 has impacted individual behavior because of different reasons. COVID-19 throughout the world has caused many people their jobs due to retrenchments from organizations. This only says that many people have the pressure to spend what they are not earning, which has not been the case. Research has shown that many consumers will be inclined to consume the cheapest goods and services in the most minimum way for survival. These consumer's behavior will also be affected by COVID-19 through globalization because the youth who are the major consumers have been forced to stay at home. Since money is limited, they might not be able to spend on things like they usually did. Most consumers on personal levels have been

moved from the notion where status is the key and thus conspicuous spending; most consumers have adapted to buying only what they need and what is basic.

Social factors that have been seen with the impact of COVID-19 in consumer behavior through the influences of social influencers. Through family members, friends, and people with personal influence, consumer behavior has been seen to change to align with those of the influencer.

### 3. Conclusions

From the research done, it can, therefore, be stated that globalization has both positive and negative impacts on consumer behavior. Globalization in developing countries has its positive impacts, where globalization brings about increased revenue production. Globalization on consumer behavior influences the consumers to buy new products with the goal to keep up with the trends from other countries and states. This kind of influence causes conspicuous spending, where the consumer buys products blindly. This is a positive impact on the country's economy through imports. Consumer behavior in a country that has been influenced by cultures through globalization influences investors who would invest in certain services that would bring the cultures close to home. From the research done, a high number of people globally are affected by the impacts of globalization on the way they consume some goods and services. Globalization in consumer behavior is a major effect on marketing since the marketers would have to understand the market to know the kind of goods and services that would best satisfy the consumers.

This research on the impacts of globalization on consumer behavior has also brought about its negative effects. With this kind of influence, local markets, goods, and services that have come to be through innovation fail and do not get to succeed because of the preference for certain and specific foreign products. This type of consumer behavior has killed innovation and the local market.

Globalization on consumer behavior has had its negative effects where it has destroyed a country's culture. The coming of globalization has made the world a common market place. This has made the participants or the consumers feel like what they represent is of lesser value than what they need to have for prestige.

It can be recommended that the consumers in all developing countries should be educated on the importance of supporting the local market. It should be a privilege to get to use the products that have been manufactured and made locally. Also, the use of social media among the youth should be monitored so as to prevent the influence of globalization on them and their actions. Through globalization, it has been proved that crime among the youth has erupted. The effects of globalization should be monitored where they should affect the economy through the growth of the revenue produced and the maintaining of culture and consumer behavior.

**PhD. Dorina Guraj**

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# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

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## Abstract

The presence of a high level of nonperforming loans has been a growing concern in the world. This problem has been present in Albania, as well, which is one of the countries with the highest level of nonperforming loans in the region. Nonperforming loans hamper economic growth and constrain the monetary policy transmission mechanism.

This paper examines the role of nonperforming loans in Albania by evaluating its level throughout the years and analyzing the ways in which these trends have shaped the credit market developments in Albania in terms of lending by economic sector and geographical position.

This study strives to examine nonperforming loans as a result of other macroeconomic factors: GDP, remittances and inflation. The methodology involves time series analysis, which is used to identify the possible association between non-performing loans and macroeconomic variables. Multiple regression is used as a model to identify any relationship among them. The period covered is from 2014 to 2020, and it uses quarterly data. The paper uses secondary data, obtained from the Bank of Albania, United Nations database, UNECE, INSTAT, World Bank. The results show that nonperforming loans and these variables are correlated in the long-run.

**Keywords:** *nonperforming loans, credit market developments, inflation, GDP, remittances, Albania, multiple regression model, time series analysis*

## 1. Introduction

Banks play a crucial role in the financial and economic system of a country. They allocate funds from savers to borrowers in an efficient way that helps the economy growth. In developing countries, like Albania the banking system plays a significant role in the financial system as the latter is composed mainly by banks. As for 2019, bank assets to GDP was about 87.92%, as shown in the Annual Supervision Report published by BoA (2020). Banks also represent the main transmission chain for the monetary policy. The Albanian banking system is considered to be relatively new as it has been developing in the last 20 years, after the fall of the communist regime. The banking environment in Albania has involved a lot of mergers and acquisitions throughout the years. Currently, there are 12 commercial banks with domestic and foreign capital in Albania. The main role of the banks is the allocation of credit within the economy. By doing so they promote economic growth and help build a business-friendly

environment. But offering credit is sometimes quite challenging for banks as they have to bear the credit risk as well. They have to make sure that the borrowers will repay their obligations. Failure to do so, imposes risks not only for banks, but for the whole economy, as it disrupts the banking and economic system of a country. In order to prevent such events, banks are careful with their credit supply and management, affecting the flow of funds available for households and businesses.

Generally, a loan is classified as nonperforming or bad debt, when there have passed more than 90 days without the borrower paying the negotiated instalments. The level of non-performing loans in an economy is a strong indicator on how credit allocation has performed and in forecasting future trend in credit management. Since 2009 banks have been experiencing a lot of difficulties, concerning lending. The issue of rising NPLs has been a global concern throughout the years, especially after the Financial Crises. Its effects have brought negative consequences, like credit stagnation, lower return

# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

on assets for banks, and lower GDP growth. Many authors have attempted to explain the main determinants of NPLs in different countries, so that the economies are prepared when to expect a rise in the ratios of NPLs and how to prevent the deterioration in banks 'assets and to reduce its macroeconomic and social effects.

This paper concerns with this topic by making an attempt in understanding NPLs in two perspectives: how NPLs have influenced the credit market and lending policies and how the main macroeconomic factors impact the level of NPLs in Albania. Some of the determining factors are GDP growth, interest rates, inflation, unemployment and remittances.

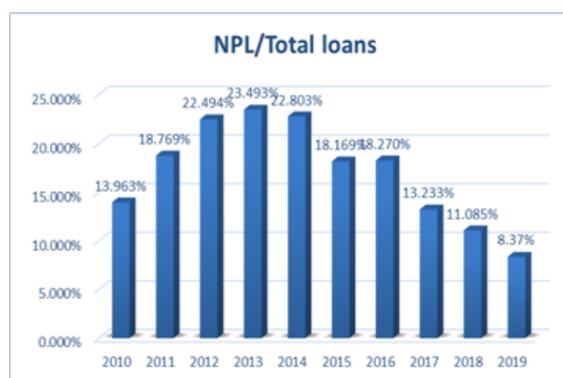
The next sections are organized as follows. The second section will focus on delivering a descriptive approach on the level and the trend of NPLs throughout the years and how this has affected the credit policies of the central bank and the commercial banks. I will highlight in this part the credit market developments in Albania. The third section will cover the literature review of NPLs and its main macroeconomic determinants. Section 4 describes the econometric model and presents the empirical findings of the study. Section 5 concludes the results and the limitations.

## 2. NPLs and Credit Analysis

### 2.1. NPLs in Albania: An Overview

Loans are classified into five categories: standard loans, special mention loans, sub-standard loans, doubtful loans and lost loans. The last three categories comprise the level of NPLs. An NPL is a loan, whose borrower has not paid the required instalments for more than 90 days. The banks need to set aside capital to cover up the loss from the loan, but this reduces on the other hand the capacity of the bank to make new loans, and as a result it decreases its profitability.

Figure 1 – NPLs in Albania 2010-2019



Source: World Bank

The level of nonperforming loans has increased from 2010 up to 2013, being in its highest level in 2013, which accounted for 23.493% of the total loans. Economic growth started to slow in 2009 until 2013. This happened because Albanian economy relies on remittances, since a great percentage of population lives abroad. According to a report published by BoA (2018) 1.15 million of Albanian emigrants send money and help almost 26% of Albanian families. However, it has been a challenge for Albania to collect data regarding this topic as it is estimated by BoA (2018) that 39% of remittances flow through unregulated channels, 57% through non-bank financial institutions and 4% through banks.

According to the World Bank (2016), more than 60% of remittances come from Greece and Italy, which both suffered the consequences of the Financial crises. This led to a decline in remittances and exports, by further declining the economic growth and increasing the number of nonperforming loans. The problem of NPLs continued for a long time in Albania, being affected by other factors as well, overexposure towards the construction sector and loans in foreign currency. According to World bank, the supply of credit declined from 57% annually in 2008, to 10 % in 2014. Since then, NPLs have been decreasing, accounting for only 11.085% of the total loans in 2018. The main reason for the decline in NPLs in 2014 and in the following years is the legal change in Article 24, Law 8438 Income tax, which recognized bad debt

# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

(nonperforming loans) as a deductible expense for commercial banks for a shorter time period (365 days). The change that has been made clarifies that if an execution procedure has been initiated and 365 days have passed, for fiscal effects this will be considered a deductible expense. This procedure would have taken years, but starting 2014 it took only one year.

Additional main causes that have contributed to the decline in the level of NPLs throughout the years are the following:

1. Loan restructuring through extension of the term or reduction of installments.

2. The write-off from the banks' balance sheets of the loans that had more than 3 years without being paid.

3. Increase of loan loss provisions. Based on the Bank of Albania's regulation and international financial reporting standards (IFRS), banks create provisions to cover possible future losses arising from non-payment of loans. Loan loss provisions is an expense, which is set aside as an allowance for bad debt, or renegotiated terms of a loan that are less than previously estimated. So, when loans are classified as "lost", they compensate this amount by decreasing with the same amount the loans loss provisions.

4. BoA's initiative to decrease informality among the business environment. In order to keep in control the level of NPLs, BoA requires banks and NBFIs to provide loans to businesses based only on tax-compliant statements starting from January 1st, 2018.

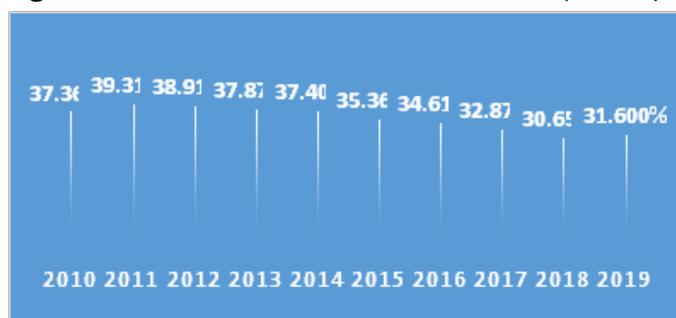
The nonperforming loans ratio has had in 2018 the same downward trend of recent years, which accounted for 11.085%, in comparison with the previous year 13.233%. The decline results from portfolio a 19% drop in nonperforming loans. The latter includes forms of restructuring, as well as partial and total repayments by borrowers. Meanwhile according to the annual supervision report of the BoA (2018), the loan portfolio itself led to a 3.36 percent decline, which was mainly affected by the decline in the foreign currency exchange rate against the Albanian lek. In the

absence of Euro and USD depreciation, the loan would have increased by about ALL 2.76 billion. According to the Financial Stability Declaration for the second half of 2019, published by the Bank of Albania, the ratio of NPLs has fallen to 8.37%, for the first time in single digits over the last decade.

## 2.2. Credit Market Developments

Credit supply has been decreasing in the last few years in Albania. Banks remain cautious in lending, as they continue to apply tight credit conditions especially for businesses. Figure 2 shows the domestic credit to the private sector by banks as a percentage of GDP, for the period of 2010-2018. It shows an increasing pattern in the first two years, and since 2012 the amount of credit has been decreasing with diminishing rates. It started decreasing by 1.01% in 2012, and in 2018 credit decreased by 6.75% compared to the previous year, accounting for 30.567% of GDP.

Figure 2 – Domestic Credit to Private Sector (% GDP)



Source: World Bank

The possible explanatory reasons behind such trend are considered to be the following:

- Albanian banks' evaluation of credit risk continues to be significant, even though the level of nonperforming loans has been decreasing.

- Loan portfolio quality: Since the banking sector has been dealing for quite a long time now with a declining quality of its loans, it is considering investing in safer securities. What proves this statement is the investment in Albanian government securities, which account for 24% of total assets, according to Bankieri (2019). This figure is the highest compared with the banking sector of the countries in the same region.

# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

-Appreciation of Albanian lek against Euro: Since the majority of outstanding loans in Albania are denominated in euro, and the trend in total banking industry loans takes into account only loans in ALL, this gives an inaccurate framework because of the strong appreciation of ALL against Euro.

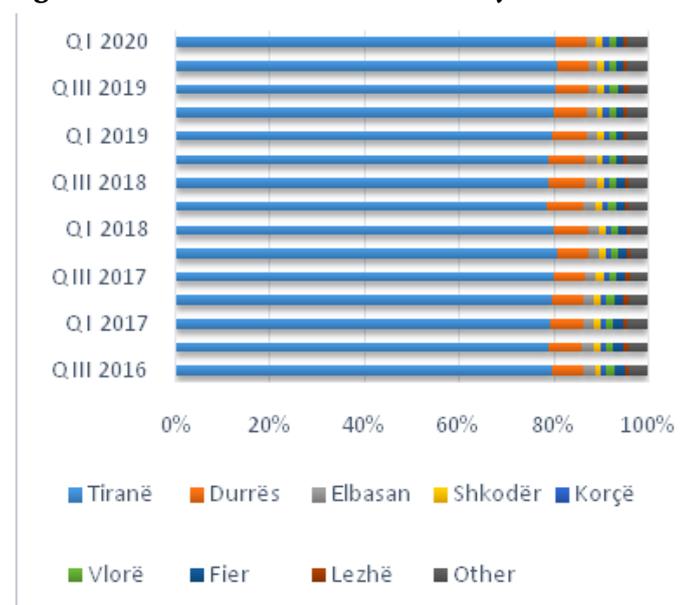
-Loan demand: According to WB (2018), 15% of SMEs in 2017 relied in informal sources of funds such as family and friends and 24% of them financed their operating investments through retained earnings.

-Loan supply: As a response to the Financial Crises, banks are increasing their loan loss provisions. In order to enhance their balance sheets, they are either increasing capital or reducing their lending exposures. Bank lending has stagnated relatively in recent years.

## 2.3. Loans by Districts

When analyzing the credit market development in Albania, it is important to look at the way banks choose to diversify their loans portfolio. The diversification of loans can be achieved through various ways: by district, by economic activity or by type of loans, etc.

Figure 3 – Total Loans to Businesses by Districts



Source: Bank of Albania

Figure 3 shows the geographical distribution of loans in Albania. The data are on quarterly basis

and cover the period from third quarter 2016 up to the first quarter 2020. As it is noticeable from the graph, Albanian banks lack geographical diversification in terms of lending, since almost 80% of all outstanding loans are concentrated in Tirana, followed by Durrës, Elbasan, Shkodër, etc. The reason behind such trend, is because of the high concentration of businesses in Tirana, compared to the other cities. Another explanation might be that most of the businesses in Albania are micro or small businesses and they rely a lot also on family and friends in terms of financing.

As for the third quarter of 2016 more than 79.59% of loans were distributed in Tirana. This percentage has been almost the same, with small decreases in 2018, and finally reaching 80.25% in the first quarter of 2020. In Durrës were concentrated 6.5% of all outstanding loans, as in the third quarter of 2016, and 6.88% in the first quarter of 2020. As for the other cities the percentage of outstanding loans is relatively low ranging from 0.77% to 1.86% throughout the years.

## 3. Macroeconomic Factors Affecting NPLs: Literature Review

Various studies have been conducted on the subject of nonperforming loans and its main determinants. The results are similar, but they might differ from one country to another, because of different economic and social differences.

Mohanty & Das & Kumar, (2018) found that real GDP and NPLs are negatively associated in India. Among real GDP, they investigated other variables, as well. They divided these variables into three major groups: macroeconomic specific, corporate specific and banking specific variables. According to their study, economic growth has a greater impact on the reduction of the Gross NPLs ratio among macroeconomic variables. As for the banking specific variables, the increase in credit deposit ratio, and higher return on equity (ROE) will lower Gross NPLs ratio. On the other hand, net sales growth and net profit margin have a negative effect on Gross NPLs ratio.

Farhan, Sattar, Chaudhry & Khalil (2012) studied

# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

the determinants of NPLs in Pakistani banking sector by using multiple regression analysis. NPL was the dependent variable and the independent variables used were: inflation rate, interest rate, GDP growth, unemployment rate, energy crises and exchange rate. The results of the study showed that interest rate, energy crises, exchange rate, inflation and unemployment have a significant and positive relationship with the NPL ratio, whereas GDP growth has a significant negative relationship with NPL ratio. The association of NPL with the exchange rates is explained by the increased global competition, which affects the credit risk of the domestic economy. In other words, whenever, we have an appreciation of the real effective exchange rate conveys into higher NPLs

Other studies concerning these issues have been published in Europe as well. Bofondi&Ropele (2011) used a single-equation time series regression to explain the determinants of NBLs (the ratio of new bad loans to the stock of performing loans at the end of previous period) in the Italian banks. The study used data from 1990 to 2010 and the results were divided into two groups: variables that affect NBLs in terms of lending to households and those in terms of lending to firms. The NBL ratio for lending to households was inversely related to real GDP growth and house prices, and it is positively related to the unemployment rate and short-term nominal interest rate. On the other hand, the NBL ratio for firms is positively associated with the unemployment rate and the ratio of net interest expense to operating profits, and negatively associated with the consumption of durables.

The determinants of NPLs were divided into two groups: macroeconomic and bank-related variables in a study conducted by Klein (2013) in an attempt to explain NPL level for CESEE (Central, Eastern and South-Eastern Europe) for the period 1998-2012. The concluding points of this paper showed that among the banking-variables, higher ROE and ROA seemed to lower the level of NPLs, reinforcing the 'moral hazard' effect and the fact that well-managed banks are associated with

lower levels of NPLs. However, the banking-related variables did not seem to contribute a lot to the level of NPLs compared to macroeconomic variables. As for the macroeconomic environment, the study showed the link between the business cycles and the banking sector.

GDP as the main driver of the NPLs was highlighted again in the study of Beck, Jakubik&PiloIU (2013). This paper analyzed data for 75 countries, in an attempt to find the main determinants of the NPLs. The results change from one country to another depending on their capital structure, export-import relationship and currency appreciations. For countries with large stock markets, like Germany, a decline in the stock market led to a considerable increase in the level of nonperforming loans. But in emerging countries, the stock market changes appear to not have a significant impact on NPLs. In these economies, the role of the exchange rates seemed to be more relevant.

Several studies on this subject have been conducted in Albania as well. Şan (2018) states that Albania has been having a large amount of NPLs as a result of the 2008 Financial Crises. He suggested that the reason for such a pattern could be explained because of the country's strong economic relations with Greece and Italy. Both these countries have faced significant economic downturns during this period. San (2018) holds accountable mainly the commercial banks for the high level of NPLs, as he points out that the main reasons for such a trend in Albania are: corrupted relations and improper risk management. Other reasons include the decrease in the prices of primary commodities in the global markets and deficiencies in external audit. According to a questionnaire conducted by the author itself, most of the bankers stated that business loans have higher NPLs ratio than retail loans, due to impractical investment projects.

## 4. Methodology

This paper will use time series analysis to identify the possible association between non-performing loans and macroeconomic variables. The study covers the period 2014 - 2020, with quarterly data.

# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

The data used are secondary data, obtained from the Bank of Albania, United Nations database, UNECE, INSTAT. The EViews 11 statistical package will be used to analyze these data.

## 4.1. Model Specification

To analyze the possible relationship between macroeconomic variables and nonperforming loans, multiple regression will be used. The dependent variable of the model is nonperforming loans (NPLs), while the dependent variables are: gross domestic product (GDP), remittances (REM) and inflation (INFL). GDP and REM will be entered into the model in logarithmic form, while NPLs and INFLs are measured in percentage.

$NPLs = f(\ln GDP, \ln REM, INFL)$ .

## 4.2. Stationarity

A time series is called stationary when its mean and variance are constant over time, otherwise the series is called non-stationary, or has a unit root. Macroeconomic variables are generally non-stationary, due to the trend. Due to non-stationarity, the use of Ordinary Least Squares (OLS) in these cases may result in spurious regression. For this reason, the first step in time series analysis is to test for stationarity or unit root. There are many tests that can be used to test stationarity, but in this paper the Augmented Dickey-Fuller (ADF) test will be used. The hypotheses that will be tested are:

$H_0$ : There is a unit root

$H_1$ : There is not a unit root

Time series can be stationary at the level (with the data as they are), and in this case they are called order stations), I (0), or they can be higher order stations, I (I), I (II), etc.

A non-stationary time series can be transformed into a stationary time series. For example, a non-stationary time series at the level can be transformed into an integrated first-order stationary series if the differences of successive values the series are stationary:  $\Delta u_t = x_t - x_{t-1}$

If the time series turn out to be stationary at the level, then the use of OLS does not result in spurious

regression. If time series are integrated in the first order I (I), OLS can only be used when residuals are stationary at level I (0). Otherwise OLS should not be used to analyze time series. In these cases, the most suitable tests are Cointegration tests, which tests for long-run relationship between variables which are first-order stationary, I (I).

The ADF test results show that the variables are non-stationary at the level, but they become stationary in first-difference, so they are integrated in order I. A summary of the results for each variable is given in the table.

**Table 1 – ADF Test Results**

Variables	t-statistics	p-value
D(NPLs)	-4.059413	0.0062
D(lnGDP)	-23.63143	0.0000
D(lnREM)	-7.689707	0.0000
D(INFL)	-26.24857	0.0000

Source: Own Calculations

The test results show that the variables are not stationary in the level, but they become stationary in the first difference, so they are integrated in the first order I (I).

## 4.3. Long Run Association

With this data the OLS test is used for the possible long-term relationship between the variables. The results are given in the table below.

**Table 2 – OLS Test Results**

Dependent Variable: NPLS

Method: Least Squares

Sample (adjusted): 2014Q1 2020Q1

Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	723.9515	82.89146	8.733729	0.0000
LNREM	-15.80433	5.921904	-2.668791	0.0144
LNGDP	-49.03621	7.430515	-6.599303	0.0000
INFL	-2.048024	0.372933	-5.491671	0.0000
R-squared	0.822880	Mean dependent var		16.99449
Adjusted R-squared	0.797577	S.D. dependent var		5.055571
S.E. of regression	2.274574	Akaike info criterion		4.627109
Sum squared resid	108.6474	Schwarz criterion		4.822129
Log likelihood	-53.83886	Hannan-Quinn criter.		4.681199
F-statistic	32.52122	Durbin-Watson stat		1.556271
Prob(F-statistic)	0.000000			

Source: Own calculations

For OLS results to be considered valid, given that all

# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

variables are I (1), we must first test the residuals, which must be I (0). The ADF result for residuals shows that they are integrated of order I (0).

**Table 3 – ADF Test Results for Residuals**

Null Hypothesis: RESID01 has a unit root  
 Exogenous: Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=5)

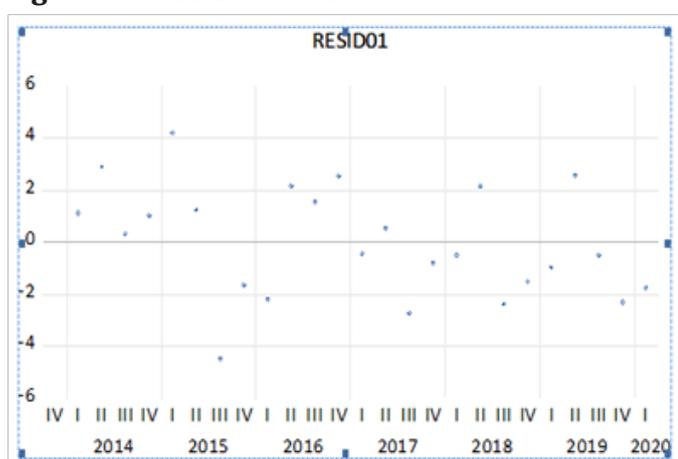
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.622189	0.0138
Test critical values:		
1% level	-3.769597	
5% level	-3.004861	
10% level	-2.642242	

\*MacKinnon (1996) one-sided p-values.

Source: Own calculations

Since the residuals are I (0), then the OLS results are statistically valid: R-squared = 0.82 and Adjusted R-squared = 0.79 show that the variables included in the model explain approximately 80% of the variation of nonperforming loans. The model is strong because F-statistic is 32.5 (P-value = 0.000). Durbin-Watson statistic = 1.56, so close to 2 and this shows that the model does not suffer from autocorrelation. Likewise, residuals do not exhibit any noticeable patterns, so the model is valid for making predictions. The test shows that all variables are statistically significant, because for each case p-value < 5% and  $|t| > 2$

**Figure 4 – Residuals Plot**



Test results indicate a negative relationship between remittances and nonperforming loans. The REM coefficient is -15.8 which shows that a 1% increase in remittances is accompanied by a

15% decrease in nonperforming loans.

The GDP coefficient is -49, which shows that a 1% increase in GDP is accompanied by a 49% decrease in nonperforming loans.

The Inflation Ratio is -2, indicating that a 1% increase in inflation is accompanied by a 2% decrease in nonperforming loans. This result seems contrary to expectations, given that the theory suggests a positive association between inflation and nonperforming loans. However, previous studies for Albania (Lleshanaku, 2015., Shingjergji and Shingjergji, 2013) have found a weak negative relationship between inflation and nonperforming loans. A similar conclusion was drawn in a study on Macedonia (Nikolov, Miso; Popovska-Kamnar, Neda, 2016).

## 5. Conclusions

The nonperforming loans have had a great impact in all countries, but these impacts are especially high in a country like Albania, where its banking sector plays a crucial role in the economy. Because of its strong relations with countries like Italy and Greece and since many Albanian families depend on remittances, the issue of nonperforming loans has been one of the main concerns in Albania and also one of the most delicate issues to deal with. Based on our econometric analysis of NPLs, we conclude that GDP, remittances and inflation are significant factors that help explain the level of NPLs in Albania in the long-run. However, one of the main limitations is the low number of observations (25). If this number were higher, it would yield results that are more accurate, but because of the lack of data for Albania prior 2014, it was impossible to increase this number. Other constraints of the model are the quality of the data used and the lack of banking, microeconomic and social variables, that would help explain the level of NPLs in Albania.

Another conclusion that can be drawn based on the analysis of the credit market developments is that the level of NPLs has affected the lending terms of banks, by using more conservative policies when this level is high, but also being more cautious

# ANALYSIS OF NONPERFORMING LOANS: CASE OF ALBANIA

by increasing their requirements when applying for a loan. Most of the outstanding loans are concentrated in the city of Tirana and are given to nonfinancial corporations. In comparison with other Balkan countries, Albanian banks have been following a conservative policy by increasing their capital and providing less loans to the economy.

It is important to include in our analysis other macroeconomic factors, such as: unemployment, foreign exchange rates etc. as well as banking, social and microeconomic related variables, because in this way we would yield a more valid conclusion and this would help us predict future trends in NPLs, in order to take the required measures on time. The decline in outstanding banking loans might lower the probability of occurrence of NPLs but it does not help the economy grow. That's why it is important to focus more on the analysis of NPLs and prevent future trends that might hamper economic growth. Important measures that might be undertaken from the banks are: monitor the loan underwriting procedures, diversifying their portfolio in terms of district and economic sector, and further conducting more detailed researches on the topic of NPLs and its main determinants, by focusing not only on the macroeconomic ones, but taking into consideration other variables, as well.

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# “STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS

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## Abstract

The psychological burden, generated “in excess” and experienced in perceptions, deemed as interdependent by the Covid-19 conditions, is a potential factor that affects the students’ life and calls for investigation and study.

The enforced restrictions to stop Covid-19 infection spread made obligatory the transfer of teaching and learning in the online format. Although it is difficult to inspect anxiety and psychological stress, yet, using specifically built questionnaires based on the theoretical and scientific guidance and in close consultation with the specialists, the present research study is developed. The developed questionnaire was used with the statistical tests applications. It was specified in separate sections that served to clearly defined purposes and hypothesis. The sample used (n=130) was randomly and not obligatorily selected from the Bachelor cycle students of the “Canadian Institute of Technology” University College population. They responded confidentially and the responses were confidentially processed. 30.8% of the selected sample were females and 69.2% were males.

The generated anxiety and stress were studied for their impact in the academic achievements and in stimulating the learning abilities and interests. A separate section evaluated the motivating perception as regards the motivating style in knowledge transfer. This study intends to find the most effective forms of transferring and evaluating knowledge. In addition, the study lays out the need for analysis in facing the challenges the online teaching and learning processes present in the Covid-19 conditions in order to identify the positive experiences to be brought forward in continuation.

**Keywords:** Covid 19, psychological burden, motivating style in knowledge transfer, academic achievement, statistical tests

## Introduction

The suddenness of the Covid-19 spread which appeared in the expanding infections and their consequences at global level, conditioned the prevention measures to forestall any more serious impacts in the real life of the human world.

As anywhere in the world, Covid-19 affected and is still affecting the operation of the academic learning process in Albania.

The governmental institutions have established and are still in the process of establishing legal

measures that go along with the social isolation approach, which make the identification of other forms of communication with the students obligatory. With the intention of non-interrupting the lessons and as an emergency need, the teaching and learning process was transferred from the auditorium to the online format, but it faced challenges that call for continuous study surveys for performance quality advancement in the academic achievements.

“I don’t think what is happening right now can

## “STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS

be or should be considered online learning or distance education, or any other established term used to describe learning that is not done face to face. This is emergency teaching and learning in a time of unprecedented crisis.” [Downes 2020]

The online teaching and learning experiences in Albania were scarce, therefore we faced two tendencies: first, embracing the online teaching and learning as an indispensability to avoid big and direct physical gatherings; second, motivating the online learning in the form of the academic teaching and learning starting from the transfer format of lectures, course assignments, etc. Along with the other factors, closure of the students’ boarding houses and the quarantines for the infection symptoms became potential factors for “added” anxiety and stress that emerged in the students’ academic life. The anxiety and stress “in excess” shocked the motivation for performance in the academic achievements. Adler [2003] says that psychology is understanding individuals’ attitude towards the sensory impressions received by other bodies ... anxiety, always in the same opinion with their lifestyle.

“The focus of the humans’ attention may move when they are in high density situations”. [Worchel & Brown 1984] In any environmental optics which encompasses and is seen by the individual, may originate stimulus that produce anxiety and stress of which the frequency and intensity bear different levels of the psychological burden caused. Covid-19 pandemics is a dominating factor in the anxiety and stress stimulus. Dread and dismay of getting infected by this virus causes agoraphobia (as fear of open and public spaces) and claustrophobia (as fear of enclosed spaces). Not rarely the anxiety and stress disorders are accompanied by panic attacks. Any individual who sees himself inadaptable to the environment where he/she lives has difficulties in fulfilling the imposed and required obligations. Therefore the research study inquiring the perceived self-evaluating anxiety and stress that emerged in the students’ life in the Covid-19 conditions not only

makes evident its implications with the academic achievements related performance but also makes further analysis in different perspectives obligatory. This study is founded on a quantitative survey with applications in statistical tests. It is based on the questionnaire survey which consists of direct confidential questions and presents to the students the survey purpose. The sample in consideration is random and with no obligation imposed.

Acceptance of the perceived self-evaluating anxiety and stress, perception of the motivating style of knowledge transfer, and the management of time are examined in an interrelated manner with the performance of the academic achievements values. A specific objective of the research is to study the impact of the above factors in relation to the study years.

### Literature

The anxiety and psychological stress burden caused by the Covid-19 and its impact in the students’ life are under extensive study by the academic world. In order to identify the stimulus factors of the Covid-19 that caused psychological burden on students [1] a study involving seven universities in the USA was conducted. From the study resulted that 45% of the sample incurred high anxiety and stress levels, 40% moderate levels, and 14% low levels of the psychological burden.

While in the study of [2] that involved a sample of 195 students, resulted that 71% indicated increased stress and anxiety due to the COVID-19 outbreak. There are many other studies in different countries that show escalation of the psychological burden in the students’ life.

Studies of the same character are conducted in the Balkans as well, such as [8]. According to the authors, the study examines the perceived anxiety and stress and inquires on the students’ attitude towards the online learning.

There are also a number of studies where the communication relations between the instructors and students are studied with the respective

## **“STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS**

effects on the online learning in the Covid-19 conditions as regards the students’ self-evaluating perceptions. [15]

The anxiety and stress in the students’ life are also reflected in the performance of the academic achievements. [3,4]

According to [6], time management is very important and it may actually affect individual’s overall performance and achievements.

In the optics of these papers, the present study is set forth with its own specifics.

### **Methodology**

This research study is focused on the self-evaluating perception of the students’ psychological burden related with the perception of the knowledge transfer motivating style in the online teaching and learning process.

The methodology used to estimate the values of the respective variables and their interactive relation is grounded on the responses to the questions in the questionnaire sections as regards the respective objectives and purposes applied in the statistical tests that are reasoned with the accompanying analysis.

The selected sample consists of students (n=130) from the Canadian Institute of Technology university college, of whom, 53.1% are first year students, 26.9% are second year students, and 20% are third year students. The study was conducted during the month of January 2021. The questionnaire consisted of a total of 50 questions set in separate sections. Questions 1 to 7 have to do with information about the student’s life status. The first section includes 24 questions about the self-evaluating perceptions of anxiety and stress. Reliability coefficient (Cronbach’s alpha) for this section is 0.905.

The second section includes 10 questions that consist in the perception of the motivating and teaching style for the transfer of knowledge. Reliability coefficient (Cronbach’s alpha) for this section is 0.784.

The third section relates to the perception of time

administration and management.

Development of the questionnaire is based on the research experiences from social and psychological sciences and psychoanalysis, on popular packages from this field, and on close consultations with specialists of the field in adaptation to the present conditions and study objectives.

The information on the academic achievements performance is taken through the average of the midterm exam points by converting the evaluation for all courses to 0-100 points. The responses to the questionnaire’s questions are based on the Likert scale (from 1 to 5): 1. “Strongly disagree”; 2. “Somewhat agree”; 3. “Neutral”; 4. “Agree”; 5. “Strongly agree”.

In defining the levels of the psychological burden as regards the values of the variables defined by the Likert scale, the difference between the real maximum value and the real minimum value is considered along with the segment of the theoretical values (for instance, in the 24-questions section, the theoretical segment of the variable value is [24,120], while the segment of the real values expansion in general has a smaller length, therefore the ratio of the real values segment with the theoretical values one is studied by also taking into account the standard deviation.). Consequently, the ranking for the psychological burden is based on this criterion.

In order to examine the truthfulness of the hypothesis, statistical non-parametric tests are used by preliminarily defining the independent and dependent variables for any case related to the applying features of each test.

1. Mann Whitney Test (the so called ‘U Test’) uses the sums of the samples’ rank, when in the independent variable two independent groups are given. It is used to compare whether there is a difference in the dependent variable for two independent groups. The statistical test is:

$$U = n_1 \cdot n_2 + n_x \cdot \frac{(n_x + 1)}{2} - T_x, \text{ where}$$

**“STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS**

Tx is the larger rank total

nx , is the number of people in group that gave the larger rank total)

2. Kruskal-Wallis Test is used to define if there are significant statistical differences among more than two independent groups with one dependent variable.

(The statistical test is

$$K = \frac{12}{n(n+1)} \left( \sum_{i=1}^{\alpha} \frac{R_i^2}{n_i} \right) - 3(n+1), \text{ where}$$

n is the number of total surveys,  $n = \sum_{i=1}^{\alpha} n_i$

$R_i$  is the sum of the given surveys ranks for the

sample ,  $R_i = \sum_{j=1}^{n_i} R(X_{ij})$ ,  $i=1,2,\dots,\alpha$

$X_{ij}$  is the  $j^{\text{th}}$  survey from the given sample and  $R(X_{ij})$  is the rank of  $X_{ij}$ )

3. The Jonckheere - Terpstra Test is similar to the Kruskal -Wallis H test, which can be used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. [24]

During the research study process, the ethics principle in the selection of the respective sample was enforced by presenting to the sample the objectives of the study, the enforcement of confidentiality as regards the answers they would give for the respective sections.

**Applications and analysis**

Scrutiny of truthfulness for any hypothesis is given by presenting the respective tables for the results gained by the statistical tests which accept or deny the laid out hypothesis. Each data table is accompanied by its own analysis where the auxiliary data, such as percentages, along with a brief reasoning, are also given.

Analysis of the laid out hypothesis

**Hypothesis 1.** “There are significant differences between the level of the perceived self-evaluating anxiety and stress based on the study years at the Bachelor cycle.” (Kruskal Wallis statistical test is used)

Ranks			
	Years	N	Mean Rank
Anxiety and stress	First year	69	53.72
	Second Year	35	76.14
	Third Year	26	82.42
	Total	130	

**Test Statistics <sup>a,b</sup>**

Anxiety and stress	
Chi-Square	19.635
df	2
Asymp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: vitet

Based on the test results table a significant statistical difference is noted between the perceived stress based on the Bachelor study years (p=.000). A significant difference is also noted to the rank average for any group. The third year has the highest rank average, which means that there’s a more significant correlation with the experienced levels of the psychological burden.

Perception based on ranking division with the perception levels of the psychological burden for the anxiety and stress variables was made as follows: to the light anxiety and stress group was given the value  $x_{k_1} \in [43,55]$ , to the moderate anxiety and stress group was given the value  $x_{k_2} \in [56,87]$ , and to the high anxiety and stress group was given the value  $x_{k_3} \geq 88$

(Based on the Likert scale, the points are 1-5 and for the 24 questions they vary from 24 to 120; for that reason, the above distribution of points is made). The division of points might have been made with four levels as well (1. With light anxiety and stress, 2. With moderate anxiety and stress, 3. With increased anxiety and stress, 4. With aggravated anxiety and stress), but the ratio of the real values

## “STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS

segment length to the theoretical values segment length is  $5296 = 0.54$ , therefore the three levels division was considered more reasonable. Should this coefficient was bigger than 0.75, the division might have been done by 4 ranking levels. The same reasoning is used for the other two sections as well. (Here also are found different experiences in different studies.)

Further, considering the values of the variable that is related to the perception of the anxiety and stress based on the years of study, it is noted that the psychological burden with high levels of anxiety and stress was for 23.1% of the third year students, 14.3% of the second year students, and 5.8% of the first year students. Thus, in the first year, as compared to the second and third years of study, a lighter level of anxiety and stress perception was noted. In making an outline of the different and potential affecting factors, the word will further be for the social and psychological sciences specialists. In addition, emphasis is made for the academic institutions that may think of specific measures for the facilitation of the negative effects.

**Hypothesis 2.** “There are significant differences for the level of the self-evaluating perceived anxiety and stress between males and females.” (Mann-Whitney statistical test is used)

	Sex:	N	Mean Rank	Sum of Ranks
Anxiety and stress	Female	40	69.69	2787.50
	Male	90	63.64	5727.50
	Total	130		

### Test Statistics <sup>a</sup>

	Anxiety and stress
Mann-Whitney U	1632.500
Wilcoxon W	5727.500
Z	-.978
Asymp. Sig. (2-tailed)	.328

a. Grouping Variable: Gjinia:

The test revealed insignificant differences in the preferences of males and females,  $U=1632.500$ ,  $Z= -.978$ ,  $p=.328$ . Although the value of  $p$  does not reveal significant differences, based on the self-evaluating perception of anxiety and stress taken from the data, it has resulted that high levels of anxiety and stress was shown for 15% of the females and 10% of males, while light levels of anxiety and stress was shown for 28.9% of males and 22.5% of females. Considering the average for the females’ rank and males’ rank, it is noted that the females tend to have higher levels of experienced anxiety and stress.

**Hypothesis 3.** “There are significant differences in the level of the motivating perception in the knowledge transfer style based on the study years for the Bachelor cycle.”

	Years	N	Mean Rank
Knowledge transfer style	First year	69	57.78
	Second year	35	78.44
	Third Year	26	68.56
	Total	130	

### Test Statistics <sup>a,b</sup>

	Knowledge transfer style
Chi-Square	11.787
df	2
Asymp. Sig.	.003

a. Kruskal Wallis Test

b. Grouping Variable: Vitet

Knowledge transfer style was divided in three levels (perception of the knowledge transfer style that stimulates added motivation, perception of the knowledge transfer style that stimulates moderate motivation, perception of the knowledge transfer style that does not stimulate motivation). Division in three ranking levels in this hypothesis is also done based on the criteria explained in the Hypothesis 1. For the first level the variable values

## “STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS

are  $x_{k1} \leq 22$ , for the second level the variable values are  $23 \leq x_{k2} \leq 35$ , and for the third level the variable values are  $x_{k3} \geq 36$ .

In order to assess the differences for the level of the motivating perception in the knowledge transfer style based on the years of study, the Kruskal Wallis test was used. The test revealed significant differences (Asymp. Sig. = .003) in the preference for the motivating perception in the knowledge transfer style for the 3 years of study. The statistically significant differences noted that were revealed due to the value of  $p < 0.005$ , but also because of the rank averages for each group, show that the first year is evaluated for higher motivation. Based on the data collected for the motivating teaching style in the knowledge transfer, added motivation have 30.4% of the first year students, 19.2% of the third year students, and 8.6% of the second year students. Differences in percentages are also noted at the level that does not stimulate motivation, like 14.3% of the second year students and 7.7% of the third year students.

**Hypothesis 4.** “There are significant differences for the perception levels of the motivating style as related to the knowledge transfer against the self-evaluating perception of the anxiety and stress.” To assess the truthfulness of this hypothesis, the Jonckheere-Terpstra test was used.

### Jonckheere-Terpstra Test<sup>a</sup>

Pedagogue's style	
Number of Levels in stres	3
N	130
Observed J-T Statistic	2966.500
Mean J-T Statistic	2284.500
Std. Deviation of J-T Statistic	165.026
Std. J-T Statistic	4.133
Asymp. Sig. (2-tailed)	.000

In the above table is noted that Asymp.Sig=.000, which means that there are significant statistical differences for the perception of the motivating style in the knowledge transfer against the self-evaluating perception of the anxiety and stress. This shows the impact of the anxiety and stress to

the attitude towards the motivating perception of the teaching style.

**Hypothesis 5.** “There are significant differences in the use of technology to acquire knowledge against performance of the academic achievements.”

Ranks				
	Attendance of online lessons	N	Mean Rank	Sum of Ranks
Academic performance	With personal(or family)computer or laptop	115	67.99	7819.00
	With personal cell phone	15	46.40	696.00
	Total	130		

### Test Statistics<sup>a</sup>

	Academic performance
Mann-Whitney U	576.000
Wilcoxon W	696.000
Z	-2.088
Asymp. Sig. (2-tailed)	.037

a. Grouping Variable: Ndjekja e mesimit online

In order to assess the differences between the groups of students who used computers and the groups of students who used the cell phones to acquire knowledge during the lessons against their academic achievements, the Mann-Whitney U test was used.

The test revealed significant differences (Asymp. Sig.=.037) in the preferences for the academic achievements for the two groups of students. In the above table is noted that the students who use computer or laptop to acquire knowledge during the lessons reflect more distinguished tendencies in the academic achievements performance against those who used cell phone.

## “STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS

Also, the respective data table shows that of the students in the group that used cell phone to acquire knowledge during the online lessons, 6.7% were evaluated with more than 80 points in the midterm exam, while in the other group 30.8% of the students.

**Hypothesis 6.** “There are significant differences between the students’ employment status and the academic achievements performance.”

	Employment status	N	Mean Rank	Sum of Ranks
Academic performance	Employed	42	64.52	2710.00
	Not employed	88	65.97	5805.00
	Total	130		

**Test Statistics<sup>a</sup>**

	Academic performance
Mann-Whitney U	1807.000
Wilcoxon W	2710.000
Z	-.204
Asymp. Sig. (2-tailed)	.838

a. Grouping Variable: Punesimi

In order to see the significant differences between the students’ employment status and the academic achievements performance, Mann-Whitney U test was used. The test showed that there are no significant differences (Asymp.Sig=.0838) in preference for the academic achievements performance between the two groups of employment. Further, considering the collected data that are shown in the table, differences are noted in the academic achievements performance between the employed students and the not employed ones. The employed students who were evaluated with over 80 points for their academic performance are 28.6%, while the not employed students are 34.1%.

**Hypothesis 7.** “There are significant differences between the self-evaluating levels of the time management based on the study years of the Bachelor cycle.

	Years	N	Mean Rank
Time management effects	First year	69	66.90
	Second year	35	64.39
	Third year	26	63.29
	Total	130	

**Test Statistics<sup>a,b</sup>**

	Time management effects
Chi-Square	.366
df	2
Asymp. Sig.	.833

a. Kruskal Wallis Test

b. Grouping Variable: vitet

Time management efficiency is divided in three levels. At the first level the values of the variable are  $x_k \leq 121$  (good time efficiency and management), at the second level the values of the variables are  $22 \leq x_{k2} \leq 33$  (moderated time efficiency and management), and at the third level the values of the variable are  $x_{k3} \geq 34$  (non motivated time efficiency and management).

In order to evaluate the significant differences between the self-evaluating levels of the time management based on the study years of the Bachelor cycle, the Kruskal Wallis test was used. The test revealed insignificant differences (Asymp. Sig.=.833) in the preference between the self-evaluating levels of the time management in the three years of studies of the Bachelor cycle. Based on the collected data shown in the table for the students’ perception values as regards the time administration, it is noted that the percentage for the “good motivation” from the time management is included in the segment [18.8%-23.1%] and the percentage for the “moderated motivation” from the time management efficiency is included in the segment [71.4%-75.4%].

## “STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS

**Hypothesis 8.** “There are significant differences among the levels of the psychological burden (self-evaluating perception for anxiety and stress) against the academic achievements.”

<b>Ranks</b>			
	Anxiety and stress level	N	Mean Rank
Academic performance	Light anxiety and stress	36	69.71
	Moderated anxiety and stress	78	65.98
	High anxiety and stress	16	53.69
	Total	130	

### Test Statistics <sup>a,b</sup>

	Academic performance
Chi-Square	2.035
df	2
Asymp. Sig.	.361

a. Kruskal Wallis Test

For the assessment of the truthfulness of this hypothesis, the Kruskal Wallis statistical test was used. From the results shown in the table is noted that the constant  $p=0.361$ , therefore we cannot say that there are significant differences among the levels of the psychological burden against the academic achievements.

If the academic achievements performance acquired through the midterm exam results average is divided in three levels: first level, less than 65 points (13% of the students’ number); second level, 66-80 points (57% of the students’ number); and the third level, over 80 points (30% of the students’ number), it is noted that 90% of the third level students have light and moderated stress level, 23.51% of the first level students have high stress level. Although there are not significant differences among the levels of the psychological burden against the performance of academic achievements, the data reveal impacts. The value of the standard deviation for the academic achievements performance is relatively small  $\Delta \sigma = 10.33$ .

## Conclusions

The study researching anxiety and psychological stress burden affecting students’ life when facing Covid-19 in the conditions of online teaching and learning showed that 73% of the students are included in the high and moderate anxiety and stress level perception. Referring to the studies conducted for the anxiety and stress psychological burden in 6 Albanian public universities prior to Covid-19 outbreak (9), this indicator was 45.1% thus showing a 27.9% increase of the psychological burden in the students’ life as a direct consequence of the Covid-19.

Scrutiny for the truthfulness of the hypothesis raised in the study by applying the respective statistical tests, confirmed that perception level rankings for the anxiety and stress are evidently affected by the study years at the Bachelor cycle. These impacts from the potential stimulating factors depend on the individual reacting perceptions of the students according to the years of study.

The impact at the perception level showed that there are interacting relations with the perceptions of the motivating style during the transfer of knowledge which is also reflected in the students’ academic achievements. The approaches presented in the study for the transfer of knowledge given in the motivating style perception, lay out the need for the improvement of this behavior as concerns the teaching style and a better conceptualization of the potential motivating factors. In addition, the study showed the influence on the performance of academic achievements depending on the technological equipment used during the knowledge acquisition (computer or cell phone).

The study puts forward that for any detail that is related to the psychological burden, findings for facilitating relation of the negative effect may be established.

# “STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS

## Limitations of the study

1. The study theme is rather broad and interrelated with the Covid-19 conditions in the online format therefore there are not a few variables that may be accepted for research which may affect the academic achievements performance.

2. The time aspect in which the study was conducted cannot predict to satisfy any response towards the consistency of the acquired results where any result is never static in a reality expanded on time.

3. Research studies in relation to the students’ psychological burden always remain necessary and should be continuous. This is dictated, as in a relation between two variables there always might be a third unconsidered factor. This constitutes another reason why there cannot be pretended that the study is exhaustive.

4. Examination of the performance of academic achievements was made only based on the general average of the midterm exams which were conducted online, while the subsequent exams may present new landscapes.

5. The selected sample was random and on volunteering basis by any individual as such it cannot be said that the findings are fully inclusive.

6. In the students’ responses, other influences related to the hesitation to give the true answers cannot be excluded. Also, the students’ perceptions are always relative and related to their individual personality.

Concluding, regardless the limitations, the study itself, with the theme it deals with, brings findings on a close recognition of the potential factors affecting the academic achievements performance in the conditions of Covid-19 and online teaching and learning format.

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## **“STRESS LEVEL” RANKING OF THE PSYCHOLOGICAL BURDEN SEEN FROM THE STUDENTS’ SELF-EVALUATING OPTICS AFFECTING THE ACADEMIC ACHIEVEMENTS IN THE COVID-19 CONDITIONS**

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# ASSESSMENT OF COMPANIES' DEGREE OF INFORMATISATION AND TRANSITION TO DIGITAL BUSINESS

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## Abstract

The article discusses the issues of assessing the effectiveness of the use of information technologies, the vector of which is set by the Solow paradox. It is proposed to look for a solution to the paradox in the accumulated level of business informationisation, as well as in a change in the methodological approach to assessing the dynamics of labor productivity as a result of business digitalization

**Keywords:** *E-business, digital enterprise, business digitalization index, business informatics.*

## 1. Introduction

In 1987, Robert Solow formulated an idea that later became known as the “Solow paradox”: it became a paradox due to the fact that his statement is counterintuitive:

“It is not possible to demonstrate conclusively that investments in IT produce measurable results that would indicate an increase in productivity as a result of their implementation” [Platonov, 2007].

In our work, we will try to show how we can resolve this paradox by taking a closer look at the features of the use of information technologies in modern enterprises.

Today, we are at the stage of active digitalization of all spheres of social and economic life, and enterprises do not stay away from this process, because the transition to e-business, based on informatization and automation of management, ensures the economic stability and competitiveness of enterprises at the moment and in the long term. E-business-automation of business processes, improving the efficiency of management decision-making and the efficiency of the enterprise through the use of information technologies, including the I2B model: Internet technologies for Business.

The implementation of the enterprise architecture based on the I2B model involves the use of distributed information systems built on such Internet technologies as:

- information support of business processes;

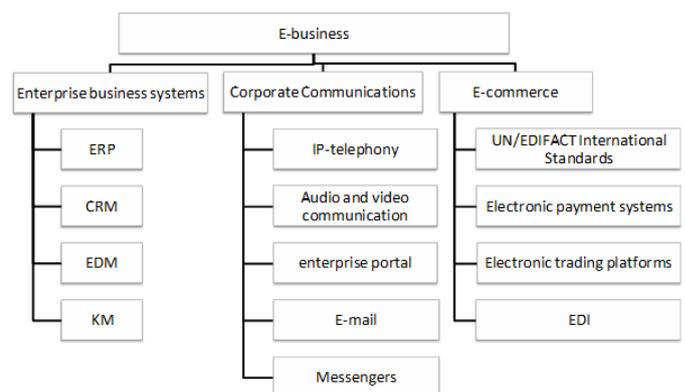
- information interaction with the external environment;
- organization of internal communications.

The main attention in this concept is paid to the organization of internal and external interaction of the company in global information systems [Smirnova, 2018].

## 2. Analysis and Evaluation of Results

Business in the Internet space is based on the idea of a common information space that is accessible to a large number of users without reference to their geographical location. E-commerce is a part of e-business, a type of activity in which transactions between participants in a commercial transaction take place using information technologies.

Figure 1 shows a block diagram of e-business.



**Figure 1-E-business block diagram**

Business systems of an e-business enterprise as an organizational and managerial model include resource management systems (ERP), customer relationship management systems (CRM), electronic document management systems (EDM), and knowledge management systems (KM). They can be implemented on the same platform base or using different software solutions. For most enterprises, the latter option is typical, and it is rather a question of the development and evolution of business systems, rather than the implementation of a strategic solution. In this case, the company faces or will always face the question of integrating such business systems into a single set of support systems and management decision-making.

Corporate communications, which form the second set of systems, provide internal and external interaction of the enterprise with stakeholders. The development of these systems has become particularly relevant in the last few years, when the heterogeneity of the composition of stakeholders is increasing, enterprises are increasingly using non-traditional ways of organizing the work of employees, including working outside the office.

A significant role in the activity of an electronic enterprise is played by a complex of information technologies that provide e-commerce functions. This is, first of all, the use of electronic payment systems, the work of which is organized in accordance with the UN/EDIFACT standards. An integral part of modern e-commerce has become the interaction with counterparties on electronic trading platforms that provide the implementation of B2B and B2C. At the same time, the company can not abandon offline sales, adding e-commerce as part of the new digital business model.

The information space of a digital company is thus presented as a platform that includes both e-commerce applications and communication interaction systems, as well as applications of internal business systems. A promising direction

is the implementation of a service-oriented architecture and the expansion of the scope of web integration, within which software "bridges" built "between web applications and business programs of local networks of the company and its partners.

Corporate interaction technologies are reaching a new level, which, by analogy with Web 2.0, is called Enterprise 2.0. Here are expert and recommendation systems that use artificial intelligence technology.

### ***2.1 Transition to Digital Business***

One of the priority areas for the development and use of artificial intelligence technologies is "the use of artificial intelligence technologies in economic sectors that are of a general ("cross-cutting") nature and contribute to the creation of conditions for improving efficiency and forming fundamentally new areas of activity of enterprises.

Artificial intelligence technologies increase the efficiency of planning, forecasting, and management decision-making processes (including predicting equipment failures and preventive maintenance, optimizing supply planning, production processes, and financial decision-making).

They allow you to automate routine (repetitive) production operations.

Enterprises can use autonomous intelligent equipment and robotic systems, as well as intelligent logistics management systems.

Artificial intelligence increases the safety of employees when performing business processes (including forecasting risks and adverse events, reducing the level of direct human participation in processes associated with an increased risk to their life and health).

Artificial intelligence helps to increase customer loyalty and satisfaction (including sending them personalized offers and recommendations containing essential information).

With the help of artificial intelligence, they optimize the processes of recruitment and training of personnel, drawing up an optimal work schedule for employees, taking into account various factors. The creation and development of artificial intelligence systems began in the middle of the XX century. And such systems, first of all, include expert systems.

Expert systems are complex software systems that accumulate the knowledge of specialists in certain subject areas and are used to advise less qualified users. A significant advantage of such systems is the ability not only to give answers to users' questions, but also to explain on the basis of what knowledge and rules, it made such a decision.

It is advisable to use such systems if there are not enough highly qualified specialists, the task to be solved requires a large team of specialists, or a complete analysis of a complex set of conditions. Nevertheless, such systems are highly specialized. The quality of the tasks to be solved is determined by the knowledge base, which is the main component of the system. Experts from specific problem areas are involved in the development and filling of the knowledge base. Such systems have found wide application in production, industry, economy, management and other spheres of human activity. Such systems include investment portfolio formation, financial risk assessment (RAD), taxation (RUNE), etc.

The development of artificial intelligence today is aimed at "increasing customer loyalty and satisfaction", including providing customers with personalized offers and recommendations. Recommendation systems are used for this purpose.

Choosing and buying any goods or services on the Internet, we see Google or Yandex, we offer these products in for some time. Personalization of Internet marketing is an obvious trend of the last decade. McKinsey estimates that 35% of

Amazon's revenue or 75% of Netflix's revenue comes from recommended products, and that percentage is likely to grow. Recommendation systems are what you need to offer the client to make him happier" [Abrashkin, Vershinin, 2018]. In addition, the producers of goods themselves can collect statistical information: where, when, how much, to whom a certain product or service may be required.

Thus, by developing systems based on artificial intelligence, the business community forms the needs of customers in a certain type of product and at the same time receives commissions in the form of income.

### ***2.2 Analysis and Assessment Of Companies' Degree of Business Digitalization***

Quite a large number of studies have been conducted to resolve the Solow paradox. We will now turn to the review work of V. Platonov, who summarized the results of these studies and showed, among other things, that for a clear manifestation of the effect of investment in IT, it is necessary to achieve a certain critical level of accumulation of information technologies. Cross-country comparisons strongly suggest that in developed countries, the return on investment in IT is more closely related to real GDP growth. Therefore, we will then use the statistical indexes published in [Platonov, 2007] to assess the current level of information technology accumulation in Russia and other countries.

The key indicators are the following:

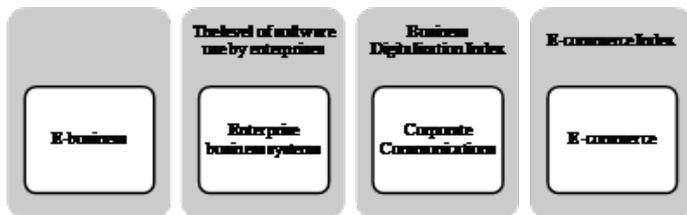
1. The level of use of software by commercial organizations, with a detailed description of the main functional areas of the software, which allows us to assess the level of management informatization and automation of internal business processes (Table 1);
2. Business digitalization index; including data on the use of broadband Internet and cloud technologies by organizations, providing an assessment of the level of use of information and

## ASSESSMENT OF COMPANIES' DEGREE OF INFORMATISATION AND TRANSITION TO DIGITAL BUSINESS

communication technologies (Figures 3-5);

3. The e-retail trade index, the value and dynamics of which characterize the development of the third element of e-business as a system – e-commerce (Table 2).

Figure 2 shows the general relationship between the elements of e-business as a system and the indicators that characterize the level of development of the main subsystems at the macroeconomic level.



**Figure 2-Key elements of e-business and indicators for assessing their status**

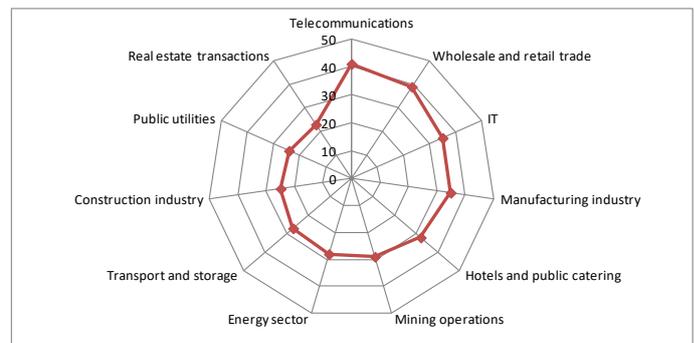
**Table 1 - Use of software tools in business sector organizations, 2018**

Directions of using software tools	Specific weight in % of the total number of enterprises
Electronic document management systems	66,0
Finance	57,7
Solving organizational, managerial, and economic problems	57,3
Reference and judicial systems	54,8
Purchasing and sales management	46,2
Providing access to the database via the Internet	31,1
Management of automated production, individual technical means or technological processes	23,6
CAD	20,2
Training programs	20,0
Editorial and publishing systems	8,8
Scientific research	6,2

Source: [Abdrakhmanova, Vishnevsky, Gokhberg, 2020]

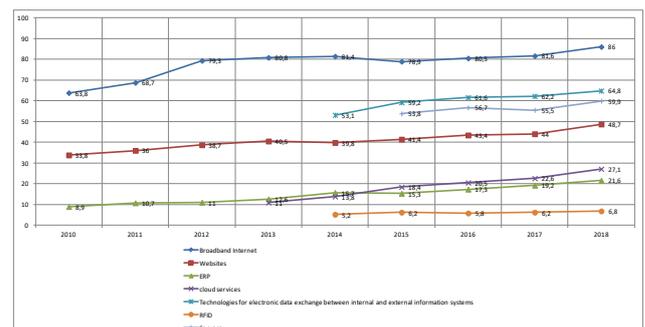
According to the Federal State Statistics Service, the total cost of software acquisition by Russian enterprises in 2018 amounted to \$ 3,270 million.

The business Digitalization index is a comprehensive indicator that reflects the level of use of broadband Internet, cloud services, RFID technologies, ERP systems, as well as the involvement of enterprises in e-commerce. Figure 3 shows a petal diagram that reflects the level of digitalization of various sectors of the national economy according to 2018 data. The highest level of digitalization is typical for the telecommunications industry, the information technology industry, as well as for wholesale and retail trade. This allowed enterprises to feel more confident in the conditions of the pandemic, which required the active use of information and telecommunications technologies.



**Figure 3-Business Digitalization Index, 2018**

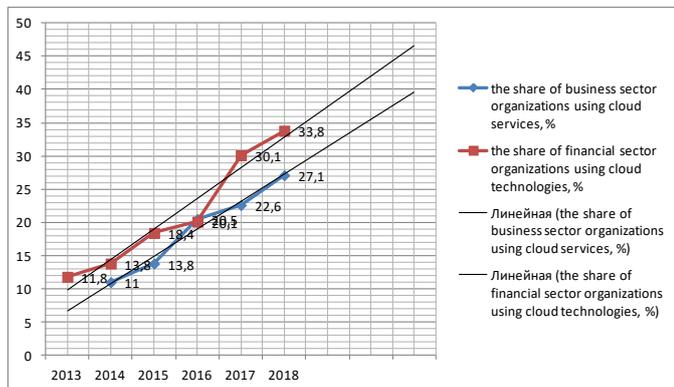
The business digitalization index is integral and consists of a set of indicators, the values of which in the dynamics for 2010-2018 are shown in Figure 4. We see that the structure of the index has changed, with the growth and development of the economy, it includes a larger number of indicators, which allows us to accurately characterize the level of digitalization of enterprises. The last adjustment to the index structure was made in 2015.



**Figure 4 - Structure of the business Digitalization Index, 2010 -2018**

## ASSESSMENT OF COMPANIES' DEGREE OF INFORMATISATION AND TRANSITION TO DIGITAL BUSINESS

One of the indicators included in the digitalization index is the indicator of the use of cloud services, the structural dynamics of which is presented below (Figure 5). Forward-looking estimates allow us to conclude that cloud technologies are increasingly being used, both in the field of internal business systems (1C-Bitrix LLC, etc., is actively promoting cloud services on the Russian market) and within the framework of the e-business communication subsystem. The trend towards the use of cloud technologies can be explained by the development of the field of information technology and the deepening of specialization in it, as well as the desire to optimize business processes and costs of organizations.



**Figure 5-The share of organizations using cloud technologies, with a forecast trend line for two periods, %**

To characterize the level of development of the third subsystem of e-business-e-commerce, we refer to the information on the state of e-commerce at the international level (Table 2). The value of the index in dynamics shows a tendency to steady growth despite the structural change in the index. It should also be noted that the national economy of Russia not only does not lose its place in the rating despite the change in the number of participants, but also shows an increase in the rating by 10 points over five years. This indicates significant changes in the national market, the readiness of enterprises and the population to use information technologies

**Table 2-E-Commerce Index (B2C)**

Russia	2014	2016	2017	2018	2019
Index value	58,0	57,6	71,0	74,2	77,9
Place in the rating	50 out of 130	47 out of 137	43 out of 144	42 out of 151	40 out of 152

Source: United Nations Conference on Trade and Development (UNCTAD)

### 3. Conclusion

As a result, the solution of the Solow paradox can be explained by two reasons. The first-a positive reason-lies in a somewhat erroneous methodology for assessing the impact of information technology on productivity and is associated with the presence of a time lag between changes in indicators that characterize the level of development and use of information and communication technologies (including investment in information technology), and the growth of labor productivity. The use of non-stationary time series allows us to prove this connection.

The second-negative reason – the value of the paradox mistakenly increased in importance due to the use of insufficiently accurate quantitative research methods.

Evidence of the actual impact of the use of information technologies is the assessment of the contribution of information and communication technologies to the production of the gross domestic product of various sectors of the national economy. As we can see, information and communication technologies play a significant role in trade, providing 14.3% of the added value. In the real sectors of the economy, such as mining (12.9%), transport (7.0%), construction (6.0%), agriculture (3.5%), the contribution of information technology is also quite significant.

We predict further growth in the level of business digitalization due to the development of all subsystems and the transition of enterprises to the digital enterprise model. Information and communication technologies have become one of the key technologies of the modern economy and the driver of its development.

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# ROBOTICS IN SUPPORT OF OBTAINING KNOWLEDGE IN COMPUTER SCIENCES BEFORE UNIVERSITY STUDIES.

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## Abstract

Gaining good knowledge in computer science before university education is considered a necessity in the most developed countries of the world. Currently, in our country, the education of ICT in pre-university studies begins from the fourth grade of primary education. How interested are students in acquiring this knowledge? Do they have difficulty in gaining programming comprehension? Would the use of robotics help in their motivation and gaining good knowledge in the field of programming? When applied to education, robotics and simulators can change the way students learn and ultimately create a more well-informed and systematic student.

**Keywords:** *robotics, programming, Arduino, motivation, education, knowledge, computer sciences, development, simulation.*

## 1. Introduction

Technology has played and continues to play a major role in changing the education environment in so many schools that implement it. The appropriate use of technologies which support teaching and learning process is an innovative, more productive and more interesting way. Combining new technologies with efficient methods and tools will help us increasing students' skills, attitudes and knowledge. As a result, high school students will be more competent as we live in the age of information technology and we will gain lifelong learning skills. Acquiring knowledge through technology, mainly in the 12th grade of secondary education in programming's field is becoming more and more difficult for students.

A student can learn to explain and understand a programming concept, e.g., what does it mean a pointer but still does not use it appropriately in a program. Students may also know the syntax and semantics of individual statements, but they do not know how to combine these features into valuable programs. Even when they know how to solve the problem manually, they have difficulty translating it into an equivalent computer program.

We must therefore incorporate robots into

education in order to stimulate a stronger interest and gaining the best knowledge in the field of programming.

When applied to education, robotics and simulators can change the way students learn and ultimately create a more well-informed and systematic student.

## 2. Problem definition

This paper initially aims to analyze the interest that is being shown every day by primary cycle's students to acquire knowledge in the field of programming. Based on the fact that students are facing difficulties in programming, mostly in the use of variables and cycles in coding has come to the aid of robotics as an efficient tool in motivating them and gaining good knowledge in programming's field. In the last part of this study, in order to gather as much information as possible, about how technology affects and how it helps students to acquire new knowledge, we have conducted some questionnaires for the age group 7-10,11-14,15-18 years old near the center Albanian ICT Academy, which gives the opportunity to all enthusiasts to increase their comprehension making available laboratories with innovative

technologies.

Furthermore, on the collected data from the questionnaire we created the database on which later generated graphs and tables in the statistical software R. Based on this questionnaire, the idea was first born to make a comparison about the students who are already using robots for coding and how much they wanted to program before using the robots to obtain knowledge in programming.

### **3. The use and impact of robotics in learning**

#### *How to use robots in education*

The use of robots is becoming progressively common around us - in our workplaces, but also in our schools. Although the use of robots is quite new in the field of education, some experts predict that within the next ten years they will be used regularly in classrooms around the world.

Many types of robots are being involved in education. They range from simple “microprocessors on wheels” (boe-bot) robots, to advanced tools (Mindstorms) to humanoids (human-like robots).

The choice of robot is usually dictated by the study area and the age group of the student.

Robots or small tools are especially used to teach us computer science. These tools can be physically manipulated by allowing students to learn a variety of disciplines. However, the human form of humanoids makes them easier to interact with, and is therefore often used for language lessons.

Education is one of the areas of society in which the artificial intelligence has the most positive impact. How will new technologies in education change, and how will artificial intelligence significantly affect students in relation to their learning processes?

#### **Instructions for implementing robots in the classroom**

Robots can be amazing teaching tools, but it is important to implement them properly for the best possible results.

Four basic guidelines when planning to use robots in the classroom:

Have a clear goal: Identify the specific learning goal you want the robot to help you achieve and then use the robot only for that purpose.

Use robots to help with repetitive tasks: Today’s robots are becoming very good at repetitive tasks, which can often be boring and time consuming for humans.

Make sure children do not become too attached to the robot: Because children need a lot of human social interaction, it is important to make sure they understand that the robot is there to help them with learning, rather than being a friend or companion.

Follow ethical guidelines: When using robots in the classroom, it is essential that you follow proper ethical guidelines. As technology becomes more powerful every day, the role of ethics is becoming more important, and this applies to the use of robots.

Following the above guidelines will help to maximize benefits for students and teachers, ensuring that robots are not misused in any way.

#### **Robots in Education - Today**

Did you know that some schools around the world have already started testing the use of robots in the classroom? For example, in the Finnish city of Tampere, schools have begun testing a social learning robot called Elias, which is mainly used for language and math teaching. As entertainment is becoming an important element of effective learning, Elias is programmed to dance and encourages students to sing and dance as well. Elias can also speak and understand 23 different languages. So far, testing of this robot is going very well, with most students reacting very positively to it. **Here are some of the benefits Elias promises to provide:**



**Figure 1.** Elias robot.

## ROBOTICS IN SUPPORT OF OBTAINING KNOWLEDGE IN COMPUTER SCIENCES BEFORE UNIVERSITY STUDIES.

Provides safe and neutral learning environment: Elias as shows in Figure 1, will never judge or laugh at anyone who makes mistakes. This is especially helpful for children who are shy or do not learn as quickly as others, allowing them to focus on learning without any shame or peer pressure.

Do not tire of repetition: This robot never goes impatiently, allowing children to feel free to learn at their own pace. Students can get everything they need to learn something new, making as much effort as possible to get something right, and robots will never make them feel like they are taking too much time.

Asks questions at the student level: Elias can personalize each child's learning on their own personal level. This is usually quite challenging, even for the most experienced teachers.

Encourages students to participate: It encourages students to actively participate in the lesson. This feature is vital, as getting motivated and engaged children helps them achieve their learning objectives much faster.

Provides feedback to teachers: Elias provides teachers with feedback on each student's progress, keeping them better informed and allowing them to make appropriate adjustments. This helps teachers do the job more efficiently, which improves the overall learning experience for students.



**Figure 2.**Irobi robot, Thomas Hawk / flickr, CC BY

Humanoids such as Irobi robot, Figure 2, have the ability to provide real-time feedback and their physical shape increases engagement. This often leads to a personal connection with the student, which research shows can help resolve issues related to the shyness, reluctance, confidence and frustration that can arise when dealing with a human teacher.

For example, a robot will not get tired no matter how many mistakes a child makes. Humanoid robots are being widely used in the classroom in many countries, including Japan and South Korea.



**Figure 3.**Pepper robot from Softbank Robotics to Japan. Amber Case / flickr, CC BY.

For example, Nao, Pepper, Figure 3, Tiro, IROBI and Robovie, are mainly used to learn English.

Telepresence - where a teacher can be remotely connected to the classroom via a robot - is also being used as a way to teach English to students. The teacher can participate in the class by being practically present through a display mechanism. In some cases, the screen is embedded in the robot torso.

Western countries have been far more reluctant in recognizing the integration of robots into the classroom, with privacy, developmental barriers, rising unemployment, and technical shortcomings identified as the main obstacles.

### **Robots as teaching tools**

Humanoid robots are still a fair way to not be placed autonomously in schools, mainly due to technological constraints such as incorrect recognition of words or emotions.

## ROBOTICS IN SUPPORT OF OBTAINING KNOWLEDGE IN COMPUTER SCIENCES BEFORE UNIVERSITY STUDIES.

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However, the goal of most researchers in robotics is not for robots to replace teachers. Rather, the design goals of most robots should function as a classroom aid and increase the added value they can bring as a stimulating and engaging educational tool. In order to facilitate the integration of robots in the classroom, we need to be able to provide convenient interconnection mechanisms (software, hardware or even mobile applications), allowing the human teacher to control the robot with minimal training.

### **Facilities offered by the use of robotics in teaching**

Four main themes were discovered where the robot was able to assist in the behavior or development of the child.

### **Topic 1: Problem solving skills, team skills and collaboration**

Studies by Barak (2009) and Varney et al. (2012) were developed to investigate how the entry of robots could influence education change, particularly to help prepare children with 21st century skills and increase student interest.

The study conducted by Barak (2009) showed that high school students were able to come up with creative solutions to problems and could benefit from working on project-based programs. Robotic kits such as the LEGO Mindstorm allowed students to work in teams as they completed their projects in small groups.

Robotics was further seen as an effective tool for developing “team skills” in students (Varney et al., 2012). The use of robots in various activities with young children supports constructivism as a teaching method.

Students discuss, solve problems, work with their colleagues, and combine their knowledge in order to build their own robots. In Chang et al. (2010), the results from the study further argued that robots can create an interactive and engaging learning.

Robots in elementary school helped foster collaboration and problem-solving skills in

children when they became involved in the process and building their own facilities for their robotic projects.

This was further emphasized by Hong et al. (2011), where robots allow children to engage in deep reflections when solving problems and collaborating with their peers, who have enhanced their learning experience.

### **Topic 2: Achievement results, science concepts, and ranking skills**

The study conducted by Baker and Ansoorge (2007) examined the results of students’ achievements with the use of robots in their science program. Robots were found to be effective in teaching students science 9-11 years old, engineering and technical concepts. Results from another experimental study conducted by Kazakoff et al. (2013) supported the use of robotic programs such as CHERP, a tangible program that helped increase skills for kindergarten children.

### **Topic 3: Articles that have reported on skills development**

Williams et al., 2007 The study shows a significant difference in the acquisition of physical knowledge, but not research skills

Barak, 2009 The study shows that students often come up with quick creative solutions to the problem of learning with robots.

Highfield, 2010 The score showed significantly that they showed perseverance, motivation and reaction.

Whittier & Robinson, 2007 The results showed that all students received significant benefits in understanding.

Slangen et al., 2011 Robots helped students to manipulate, reason, predict, hypothesize, analyze. Robots were also used to develop and enhance learning the concepts of science, technology and problem solving, which was further supported by Barak (2009) qualitative analysis of observations, interviews and reflections of students working on their projects.

In the Highfield study (2010) they showed that robotic toys could be catalysts for solving mathematical problems through multiple participation by integrating and interconnecting concepts and skills through dynamic tasks.

#### **Topic 4: Development of language skills**

In the study of Chang et al. (2010), a humanoid robot was used to teach a second language in an elementary school.

The results showed that robots could create interactive and engaging learning experiences with children with whom they responded with high motivation. The use of robots for language development was found to be useful as well as allowing the demonstration of highly mobile behavior.

Sugimoto (2011) used the robot for storytelling, where the robot was used in teaching students and enabled children to learn in an environment. The children engaged strongly in expressing the story and acted in a coordinated manner.

#### **Children's reaction to the design or appearance of the robot**

In addition, a study conducted with 184 (Beran et al., 2011) showed that a significant proportion of children describe the cognitive, behavioral characteristics of robots.

159 children were asked to rate 40 images of the robot through questionnaires to investigate how children perceive the robot's appearance (Woods, 2006). The study showed that children perceive robot goals and robot-based presentation skills.

In education, the use of robots has the potential to help children develop a variety of academic skills such as the science process, developing mathematical concepts, and improving achievement outcomes (Barker & Ansorge, 2007; Williams et al., 2007; Highfield, 2010).

In addition, the introduction of robotics in the curriculum also increases the interest of students. As reported in Chang et al., 2010, the use of the robot in education allows children to engage in interactive and engaging learning experiences.

#### **Learning coding at a young age**

Learning coding at a young age can lead your child to a successful life. What is coding for kids? What are the appropriate ages to learn coding?

Coding, or computer programming, is a creative process performed by programmers to show a computer how to do a task. Coding involves writing software using programming languages. Coding for children is usually taught using content that is of high interest when creating projects that involve creative input.

In short, coding for kids becomes like a kind of game making it fun for kids to learn!

Since coding can be done in the form of games, children can start learning coding with visual blocks or text coding classes that are designed for younger ages from the age of 5.

#### **What are the best programming languages for children?**

Many parents prefer to start blockchain visual platforms with new students. Some, however, prefer their children to write from an early age.

It always depends on what field you want your child to learn to program. If you want your kids to create websites, then you can run them in HTML, CSS and JavaScript, if you want to teach them how to make applications, you can run them in Java or Swift. If you want your kids to move towards robotics, Lua and Scala are languages that are more accessible to children as well.

Another language that has grown in popularity is Python.

Python is a written language that many consider one of the easiest to learn. Python was used to create Instagram, YouTube and Spotify, and students can even use it to develop a website using Django, a popular web framework.

Finally, learning coding from an early age is a very good idea. The earlier children learn, the more time they have to reach the highest peaks and find jobs in various areas of programming.

#### **4. Test results of how robots affect children ICub Research Robot: Programmed to learn**

ICub Figure 4, sees through cameras what is shown to it. Through microphones he can hear what is being said. The robot is programmed to react to changes, such as movement and a change in sound level. Schillingmann points to one of the graphs: "Here you see what data the iCub is analyzing. It records when something changes within the frame that it distinguishes. Be careful when I start talking and when I stop talking."

Schillingmann says that the principle applies here: the more changes in the starting situation, the more interesting it is for the robot and the faster it will intertwine the recorded signals. In this way he learns step by step how to put in context the visual and audio information transmitted by people.

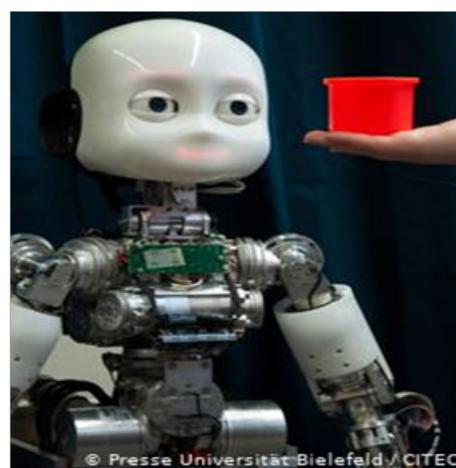
#### **The energy for programming makes it difficult to use robots**

CoR-Lab computer scientists have been collaborating since 2007 with engineers and neuroscientists, psychologists and linguists in the construction of machines that adapt to human behavior and are able to learn from humans. This is because the more ubiquitous robots are in the workplace or at home, the more necessary it is for them to interact with humans and be flexible. It is true that a number of different models of home robots or service robots are currently being tested, but in most cases they can not be used effectively, says Sven Behnke, professor of practical computing at the University of Bonn.

He himself is developing with Coseron students (and knows its limits). "For example, at the World Robotics Championships last year Cosero cooked omelets," says Behnke. The robot grabbed a bottle of egg juice, lit the cooking plate, on which was a pan, and poured the egg mass into the pan. "But this is a rigidly programmed course of action, which requires a lot of things: for example, to have a cooking plate the same as this, and not another." So this thing may look nice and show what is possible, but it is far enough away from use, says Behnke.

#### **Listen and Imitate: Robots learn like children**

On the other hand at the CoR-Lab in Bielefeld the foundations for the development of the cognitive abilities of the robots themselves will be explored. "The people who will be dealing with robots in the future will not all be robotics experts," says Lars. Robots can be programmed to distinguish what humans naturally know: talk and demonstrate, says Schillingmann. That is why iCub basically learns like children from adults, he adds: through listening and imitating, failing and trying.



**Figure 4. ICub and glasses**

#### **5. Realization of questionnaires at the Albanian ICT Academy Methodology center**

The methods used during this study are:

##### **Method of using the literature.**

Data collection and analysis begins with the collection of data, which are specified in the purpose of the research and related to the hypotheses we have put forward.

We have researched how robots affect children's motivation in various scientific texts and websites on the Internet.

##### **Statistical method**

The statistical method used to analyze and recommend issues related to the impact of robots on students' knowledge acquisition is the questionnaire. Through questionnaires for

## ROBOTICS IN SUPPORT OF OBTAINING KNOWLEDGE IN COMPUTER SCIENCES BEFORE UNIVERSITY STUDIES.

age groups from 7 to 18 years who attend the programming course on robotics at the Albanian ICT Academy, the data were extracted and compared.

The sample of this questionnaire was determined by primary school students and 12th grade students at the Albanian ICT Academy. There were selected 80 students where none of them refused to complete the questionnaire. A total of 80 questionnaires were completed. The questionnaires were completed by 80 students from the age group of 7 to 14 years old that have been willing to respond.

### Questionnaire:

1. What class are you in?
2. Did you do ICT at school before you came here?
3. Did you learn coding in school before coming here?
4. Did you know what coding was before you came here?
5. How much did you wish to learn coding from 1 to 10 before coming here?
6. Have you attended lectures on coding robots?
7. If yes:
  - a. Why did you start taking lessons on robot coding?
  - b. How much did you want to learn coding before you started coding robots?
  - c. How long did it take to take lectures on robot coding?
  - d. What robots do you use during lectures?
  - e. What programming language do you use to command visual or standard robots (python, javascript java)?
  - f. How much do you wish from 1 to 10 to learn about coding now after taking lectures coding robots?
  - g. How has attending robot coding lessons affected you?
    - Developed my logic
    - I am more active in the subject of ICT
    - It has stimulated my motivation to learn coding
    - Has not affected
    - Other

If the answer is different, how?

### Questionnaire analysis:

This questionnaire was conducted by Grigorina Boce, Alma Hyra, Frida Zisko, to assess how robotics affects the acquisition of knowledge in children aged 7-18 years near the Albanian ICT Academy, the first academy established in Albania which gives the opportunity all enthusiasts to increase their knowledge by making available laboratories with innovative technologies.

In cooperation with the Albanian ICT Academy, we initially received information about the development of trainings in the field of programming and robotics which were conducted 3 times a week, in total of which 2 hours per week were theory, teaching and 1 time practice in the laboratory. Some groups children, developed training related to programming, through robotics, every day of the week in theory and practice. In this center, were used curricula from Massachusetts, suitable for different age groups, so that there is no information load on children. The programming was mainly used with color blocks, where each block is related to colors as: DreamWeaves, Notepad ++ and microbit.org.

After this complete analysis we had the opportunity to guide students in completing the questionnaire to see how robotics has influenced the growth of interest, boost motivation and open a new door to the future. 80 children, around the age group 7-18 years, were selected to participate in this questionnaire. They were part of the Albanian ICT Academy, as **table 1** below based on the following data: **Table 1**

**Table 1: Distribution of children by gender**

Gender	Number of children	Age
Female	30	7-18 years
Male	50	7-18years

From the analysis of the results of the questionnaire developed in the statistical program R we managed to derive the following results.

## ROBOTICS IN SUPPORT OF OBTAINING KNOWLEDGE IN COMPUTER SCIENCES BEFORE UNIVERSITY STUDIES.

As can be seen from the graph in the Figure 4, the average time that children spend programming with the help of robotics is 2 hours.

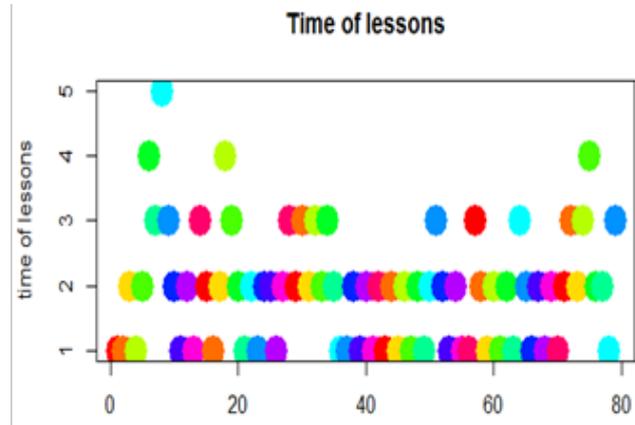


Figure 4. The graph of average time lessons.

Pie chart of programming languages

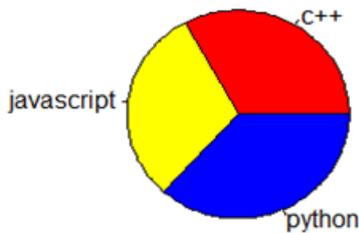


Figure 5. Pie chart of main programming languages.

The graph above in Figure 5 shows a distribution of the most used programming languages according to children's responses. Thus, with small differences, there is almost an equal distribution between the three programming languages: Python, JavaScript and C ++.

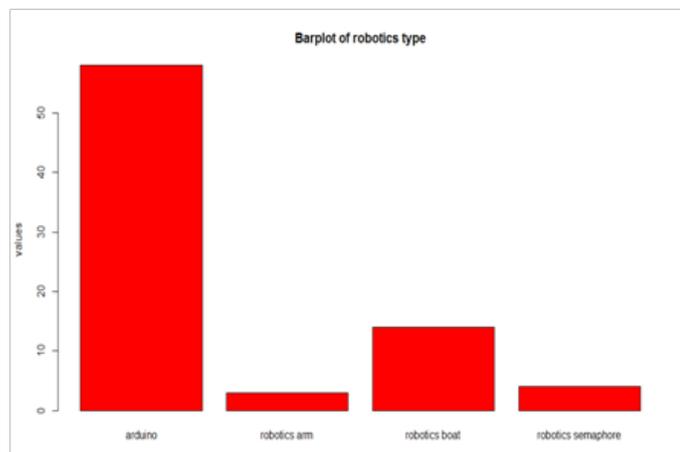


Figure 6. Barplot of robotics type

As for the robots, which they used during the lecture, as can be seen from Figure 5, most of the students said that Arduino is one of the favorites. This is due to the fact that it is visually simpler and practical in implementation.

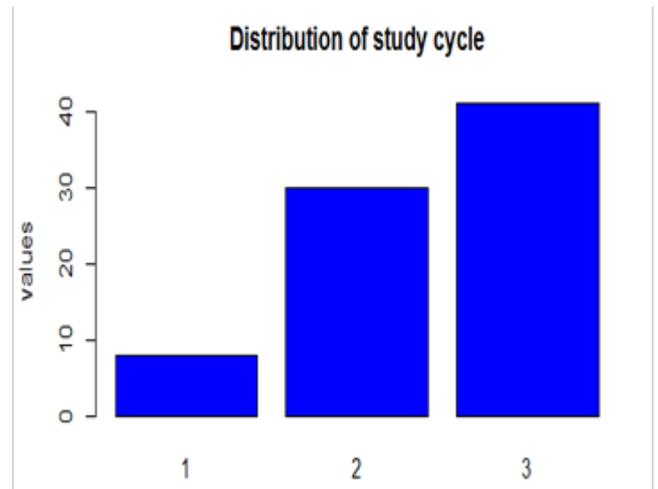


Figure 7. The distribution of study cycle.

Our study aims to assess the distribution of children learning in the ICT center, thus giving an overview of the distribution of their age groups. Since the first cycle of the study includes the age group 7-12, the second cycle includes the age group 13-15 and the third cycle 16-18. In fig.2.2 it is noticed that most of the students who study programming through robotics, respectively 53% of them belong to the third cycle of study, i.e. the age group 16-18 years, while the rest, respectively 9% and 38% of belong to the first and second cycle.

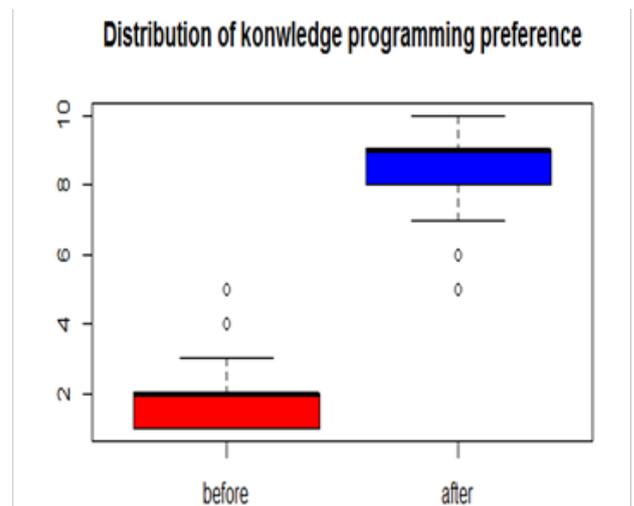


Figure 8. Boxplot of lessons preference

## ROBOTICS IN SUPPORT OF OBTAINING KNOWLEDGE IN COMPUTER SCIENCES BEFORE UNIVERSITY STUDIES.

In Figure 8.above is presented the distribution of preferences for gaining knowledge on programming using robots before and after training in the ICT center, where it is clear that the preferences have increased after the use of robotics in programming.

In the completed questionnaire the children were ready to answer as follows:

### 1. What class are you in?

About 25 out of 50 boys, were around 12 years old and were studying at Fan Noli School, while about 17 out of 30 girls, were between 12 and 14 years old.

### 2. Did you do ICT at school before you came here?

About 29 out of 50 boys, in the ninth grade, did not learn coding in school, so they did not know programming, while about 14 out of 29 girls in the ninth grade, developed programming languages like python, C ++ in school and about 15 out of 30 girls, in the fourth grade, did not know coding.

### 3. Did you learn coding in school before coming here?

About 30 out of 50 boys, have answered this question, that they have not yet learned coding from school, because there they develop only basic knowledge about Word, Exel, PowerPoint. The girls in the ninth grade,about 15 out of 30 girls, have expressed that they have learned to program in school, in the language of like C ++, Python and is already in the phase of developing this knowledge, at the Albanian ICT Academy. The girls also said that in school, they were mainly involved in creating blogs, web pages on how to control a social network and materials in Word

### 4. Did you know what coding was before you came here?

About 34 out of 50 boys, uttered that individually at home, having and a push from

The family, especially from their mothers who are computer teachers, have seen several videos individually about programming via Python, mainly related to building microbial and Arduino circuits. The ninth-grade girls,about 10 out of

30 girls, expressed that they are familiar with school coding in the subject of ICT mainly with C ++ programming languages, Python and have reinforced this knowledge, in the coding week OPEN CODING AND ROBOTICS DAY, an edition offered by Albanian ICT Academy, in the framework of Albanian Skills 2017.

### 5. How much did you want to learn about coding from 1 to 10 before coming here?

About 42 out of 50 boys, answered this question, that before they were part of the Albanian ICT Academy, they did not want to learn about coding, so their grade was 1. Whereas now that they attend the trainings at this academy, their desire to continue and strengthen their knowledge related to coding has increased, so their evaluation was 10. About 14 out of 30 girls, expressed that before, without starting the academy, they wanted to learn about coding. Given the fact that they had the impetus from parents, who are computer teachers, the grade was 9, while now attending

training near this center, their desire to acquire knowledge, especially on robotics, has increased. So, their evaluation was maximum 10.6.



### 6. Have you attended lectures on coding robots?

Related to this question, about 35 out of 50 boys, indicated that they have attended online lectures individually, regarding the coding of robots, which allow the development of intelligent mechanical devices. The boys said that common tasks in robots include response ring, control, path finding, data filtering, data retrieval and sharing.

About 18 out of 30 girls, said that they have seen some videos on the Internet, on the coding of robots with artificial intelligence, on how to build small robots, traffic lights, digital clocks, alarm systems, photoresistors, microbial and arduino circuits, intelligent cars.

### **7. Why did you start taking lessons on robot coding?**

About 44 out of 50 boys, answered that they have passion and motivation from the family while about 15 out of 30 girls, expressed that they feel more active in school. This stimulates their motivation and develops their logic.

### **8. How long did it take to take lectures on robot coding?**

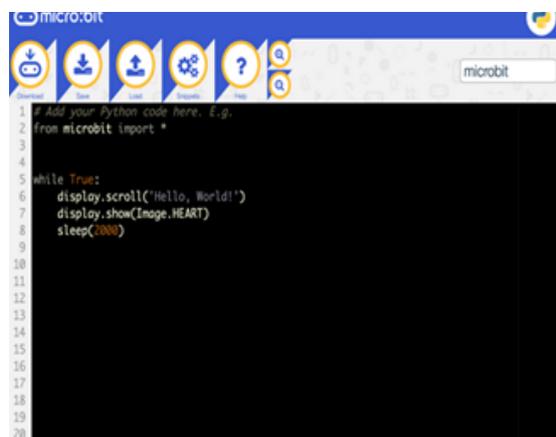
The children replied this question by saying that taking lectures on robot coding lasted seven weeks organized in three hours of course per day each day of the week of which two hours are theory and one hour practice in the laboratory.

### **9. What robots do you use during lectures?**

About 43 out of 50 boys, responded they use the Arduino Robot as shows in Figure 9, which is a chip or minicomputer consisting of two processors, one on each of its two boards. The Motor Board controls the motors and the Control Board reads the sensors and decides how to operate. Each of the boards is a complete programmable Arduino board using the Arduino IDE and generating codes in the Python programming language. Both Arduino processors have built in USB communication, eliminating the need for a secondary processor. This allows the Robot to be displayed on a connected computer as a virtual / COM (virtual) (CDC) port. As always with Arduino, every element of the platform - hardware, software and documentation - is freely available and open source.

About 20 out of 30 girls, answered that during the lectures they use the microbit circuit which is an integrated system based on the ARM system with open base. The device has an ARM Cortex-M0 processor, battery and magnetometer sensors, Bluetooth and USB connection, a screen consisting of 25 small lights and two programmable buttons. This microbial circuit works with programs, which are programmed in the MakeCode Editor, in Microbit.org platforms, through javascript and python blocks and languages.

### **Mikrobit Circuit MakeCode Editor Python Editor**



### **10. What programming language do you use to command visual or standard robots? (python, javascript, java)?**

The children said they use python and javascript programming languages to command the robots.

### **11. How much do you wish, from 1 to 10, to learn about coding now after taking lectures on coding robots?**

All the children replied that already after gaining knowledge of robot coding lessons, their desire to learn has increased, so the rating is 10 maximum because they said that it is something interesting and necessary which we did not know before.

About 20 out of 30 girls, also stated that they already feel even more motivated, more active in school and find it easier to learn the functions of codes in other programming languages.

### **12. How did attending robot coding lessons affect you?**

About 24 out of 30 girls, uttered that attending robot coding lessons has increased interest in the field of ICT as everything is digital, everything has become a trend around the world, science is evolving and in the future the world will become electronic. After all, why should we not follow the footsteps of the world and become skilled programmers?

## ROBOTICS IN SUPPORT OF OBTAINING KNOWLEDGE IN COMPUTER SCIENCES BEFORE UNIVERSITY STUDIES.

About 22 out of 30 girls, also responded that coding through robots has developed logic, the creative aspect, critical thinking. This made them more active in school in the subject of ICT, developed intelligence and opened a new door to the future, to create career and get a lucrative profession as a programmer.

### 6. Conclusions

This paper aimed to demonstrate that today in the XXI century, Information and Communication Technology (ICT) has become almost essential in the development of the learning process and in gaining good knowledge in the field of programming using robotics.

The use of appropriate technologies and the introduction of robotics in the learning process is an innovative, more productive and interesting way. It also helps to develop logic, trains intelligence, enhances the creative aspect and critical thinking. Combining new technologies, with efficient methods and tools and using robots in teaching, will help us increase students' skills, attitudes and knowledge in the field of programming. As a result, high school students will be more competent and active in the subject of ICT, as we live in the age of information technology and will gain lifelong learning skills.

Since digital education starts at an early age and has become a worldwide trend, why not following the footsteps of the world and prepare children for the future by opening a new door to the field of programming which is increasingly being developed and considered as one of the most profitable professions.

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# EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

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## Abstract

This research paper provides a survey which addresses factors that make a significant impact on customer online shopping process and the assessment of their importance during this process. It is focused on five different sections consisting of demographics, security, time saving, product quality, website features and customer service. The albanian case is interesting to study because it has grown into giant leaps since 2020, and a slight amount of scientific studies are publicly available about it. As a result, a better understanding of albanian customers attitude towards online shopping is likely to be convenient for monitoring upcoming problems and concerns. The motivation behind this study arises from the risk perception as well as speculations that inevitably exist among consumers regarding the significance of the influence of decisive factors on the shopping online process in Albania. The purpose of this scientific study is to appropriately investigate how albanian consumers' point of view towards products' quality, website features, customer service as well as their security perception have a considerable effect on their online purchases. Data were collected via self-administered questionnaire which contains 26 questions splitted in 6 sections and it was answered by 206 albanians. One-way ANOVA were utilised to evaluate the difference between independent or explanatory variables and dependant variable such as customers' reaction towards online shopping. Further scientific study should be mainly focused on exploring more factors impacting consumers' reaction towards e-commerce purchases through online shopping as well as assessing their importance in this process.

**Keywords:** *online shopping, demographics, security, time saving, product quality, website features, customer service.*

## 1. Introduction

### 1.1. Online shopping definition

Online shopping or e-shopping is the process of searching for and purchasing goods and services over the Internet through the use of a web browser. (Computer Hope, 2020) The main advantage of online shopping is that costumers can asset and purchase items they feel the necessity for and ship it according to the customers' request. In this century, almost anything can be bought through the process of online shopping, amounting to billions of dollars a year in sales. Nearly most retail stores have a website for customers to buy from online and either ship them to their home or pick up at a nearby store location. Some companies only sell products through their website and do not have a retail storefront.

All the assortments in online stores are represented through text, photos and multimedia files. Many

online shops will provide additional links for extra information about their products. They usually make accessible, safety proceedings, directions, manufacture specification and demonstrations as well. Some will even provide how-to guides. As you are already on the Internet, you can easily read product reviews that other consumers have posted about a specific item. Many allow users to rate their products. Advisability such as this from other customers about an item would be unaccessible in a conventional store.

### 1.2. Advantages of the online purchasing process

There are many benefits involved with online purchasing process, the most noticeable of which is convenience. (Groshan Fabiola, 2020) As long as you have a computer, online shopping can be executed from home, from work or from any place

you are most comfortable in. There is no need to spend further time traveling to a conventional store. Another point worth mentioning is the fact that online shops typically operate 24 hours a day so you don't need to rush to get there during business hours. Especially if you have a broadband Internet connection, browsing online can be done very effectively - in fact, it can be quicker than browsing up and down the aisles of a physical shop, where it would be hard to find the particular section of the product you are looking for. By making use of online shopping, there is no need to waste time in queues at the check-out once you have your items placed in your shopping cart. You are not enforced to lift any heavy or awkward-sized and shaped assortments. Your shopping is collected with the click of a button and stocked up into your shopping basket by no physical struggle on your part. You will often be given a choice as to how to receive the merchandise you have bought - either it can be delivered to you or you can go to the store to collect it. This resilience can be very advantageous depending on what time you necessitate the product. Search engines and online price comparison services are useful for finding several sellers of a specific product. This way, you can find very good deals on various pieces. Some items will typically be found in a lower price if purchased over the Internet as there can be special occasions when prices go down. On large orders shipping costs may be waved. There are also innumerable websites that compile information on coupons and discounts provided in numerous periods throughout the year. Online shopping process is enhancing in giant leaps and preferred due to these many facilities presented.

### **1.3. Objectives**

1. To evaluate the significance of difference between security issues and albanian customers' reaction towards online shopping among four groups.
2. To investigate the significance of difference between time saving efficiency and albanian customers' reaction towards online shopping among four groups.

3. To examine the significance of difference between product quality and albanian customers' reaction towards online shopping among four groups.
4. To measure the significance of difference between website features and albanian customers' reaction towards online shopping among four groups.
5. To assess the significance of difference between customer service and albanian customers' reaction towards online shopping among four groups.
6. To obtain a demographic profile of the respondents as for age, gender, education level and concerns perceptions.
7. To report the customers' reaction towards online shopping regarding the factors list consisting of: security issues, time saving efficiency, product quality, website features and customer service.

To meet the objectives of the research, a review of the literature on analyzing customers' decisions towards online purchasing and significance of several factors affecting consumers' shopping behavior should be conducted. This is succeeded by a synopsis of the research methodology and the study results are shown and described scientifically. In the end, the conclusion and further improvements on research are disserted.

## **2. Literature Review**

This chapter outlines the literature that serves as a theoretical overview. As observed in other research papers regarding the online shopping process, there are pointed out several factors that have a significant impact on customers' online purchases. Taking into consideration the demographic profile, studies have come into conclusion that demographic profile of a customer determines his/her attitude towards online shopping. (Gupta et al., 1995; Haque and Khatibi, 2005; Khatibi et al., 2006) Another group of researches found that the age of consumers also has a considerable impact on their online purchasing attitude. These studies concluded that the younger generation tends to be focused more on online purchasing. This is supported by the fact

## EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

that younger generation tends to make use of the web browsers more than the older generations. Another literature suggested that education level may not play a significant role in customers' online shopping behaviours. (Harn et al., 2006; Haque and Khatibi, 2005) They did not have any conclusive evidence that education level significantly impacts consumers' online shopping attitude. According to Bellman, Lohse & Johnson (1999), various demographic variables such as income, education and age have a moderate influence on online shopping, whereas the most decisive factor impacting online shopping was previous behavior such as earlier online purchasing experience. Customers tend to pay closer attention to the convenience of online shopping for the purpose of time saving. (Seock and Bailey, 2008) A considerable number of purchasers treat convenience as their primary objective related to saving time for entertainment and relaxation based on a research conducted by Chang & Michael et al., (2011). A list of additional factors impacting significantly the online shopping process is obtained in table 1 as below.

Independent variables	Scientific studies
Security issues	Kukar-Kinney & Close, 2010; Liao & Cheung, 2001.
Risk perception	Janda, Trocchia & Gwinner, 2002; Javadi, Dolatabadi, Nourbakhsh & Poursaedi, 2012; Lian & Yen, 2014.
Previous experience	Liao & Cheung, 2001; Koyuncu & Lien, 2003.
Shipping process	Rodriguez-ardura et al., 2008; Kukar-Kinney & Close, 2010.
Payment methods	Kukar-Kinney & Close, 2010.
Website features	Goode & Harris, 2007; Alam & Yasin, 2010.
Social media	Forbes & Vespoli, 2013.

*Table 1: Significant factors list along with their respective studies*

### 3. Research Methodology

#### 3.1. Research approach and questions

This research attempts to evaluate the effectiveness of several considerable aspects which are pointed out by previous studies on customers' attitude towards online purchases.

The research questions are stated as below.

- 1) What is the demographic profile of the respondents in terms of age, gender, education level and concerns perceptions?
- 2) Is there any statistical significant difference between security issues, time saving efficiency, product quality, website features, customer service compared to albanian customers' reaction towards online shopping among four groups?
- 3) What is the customers' reaction towards online shopping regarding security issues, time saving efficiency, product quality, website features and customer service?

#### 3.2. Hypotheses

$H_0^1$ : There is no statistically significant difference between security issues and albanian customers' reaction to online shopping process among four groups.

$H_0^2$ : There is no statistically significant difference between time saving efficiency and albanian customers' reaction to online shopping process among four groups.

$H_0^3$ : There is no statistically significant difference between product quality and albanian customers' reaction to online shopping process among four groups.

$H_0^4$ : There is no statistically significant difference between website features and albanian customers' reaction to online shopping process among four groups.

$H_0^5$ : There is no statistically significant difference between customer service and albanian customers' reaction to online shopping process among four groups.

# EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

### 3.3. Selection of methodology

In general, researchers make use of two types of research methods: quantitative and qualitative. The qualitative methods give participants a certain degree of freedom and permit spontaneity rather than having them to select from a set of predetermined responses. (Bogdan & Biklen, 1998)The quantitative research on the other hand involves collecting and converting data into numerical form so that statistical calculations can be made and conclusions can be drawn.(Burns & Bush, 2003)

I am going to conduct a quantitative approach regarding the five factors mentioned above in this research paper in order for the results to be as much well-defined as possible.

### 3.4. Definition of variables

The variables to be examined are security issues, time saving efficiency, product quality, website features and customer service. These five aspects represent the independent or explanatory variables, which affect undeviatingly the volume of online shopping. On the other side, the dependent variable which is directly affected by each of these factors is the albanian customers' reaction towards online shopping.

### 3.5. Measurement and Sampling

The main instrument used in order to obtain data was a questionnaire conducted online. Motivation and availability, the two driving factors behind determining constructs and measures, are also important when choosing samples. (Loeb, S., Dynarski, S., McFarland, D., Morris, P., Reardon, S., & Reber, S.,2017) The questionnaire objectives were to gather information about albanian customers' demographic background, their approach to the volume of online shopping being impacted by security issues, time saving properties, product quality, website features and customer service based on their own experience in Albania. As a result, the questionnaire was divided into six parts, each of them subdivided into 4-6 questions. This study made proper use of convenience

sampling method because of the unaccessibility of the albanian buyers list that chose online shopping. In total, there were 206 respondents in this questionnaire. Convenience sampling is a type of nonprobability sampling in which people are sampled simply because they are "convenient" sources of data for researchers. In probability sampling, each element in the population has a known nonzero chance of being selected through the use of a random selection procedure. Nonprobability sampling does not involve known nonzero probabilities of selection. (Michael P. Battaglia, Paul J. Lavrakas, 2008)

## 4. Demographic Profile

Variable	Frequency	Percentage
<b>Age</b>		
Less than 18	9	4.4
18-27	111	53.9
28-37	22	10.7
38-47	28	13.6
Above 47	36	17.5
<b>Gender</b>		
Female	168	81.6
Male	38	18.4
<b>Education level</b>		
9 <sup>th</sup> grade	5	2.4
High school	27	13.1
Bachelor	80	38.8
Master	85	41.3
PhD.	3	1.5
Postdoctoral	0	0
Other	6	2.9

*Table 2: Demographic profile of albanian e-customers*

### 4.1. Age

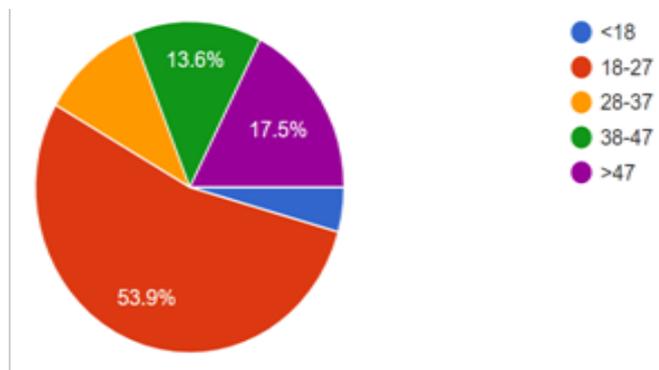
By taking figure 1 into consideration, which shows a pie chart divided into five different sections, we can draw a conclusion that there are 53.9% of participants at the ages of between 18 and 27, 17.5% of respondents above 47 years old, 13.6% who are 38-47 years old, 10.7% of people corresponding to the age of 28-37 and lastly 4.4% of teenagers being younger than 18 years old. Therefore, the samples to be examined are generally younger in age. The vast majority of albanian online customers are 18-27 years old. This can be explained by the fact that most people in this age bracket are mostly

## EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

students, people who have just been married and become parents as well.

On the whole, their shopping basket usually is composed of stationary items, books, electronic equipments, clothes along with cosmetics products too. As they become more mature, they are more prone to scale down their purchases, by being keen on buying consumer durables known as white goods. Additionally, as their home appliances start occupying their shopping list, there can be smoothly figured out a compression of clothes and cosmetic products.

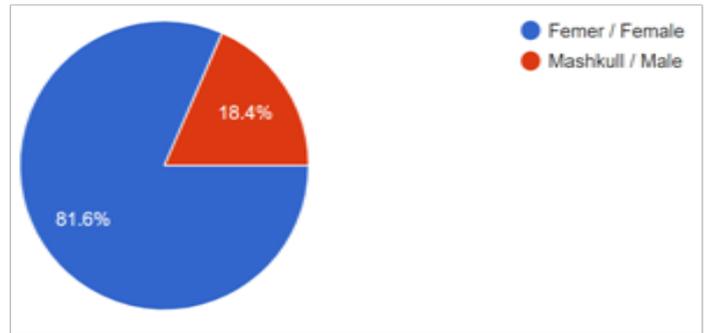
After having a family, which is furthermore accompanied by an intensive care on their children's basic necessities, they tend to decrease even more their shopping habits for themselves. On the other hand, as they start aging, their children grow older too, so their children's needs have a boost tendency along with their salaries escalations.



**Figure 1: Age distribution among Albanian e-customers**

### 4.2. Gender

In this study, the gender percentage of Albanian online consumers is divided into 81.6% for female and 18.4% for male. Among the respondents, there were 168 women and 38 men as seen in figure 2 below. In virtually every society in the world, women have primary care-giving responsibilities for both children and the elderly. In this primary caregiving role, women find themselves buying on behalf of everyone else in their lives. (Bridget Brennan, 2013)



**Figure 2: Gender distribution among Albanian e-customers**

### 4.3. Education level

Figure 3 presents information on the level of education. According to this pie chart, it is obvious that the questionnaire was mostly responded by highly educated people. The share of respondents with a master degree consists of 41.3%, while the share of the respondents holding a bachelor degree is attributed to 38.8%. The percentage of online customers who have finished their high school is precisely 13.1%, which is followed by secondary school and doctorate. It is clear that none of the respondents had pursued postdoctoral studies, nor had any not attended school at all.



**Figure 3: Education level among Albanian e-customers**

### 4.4. Categories

Category	Frequency	Percentage
Books	38	18.4
Food	23	11.2
Clothes	155	75.2
Furniture	15	7.3
Vitamins	11	5.3
Cosmetics	66	32
Other	44	21.4

**Table 3: List of categories shopped online**

## EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

Respondents were asked to choose one or more of the categories based on what products they usually buy online. The various categories shopped online are listed in table 2 along with the frequency distribution as well as their respective percentage. We conclude that clothes (75.2%) and cosmetics products (32.2%) are the most frequently purchased categories online from the evaluation of table 2. It is important to emphasize the fact that more than three fourth of the respondents have chosen clothes category, which is attributed to the vast majority of respondents being between the age of 18 and 27. Other categories not mentioned above, books and food come next as their percentages correspond to 21.4%, 18.4% and 11.2% respectively followed by furniture holding 7.3%. Lastly, vitamins is the least frequently category purchased online, which contributes to the fact that people tend to take advices from doctors and pharmacists physically.

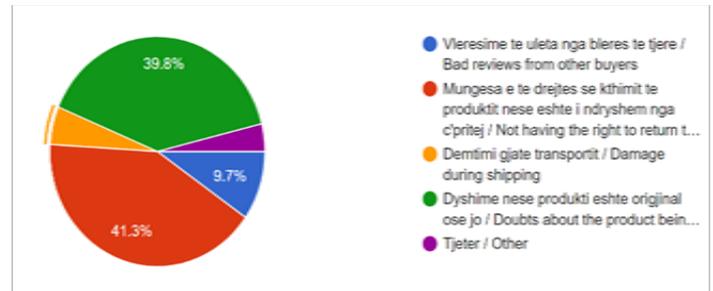
### 4.5. Concerns

The concerns list from which the respondents had to choose the biggest one affecting their shopping online experience is composed of:

- Bad reviews from other buyers
- Not having the right to return the product if it is different from expected
- Damage during shipping
- Doubts about the product being original or not
- Other.

By examining the pie chart shown in figure 4, we come into conclusion that the biggest concern chosen at 41.3% rate is the nonavailability of returning the product if it is evaluated different from the expected one, which highly needs to be taken into consideration from albanian online stores, proceeded by doubts regarding the originality of the product bought during online experience rated at 39.8%. These two concerns hold together 167 votes out of 206 in total. The consequent concern is represented by bad reviews from other buyers, which is nearly voted by one-tenth of the respondents. The penultimate option is considered damage during shipping as it was

selected by 11 people, while only 8 respondents chose the other option.



**Figure 4: Concerns distribution among albanian e-customers**

### 5. Data Analysis

One of the most important procedures is examining the data and discussing the results obtained. One-way ANOVA was utilised to assess the difference between independent variables such as security issues, time saving efficiency, product quality, website features, customer service and the albanian customers' reaction to the online shopping process among four groups. In ANOVA, the null hypothesis is that there is no difference among group means. If any group differs significantly from the overall group mean, then the ANOVA will report a statistically significant result. The tool that will be utilised in order to properly analyze the input data is a 5-point Likert scale, which is commonly used in survey-based researches. The substitutions are displayed below

Option	1	2	3	4	5
Always					✓
Usually				✓	
Occasionally			✓		
Seldom		✓			
Never	✓				
Completely comfortable					✓
Fairly comfortable				✓	
Somewhat comfortable			✓		
Slightly comfortable		✓			
Not comfortable	✓				
Completely agree					✓
Agree				✓	
Undecided			✓		

# EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

Disagree		✓			
Completely disagree	✓				
Entirely					✓
To a great degree				✓	
To a considerable degree			✓		
To a lesser degree		✓			
Not at all	✓				

Table 5: Options' correspondents to a 5 point Likert scale

## 5.1. Questionnaire design

Factor	Statement/Question	1	2	3	4	5
Security issues	While purchasing online, I avoid providing my credit/debit card and choose cash instead.	24	14	35	38	95
	How often do privacy concerns prevent you from shopping online?	33	32	75	52	14
	How comfortable are you that your personal information is kept confidential when buying online?	16	24	63	66	37
	When purchasing online, there is a risk of identity theft.	6	19	54	92	35
	<b>Total</b>	<b>79</b>	<b>89</b>	<b>227</b>	<b>248</b>	<b>181</b>

Factor	Statement/Question	1	2	3	4	5
Time saving efficiency	I believe that it takes less time in evaluating and selecting a product while shopping online.	5	24	20	103	54
	I believe that payment process takes less time while shopping online.	6	26	30	92	52
	Online shopping is a smart way of saving time.	0	10	16	97	83
	I find it important that I can buy the products anytime 24 hours a day.	0	4	70	41	91
	<b>Total</b>	<b>11</b>	<b>64</b>	<b>136</b>	<b>333</b>	<b>280</b>

Factor	Statement/Question	1	2	3	4	5
Product quality	How often did the product bought online meet your expectations?	0	8	64	116	18
	How often did the photographs of the advertised product accurately represent what you received?	2	17	65	100	22
	How often did the description of the advertised product accurately represent what you received?	4	13	46	119	24

How often have you not received a broken/rotten/torn product when purchasing online?	3	6	32	65	100
<b>Total</b>	<b>9</b>	<b>44</b>	<b>207</b>	<b>400</b>	<b>164</b>
The website design helps me in searching the products easily.	0	3	17	90	96
Did the website load efficiently?	2	13	80	79	32
Were you able to locate products/services/information without assistance?	0	7	63	67	69
If the website is easy to navigate, I am more prone to returning for another online purchase.	2	7	51	52	94
<b>Total</b>	<b>4</b>	<b>30</b>	<b>211</b>	<b>288</b>	<b>291</b>
Did your online agent resolve your issue competently?	4	25	84	64	29
Do you think that your online agent was knowledgeable about the company/products/policies?	3	17	81	74	31
Did your online agent communicate in a clear manner?	3	11	67	79	46
Did your online agent make you feel like a valued customer?	9	10	64	72	51
<b>Total</b>	<b>19</b>	<b>63</b>	<b>296</b>	<b>289</b>	<b>157</b>

Table 6: Frequency distribution of statements/questions' answers

## 5.2. Inferential statistics

There were 5 hypotheses in this research; all of which failed to be rejected via one-way ANOVA statistical analysis.

Objective	Hypothesis	Statistical test	Results	Decision
1. To evaluate the significance of difference between security issues and albanian customers' reaction towards online shopping among four groups.	H01: There is no statistically significant difference between security issues and albanian customers' reaction to online shopping process among four groups.	One-way ANOVA	F-crit=3.4 p>0.05	Fail to reject

## EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

2. To investigate the significance of difference between time saving efficiency and albanian customers' reaction towards online shopping among four groups.	H02: There is no statistically significant difference between time saving efficiency and albanian customers' reaction to online shopping process among four groups.	One-way ANOVA VA	F-crit=1 2.2  p>0.05	Fail to reject
3. To examine the significance of difference between product quality and albanian customers' reaction towards online shopping among four groups.	H03: There is no statistically significant difference between product quality and albanian customers' reaction to online shopping process among four groups.	One-way ANOVA VA	F-crit=3 .23  p>0.05	Fail to reject
4. To measure the significance of difference between website features and albanian customers' reaction towards online shopping among four groups.	H04: There is no statistically significant difference between website features and albanian customers' reaction to online shopping process among four groups.	One-way ANOVA VA	F-crit=3 .23  p>0.05	Fail to reject
5. To assess the significance of difference between customer service and albanian customers' reaction towards online shopping among four groups.	H05: There is no statistically significant difference between customer service and albanian customers' reaction to online shopping process among four groups.	One-way ANOVA VA	F-crit=3 .23  p>0.05	Fail to reject

**Table 7: Summary of one-way ANOVA analysis**

Table 7 shows the summary of one-way ANOVA analysis along with the decisions made. In all of the five analysis the p-value was bigger than 0.05, by indicating that there was no significant difference in customers' reaction towards online shopping among every group in each of the five factors mentioned. Hence,  $H_0^1$  to  $H_0^5$  failed to be rejected.

### 5.3. Descriptive statistics

Dependent variable	Mode				Overall Mode
	Q1	Q2	Q3	Q4	
Security issues	5	3	4	4	4
Time saving efficiency	4	4	4	5	4
Product quality	4	4	4	5	4
Website features	5	3	5	5	5
Customer service	3	3	4	4	3

*Table 8: Summary of mode values*

#### 5.3.1. Security issues

Even though technology is advancing with giant leaps across Albania, nearly half of the respondents avoid providing their credit/debit card and choose cash instead. There were 75 albanian customers who are occasionally prevented from buying online due to privacy concerns, whereas 25.2% of the respondents usually do not proceed online buying only because of security issues. Regarding the confidentiality perception, 32% of the albanian customers feel fairly comfortable. A percentage of 30.2 among the online consumers are somewhat comfortable that their personal information is kept confidential when buying online. A majority consisting of 92 customers who make 44.7% in total agree that there is a risk of identity theft while shopping online, which makes an even higher problem nowadays that needs to be seriously taken into consideration from every albanian website, as it results in a decreasing number of e-purchases. By making secure websites as well as by stating proper terms and conditions, the security risk perception is going to be less common among albanian online consumers.

#### 5.3.2. Time saving

Precisely 50% of albanian e-consumers agree that it takes less time in evaluating and selecting a product while shopping online, which is further supported by a percentage of 26.2 who completely agree in time saving property by making it 76.2% in total. However, there are still 20 people who are

## EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

left undecided. As for the payment process, it is highly supported by 144 of the respondents the fact that it takes less time too, although there is an increase in people left undecided who make 30 in total in this case. Surprisingly, there is no one who completely disagrees with the statement: "Online shopping is a smart way of saving time." as there are 180 out of 206 respondents who mainly agree as well as completely agree. Moreover, there is none among albanian e-customers who does not find it important the fact that they can buy the products anytime 24 hours a day. This way, if there is any website that does not offer this service, it should be taken profoundly under advisement.

### 5.3.3. Product quality

During this research, key findings showed that product quality makes a positive feature of e-shopping as there was no one whose purchased product did not meet their expectations. Additionally, more than half of the e-consumers usually receive a product that meets their expected features. Precisely 100 out of 206 respondents usually receive a product that is accurately represented by the advertised photographs. On the other hand, 65 customers occasionally get a product as represented by the photographs. Unsurprisingly, a vast majority making 57.8% in total usually get a product as represented by the description, by making "usually" the most frequently occurring response. As a matter of fact, the percentage that never has got hands on a broken, rotten or torn product adds up to 48.5%. In addition, 31.6% corresponds to the percentage of people that seldom has got a product in an inappropriate condition. Taking everything into account, the quality of the online purchased products is considered to be high which makes the albanian e-shops tremendously serious and responsible.

### 5.3.4. Website features

It is first and foremost an immensely obvious agreement that the website design helps customers in searching the products easily by

making "completely agree" the option that occurs most frequently, followed by "agree", both of which notably measure 90.3% overall. Boiling down to loading efficiency, it is predominantly voted that the website loads to a considerable degree which is tightly succeeded by the "great degree" preference. There is interestingly noticed a nearabout distribution among three choices pertaining to the ability to locate products, services and information without assistance, where 69 went along without any assistance at all, 32.5% acknowledged the statement of navigating without cooperation at a great degree, while 63 respondents did not need a helping hand at a considerable extent. The bulk of the albanian e-consumers are entirely more prone to returning for another online purchase if the website can be navigated easily.

### 5.3.5. Customer service

Apropos of customer service-related questions asked in the questionnaire, the greatest part of respondents' issues had been solved by their online agent in a considerable degree, by making over 40% of votes, which contributes to the fact that customer service in Albania has a lot to improve with reference to solving problems encountered by online purchasers. Unfortunately, the mode sticks to "a considerable degree" even when it comes to online agents' proficiency in information about the company they represent, their products and their policies correspondingly. Above all, albanian customers seem to be satisfied with the agents' communications as 38.2% of them agree that their online issue handler talked in a clear manner to a great extent. With respect to the perception of feeling valued, there is a positive feedback consisting of 35% choosing "to a great degree". Afterwards, the second most popular response turned out to be "to a considerable degree", which by the other side still leaves place for improvements in the future.

**6. liability And Validity Of The Research**

Reliability refers to the ability of a questionnaire to consistently measure an attribute and how good the items fit together. ( Haladyna 1999; DeVon et al. 2007) Even though reliability is necessary, it is not sufficient to validate an instrument, because an instrument may be reliable but not valid. (DeVon et al. 2007) In order for this study to be categorically reliable, it is needed a bigger number of albanian customers respondents. Hence, the number of answers consisting of 206 will not necessarily produce a generic representation of the albanian e-consumers' attitude towards the online shopping process.

Two estimators of reliability are regularly applied: internal consistency reliability and test-retest reliability. Internal consistency examines the inter-item correlations within an instrument and indicates how well the items fit together conceptually. (DeVon et al. 2007) Internal consistency can be evaluated in two ways: Cronbach's alpha correlation coefficient and Split-Half reliability.(Trochim W., 2007) Cronbach's alpha is equivalent to the average of all possible split-half estimates and it is the most frequently used reliability measurement to estimate internal consistency reliability. (Trochim W., 2007; DeVon et al. 2007)In this research, 5 Cronbach's Alpha coefficients are evaluated to examine the internal consistency of every section defined in the questionnaire conducted online, which are displayed in table 9.

Factor	Number of questions	Cronbach's Alpha
Security issues	4	0.97
Time saving efficiency	4	0.98
Product quality	4	0.66
Website features	4	0.96
Customer service	4	0.99

*Table 9: Reliability of every factor*

However, high reliability on its own is not enough to ensure validity. Even if a test is reliable, it may not accurately reflect the real situation.(Efthymiou A., Middleton N., Charalambous A., Papastavrou E.,

2019) Content validity is defined as the degree to which items in an instrument reflect the content universe to which the instrument will be generalized. (Straub, Boudreau et al. 2004) In this type of questionnaires, it is highly recommended to apply content validity.

Essentially, content validity incorporates evaluation of a new survey instrument in order to ensure that it includes all the items that are essential and eliminates undesirable items to a particular construct domain. (Boudreau et al., 2001) In this scientific study, there are only considered five factors significantly impacting the online shopping process, while there are many more which need to be evaluated by other researchers as well. Conjointly, due to time constraints the respondents were predominantly located in Coastal and Southeastern Albania. This poses a limitation to conduct content validity on a survey instrument as long as other albanian e-consumers can reflect different types of behaviours by being located in other parts of Albania as well.

**7. Conclusions And Reccomendations**

The research concludes on the first five objectives regarding each of the factors that security issues, time saving efficiency properties, product quality, website features as well as customer service have a statistically significant impact on the albanian online customers' experience among four different groups of topics with respect to each of the factors mentioned earlier. However, it was mainly observed that albanian e-consumers perceived a considerable risk perception concerning security issues. Hence, it affected the online shopping process negatively by preventing the customers from buying online at a great extent. This is evidence that albanian websites need to establish higher levels of security and privacy to ensure larger amounts of e-purchases. The influence of product quality and time saving properties on online shopping derived a positive relationship among a vast majority of the respondents. It was hugely obtained the idea of the customers being immensely motivated by considering e-shopping

## EVALUATING THE SIGNIFICANCE OF DECISIVE FACTORS AFFECTING CUSTOMERS' REACTION TOWARDS ONLINE SHOPPING-CASE OF ALBANIA

as a smart way of saving time. Having observed that, as long as e-consumers are satisfied with the product quality and do not get disappointed, the effect on online purchases will be positive too.

The ability to shop 24 hours a day triggers positive returns for purchasers in the albanianonline shopping markets. This way, every online shop that does not provide this feature should have an urgency in contributing to a non-stop e-service. Website features and design combined with customer service yield a moderate relationship in terms of post e-buying. Customers are more prone to returning for additional online purchases when faced with a good design and easy navigation of the website itself, insofar as description of the advertised products provided along with photographs represent the products accurately. This is an indication that web-designers should take into account the fact that albanian customers need the website to be easily navigated, but in the same time not largely stuffed with unnecessary information. However, if they are faced with inconsistency between the description and photographs advertised with respect to the products itself, a considerable mass of people are not returning again. Customer service plays a crucial role for albanian online buyers. The questionnaire conducted online gathered information about the potentiality of the online agents for solving problems with competence. Moreover, the research summarised that there is still a lack of knowledge undoubtedly present in dispersion through online agents in terms of the company they represent, their products and policies. Therefore, companies should establish more efficient trainings as well as practice-focused ones.

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## Abstract

The use of behavioural science in government and policy and regulation has been gaining popularity and momentum over the last five to ten years. Applications have historically been related to individual behaviour – either individuals working within government or citizens themselves. However, there is growing interest among governments and policy institutions to utilize behavioural science to enhance organisational behavior – from government institutions themselves to external organisations that interact with and are regulated by governments.

Organizational Behavior is the identification, analyzing and application of knowledge about how individuals and groups act in organizations. It interprets people-organization relationships in terms of the person, group, organization, and whole social system. Objective of it is to build better relationships by achieving people objectives, organizational objectives, and social objectives. It encompasses a wide range of areas, such as human behavior, Training and development, change management, leadership, teams, Group behavior etc. In the study of organizational behavior and diversity, the use of models, theories, and past experience are each helpful in gaining a complete understanding. Individuals within an organization behave as they do as a result of the context in which they are immersed. This short article seeks to examine this context in order to further the cause of helping managers deal with issues in their organizations from a standpoint of knowledge and understanding, rather than guesswork and out-dated methods.

First, the organization as a system will be discussed, including its interdependence upon other systems. Next, the importance of relationships as a vital part of the operation of organizations will be mentioned. Then, the management of diversity will be outlined, leading to a discussion of the importance of culture in influencing values. This paper is a theoretical paper with some concept in the behavior organizational as a important part of management.

**Keywords:** *human behaviour ,organisational structure,individuals behavior etc.*

## 1. The organization as a system

Organizations may most accurately be thought of as systems in which dynamic processes continually re-shape the system in response to sub-systems, other systems, and the environment. According to Cohen, Fink, Gadon, and Willits (2001), the model of a system helps understand the way organizations operate. They define a system as a set of mutually interdependent elements. In the case of a social system, the elements are behaviors and attitudes. The system takes in energy and translates it into a pattern, producing a useful output. In order to maintain equilibrium, the system must process information from its environment, analyze the feedback, and make the appropriate adjustments (Katz and Kahn, 1978). For social systems, this means developing self-adjusting behaviors. Systems are open in that they operate within the context of their environment,

responding to changes in that environment with changes in policies, rules, or other operating behavior. An individual may be seen as a part of a system, but since most systems are subsystems of larger systems, every individual is a part of numerous systems. Each of the systems influence an individual's behavior. This text is a theoretical point of view for organizational behavior and diversity.

## 2. The importance of relationship

When the organization is conceptualized as a system, the importance of relationships becomes obvious. Certain elements of relationships, such as trust and rapport, determine the nature of communication that takes place within an organizational system. Problems resulting from interpersonal relationships are the largest single reason for terminating a competent manager (Cohen, Fink,

Gadon, and Willits (2001). If communication is smooth and unfettered by personal disputes, dislikes, and other problems, the organization as system is most efficient in responding to changes in the environment and making the necessary adaptations. Therefore, management should place a high priority on developing healthy relationships with organizational members, as well as helping make relationships between members cordial and effective (McDaniels and Walls, 1997).

### 3. Management of diversity

Originally, diversity was seen as desirable because of its justness or fairness (Kirby and Richard, 2000). However, it was not seen as having other benefits to organizations. More recently, the benefits of diversity have been touted as being numerous and widespread. Diversifying the workforce is believed to have the effect of enriching organizational relationships, which allows for more effective self-organization (McDaniel and Walls, 1997). Another benefit of diversity is the ability to view problems from multiple perspectives, allowing work-groups to solve such problems most efficiently by using the correct approach for the correct problem. In the model of cultural synergy, managers create policies and strategies based partially on the cultural patterns of organization members and clients. In doing so, they are able to “transcend the individual cultures of their members” and create cultural synergy (Adler, 1991, p. 108). McDaniel and Walls (1997) use quantum theory and chaos theory to illustrate the “unknowable” nature of organizations. They see organizations as akin to organisms in their possession of organizational intelligence and their ability to learn. Seen in this way, organizations explore new possibilities which increase performance and improve systems. Infusion of a diversity of thinking styles and world views would only make such an organization more effective. Therefore, in the management of diversity, it appears that along with more diversity, more tolerance for ambiguity is necessary.

### 3.1. Values

In addition to environmental or system influences on behavior, members of organizations bring with them their own sets of internal values, which also influence their behavior. Values be defined as “something (as a principle or quality) intrinsically valuable or desirable” (Merriam-Webster, 1988) or “what is really important in life” (Cohen, Fink, Gadon, and Willits (2001, p. 174). Values may be seen as predictors of behavior because they determine how a person conceptualizes his or her world. Behaviors that will be performed include those that are in line with one’s most deeply-held values, whereas those that will be avoided may conflict with one’s values.

Cohen, Fink, Gadon, and Willits (2001) claim that values come from an individual’s personality, but these authors ignore the role of culture in shaping values. The assumption is that somehow each individual comes up with his or her set of values on their own. Values are actually created within a context of many overlapping cultures, including, family, regional, national, language. As children are socialized, they learn an implicit set of values that are held in common amongst members of particular groups. This “programming of the mind” does allow for some individual differences, but it also predetermines the value-sets of most people (Hofstede, 1997).

As a result of the importance of relationships in the organization as system, the role of values in predicting behavior is also pertinent to the management of diversity. Relationships between people from different cultural backgrounds will involve behavior which is motivated by underlying values. Since these underlying values are different amongst different cultures, the potential exists for misunderstanding. Therefore, management must oversee not only the implementation of diversity, but also ensure that relationships between members of different groups are based on cooperation and mutual understanding (Chen, Chen, and Meindl, 1998).

### 4. Conclusion

The main focus of the organizational behavior is to obtain a greater understanding of those factors which influence individual and group dynamics in an organization. Therefore individuals and the groups and organizations to which they belong may become more efficient and effective. Organizational behavior research is ultimately focused at providing human resource management professionals with the information and techniques which they need to select, train, and retain employees in a fashion which gives maximum benefit for the individual employee and for the organization.

The behavior of individuals in organizations can be understood by examining the context within which each individual operates. When viewed as a system, an organization consists of people who are engaged in interdependent relationships which enable dynamic, responsive changes, allowing the system to survive. Diversity is gradually becoming seen as a benefit rather than a liability to organizations, making them more innovative, competitive, and responsive to diverse customers.

In addition to maintaining and encouraging diversity, managers must go further to ensure that the relationships between diverse members are effective. Values, part of a person's self-concept, are culturally-determined constraints which affect how an individual within a system behaves and communicates with others. Therefore, the importance of attaining an understanding for other cultures' underlying sets of values is vital for maintaining healthy relationships in a diverse organization.

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# HEATMAPS AS OPTIMIZATION OF MARKETING SOLUTIONS TO INCREASE THE INFORMATIVE CONTENT OF THE WEBSITE

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## Abstract

This article deals with the basic concepts of this topic, illustrating the need for organizations to introduce heat maps as a means to optimize marketing decisions. The application of this resource in various areas of the organization's activities are studied in detail, as well as the options for using heat maps to study the desires and preferences of the consumer. The article also provides an analysis of correct and incorrect utilization of heat maps, and how their data should be interpreted to maximize website effectiveness.

**Keywords:** *neuromarketing, marketing, heat maps, consumer behavior.*

**JEL:**M31, M370, M300.

## 1. Literature review

In my research, I relied on some of the most popular articles on neuromarketing, which are listed and described below.

The article "Opportunities and limitations of using neuromarketing methods" (Nedelko A. Y., 2018) discusses data analysis methods by functional magnetic resonance imaging, electroencephalography, magnetoencephalography, electromyography, eye-tracking, as well as measuring cardiovascular data and skin-galvanic response, which scientists use to study how the brain reacts to any marketing actions. This article fully covers the methods used to study human behavior, which allows us to judge their effectiveness.

In her article titled "Neuromarketing tools: problems and prospects" (2018) Dershen V. describes the tools and methods of neuromarketing, and conducts a critical analysis of existing methods of data analysis. Thanks to this article we have a complete picture of the directions of application of neuromarketing, as well as the potential shortfalls of using these methods in research and commerce.

## 2. Problem definition.

Russian consumers have become more selective in their purchases as a result of the decline in

incomes in recent years. Consequently, in order to increase the effectiveness of their activities, advertisers have focused on creating ads that have the strongest effect on the consumer's motivation.

In the age of digital technology, all businesses are gradually moving online, which has an impact on advertising. To improve their competitiveness, advertisers are resorting to unconventional methods to make an impact on the consumer's purchasing habits, and this one of these techniques is the promotion of products using neuromarketing tools. A store's website has become very important, because digital storefronts account for 80% of sales.

## 3. Research

Marketing is an activity aimed at meeting market needs to make a profit.

Heat maps are a graphical representation of data where individual values in a table are displayed using color.

In the modern world, there is an accelerated digitalization of society, which has been further hastened by the coronavirus pandemic. Over the past 10 years, the number of online ads has increased. In any social network, one can observe increased activity from various firms and companies engaged in the sale of goods and

## HEATMAPS AS OPTIMIZATION OF MARKETING SOLUTIONS TO INCREASE THE INFORMATIVE CONTENT OF THE WEBSITE

services, including state-owned companies. The success of sales depends on effective advertising, so managers pay close attention to their marketing department. Every day there are new technologies to aid in the development of advertising, and marketing methods also need to be modernized in order to remain competitive. One of these methods is heat maps.

The term “heatmap” was coined and registered as a trademark by software developer Cormac Kinney in 1991. He used the term to describe a 2D display that displays real-time financial market information. Over time, the scope of this technology has expanded. Today, heat maps are used for medical research, marketing, and sociological research, engineering, geography, and many other fields. Since a huge number of companies use Internet re-sources to attract customers, marketing teams have come up with a way to use heat maps to study people’s desires and needs based on their behavior interacting with websites.

There are several types of heat maps:

- mouse activity maps;
- click maps;
- scrolling maps.

Mouse activity maps are based on human eye movement tracking technology. This technology helps to analyze the behavior of users on the site, but conclusions based on cursor movements can be very questionable.

In 2010, a Google user experience study found that only 6% of people had a direct connection between cursor movements and eye movements; 19% of people had an indirect connection between cursor movements and eye movements; 10% of people hovered over a link and then continued to study other elements of the site.

A click map is a type of heat map that is based on data on clicks made (see Figure 1). The blue color indicates the zones that are least popular with

users, and the red color indicates the most popular ones. The white and yellow colors indicate the most frequent places where the site visitors clicked.

Cohen, Fink, Gadon, and Willits (2001) claim that values come from an individual’s personality, but these authors ignore the role of culture in shaping values. The assumption is that somehow each individual comes up with his or her set of values on their own. Values are actually created within a context of many overlapping cultures, including, family, regional, national, language. As children are socialized, they learn an implicit set of values that are held in common amongst members of particular groups. This “programming of the mind” does allow for some individual differences, but it also predetermines the value-sets of most people (Hofstede, 1997).

As a result of the importance of relationships in the organization as system, the role of values in predicting behavior is also pertinent to the management of diversity. Relationships between people from different cultural backgrounds will involve behavior which is motivated by underlying values. Since these underlying values are different amongst different cultures, the potential exists for misunderstanding. Therefore, management must oversee not only the implementation of diversity, but also ensure that relationships between members of different groups are based on cooperation and mutual understanding (Chen, Chen, and Meindl, 1998).

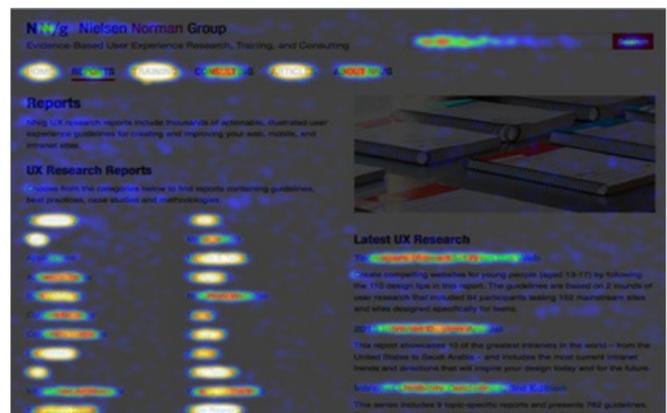


Figure 1 - Heat map.

## HEATMAPS AS OPTIMIZATION OF MARKETING SOLUTIONS TO INCREASE THE INFORMATIVE CONTENT OF THE WEBSITE

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The click map can justify the need for optimization, as well as reveal which elements are not working as intended. For example, the large image on the page, which, as the map shows, is clicked on by many people.

Scrolling maps are heat maps that show how much users are scrolling through a webpage. This metric is interesting because one can use it to see at which stage visitors lose interest in exploring a page. Scrolling maps help us to adjust the design to assure important information is reaching as many users as possible, as well as guiding developers as to whether the page is of appropriate length. Other observations can be gleaned from this data as well, especially by taking careful notice of design choices at the point in which a user has stopped scrolling. Perhaps it is because the colors on the landing page are too different from one another, causing users to think that the blocks are unrelated.

The main reasons for using heat maps in marketing:

- obtaining information on the use of Internet resources (tracking traffic and the number of clicks on links will help optimize the site and make it more successful);
- testing the resources (using the heat map, you can choose the best option for placing site links and main site information);
- content marketing (the heat map allows one to find out if the content is being engaged with, and provides feedback as to the optimal placement of links).

Despite the above advantages of this technology, there are also significant disadvantages. Change to: Despite the inherent advantages of this technology, it can lead to some incorrect assumptions if it is utilized improperly.

The sample for conducting research should be at least 2-3 thousand daily users, a smaller number will lead to incorrect indicators. When examining the click map, one needs to consider the human factor, taking into account that a person can view something on the site without hovering the cursor over this element. In addition, a person can

unintentionally hover the cursor over an element that they are not actually paying attention to.

If a marketer uses heat maps, they must be able to interpret the data they receive. In general, these maps are universally useful, but if one does not analyze the data properly, they may rush to an incorrect conclusion. To reduce risk, one should take into account several sessions with the highest number of visitors per day.

Depending on the problem, the methods of solving it can be varied. Most common situations:

- Problem: users don't scroll the page far enough. Solution: move the most important information to the top of the page or leave a link at the top of the page which allows a user to immediately scroll to the appropriate section of the website.
- Problem: the user clicks on the most ordinary images or icons. Solution: select the most popular images among site visitors and insert links to similar content in them.
- Problem: users click on the wrong resources that the marketer expects. Solution: try to redistribute important information to the links that you want the user to click on.

In the modern world, the importance of online advertising has increased due to the digitalization of society. To remain competitive and attract more consumers, many organizations, for-profit and nonprofit, have shifted their strategy to make more resources available online. At the moment, the amount of sales from online stores is approaching the amount of sales from traditional storefronts. Because of this, many managers have begun to attract Internet marketers to increase sales efficiency. Marketers, in turn, utilize neuromarketing techniques to modernize the websites of sellers using various methods, including heat maps, to analyze the behavior of users. The analysis of heat maps will be effective only in the case of a large number of site visitors. Based on the collected data, marketers change the design of the site, redistribute important

information, reduce or increase the site content, with the end goal of making the web resource more focused on the needs of the buyer.

### 4. Results

I believe using heat maps for decision-making in marketing is underestimated. By analyzing data from such maps, sellers more efficiently hone in on the needs of the consumer, which will increase sales, as well as indicate the weaknesses of the web resources and reveal ways in which to improve the efficiency and effectiveness of online storefronts. When choosing this method of analysis, to improve the quality of research results, it is recommended to base the results on a sample of 2,000 respondents, in our case 2,000 website visitors

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# ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

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## Abstract

The aim of this research is to evaluate the effectiveness of fiscal policy as a means of influencing output in North Macedonia. We apply a VEC model, and use quarterly data for the period 2000q1-2019q4. Our findings suggest that the possibility of fiscal policy to be used as a short-term stabilization tool was limited by the turbulent early phase of transition and several IMF arrangements; the exchange rate peg; and the scarcity of financial resources. The results of the baseline model suggest that a government spending shock is more effective as a stabilization fiscal tool in Macedonia, compared to a tax shock, although fiscal multipliers smaller than one suggest that the effectiveness of fiscal policy in boosting output is limited. The findings confirm the importance of structural characteristics, suggesting that not accounting for monetary policy reaction and debt dynamics will result in an overstatement of fiscal multipliers. In particular, the results suggest that the “crowding out” effect of fiscal policy due to interest rate pressure is absent and that monetary policy is accommodating an expansionary fiscal policy. The results of our investigation suggest that an increase in government expenditures will induce a significant increase in taxes. Moreover, although an increase in spending/taxes will result in a short-lived increase/decrease in public debt, as a priori expected, we find a long-equilibrium relationship between government spending and taxation suggesting that debt sustainability is not an issue in the case of Macedonia.

**Keywords:** *fiscal policy, fiscal multipliers, government spending, taxation, North Macedonia.*

## Introduction

The objectives of this research are to evaluate whether there is any room/possibility for using fiscal policy as a tool for short-term economic stabilization considering a number of specific features of the Macedonian economy; to provide quantitative estimates for the effect of fiscal shocks on output; and to empirically investigate the effects of the structural characteristics of the country on the transmission channels of fiscal policy.

The fiscal policy overview in North Macedonia suggests a division (paradigm shift) of fiscal policy between two periods: before and after 2008. Fiscal policy in the first period, especially in the first years of transition was focused on consolidating public finances in order to achieve macroeconomic stability, hence, the possibility to be used as a short-term stabilization tool was severely limited. The role of fiscal policy was confined to the work of automatic stabilizers. However, the low level and coverage of unemployment benefits, and the low level of social assistance and its inability to react swiftly to changes in incomes, as well as the

predominance of indirect taxes, which are procyclical, are the main factors that make automatic stabilizers largely ineffective (Mojsoska-Blazheski, 2012).

An additional constraint on the usage of fiscal policy for stabilization purposes was the monetary strategy of a fixed exchange rate regime. Considering the fact that North Macedonia is a small open economy, and the insufficient level of foreign exchange reserves in the first years of transition, this would translate into coordinating fiscal policy in order to not disrupt the maintenance of the fixed exchange rate, therefore, additionally limiting any room for using fiscal policy as an output stabilization tool.

For most of the period analyzed North Macedonia was using IMF arrangement in order to stabilize its economy. Therefore, during these years, the macroeconomic policy mix was set up mutually by the North Macedonian government and IMF staff approval, giving priority to the monetary policy objective of maintaining the fixed exchange rate and, consequently, setting small budget deficit

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

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targets or even surpluses, hence limiting the possibility of using fiscal policy as a stabilization tool.

The usage of fiscal policy as a stabilization tool was also constrained by the availability of financial sources, the underdeveloped domestic securities market, and not having access to international capital markets, especially in the first years of transition.

Fiscal policy in North Macedonia experienced a paradigm shift, turning from a prudent use mainly as a subordinate measure of monetary policy objective, to a more proactive use as an output stabilization tool. Several actions in terms of fiscal shocks, albeit small in magnitude, were implemented in 2008 in order to tackle the negative consequences of the global financial crisis in the North Macedonian economy. Additionally, from 2008, a higher budget deficit in the medium term was targeted. The improved macroeconomic stability situation, the improved access to financial sources and improved foreign exchange deposit coverage contributed to increasing the possibility of using fiscal policy as a stabilization tool in the period after 2008.

In this empirical investigation a Vector Error Correction Model (VECM) is used. The VECM is advantageous compared to the Vector Autoregression (VAR), because besides being 'data driven' it also imposes structure in the model reflecting both (i) theoretical judgements and (ii) the cointegration properties of the variables of interest. This feature of our modelling strategy allows us to investigate the long-term fiscal multipliers while considering the government solvency condition. This research contributes to the existing literature of fiscal policy in two aspects. Firstly, considering the lack of thorough studies investigating the short-run dynamics and long-run effects of fiscal policy on output in North Macedonia, this empirical evidence will fill a gap in the empirical literature on Macedonia. Secondly, this investigation will shed more light on the transmission mechanism of fiscal policy in North Macedonia, refer to and compare two main theoretical predictions on fiscal policy, and provide possible recommendations to policymakers in North Macedonia.

The rest of the paper is organized as follows: In the first section a literature overview is provided. The second and third section describes the data and the methodology of investigation. The fourth section unit root and cointegration analysis is provided. The fifth and sixth sections provide the results of the baseline model and the results of robustness checking of the baseline model for different samples and alternative specifications. The final section provides the findings of this research.

**Literature Overview** The research investigating the effects of fiscal policy in North Macedonia is scarce, mainly due to the short span of data available on fiscal variables on a quarterly basis and its disputable quality. Angelovska-Bezovska et al. (2011) investigate the cyclical behavior of fiscal policy to output gap for the period 1999-2009 by applying a GMM model. Their findings suggest that fiscal policy was procyclical during the period of transition but after 1995 fiscal policy appears to be countercyclical. Stojcevska and Miteski (2016) explore the twin deficit hypothesis in Macedonia for the period 1998-2013 using a VAR model with the following variables: budget balance, GDP, balance of goods and services and exchange rate. Their findings suggest that an expansionary fiscal policy does not aggravate the current account deficit. Petrevski et al. (2016) investigate the interaction of fiscal and monetary policy in Macedonia, Croatia and Bulgaria using a VAR model with the following variables: output inflation, interest rate and budget surplus. Their findings suggest that an expansionary fiscal policy will result in a decrease of interest rates, hence implying that monetary policy is accommodating the fiscal policy shock stabilization role. Their findings also suggest that fiscal policy is procyclical for the period of investigation 1999q1-2011q4. To our best knowledge, so far, there are only two studies investigating the effectiveness of fiscal policy as a stabilisation tool in North Macedonia and computing fiscal multipliers for the corresponding fiscal shocks, Kurtishi (2012) and Trenovski et al. (2016). Kurtishi (2012) investigates the effects of fiscal policy on output and other macroeconomic variables using quarterly data for the period

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

1997q1-2011q4, and employing a recursive VAR model with the variables ordered as follows: GDP; inflation; average net wage; net imports; the level of credit of the non-government sector; the interest rate; tax revenues; and government expenditure. Kurtishi (2012) suggests that an expansionary fiscal policy in North Macedonia will result in negative fiscal multipliers; i.e. an increase in government spending will result in a positive increase of GDP on impact but afterwards becomes negative. However, it should be emphasized that the IRF plots of fiscal shocks in Kurtishi (2012), on which the computation of the fiscal multipliers is based, show an insignificant response of GDP to both shocks: government spending and tax revenues. The drawback of this study is using relatively many variables (8) in the model with a fairly small number of observations (60), which in turn yields insignificant results. Trenovski et al. (2016) investigate the effects of fiscal policy on output and other macroeconomic variables using quarterly data for the period 2000 q1-2011q4, and employing a recursive VAR model with the variables ordered as follows: government spending; output gap; tax revenue; public debt; inflation; the level of foreign exchange reserves; and interest rate. The Trenovski et al. (2016) findings also suggest fiscal multipliers smaller than one but negative; i.e. an expansionary fiscal policy in North Macedonia will result in a decrease of GDP. However, this study also relies on a short span of data and a relatively big model, hence, small degrees of freedom. To, our best knowledge, there is no study employing a VECM in analyzing the effectiveness of fiscal policy in North Macedonia.

### Data Description

The scope of this analysis of the effects of fiscal policy in North Macedonia is limited by data quality and availability on a quarterly basis. The availability of quarterly fiscal series starts from 1997. However, in the early years quarterly budgetary data are fairly problematic in terms of their accuracy, reliability and consistency. Hence, considering the endogeneity bias that may arise if quarterly data are interpolated from annual fiscal data, we refrain from using the whole sample but instead define the sample period from 2000q1-

2019q4, considering the quality of the data i.e. that for this period we are assured that the original budgetary data are not interpolated but collected on a monthly basis and are presented in nominal terms and not seasonally adjusted. Although the standard compilation of the fiscal variables in the fiscal policy literature is to use disaggregated data following Blanchard and Perroti (2002), we use total figures of revenues and expenditures in this study due to certain data limitations and methodological inconsistency in the data before 2005. However, for a robustness check, the model will be executed on a different sample period 2005q1-2019q4, with fiscal variables compiled as in Blanchard and Perroti (2002). Fiscal variables are seasonally adjusted by the TRAMO-SEATS method in EViews and deflated by using CPI(2005). The sources of variables used are NBRM and the bulletins of the Ministry of Finance. Considering the short span time series of data available for Macedonia we are constrained to use a parsimonious model with only three variables: GDP, revenues and expenditure. However, in terms of robustness check we augment this baseline model with other macroeconomic variables suggested by the fiscal policy literature.

### Methodology

This section provides a brief discussion of the method of investigation used in our empirical analysis and gives arguments for the choice of this methodology. In this empirical investigation a Vector Error Correction Model (VECM) will be used. Similar to vector auto-regression (VAR) models, the VECM is 'data driven', treating the variables in the system as endogenous and exploiting the cointegration properties of the variables of interest. However, VEC models are specified by imposing structure reflecting theoretical judgments. For example, the VECM simultaneously identifies the long-run equilibrium relationships between the levels of the variables, the adjustment mechanisms that maintain or disrupt the long-run relationships, and short-run dynamics, therefore yielding more efficient estimates compared to VAR models. VECM is also advantageous in treating the unit root problem that is apparent in VAR models. Even though VAR models yield consistent

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

parameter estimates for short-run horizons irrespective of the non-stationarity of variables, Philips (1998) argues that impulse responses for longer time horizons are not consistent in a VAR model with variables containing a unit root. Philips (1998) suggests using a VECM with non-stationary variables if cointegration relationships are present. Additionally, the cointegration properties of the variables can be utilized as identifying restrictions by distinguishing between permanent and transitory shocks.

The reduced form VECM is as follows:

$$\Delta y_t = \alpha \beta' y_{t-1} + \Gamma_1 y_{t-1} + \dots + \Gamma_{p-1} y_{t-p+1} + D_t + u_t \quad \text{Eq. (1)}$$

where  $y_t$  is a  $K \times 1$  vector of time series,  $\alpha$  is a  $K \times r$  matrix of loading coefficients,  $\beta$  is a  $K \times r$  cointegration matrix,  $D_t$  is a vector of deterministic terms,  $\Gamma_j$  is a  $K \times K$  short run coefficient matrix and  $u_t \sim (0, \Sigma_u)$  is a white noise error term. The relationship between the error term of the structural form VECM,  $\varepsilon_t$  and reduced form disturbances,  $u_t$  is as follows:

$$u_t = A \varepsilon_t \quad \text{Eq. (2)}$$

where the contemporaneous impact matrix  $A$  needs to be identified in order to compute the responses to structural shocks,  $\varepsilon_t$ . If the assumption that structural shocks are uncorrelated and have unit variance holds ( $\Sigma_u = I_K$ ), then:

$$\Sigma_u = E [u_t u_t'] = E[\varepsilon_t \varepsilon_t'] = A \Sigma_\varepsilon A' = A A' \quad \text{Eq. (3)}$$

and the symmetry of  $\Sigma_\varepsilon$  and the normalization of structural variances impose  $K(K+1)/2$  restrictions on the  $K^2$  parameters of  $A$ ; hence, in order to exactly identify elements of  $A$ , an additional  $K(K-1)/2$  linear independent restrictions should be imposed. The VECM can be expressed in a vector moving average (VMA) representation as follows:

$$y_t = C(1) \sum_{i=1}^t (u_i + \Xi D_i) + C_1(L)(u_t + \Xi D_t) + y_0 \quad \text{Eq. (4)}$$

where the total impact matrix

$$C(1) = \beta \perp (\alpha \perp (I_K - \sum_{i=1}^{p-1} \Gamma_i) \beta \perp)^{-1} \alpha \perp'$$

has a reduced rank  $\text{rk}(C(1)) = K-r$  and  $\alpha \perp$  and  $\beta \perp$  represent the orthogonal complements of  $\alpha$  and  $\beta$ , respectively. From Eq.(4) the long run effects of structural shocks can be written as follows:

$$C(1)A \quad \text{Eq. (5)}$$

Considering the economic theory on fiscal policy,

long-run restrictions can be imposed by setting the elements of Eq.(5) to zero. Hence, following Krusec (2003) and Marattin and Salotti (2013) this empirical analysis will continue as follows:

- Investigate the order of the integration of the variables in the model;
- Determine the cointegration rank and identify cointegration relations using Johansen (1995) ML and Saikkonen and Lutkepohl (2000) methodology;
- Setup a full VEC and subset VEC using cointegration relationships and use the residuals from the full and subset models to form estimates for  $\Sigma_u$ ;
- Long-run and contemporaneous restrictions are used to form estimates of  $A$  and using the estimated contemporaneous impact matrix structural shocks are recovered;
- Analyse IRFs of the shocks of interest;
- Compute and interpret fiscal multipliers.

### Unit Root Testing And Cointegration Analysis

The standard Augmented Dickey Fuller (ADF) test is conducted for all the series augmented by a deterministic term and a constant. The number of lagged differences used on the specification of the testing equation is based firstly on the model diagnostics, and secondly on the information criteria. Additionally, the ADF test with structural break is conducted in a presence of a single structural break (in each case identified by the algorithm included in JMulti). The unit root testing suggests that all of the variables of interest are integrated of order one  $I(1)$ .

The cointegration properties of the variables in our model are investigated using both the Johansen Trace Test and the Saikkonen and Lütkepohl Test, which allows for cointegration testing in the presence of one or two structural breaks. Testing for cointegration is conducted conditional on the choice of deterministic components and their role in the VECM. Hence, in order to test for cointegration, the underlying VAR model should be specified: i.e. to be determined are both the order of the VAR and the deterministic components to be included in the VAR. Therefore, the following cointegration tests are based on the underlying

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

fully specified VAR model in I(1) levels:

- Endogenous variables:
  - o the log of GDP (lngdp);
  - o the log of tax revenues (lnt);
  - o and the log of government expenditures (lng)
- 4 lags of endogenous variables
- Deterministic terms:
  - o an intercept and a trend,
  - o impulse, shift and trendshift dummies for both 2005 q1 and 2008 q4

The results suggest 2 cointegration vectors in our model. In order to interpret these cointegration vectors, theoretical considerations should be used for guidance in order to express meaningful long-run relationships (Pesaran and Shin, 2002). These cointegration vectors can be written in terms of Eq. (1) as follows:

$$\begin{bmatrix} \Delta Y_t \\ \Delta T_t \\ \Delta G_t \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \end{bmatrix} \begin{bmatrix} 1 & 0 & \beta_1 \\ 0 & 1 & \beta_2 \end{bmatrix} \begin{bmatrix} Y_{t-1} \\ T_{t-1} \\ G_{t-1} \end{bmatrix} + \sum_{i=1}^p \Gamma_i \Delta Y_{t-i} + D_t + u_t \quad Eq. (6)$$

The first cointegration relationship between government expenditure and GDP can be intuitively interpreted in terms of a long-run fiscal multiplier. The second cointegration relationship between government expenditure and tax revenues can be intuitively interpreted in terms of the government solvency condition; i.e., in the long-run, total government expenditures including interest payments on the outstanding debt must equal government revenues in the form of taxes.

### Empirical Results

In this section the results of our preferred VECM are provided. A VECM estimated with subset restrictions is reported in Table 1. We note that in this analysis we use a relatively short span of data set from which to extract: the long-run relationship between the log-levels of our two endogenous variables, conditional on a structural break; adjustment paths toward this equilibrium relationship; and short-run relationships between the differenced variables in the VECM. Hence, the number of estimated parameters is reduced using the top-down algorithm that at each iteration omits the variable contributing least to the model. Therefore, the following VECM with subset restrictions is reported in Table 1:

- Endogenous variables ordered as follows:
  - o the log of GDP (lngdp)
  - o the log of tax revenue (lnt)
  - o the log of government expenditure (lng)
- 4 lags of endogenous variables
- 2 cointegration vectors:
  - o The long-term fiscal multiplier: GDP=Bg
  - o The solvency condition: T=Bg
- Deterministic terms constrained to the Cointegration vectors:
  - o shift and trendshift for 2005 Q1
  - o shift 1 and trendshift 1 for 2008 Q4
  - o constant and trend
- Deterministic terms outside of the cointegrating vectors:
  - o impulse dummies

**Table 1 VECM with subset restrictions**

Estimation results	Model Coefficients	Coefficients
Estimation method	Two stage, 1st=S2S, 2nd=EGLS	Standard Dev.
Estimation period	[2001 Q2, 2015 Q2], T = 57	t-values

$$\begin{bmatrix} d(\text{lngdp}(t)) \\ d(\text{lnt}(t)) \\ d(\text{lng}(t)) \end{bmatrix} = \begin{bmatrix} -0.717 & \dots \\ 1.884 & -2.047 \\ 0.556 & \dots \end{bmatrix} \begin{bmatrix} 1.000 & \dots & -0.191 \\ \dots & 1.000 & -1.128 \end{bmatrix} \begin{bmatrix} \text{lngdp}(t-1) \\ \text{lnt}(t-1) \\ \text{lng}(t-1) \end{bmatrix} + \begin{bmatrix} 0.006 & 0.002 & -0.189 & 0.028 & -9.112 & -0.012 \\ 0.003 & 0.007 & 0.036 & -0.121 & 1.399 & -0.007 \end{bmatrix} \begin{bmatrix} \text{trendshift1}(t-1) \\ \text{trendshift1}(t-1) \\ \text{shift1}(t-1) \\ \text{shift1}(t-1) \\ \text{CONST} \\ \text{TREND}(t-1) \end{bmatrix} + \begin{bmatrix} 0.236 & 0.061 & 0.043 \\ -1.125 & 1.057 & -0.807 \\ 0.320 & 0.163 & \dots \end{bmatrix} \begin{bmatrix} d(\text{lngdp}(t-1)) \\ d(\text{lnt}(t-1)) \\ d(\text{lng}(t-1)) \end{bmatrix} \\ + \begin{bmatrix} \dots & \dots & \dots \\ -1.306 & 0.718 & -0.506 \\ \dots & \dots & 0.148 \end{bmatrix} \begin{bmatrix} d(\text{lngdp}(t-2)) \\ d(\text{lnt}(t-2)) \\ d(\text{lng}(t-2)) \end{bmatrix} + \begin{bmatrix} \dots & 0.062 & -0.154 \\ \dots & 0.515 & -0.814 \\ \dots & 0.135 & \dots \end{bmatrix} \begin{bmatrix} d(\text{lngdp}(t-3)) \\ d(\text{lnt}(t-3)) \\ d(\text{lng}(t-3)) \end{bmatrix} + \begin{bmatrix} \dots & 0.031 & \dots \\ \dots & \dots & -0.417 \\ \dots & -0.123 & \dots \end{bmatrix} \begin{bmatrix} d(\text{lngdp}(t-4)) \\ d(\text{lnt}(t-4)) \\ d(\text{lng}(t-4)) \end{bmatrix} + \begin{bmatrix} \dots & \dots \\ -0.171 & 0.271 \\ \dots & 0.192 \end{bmatrix} \begin{bmatrix} \text{impulse1}(t) \\ \text{impulse}(t) \end{bmatrix} + \begin{bmatrix} u1(t) \\ u2(t) \\ u3(t) \end{bmatrix}$$

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

Before proceeding with the interpretation of the VECM estimates, in the following part we investigate whether the model is statistically valid and structurally stable. The diagnostic tests are satisfactory. The model is well specified in terms of normality and absence of ARCH effects, although there is some evidence of autocorrelation effects at the sixth lag in the government spending equation. The VEC model is considered to be satisfactory if each adjustment causes the ECM to behave more like a white noise residual: i.e. the cointegrating vector estimated with a constant should fluctuate randomly around mean zero. The plots of the ECM suggest that there is no evidence of significant cross correlation between residuals in the model, and plots of the residuals of the individual equations in the VECM suggest that they are stationary, mean reverting around zero. The plots of Chow stability tests suggest good evidence of structural stability.

In Tables 2 and 3, the  $\alpha$  and  $\beta'$  matrices are presented – i.e. the estimated loading coefficients ( $\alpha$ ) and the estimated cointegration matrix ( $\beta$ ) – together with their corresponding statistical significance (shown by t-statistics). The first estimated cointegration relationship captures the co-movement of government expenditure and GDP. The estimate is significant, suggesting that a 1% increase in government expenditure will increase GDP by 0.2% in GDP in the long run.

The second cointegration relationship between government expenditures and tax revenue suggests that, in this case, the government intertemporal budget constraint is binding: i.e. the estimate is significant and suggesting that an increase in government expenditure by 1% must be matched by a long run increase in taxes by 1.128%. The value of the adjustment coefficients is high, statistically significant and stabilizing (i.e. each one has the opposite sign to the respective coefficient in the cointegration vector). For instance, if the level of GDP is too high one period in the past, say by 1%, then the response in the current quarter will be (i) a fall in GDP by 0.717%, (ii) a large rise in tax revenues of 1.884% (which would tend to curtail current GDP), and (iii) a rise in government expenditure by 0.556%. If tax revenues are higher than government expenditure, say by 1%, then in order to restore equilibrium the growth rate of taxes will fall by 2.047%. Additionally, in the context of the second cointegration vector we test the government solvency condition:  $\ln t = \beta \ln g$  by imposing the corresponding restriction on the beta coefficient,  $H_0: \beta = 1$ . The Wald test results suggest that the restriction imposed on  $\beta$  holds; i.e. we cannot reject the  $H_0: \beta = 1$ . Moreover, the remaining coefficients of the VEC model with this restriction on the beta coefficient together with the diagnostic test results are very similar to the model without this restriction.

**Table 2  $\alpha$  and  $\beta'$  matrix: coefficient estimates**

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">-0.717</td><td style="padding: 2px;">---</td></tr> <tr><td style="padding: 2px;">1.884</td><td style="padding: 2px;">-2.047</td></tr> <tr><td style="padding: 2px;">0.556</td><td style="padding: 2px;">---</td></tr> </table>	-0.717	---	1.884	-2.047	0.556	---	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">1.000</td><td style="padding: 2px;">---</td><td style="padding: 2px;">-0.191</td></tr> <tr><td style="padding: 2px;">---</td><td style="padding: 2px;">1.000</td><td style="padding: 2px;">-1.128</td></tr> </table>	1.000	---	-0.191	---	1.000	-1.128	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;"><math>\ln gdp(t-1)</math></td></tr> <tr><td style="padding: 2px;"><math>\ln t(t-1)</math></td></tr> <tr><td style="padding: 2px;"><math>\ln g(t-1)</math></td></tr> </table>	$\ln gdp(t-1)$	$\ln t(t-1)$	$\ln g(t-1)$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">0.006</td><td style="padding: 2px;">0.002</td><td style="padding: 2px;">-0.189</td><td style="padding: 2px;">0.028</td><td style="padding: 2px;">-9.112</td><td style="padding: 2px;">-0.012</td></tr> <tr><td style="padding: 2px;">0.003</td><td style="padding: 2px;">0.007</td><td style="padding: 2px;">0.036</td><td style="padding: 2px;">-0.121</td><td style="padding: 2px;">1.399</td><td style="padding: 2px;">-0.007</td></tr> </table>	0.006	0.002	-0.189	0.028	-9.112	-0.012	0.003	0.007	0.036	-0.121	1.399	-0.007	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">trendshift1(t-1)</td></tr> <tr><td style="padding: 2px;">trendshift(t-1)</td></tr> <tr><td style="padding: 2px;">shift1(t-1)</td></tr> <tr><td style="padding: 2px;">shift(t-1)</td></tr> <tr><td style="padding: 2px;">CONST</td></tr> <tr><td style="padding: 2px;">TREND(t-1)</td></tr> </table>	trendshift1(t-1)	trendshift(t-1)	shift1(t-1)	shift(t-1)	CONST	TREND(t-1)
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**Table 3  $\alpha$  and  $\beta'$  matrix: t-values of coefficients**

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## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

### Structural Vector Error Correction Model

In this section, we derive identifying restrictions in order to identify structural shocks. Accordingly, as shown in Table 4, following Krusec (2003) and Marattin and Salotti (2013), we impose the assumption that change in taxes for stabilization purposes does not have a long-term effect on GDP. Also, we restrict the permanent effect of tax changes for stabilization purposes on government expenditure to be zero; i.e. tax changes do not affect government expenditure in the long term. In order to identify structural shocks, additional restrictions must be imposed on the contemporaneous relation matrix. Hence, we assume no contemporaneous effect of tax shocks on government spending, which is an intuitive assumption, because there is unlikely to be a quarterly revision of predetermined spending categories on the basis of unexpected movements in tax collection. We use the decision lag argument to restrict the contemporaneous effect of government expenditure on taxes to zero and also to assume that, within a quarter, there is no contemporaneous effect of GDP on government expenditure. These long-run and contemporaneous restrictions are used to form estimates of the A matrix and, using the estimated contemporaneous impact matrix, structural shocks are recovered. In turn, these assumptions and corresponding restrictions are the platform for computing and analyzing Impulse Response Functions of the shocks to fiscal variables and to compute the corresponding fiscal multipliers.

**Table 4 Identifying structural shocks: implementation in JMULti**

The screenshot shows two matrices side-by-side. The left matrix is labeled 'B matrix' and has three columns labeled 'logdp', 'it', and 'hg'. The right matrix is labeled 'identified long-run impact matrix' and has the same three columns. Both matrices contain numerical values and asterisks representing restrictions.

	logdp	it	hg
*	*	*	*
*	*	*	*
0	0	*	*

	logdp	it	hg
*	0	*	*
*	*	*	*
*	0	*	*

### Impulse Response Function analysis

Figure 1 compares the impulse-responses derived from the estimated reduced form VECM and the Structural VECM. The IRFs of VECM and SVECM are calculated using different units of fiscal shock: a one unit (i.e. one percentage point) shock in the case of IRFs calculated on the platform of the reduced form VECM; and a one standard

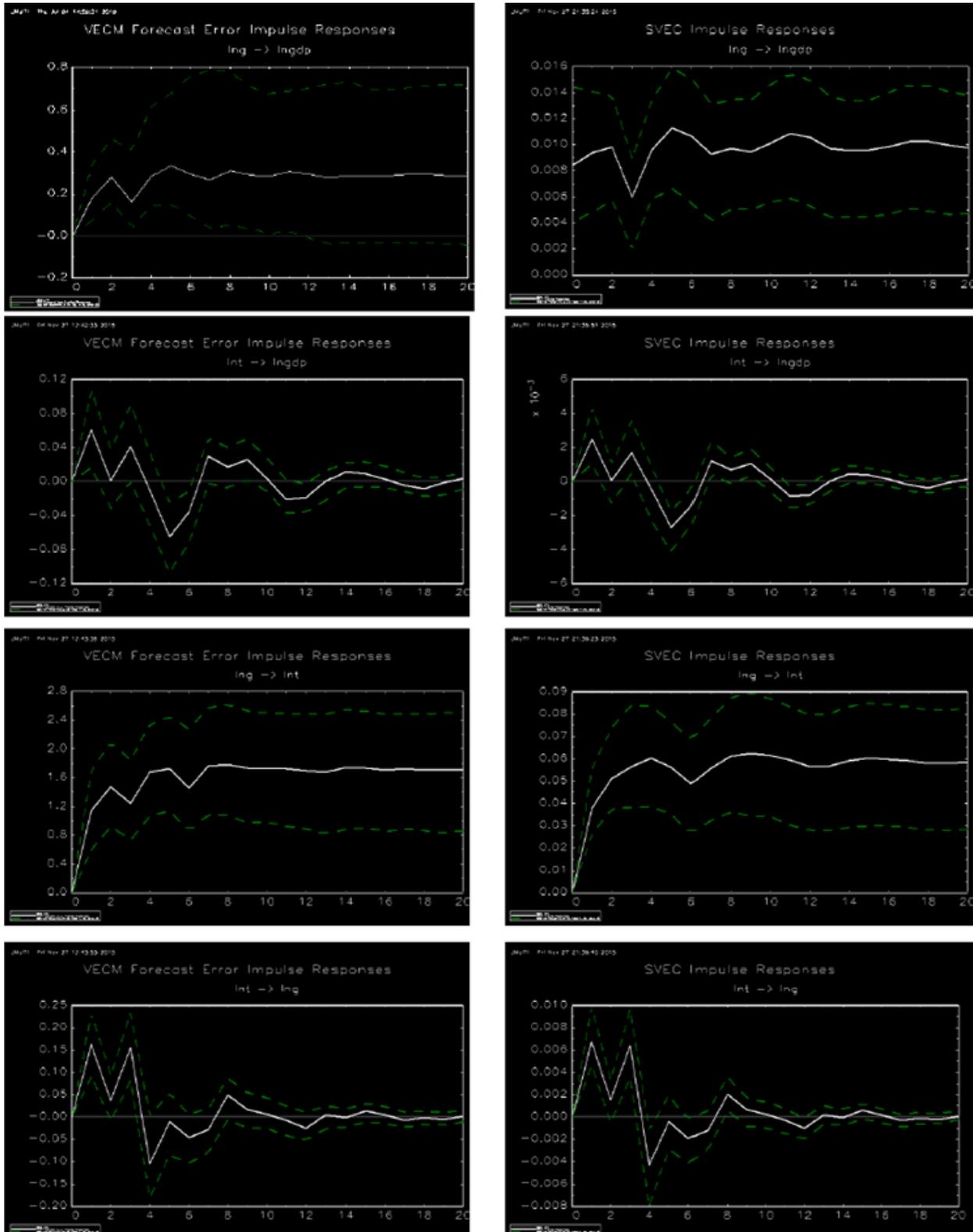
deviation shock in the case of IRFs calculated from the SVECM. Qualitatively, in Fig.1 the effects can be seen to be very similar with respect to the direction and duration of the responses; however, the responses are measured on different scales and thus cannot be easily compared quantitatively. Considering Lütkepohl's (2005, p.262) suggestion that IR analysis is valid only if the shocks in different variables are independent, we investigate the cross correlation among residuals of the equations in the VECM. In order to make sure that there are not statistically significant cross correlations among the residuals of the equations in the VECM, we compare the off-diagonal elements with the test statistic  $2/(\text{square root of } T)$ , where T is the number of time-series observations used in estimation. In our case, the test statistic is  $2/\sqrt{57}=0.265$  and each of the off-diagonal estimated correlation is smaller than the test statistic (0.265). Hence, in our case, the correlation of residuals is not significantly different from zero and, therefore, we give preference to the IRFs calculated from the VECM and proceed with their quantitative interpretation. The 95% confidence intervals are bootstrapped using the Hall (1992) percentile method. The IRFs represent the response of the variable of interest to a one unit shock (i.e. one percentage point) of the fiscal variable. The first two graphs of Fig. 1 correspond to the effect of a government expenditure shock on GDP. The plots indicate that an increase in government expenditure will cause a positive effect on GDP. For instance, a 1% increase in government spending will increase GDP by around 0.3% after a year. The positive effect, albeit small in magnitude, is persistent and significant up to 3 years after the shock. The fifth and sixth graphs in Fig.1 correspond to the effect of a tax revenue shock on GDP. The plots indicate that an increase in taxes, in general, does not significantly affect GDP in Macedonia. The IRF plot shows only a short-lived significant decrease of 0.06% of GDP in the fifth quarter due to 1% increase in taxes. The results are in line with theoretical predictions of the fiscal policy literature and with the findings for other transition countries. However, these results are contrary to the findings of the two previous studies for Macedonia, Kurtishi (2013) and Trenoski (2015), both of which find a positive effect on GDP from a tax increase and a negative effect – albeit not significant – from a government expenditure

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

shock. The last two graphs of Fig.1 correspond to the effect of a government expenditure shock on taxes and vice versa. Even though these are not our shocks of interest, the plots suggest that an

increase in government expenditures will induce a significant increase in taxes, while an increase in taxes will significantly be followed by an increase in government expenditures only in the first year.

**Fig.1 Comparison of VECM (left) and SVEC (right) Impulse Response Functions**



## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

The IRF plots cannot directly be interpreted as fiscal multipliers, because the fiscal shock and the response of GDP would be expressed in different units: the shock as 1% of spending or tax revenues, and the GDP response as a percentage of GDP. In order to compute fiscal multipliers, additional calculations are done. Specifically, a re-scaling transformation is applied. For instance, the unit shock of government spending is multiplied by the inverse of the average share of spending in GDP in the corresponding sample in order to define the size of the spending shock to be equal to one unit of GDP, hence, to be able to directly interpret impulse responses of GDP as fiscal multipliers.

The results presented in Table 5, corresponding to the VECM IRFs, suggest that the output fiscal multiplier from a shock to government spending would be around one. The peak multiplier at the 5th quarter is 0.98, suggesting that an increase in government expenditure equal to 1% of GDP will trigger an increase of 0.98% of GDP. The results suggest that the positive effect of spending shock on GDP, even though small, is persistent, yielding a fiscal multiplier of 0.84 even after 5 years of the initial shock on spending. The results suggest that, *ceteris paribus*, it is more effectively to use government spending rather than tax shocks, as a stabilization fiscal tool in Macedonia.

**Table 5 Output fiscal multipliers from the shock on government expenditure, VECMIR graphs**

Quarters	1	2	3	4	5	6	7	8	10	12	16	20
<b>Fiscal multipliers</b>	0.53	0.82	0.48	0.83	0.98	0.86	0.79	0.91	0.83	0.87	0.85	0.84

Source: Authors calculations

### Robustness Analysis

For a robustness check, the model will be estimated (i) on a shorter sample period 2005q1-2019q4, and (ii) with fiscal variables compiled as in Blanchard and Perroti (2002). In particular, government expenditure is compiled as the sum of compensation of public employees, intermediate consumption and government gross fixed capital formation. The series on government revenue consists of the sum of direct taxes, indirect taxes, net of social benefits and transfers in kind and subsidies. The results are similar to the baseline model. In the case of North Macedonia, considering the large number of reforms that occurred during this period, in particular several changes of public revenues, which had affected other items besides taxes, for instance contributions, and therefore altered the revenue structure, hence their effect on economic activity, it might be argued in favor of using the total figures of fiscal variables as in the baseline model, in order to better capture the effect of fiscal shocks on the economic activity in Macedonia. As a final robustness check, we use the 2000q1-2019q4 sample period to investigate the effect of monetary policy and debt dynamics on fiscal policy

effectiveness in North Macedonia. Considering the North Macedonian economy context, as a small open economy, where monetary policy targets a fixed exchange rate regime, it is important to incorporate in the model the monetary policy reaction while investigating the effects of fiscal policy in Macedonia. A fiscal policy shock may trigger a monetary policy reaction by several transmission channels. For instance, a positive fiscal shock, considering the level of openness of the country may translate into an increase in imports which, in turn, would worsen the current account deficit and put pressure in the fixed exchange rate; hence, the monetary policy would be tightened by increasing interest rates. Consequently, the increase in interest rate would crowd out the initial positive effect of fiscal shock on GDP. Therefore, for a robustness check, we incorporate in the model the interest rate variable (the real interest rate on central bank bills sold at auction), in order to control for the effect of monetary policy in the system. Additionally, as Sims (1988) suggests, the inclusion of financial variables that embody expectations of future changes in fiscal policy, will ameliorate the fiscal foresight problem due

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

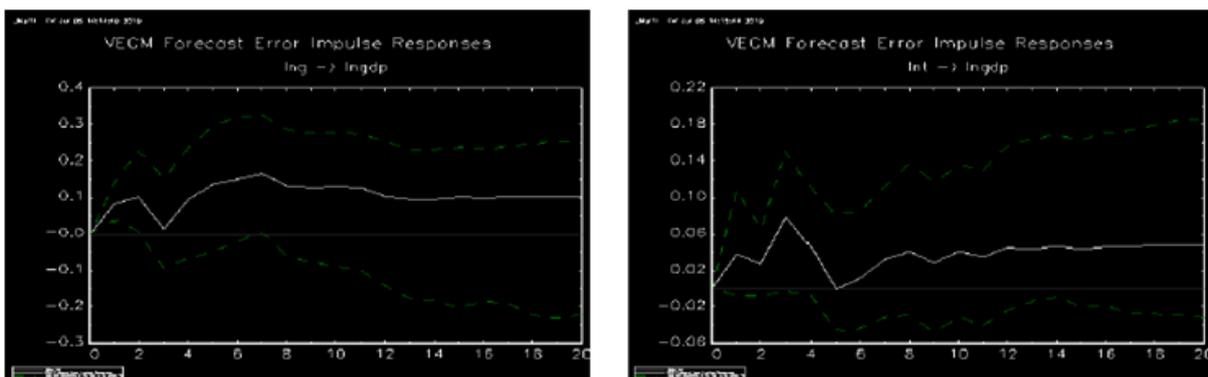
to the decision and implementation lags of fiscal policy. To this end, we augment our parsimonious baseline model with interest rate and public debt variables. The VECM with subset restrictions and the following order of variables is estimated:

- Endogenous variables ordered as follows:
  - o the log of real GDP (lngdp)
  - o the log of real tax revenues (Int)
  - o the log of real government expenditure (lng)
  - o the real interest rate (real r)
  - o public debt as a % of GDP (debt)
- 4 lags of endogenous variables
- 2 cointegration vectors:
  - o The long-term fiscal multiplier:  $GDP = Bg$
  - o The solvency condition:  $T = Bg$
- Deterministic terms constrained to the cointegration vectors:
  - o shift and trendshift for 2008 Q4
  - o constant and trend
- Deterministic terms outside of the cointegrating vectors:
  - o impulse dummies for 2008 Q4

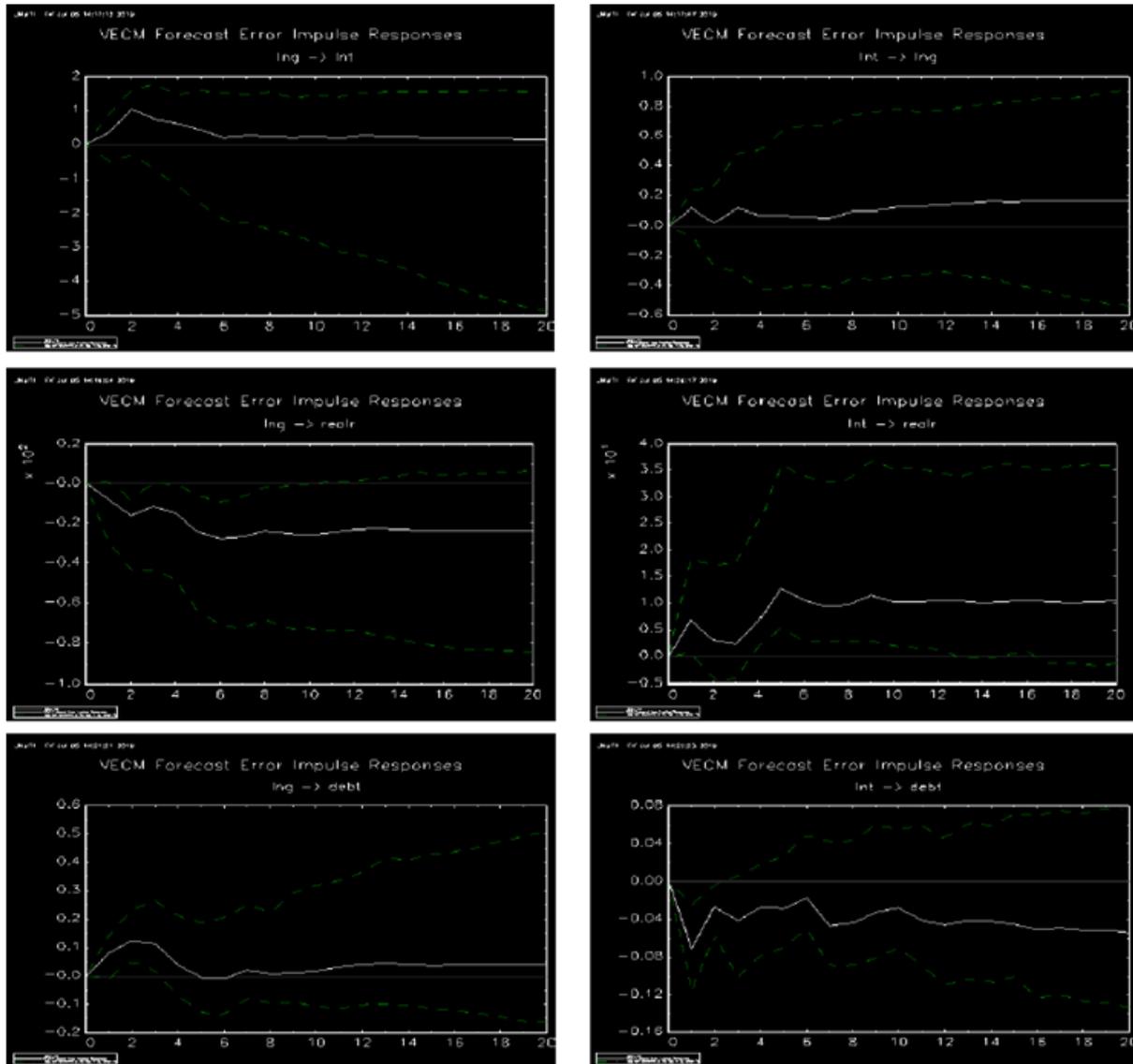
The diagnostic tests suggest that the model is well specified in terms of serial correlation, although it suffers from non-normality. The plots of the ECM suggest that each of the error correction terms behaves as a white noise residual, and the plots of the stability tests suggest that the model is structurally stable. We give preference to the VECM model compared to the SVEC model, considering that there are no significant cross-correlations among the residuals from the equations of the VECM.

The IRFs of the VECM model presented in Fig.2 suggest that the direction of the response of GDP to a spending shock is similar to the baseline model, although the response is only significant in the first two quarters, possibility due to low degrees of freedom. The first graph in Fig.2 suggests that there is a significant increase in GDP due to an increase in spending, although the fiscal multipliers presented in Table 6 are smaller compared to the baseline model, being 0.52 and 0.27 in the first and second quarters, respectively. Hence, the results suggest that the fiscal multipliers of the baseline model that ignores the influence of monetary policy and debt dynamics are overstated. Similar to the baseline model, the response of output to a tax increase is insignificant. The third and the fourth graph in Fig.2 suggest that fiscal variables do not significantly respond to each other's shocks. The fifth graph suggests that an increase in spending will significantly reduce the real interest rate for the first two years, suggesting that the "crowding out" effect of fiscal policy due to an interest rate pressure is absent and that monetary policy is accommodating an expansionary fiscal policy, in line with the findings of Petrevski et al. (2016). On the other hand, an increase in taxes will result in a significant increase in real interest rates suggesting that austerity measures will be followed by a contractionary monetary policy. The response of the debt/GDP ratio to a spending shock is in line with a priori expectations. An increase in spending will result in a short-lived increase of public debt, whereas an increase in taxes will result in a decrease in public debt, although in both cases the IRFs are only significant in the first two quarters.

**Fig.2 Robustness analysis: baseline model +interest rate + debt IRF's of the VECM model**



## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL



**Table 6 Robustness analysis: baseline model +interest rate + debt, sample up to 2018q4, VECM model**

Quarters	1	2	3	4	5	6	7	8	10	12	16	20
<b>Fiscal multipliers</b>	0.52	0.27	0.02	0.26	0.14	0.09	0.09	0.15	0.15	0.22	0.17	0.19

Source: Authors calculations

### Conclusion

The aim of this chapter is to empirically investigate the effectiveness of fiscal policy on boosting output and effects of fiscal shocks on other macroeconomic variables in North Macedonia. The overview of fiscal policy in Macedonia suggests a “paradigm shift” of fiscal policy after 2008. In the early phase of transition, in order to achieve macroeconomic stability, North Macedonia pursued a prudent fiscal consolidation policy under several supported

IMF arrangements. However, after 2008, North Macedonia shifted to an expansionary fiscal policy, which resulted in a doubling of public debt and increasing the risk of debt sustainability.

The possibility of using fiscal policy as a short-term stabilization tool was severely limited due to: a) the turbulent early phase of transition; b) the fixed exchange rate regime and low foreign exchange deposit coverage; c) IMF arrangements aiming at fiscal consolidation; and d) non

## ESTIMATING FISCAL MULTIPLIERS FOR NORTH MACEDONIA: A STRUCTURAL VECTOR ERROR CORRECTION MODEL

availability of financial resources and dependency on external borrowing.

We specified and estimated a VEC model in order to empirically investigate the effectiveness of fiscal policy. The choice of this methodology is based on its feature of exploiting the cointegration properties of the variables and simultaneously identifying the long-run equilibrium relationships between the levels of 1) government spending and GDP (long-run fiscal multipliers) and 2) spending and taxes (government solvency condition), the adjustment mechanisms that maintain or disrupt the long-run relationships, and short-run dynamics, hence, yielding more efficient estimates compared to VAR models.

The results of the baseline model suggest that a government spending shock is more effective as a stabilization fiscal tool in North Macedonia, compared to a tax shock. The response of output to a spending shock is positive, and persistent, yielding a fiscal multiplier of 0.84 even after 5 years of the initial shock on spending. However fiscal multipliers smaller than one suggest that the effectiveness of fiscal policy in boosting output is limited. The results are in line with theoretical predictions from the fiscal policy literature and with findings for other transition countries. However, our findings contradict the findings of the two previous studies for Macedonia that calculate negative fiscal multipliers, Kurtishi (2013) and Trenoski (2015).

The robustness checks generally confirm the results of the baseline model, suggesting that our findings are stable across different samples and alternative specifications. However, the results suggest that not accounting for monetary policy reaction and debt dynamics will result in an overstatement of fiscal multipliers. Similar to Petrevski et al. (2016), our findings suggest that the “crowding out” effect of fiscal policy due to interest rate pressure is absent and that monetary policy has accommodated expansionary fiscal policy. The results suggest that an increase in spending/taxes will result in a short-lived increase/decrease in public debt, as a priori expected. However, our finding that there is a cointegrating vector between government spending and taxation, indeed an equilibrium relationship in which they moved together in the same proportions, suggests that over the sample period the government solvency condition was

satisfied, implying that debt sustainability was not an issue in the case of Macedonia.

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