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AN ANALYSIS OF IMPORTANT SECTORS IN ECONOMIC GROWTH. CASE STUDY FOR KOSOVA

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ABSTRACT

Education, innovation, the labour force, and new businesses are considered the key important sectors (factors) for developed and emerging economies. The paper analyses are performed by using the Cobb Douglas production function for analysing the impact and correlation of these factors (variables) on the economic growth of Kosova during the period 2013 - 2021. The variables of public expenditures on education as a percentage of GDP and the labour force have shown a negative impact on growth and they have operated under decreasing returns to scale (based on the Cobb-Douglas function), while the variables of information, computer and telecommunication services (which refer to innovation technology)

and new business creation have indicated a positive impact on growth and they have operated under increasing returns to scale (based on the Cobb-Douglas function). In addition, this paper summarized a few useful conclusions: first, public expenditure on education should provide an important contribution on growth; second, enhancing the role of education to improve and develop new knowledge for the labour force in Kosova, and at the same time, to adapt with new labour market demand; third, information, computer and telecommunication is one of the leading export sectors and this sector should provide higher potential and contributions on the economic growth of Kosova; fourth, new businesses creation should provide a significant contribution to increase economic growth. These variables in many countries have made a key value contribution to the economy by driving it toward sustainability, development, and growth.

Key words: (un)employment rate, human capital, ICT services, income, labour market, logarithmic form, productivity, public expenditure on education

JEL classification: E24, I21, I22, I25, J21, O32, O40

INTRODUCTION

Many countries around the world have paid attention to education, innovation (technology), the labour market and new business creation, and these are defined as the leading sectors to archive long-term economic growth. In recent decades, theories and discussions on the relationship between these sectors and economic growth have attracted the interest of many policymakers, governments, research institutions and economists. Nowadays, these sectors (factors) are very important to improve the local economy, quality of life, GDP per capita, and at the same time, these influential sectors have a major role in the economy of the country. The main aim of this paper is to highlight the importance of these sectors (factors) and their contributions to the economic growth of Kosova during the period 2013 - 2021. In fact, these influential sectors have had continuous growth and progress during the last few years. Thus, the institutions of Kosova have provided the highest annual average of public expenditure on education as percentage of GDP and of government expenditure than other Western Balkan countries. Also, the information, computer and telecommunication (ICT) services in Kosova are one of the leading sectors for export markets and their annual turnover is increased significantly (almost 100 million euros in 202, while over 130 million euros only in 2022).

Then, the number of new businesses has had a slight increase during the research period, but their number is increased by 9% only in the first quarter of 2023 compared to the first quarter of 2022. Furthermore, the contribution of these sectors (factors) is very important for economic growth not only in Kosova, but also in many different countries. The importance of these sectors (factors) is also discussed and analysed by many authors, research institutions, and policymakers around the world. Besides the contribution of these sectors to economic growth, they have a major role in many other social and economic aspects (such as the local economy, social well-being, public infrastructure, foreign investments, GDP, etc.). In fact, the combination of these sectors (such as education, innovative technology, labour force and new businesses) is one of the most influential factors in the modern economy and growth, and thus, its main importance is to evaluate and analyse the contribution of these sectors in the economic growth of Kosova during the period 2013 - 2021. Despite the importance of these sectors, their impact and contribution have not been significant in different empirical research analyses, therefore the main research gap of this paper is focused to evaluate and to analyse the impact, contribution, significance and correlation between these sectors and economic growth.

In terms of the research flow, this paper leverages secondary data to evaluate the impact (contribution) and correlation of very important sectors (as defined by education, innovation technology, labour force and new business creation) on the economic growth of Kosova during the period 2013 - 2021. Section 2 of the paper presents the literature review and its structure is as follows; the first part of the literature review is discussed the link between public expenditures on education (which refer to education) and growth; the second part provides the relevant literature of ICT services (which refer to innovation technology) and economic growth; the third part of the literature review discusses the effect of labour force and new business creation on economic growth. Section 3 of the paper describes the methodology and its main sections are as follows: the first explains the research design, which includes the research strategy, research approach, research questions, research objectives, limitations and future direction part of research; the second presents the data used for paper analyses and their sources; the third provides an overview of the main methods of data analyses. Section 4 of the paper presents the main results of the paper's analyses (such as regression and correlation), and the discussions of the paper’s findings are presented in the last Section (5).

LITERATURE REVIEW

In today's economy, the model of economic growth is a very complex phenomenon, and it is becoming more and more dependent on the education of the labour force, innovation technology and the business environment (Feldman and Stewart 2008). Authors (Funke and Strulik 2000; Iacopetta 2010) have concluded that a typical advanced economy is characterized by three main stages of development, such as a) physical capital accumulation, b) human capital skills (education) and c) innovation. Thus, these stages drive income expansion and growth. Then, innovations that generate sustainable economic growth provide solid employment, and social well-being and improve the per capita income rate (Ahlstrom 2017). During the 1990s, the impact of labour market reforms through macroeconomic policies, futures investments in education and research, as well as technological modernization has been one of the most important factors of economic performance in many European countries and the United States (Aiginger 2005). In terms of new business creation, lack of resources to operate in their markets has been identified as the main challenge for these businesses and it has pushed these businesses into research and development (R&D) activities, where these activities have stimulated the local economy by increasing the employment rate and economic growth (Kirchhoff *et al*. 2007).

THE ROLE OF EDUCATION ON ECONOMIC GROWTH

Education has a crucial role in economic growth, and it has a major contribution to advancing economic progress (Brunello *et al*. 2007; Grant 2017). Also, education seems to be a key determinant of economic development, employment rate, well-being, and growth (Hanushek and Wößmann 2010; Marquez-Ramos and Mourelle 2019; Woessmann 2015). Consequently, many countries around the world have increased public expenditure on education because they improve the quality of human capital, which has a strong positive impact on growth (Haini 2020; Mercan and Sezer 2014; Suwandaru *et al*. 2021). Otherwise, poor quality education does not provide long-term economic performance and therefore, public expenditure on education has become one of the top priorities of governments in recent decades (Grant 2017; Hanushek and Wößmann 2010). Authors (Gregoriou and Ghosh 2007; Rajkumar and Swaroop 2018) have argued that public expenditure on education may be relatively low when the government budget is poor and it will produce an insufficient quality of education and low economic growth, whereas large government expenditure on education will enable higher growth. In addition, differences in the education system and innovation activities in a

country or region may cause increased inequality in the distribution of income and/or wealth (Dmitriev *et al*. 2016).

Thus, deep reforms in the education system have developed human capital, increased economic performance and improved social, cultural and economic cohesion, while the success of an economy is becoming more dependent on modernization and increasing the level of education and training systems (Domínguez 2021; Hyz 2021). According to (UNESCO Report 2012), investments in education have a major impact on growth, because every US$1 invested in education may have an effect of US$10 to US$15 on economic growth. In terms of R&D activities, it is essential that these activities develop and enhance innovations of products and services, which can lead to increased income earnings, provide lower production costs, enable positive effects on national income and growth (Das 2020; Das and Mukherjee 2019; Kuo and Yang 2008; Kwack and Lee 2006). In the same way, investments in R&D have a positive and significant effect on long-term economic growth and these investments are very important for innovation, productivity and growth (Freimane and Bāliņa 2016; Gumus and Celikay 2015). Similarly, expenditures on R&D activities have stimulated the local economy by increasing the level of employment, and new business creation and they have indirectly contributed to economic growth (Kirchhoff *et al*. 2007).

INNOVATION TECHNOLOGY AND ITS IMPORTANCE ON GROWTH

In recent decades, innovation is considered one of the main drivers' factors of economic growth and it enables through multiple channels, such as increasing market competition, accessing foreign markets, and improving public infrastructure and quality of life (Agenor and Neanidis 2015; Andergassen *et al*. 2009; Bae and Yoo 2015; Dachs and Peters 2014; Santacreu 2015). Also, authors (Akçomaka and Weelab 2009; Ahlstrom 2017) concluded that innovation increases per capita income improves the employment rate and provides stable economic growth. Furthermore, innovations in technology and high-tech services are believed to be a major contributor to economic growth (Maradana *et al*. 2017; Pece *et al*. 2015). Then, authors (Timmer *et al* 2010; Visvizi *et al*. 2018) suggest that the advancement of information and communication technologies (ICTs) services have shown a positive effect and economically are significance on growth. During the period 1995 - 2010, ICT capital has a positive impact on GDP, but the statistical significance between ICT capital and output was not revealed between different economies (Niebel 2014). In terms of OECD countries, ICT capital has

contributed between 0.2 and 0.5 percentage points per year to growth, while later its contribution increased to 0.3 and 0.9 percentage points per year (Colecchia and Schreyer 2002).

However, several econometric studies have concluded that ICTs capital in developed economies has shown a higher significant effect on output growth than in other economies (Dimelis and Papaioannou 2011; O'Mahony and Timmer 2009; O'Mahony and Vecchi 2005; Stiroh, 2005). Also, total revenues resulting from ICT services are higher in developed countries, although some developing countries have increased their revenues from ICT services more rapidly in recent years (Wilson 2004). According to (CBK Report 2021), exports of ICT services in Kosova have increased significantly in recent years. In addition, ICT services can also be measured through their effect on key macroeconomic indicators (such as GDP, income, labour force and investment), where ICT services have shown a positive relationship with these indicators (Hodrab *et al*. 2016). According to (World Bank Report 2012), ICTs services positively reduce poverty and unemployment rate, increase productivity and improve economic development. In terms of transition countries, ICT services have contributed to the labour market, and GDP growth promoted market competition (Piatkowski 2004). Thus, ICTs services have a long-term chain effect on the economy and society (McArthur and Sachs 2002).

THE EFFECT OF LABOUR FORCE AND NEW BUSINESS ON GROWTH

In the post-transition period, the labour market changed significantly, and these changes were evident mainly in market flexibility (Lissowska 2017). Inflexible labour markets and the ever-increasing cost of welfare may be the main causes of reduced growth, but investment in education and the skilled labour force seems to be important factors in advancing labour market flexibility, where they provide long-term growth (Aiginger 2004). Moreover, spreading funds equally within countries is essential to improving the skills of the labour force and these funds enable long-term labour productivity and growth (Dawid *et al*. 2008). Consequently, economic growth is always associated with increased spending on education and/or skilled labour force, while additional investment in human capital remains very important for economic growth in the short- and long-term periods (Tkachenko and Mosiychuk 2014). Thus, increasing the skills of the labour force should be the primary policy of policymakers and governments and these skills provide opportunities to increase the employment rate, labour productivity and output (Meidani and Zabihi 2011). Otherwise, if the potential of the labour force cannot be coherent with the employment opportunities that offered by the labour market, it will cause a high unemployment rate and then, it will reduce growth (Muryani and Pamungkas 2018).

This evidence supports (Blanchard 2011) theory that a high unemployment rate has a negative relationship with growth and vice versa. However, reducing the unemployment rate and increasing employment are always expected to be achieved during periods of sustained economic growth, but it is only possible in theoretical aspects because economic growth sometimes cannot provide a sustainable employment rate (Kargi 2014; Khemjar *et al*. 2014). In addition to providing the labour force, new business creation is considered to be a key factor in the modern economy, and it is highly associated with economic development (Reynolds 2011). Another author (Van Stel, 2005) has concluded that economic growth is closely linked with new business creation and without these businesses is impossible to generate growth. Some authors (Cao-Alvira and Palacios-Chacón 2021; Kritikos 2014; Wong *et al*. 2005) argue that new businesses with rapid growth have the potential to create new jobs opportunities and they are found to have a significant impact and positive correlation on growth. On the other hand, where regions in a country face a modest decline in population, new businesses offer long- and short-term employment opportunities and are seen as the main driver of future employment (Delfmann and Koster 2016).

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Besides the effect on growth and employment, new businesses have shown as an important generator of new ways of production (innovation) and knowledge diffusion across their markets (Anokhin and Schulze 2009; Huang and Chen 2021; Nikolaev *et al*. 2018; Van

Praag and Versloot 2007). Similarly, new businesses can affect regional economic performance and growth within a country through three main ways: a) diffusion of knowledge in the business environment; b) increased competition, which is caused by the large number of businesses in the market; and c) increasing the diversity of products and services that these businesses offer in an economy (Audretsch and Keilbach 2004). In business environment, new businesses creation has a direct competition-enhancing effect by pushing other businesses to improve product variety, service quality, market prices, market mobility and these effects contribute to growth (Koster *et al*. 2012; Kritikos 2014). Thus, new businesses that provide innovation in their markets have more opportunities to survive the market competition and to develop their business capacities (Ahlstrom 2017). Also, new businesses with intensive (radical) innovations often create new products and services, technology, market opportunities and these businesses often lead to growth (Audretsch 2002; Valliere and Rein 2009).

METHODOLOGY

This section explains the basic procedures and techniques of methodology that are used in this paper during the process of research. This process appears in the following sections: in the first session is presented the research design and there is explained the main research questions and research objectives; in the second session is determined an overview of data collection; in the last section are presented the methods of data analysis and there is described the main mathematical models of these analyses.

RESEARCH DESIGN

Research design is a plan that enables researchers to create a research strategy and research approach (Sekaran and Bougie 2016). Besides these, this session of the methodology is defined the main research questions and research objectives. This paper is used the research strategy of a case study for Kosova. The case study is a method that intensively studies a phenomenon over time within its natural environment (Bhattacherjee 2012). In terms of the research approach, there is used the quantitative approach. It is an approach that estimates the relationship among research variables using numbered data, which can be analysed through statistical procedures (Creswell 2014). Then, the research questions are as follows:

- How much is the impact (contribution) of the (four) independent variables on the economic growth of Kosova during the period 2013 - 2021?

- ⇨ Which of the (four) independent variables is (non) significant in explaining economic growth (based on the level of significance 0.05)?
- ⇨ How much is the percentage of determination (variation) in the regression line (model)?
- ⇨ Which of the variables has provided the product that operates under increase / decrease constant returns of scale?
- ⇨ Which of the (four) independent variables has shown a positive or negative correlation to the economic growth of Kosova during the research period?

The main paper objectives are presented as follows:

- ⇨ to identify the main factors that have influenced the impact (contribution) of the four independent variables on the economic growth of Kosova during the period 2013 - 2021;
- ⇨ to evaluate the level of statistical significance between the independent and dependent variables through the test of hypothesis (such as the null and/or alternative hypothesis);
- ⇨ to estimate the percentage of the determination and how well the regression line (model) fits perfectly the data of the dependent variable on the independent variables;
- ⇨ to estimate the production that variables have operated under constant returns of scale;
- ⇨ to identify the factors that have influenced the correlation matrix of the four independent variables on the economic growth (dependent) variable;

In terms of limitations, the focus of this paper was to include more research periods, but it was impossible to provide some of the data within the annual reports of Kosova's institutions and it has made a limitation to include a large amount of data for paper’s analyses. Future directions of this paper should focus on analysing the effects and further contributions of these sectors (factors) on the economic growth in Kosova and their potential in many other aspects of the economy. In addition, enhancing the database with a large number of these data and evaluating these data with any suitable analysis and/or model will enable a comprehensive overview of these sectors on the economic growth of Kosova. Also, there is presented a few questions, which may be considered as further direction part of the research: How to address the main needs for further increase of economic growth by empowering these sectors in the short- and long-term? What are the main barriers and challenges to increasing the impact and contributions of these sectors on economic growth? Which are the main areas to improve the

potential and opportunities of these sectors, which may have a significant contribution and positive impact on the economic growth of Kosova?

DATA COLLECTION

In this paper, the data used are secondary data (sources) and they are collected from annual reports of different public institutions in Kosova (such as the Central Bank of the Republic of Kosova, the Kosova Agency of Statistics, the Ministry of Industry, Entrepreneurship and Trade and Ministry of Education, Science and Technology). These data are time-series data, and they include the period of time 2013 - 2021. Data are collected in different units, where they are transformed into logarithmic form, and then used for paper analyses. Moreover, economic growth is used as a dependent variable and four other independent variables. These data (variables) have been widely used by many authors and they are described as follows:

- *Economic growth* (*log_eg*) refers to an increase in the value of goods and services that are produced within an economy over a period of time (Dimitrev *et al*. 2016; Goedhuysa and Veugelersb 2012; Wong *et al*. 2005);
- *Public Expenditures on Education as a percentage of GDP* (*log_edu/gdp*) determines direct expenditure as a share of GDP on the education services from primary education to tertiary education levels (Hoareau *et al*. 2013; Pessoa 2007; Tomić 2017; Yazgan and Yalçinkaya 2018);
- *Information, Computer and Telecommunication* (*log_ict*) services is related to news-related service transactions, data processing services, business network services, ICT goods imports, ICT services exports, high-technology exports, etc (Bujari and Martínez 2016; Goliuk 2017; Haq 2018; Maradana *et al*. 2017; Raghupathi and Raghupathi 2019);
- *Labour Force* (*log_lf*) constitutes the total number of potential employees between 15 and 64 years within an economy over a period of time, but only active employees are included in this variable (Dachs 2017; Dimitrev *et al*. 2016; Ulku 2012; Vivarelli 2014; Yazgan and Yalçinkaya 2018);
- *New Business Creation* (*log_nbc*) includes the total annual number of new businesses that are created within an economy over a period of time (Brem 2011; Elbaz *et al*. 2013; Soete and Stephan 2004; Wong *et al*. 2005);

DATA ANALYSIS

This section presents the methods that are used to analyse the data (variables). These analyses are conducted through the regression model and the correlation matrix based on the Cobb Douglas (C-D) production function. The data used are transformed into logarithmic form (based on the Cobb-Douglas function) and then used for both paper analyses. According to (Apostolov 2016), the Cobb-Douglas function represents a relationship between specified output and input(s). As cited by (Cottrell 2019), the Cobb-Douglas function can be applied to estimate the level of production (output) for a business, industry and a country, as well as it can be also applied for the whole economy when we estimate the aggregate production function at the macroeconomic level. Initially, the production function is used by (Solomon 1956) and through this function, the output expresses a function of labour, capital, and a constant level of technological knowledge (Akinwale *et al*. 2012). It takes the following form:

$$Q = f(A, K, L) \quad (1)$$

Where: Q - output, K - capital/investment, L - labour and A - a constant level of technology.

Then, the function mentioned above can express in the Cobb-Douglas function and it is adopted by (Barro 1990). The basic equation of the Cobb-Douglas function is presented as follows:

$$Y = A + K\alpha + L\beta \quad (2)$$

Where: α and β are coefficients that represent the output elasticity of capital and labour.

As cited by (Hossain and Al Amri 2010), the Cobb-Douglas function provides three types of results: a) the production operates under constant returns to scale ($\alpha + \beta = 1$); b) the production operates under increasing returns to scale ($\alpha + \beta > 1$); and c) the production operates under decrease returns to scale ($\alpha + \beta < 1$). In addition, taking logarithmic form on both sides of equation (2), the Cobb-Douglas function is transformed into a linear function of the logarithmic form (Apostolov 2016; Omar 2019). It is presented as:

$$\log(Y) = \log(A) + \alpha \log(K) + \beta \log(L) \quad (3)$$

In this paper, the Cobb-Douglas function to analyse the impact (contribution) and correlation between a variable of Economic Growth (*log_eg*) and variables of Public Expenditures on Education as a percentage of GDP (*log_edu*), Information, Computer and Telecommunication (*log_ict*), Labour Force (*log_lb*) and New Business Creation (*log_nbc*). The regression model of the paper is shown as follows:

$$log_eg = \beta 0 + \beta 1\ log_edu/gdp + \beta 2\ log_ict + \beta 3\ log_lb + \beta 4\ log_nbc \quad (4)$$

FINDING RESULTS AND INTERPRETATION

This section of the paper describes the main research findings, and they are analysed through the Regression method and the Correlation matrix (based on the Cobb-Douglas production function). The result of the regression method shows that Public Expenditure on Education as a percentage of GDP has shown the highest negative impact (*log_edu/GDP* = -1.80) on the economic growth of Kosova during the period 2013 - 2021. It is a result that the annual budget of this variable has been only 4.40% and their annual budget is reduced from 4.60% in 2013 to 4.10% in 2021. Even though the institutions of Kosova have adopted the Law on Research and Scientific activities and through it, they must provide 0.7% of the annual budget of Kosova for these activities, the budget is partially allocated (approximately 0.2% in 2015 and over 0.3% in 2016). In addition, Kosova has provided the lowest share of GDP for research and development (R&D) activities than other countries. Based on the above findings, Public Expenditure on Education has not provided a positive contribution to the economic growth of Kosova during the research period. Similarly, the Labour Force variable has shown a negative impact on growth with coefficients (*log_lf* = -0.47) and it is a result that this variable has shown a slow annual average growth (only 1.82%) during the period 2013 - 2021. Recently, Kosova is constantly facing a decrease in the labour force (mainly of young age) which is mainly caused by the increased demand for the labour force in many European countries and beyond.

Table 1/A The Regression Results

Variables	Coeff.	Std Error	t Stat	P > |t|	[95% Conf.	Interval]
Constant	3.73	25.5	0.15	0.88	-64.25	71.72
log_edu/gdp	-1.80	4.27	-0.42	0.69	13.66	10.05
log_ict	0.03	0.67	0.05	0.96	-1.82	1.88
log_lf	-0.47	3.44	-0.14	0.89	-10.01	9.07
log_nbc	1.82	3.01	0.61	0.58	-6.52	10.18

Source: Author's Calculation

Despite the fact that Information, Computer and Telecommunication (ICT) services in Kosova are considered with high market demand (particularly with outsourcing services), these services have shown a slight positive impact (*log_ict* = 0.03) on the economic growth of Kosova. Thus, these services increased from 60.0 million euros in 2013 to 98.8 million euros in 2021 and their annual average growth is 8.70% during the research period. Then, the most

important variable that has shown the highest positive impact on growth is the variable of New of Business Creation (*log_nbc* = 12.4) and their positive impact is a result of increasing the number of new businesses, particularly in the sector of manufacturing, education, information services, communication, financial and security activities, etc. Based on the Cobb-Douglas function, the production of the *log_edu/GDP* and *log_lf* variables has operated under decreasing returns to scale ($\alpha + \beta < 1$), while the production of the *log_ict* variable has operated almost under constant returns to scale ($\alpha + \beta = 1$), but the production of the *log_nbc* variable has operated under increasing returns to scale ($\alpha + \beta > 1$). In terms of the t-value, the probability of these paper variables has shown higher results than the level of statistical significance (0.05). Therefore, the variables in the paper are statistically significant to explain their impact (contribution) on the economic growth of Kosova and accept the null hypothesis (H_0) and, at the same time, reject the alternative hypothesis (H_a).

Table 1/B The Regression Results (based on the logarithmic analysis form)

Regression Statistics	Results	Anova	Model	Residual	Total
No of Observations	9	df	4	4	8
F (4, 4)	0.21	SS	0.12	0.54	0.66
Probability > F	0.92	MS	0.03	0.14	0.08
R Square	0.17				
Adjusted R Square	-0.65	Root M.	0.37		

Source: Author's Calculation

The coefficient of determination is $R^2 = 0.17$ and this result means that only 17% of the variables used in this paper fit the regression line (model). Consequently, four independent variables explain only 17% of the variation in the economic growth variable. In terms of the Correlation Matrix, the variable of New of Business Creation (*log_nbc* = 0.335) has shown the highest positive correlation (relationship) on the economic growth of Kosova (see Table 2). It indicates the strength of the correlation between this variable and economic growth during the period 2013 - 2021. Then, the variable of the labour force (*log_lf* = 0.248) has indicated less positive correlation, which is mainly caused by the reduction of the annual average of this variable during the research period. Despite increasing demand for ICT services, this variable has provided the lowest positive correlation (*log_ict* = 0.128). In fact, its annual average growth decreased from 77.7 million euros to 46.4 million euros during the period 2014 - 2017. Unlike the other variables, the variable of public expenditure on education as a percentage of GDP

(log_edu/GDP = -0.299) has shown a negative correlation with the economic growth of Kosova. This result is mainly caused by reducing the annual average growth (annual budget expressed as a percentage of GDP) from 4.70% to 4.10% during the research period.

Table 2 Correlation Matrix (based on the logarithmic analysis form)

	log_eg	*log_edu/gdp*	*log_ict*	*log_lf*	*log_nbc*
log_eg	1.000				
log_edu/gdp	-0.299	1.000			
log_ict	0.128	-0.118	1.000		
log_lf	0.248	-0.786	0.422	1.000	
log_nbc	0.335	0.178	0.371	0.304	1.000

Source: Author's Calculation

CONCLUSIONS

In the context of this paper, there is analysed the impact and correlation of education, innovation, labour force, and new businesses on the economic growth of Kosova during the period 2013 - 2021. The main paper's findings suggest that having an annual average increase of these variables does not provide faster rates of economic growth and higher economic outcomes. Public expenditure on education as a percentage of the GDP variable has shown a negative impact (contribution) and a negative correlation on growth, while the labour force variable has provided a negative impact, but a positive correlation. Then, information, computer, telecommunication services and new business creation variables have indicated a positive impact and positive correlation on growth during the research period. Finally, there is no doubt that improving education and innovation, increasing the quality of the labour force, and supporting policies for new businesses are very important factors for economic growth. Thus, the government should effort to increase their budget for education and research activities, it may have an effect to enhance the innovation potential and at the same time, the economy will be highly developed. Also, the government should focus to increase the quality of the labour force (particularly on primary and non-vocational secondary education), creating an appropriate environment for new businesses and encouraging their private investment in R&D, in order to maximize their benefits.

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APPENDIX 1

Appendix 1 Statistic Descriptive (Logarithmic method)

	log_eg	*log_edu/gdp*	*log_ict*	*log_lf*	*log_nbc*
Count	9	9	9	9	9
Std Dev	0.29	0.05	0.24	0.07	0.05
Min	1.96	1.41	3.84	5.69	2.22
Mean	2.64	1.48	4.14	5.84	2.29
Max	3.07	1.55	4.59	5.95	2.37
Sum	23.74	13.32	37.27	52.52	20.57
Variance	0.08	0.00	0.06	0.01	0.00
Range	1.11	0.14	0.76	0.26	0.14
Kurtosis	5.07	1.44	2.36	2.92	2.12
Skewness	-1.29	-0.15	0.50	-0.44	0.36
Median	2.67	1.48	4.09	5.84	2.28
Mode	0.06	0.09	0.27	0.07	0.06

Source: Author's Calculation

APPENDIX 2

Appendix 2 The variables used in the paper's analysis, their meaning and data sources

No	Denote Variables	Name of the Variables	The Meaning of the Variables	Source
1	*log_eg*	Economic Growth (annual %)	Economic growth is an increase in the production of goods and services in an economy over a period of time (mostly a one-year period).	CBK Reports
2	*log_edu/gdp*	Public Expenditures on Education, (as a percentage of the GDP)	Public expenditures dedicated to education as a percentage of the GDP represent total public expenditures on education expressed as a percentage of the GDP in a given (financial) year.	MEST Reports
3	*log_ict*	Information, Computer and Telecommunication services	Information, Computer and Telecommunication (ICT) services include different services and products, such as: data processing services, business network services, digital marketing, high-technology exports, etc.	CBK (Online Time Series Data)
4	*log_lf*	Labour Force (active employees in the labour market)	The labour force includes the total number of employees (active and non-active employees) between the ages of 15 and 64 within an economy. But only active employees in the labour market are included.	ASK Reports
5	*log_nbc*	New Businesses Creation	New Businesses Creation includes the total number of new businesses that are registered in all economic activities within a period of time (mostly a one-year period).	ASK Reports

Source: Authors