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CHARACTERISTICS AND MACROECONOMIC DETERMINANTS OF YOUTH EMPLOYMENT IN MACEDONIA

Abstract

Employment, especially youth employment is considered to be one of the greatest challenges worldwide. The aim of this paper is to investigate the determinants which have influence over the youth participation (individuals aged 15-24) in the labour market in Republic of Macedonia. Quantitative methods are applied on data gathered from State Statistical Office to investigate classical macroeconomic determinants such as inflation rate, access to credit by the private sector, globalization and economic growth. Globalization is investigated through international trade and foreign direct investments, while economic growth through gross domestic product per capita and gross domestic investments. Youth employment rate is regressed on the set of macroeconomic variables in order to determine what has influence of employment of young individuals.

Results from this research suggest that macroeconomic variables as gross domestic product per capita, gross domestic investments, foreign direct investments, access to credit by the private sector have positive effect on youth employment rate in the country, while import is found to have negative effect on youth employment rate. Other macroeconomic variables like inflation rate and total youth population are found to be statistically insignificant for youth employment in the country.

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Introduction

Employment is considered to be the most important concern either in developing or developed countries. Macroeconomic policies can effectively influence employment and employment performance. Proper solution of the phenomena of lower employment rates is very important because low employment rates can act as heavy burden to a nation. In this context, youth employment is considered to be one of the greatest challenges of the countries globally. While the literature on macroeconomic determinants of unemployment for all age groups is very broad, few studies have attempted to answer the questions of the link between macroeconomic indicators and employment mostly focusing on female employment and employment in general. Most of studies for influence of macroeconomic factors on employment are related to Asia, Africa and very few for European countries, with no similar studies either for transition countries or Western Balkans countries.

Republic of Macedonia as in many developing countries develops strategies which are influenced by the vision of achieving respectable economic growth. In Republic of Macedonia changes in the structure of industries and economic activities generated a large scale of structural unemployment with very little prospect of reintegrating in the labour market. Unfavorable international economic and political situation, oscillations in economic growth rate due to military conflict and embargo towards Republic of Macedonia contributed to high unemployment in all age groups and especially high unemployment rates for young individuals. By presenting characteristics of the labour market in Macedonia and analyzing macroeconomic factors of youth employment in Republic of Macedonia, this paper aims to empirically explore which macroeconomic factors can influence employment of young individuals in Republic of Macedonia.

The present paper makes a contribution to the current literature because to our knowledge, there is no other relevant literature tackling this subject in transition economies. In that respect, findings may reveal future steps for increasing youth employment rates in the country. The structure of the paper

is as follows: in the next section review of the relevant literature is presented, in section 3 short overview of the labour market in Republic of Macedonia is presented, section 4 deals with data and used methodology, in section 5 results from the findings are presented while section 6 concludes.

1. LITERATURE REVIEW

Having a job in modern societies is considered to be more than just a financial input for an individual or for a household. Successful integration of an individual into society is through employment, it deepens the social capital for an individual and widens professional and personal network. This is especially important for young people since they need to successfully integrate into society as productive members. There is substantial literature that examines macroeconomic factors that affect unemployment rate in certain country, with very little focus how those factors can affect employment rate. Literature suggest that major factors that affect youth employment are macroeconomic factors as gross domestic product per capita, gross domestic investments, inflation rate, credit to private sector, globalization in terms of foreign direct investments and international trade, cultural and social norms, demographic factors, education, expectations and perceptions (Gomez-Salvador and Leiner-Killinger, 2008; Tam, 2011; Olivetti, 2013; Tsani et al, 2013, Verick 2014; Lechman and Kaur, 2015; Patimo et al., 2015). We will proceed by examining macroeconomic factors. Domestic investment acts as key source of employment and wealth creation in the country. Increasing domestic investment is major factor for reducing poverty. If domestic investment is low, economy will fail to increase which will lead to decline in economic growth and less employment opportunities. Study from International Labour organizations (2011) suggest that there is strong and positive relationship between domestic investment and creating job opportunities. This study reveals that increase of 1 percentage point in domestic investment will lead to 0.12 percentage points increase in employment rates. Level of economic development of the country can successfully reveal situation of the labour market in selected country. Findings from the study of Gomez-Salvador and Leiner-Killinger (2008) conducted for the countries from European Union suggest that there is negative effect of economic growth on youth unemployment. Lozanoska and Dzambaska (2015) state that sustainable economic growth is a key factor for increasing employment rate in Republic of Macedonia which on

the other hand can lighten the burden of the unemployment in the country. Labor market trends (2017) on the other side argues that economic growth alone in the countries from Western Balkans will not be sufficient to create available jobs needed in the labour market. This study suggest that positive relationship between economic growth and employment found in countries from central Europe is in contrast with findings from countries in Western Balkans, economic growth at this point will not guarantee employment growth suggesting that great part of unemployment in countries from Western Balkans is structural unemployment. Literature is not consistent of the effect on inflation rate on youth employment. In the study from Cashell (2004) who studied the connection between inflation rate and unemployment in general is found that unemployment rates response very slow to changes in inflation rate. Niemi and Lloyd (1981) found that inflation has positive impact on female participation in the labour market, and increasing inflation will affect male employment more than female employment. This result, regarding youth population, is in line with results for the study of Choudhry et al. (2012) in their cross-sectional study who found that inflation rate has significant and negative effect on youth unemployment. Opposite to this, Anyanwu (2013) found significant negative effect of inflation over youth employment.

Access to credit by private sector is an important tool for job creations. Companies who has adequate access to credit have greater potential to expand their business and therefore to increase job opportunities. In addition to this, expansion of the businesses should have effect of economic growth of the country. Acemoglu (2001) points out that financial restriction can be destructive for employment since it will reduce the number of new companies which are potential job creators. Positive effect of access to credit by private sector is confirmed in Anyanwu (2013). Literature examines globalization as factor that can influence employment in the country by exploring international trade and foreign direct investments. Literature is consistent with the effect of foreign direct investments on employment in general, foreign direct investments has significant and positive effect of employment (Oostendorp, 2009; Javorick, 2013). Javorick (2013) states that countries are pursuing foreign direct investments with one goal: to reduce unemployment in the country. Anyanwu (2013) argues that foreign direct investments on a long run can have negative impact on female unemployment since technical trainings are usually offered to males. However, Choudhry et al (2013) found negative impact of foreign direct investments on youth employment. International trade

is also considered as key factor of reducing unemployment. It is expected that increase of the export will affect companies to grow and with that to increase employment in the countries. However, Choudhry et al (2013) and Anyanwu (2013) found negative impact of international trade and youth employment.

In summary, macroeconomic factors are considered as key to reduce unemployment. Review of the relevant literature reveals the complexity of labour market. Despite social and demographic factors, inflation, credit to private sector, economic growth and globalization are major determinants of employment in the countries worldwide.

2. CHARACTERISTICS OF THE LABOUR MARKET IN MACEDONIA

Macedonian labour market is faced with many challenges from the independence in 1991 until today. Within that period, Republic of Macedonia experienced political instability and turbulent and unstable economic growth which has resulted with high unemployment rate, significantly lower employment rate compared with countries from European Union, high inactivity especially among females and young people and high informal employment. Despite this, Macedonia has experienced employment growth throughout the last decade and managed to continuously reduce the unemployment rate which is unfortunately still significantly higher than unemployment rate in the countries from European Union.

Table 1 shows total employment rate of working population aged 15-64 in Macedonia compared with countries from EU28 in the period from 2006 until 2016. The difference of total employment rate between Republic of Macedonia and EU28 countries of almost 25 percentage points in 2006 is reduced to 17.5 percentage points in 2016.

Table 1: Employment rates in Macedonia and EU28 between 2006 and 2016 in %

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
European Union (28 countries)	64.3	65.2	65.7	64.5	64.1	64.2	64.1	64.1	64.8	65.6	66.6
Republic of Macedonia	39.6	40.7	41.9	43.3	43.5	43.9	44.0	46.0	46.9	47.8	49.1

Source: Eurostat: <http://ec.europa.eu/eurostat/data/database>, Accessed date: May 15, 2017

According to Petreski et al (2016) such large gap can be explained by lower participation rates of young people (working population aged 15-24 years) and lower employment rate of females compared to males. However table 2 suggest increase of almost 2 percentage points in employment rates in working population aged 15-24 in the period of 2006-2016 in Macedonia while there is decrease of almost 3 percentage points in the same group for the same period in EU28. Analyzing the working population aged 25-54, in Macedonia there is growth of 9.6 percentage points in employment rates for the period between 2006 and 2016. Both EU28 and Macedonia are facing increase in employment rates for the age group 55-64, in EU 28 increase of 8 percentage points and in Macedonia increase of 12.2 percentage points.

Table 2: Employment rates by age groups in Macedonia and EU 28 between 2006 and 2016 in %

age Time/ Geo	15-24		25-54		55-64	
	EU28	<i>MK</i>	EU28	<i>MK</i>	EU28	<i>MK</i>
2006	36.4	14.4	78.1	51.6	43.3	27.9
2007	37.2	15.2	79.0	52.8	44.5	28.8
2008	37.3	15.7	79.4	53.9	45.5	31.7
2009	34.8	15.7	78.0	55.3	45.9	34.6
2010	33.8	15.4	77.7	55.8	46.2	34.2
2011	33.3	14.4	77.7	56.4	47.2	35.4
2012	32.5	15.5	77.3	55.8	48.7	35.4
2013	32.1	16.2	76.9	57.9	50.1	37.9
2014	32.4	15.2	77.4	59.3	51.8	38.6
2015	33.0	17.3	78.0	59.4	53.3	40.1
2016	33.7	16.2	78.7	61.2	55.3	40.7

Source: Eurostat: <http://ec.europa.eu/eurostat/data/database>, Accessed date: May 15, 2017

A high unemployment rate in Macedonia is one of the major issues and it is considered to be one of the most difficult, social, economic and political problem.

Table 3 presents unemployment rates for males and females aged 15-64 with respect to educational level for Macedonia and countries from EU 28 for the period between 2006 and 2016. Unemployment rates for Macedonia are considerably higher than unemployment rates for EU28 especially for educational levels above primary education. Unemployment rates from the

period between 2006 and 2016 for Republic of Macedonia are continuously declining for both genders but very modestly especially for individuals with tertiary education and above. Moreover, according to Western Balkans-Labour market trends (2017) migration is playing an important role in unemployment as well as in the inactivity because it has become an important source of income of individuals in Republic of Macedonia.

Table 3: Unemployment rates by gender and educational attainment

	15-64											
	Less than primary, primary and lower secondary education				Upper secondary and post-secondary non-tertiary education				Tertiary education			
	Males		Females		Males		Females		Males		Females	
	EU28	<i>MK</i>	EU28	<i>MK</i>	EU28	<i>MK</i>	EU28	<i>MK</i>	EU28	<i>MK</i>	EU28	<i>MK</i>
2006	10.7	41.2	13.1	45.3	7.6	36.0	9.2	38.4	4.1	19.6	5.1	23.0
2007	10.0	43.1	12.1	44.5	6.4	34.4	7.8	36.4	3.5	17.9	4.5	23.2
2008	10.9	42.0	12.3	42.0	6.0	32.5	7.2	34.1	3.4	19.3	4.3	23.7
2009	14.8	38.4	14.7	40.9	8.2	32.1	8.6	32.6	4.8	17.8	5.2	24.8
2010	16.2	40.9	15.9	37.7	8.8	31.3	9.3	33.4	5.1	19.0	5.7	24.8
2011	16.7	40.0	16.5	34.8	8.6	31.5	9.4	31.8	5.1	19.6	6.0	26.3
2012	18.8	41.3	18.3	33.2	9.3	31.1	10.1	31.9	5.6	18.8	6.7	25.9
2013	19.9	35.8	19.4	32.9	9.7	28.7	10.5	29.0	5.9	19.8	7.0	26.8
2014	19.1	33.3	18.9	31.5	9.1	27.4	10.0	29.8	5.6	20.1	6.7	24.6
2015	17.7	32.1	18.0	27.8	8.4	27.1	9.2	26.0	5.1	19.4	6.2	22.6
2016	16.2	31.2	17.1	27.6	7.5	24.3	8.4	22.7	4.6	17.7	5.7	21.0

Source: Eurostat: <http://ec.europa.eu/eurostat/data/database>, Accessed date: May 15, 2017

Part of the high unemployment rate in Macedonia can be explained by high female inactivity for in labour market for the age group 15-64 (Table 4). Difference in inactivity rates for males in Republic of Macedonia and countries from EU28 is 0.7 percentage points, and the difference in inactivity rates for females in Republic of Macedonia and countries from EU28 is 16.5 percentage points.

Table 4: Inactivity rates by gender

	15-64			
	Males		Females	
	EU28	<i>MK</i>	EU28	<i>MK</i>
2006	22.5	25.0	37.2	50.8
2007	22.4	25.2	36.9	49.6
2008	22.2	23.4	36.4	49.8
2009	22.4	22.4	35.9	50.0
2010	22.4	22.3	35.6	49.6
2011	22.5	23.2	35.2	48.8
2012	22.2	23.4	34.5	49.2
2013	22.1	23.2	34.0	47.3
2014	21.9	22.3	33.5	47.5
2015	21.7	22.5	33.2	48.0
2016	21.5	22.2	32.7	49.2

Source: Eurostat: <http://ec.europa.eu/eurostat/data/database>, Accessed date: May 15, 2017

Moreover, if we analyze inactivity in the age group 15-24, we can see that part of the high inactivity in the labour market in Macedonia can be explained by high inactivity rates in the age group 15-24 especially for the females and those numbers are increasing for the past 10 years. In Table 5 are presented inactivity rates for males and females from EU28 and Republic of Macedonia in the age group 15-24.

Table 5: Inactivity rates for age group 15-24 for Republic of Macedonia and EU28

	15-24					
	Total		Males		Females	
	EU28	MK	EU28	MK	EU28	MK
2006	55,9	64,2	52,6	58,0	59,4	70,7
2007	56,0	64,1	52,6	56,2	59,5	72,5
2008	55,8	64,1	52,4	56,7	59,4	71,9
2009	56,5	65,0	53,4	56,6	59,8	73,8
2010	57,2	66,7	54,1	57,8	60,4	76,0
2011	57,5	67,9	54,6	60,1	60,6	76,1
2012	57,7	66,4	54,8	59,5	60,7	73,8
2013	58,0	66,4	55,2	60,1	60,8	72,9
2014	58,3	67,6	55,6	60,7	61,2	74,9
2015	58,5	67,2	55,9	59,9	61,3	74,9
2016	58,5	68,7	56,0	60,8	61,1	77,0

Source: Eurostat: <http://ec.europa.eu/eurostat/data/database>, Accessed date: May 15, 2017

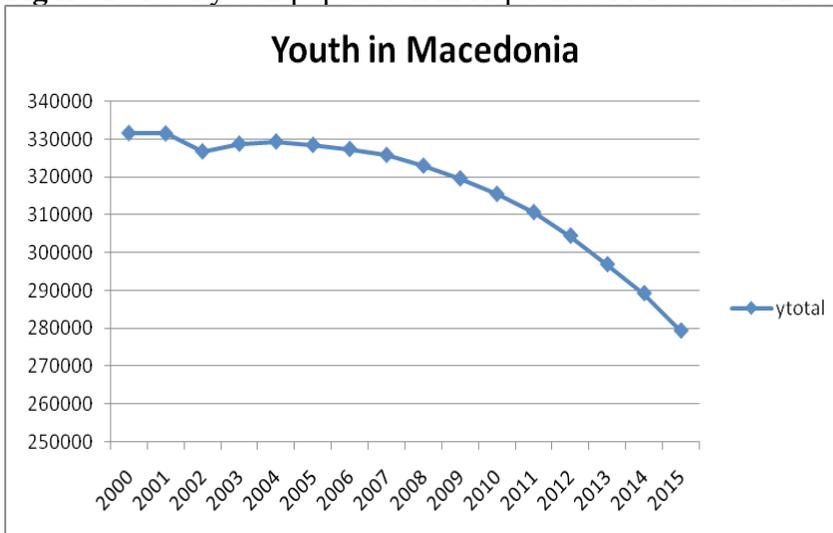
According to Western Balkans-Labour market trends (2017) the increasing of the employment rate is considered to be one of the major goals of South Eastern Europe 2020 strategy. The analysis of employment and unemployment rates in Macedonia suggest that for the past 10 years Macedonia has some improvements in labour market strategies which resulted with declining in unemployment rates and increasing the employment rates but the numbers are significantly different from unemployment and employment rates in the countries from EU28. Young workers from Macedonia aged 15-24 are less likely to be employed relative to other age groups. Tomic (2016) explains that risk of unemployment is higher for young people because of their lack of experience, incomplete or lower level of education, personal network is not developed enough and difficulties in school-to-work transition. Individuals with completed primary education are most affected with high unemployment in the country compared with other age groups and with results from the countries from EU28. Moreover, according to Western Balkans-Labour market trends (2017) migration is playing an important role in unemployment as well as in the inactivity because it has become an important source of income of individuals in Republic of Macedonia.

3. DATA AND METHODOLOGY

This section focuses on econometric analysis of macroeconomic determinants of youth employment in Macedonia. Very few authors using different approaches have tried to examine macroeconomic factors that influence employment in the country (Abdullah, 2011, Anyanwu, 2012, Anyanwu, 2013, Verick 2014; Patimo et al., 2015). This study is based on the methodology used in the work of Anyanwu (2013) with minor modifications in regards to country specifics and available data. Anyanwu (2013) by using cross-sectional data over the period 1991-2009 to investigate macroeconomic determinants of youth employment in Africa have tried to shed a light of high unemployment rate of youth aged 15-24 in Africa. We use annual data for the period between 2000 and 2016 since for some variables included in the regression quarterly data are missing. Data are gathered from the online base of State Statistical Office in Macedonia.

Figure 1 presents number of total youth in Republic of Macedonia for the period between 2000 and 2016. There is a clear presentation of declining in youth population in Macedonia, from 331593 young individuals in Macedonia in 2000 to 279343 in 2016.

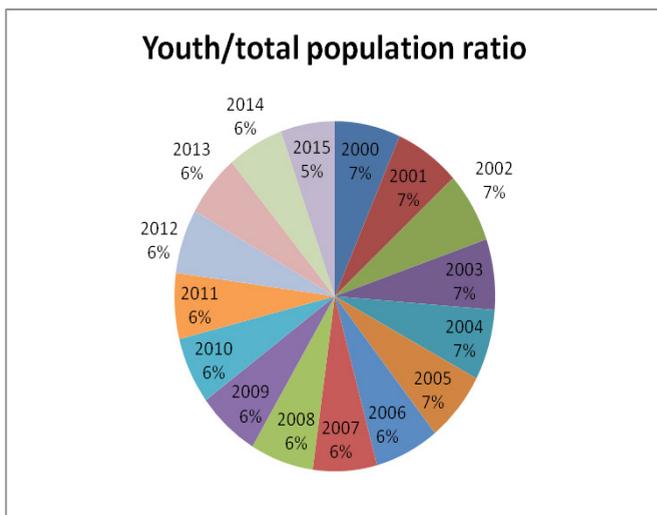
Figure 1: Total youth population in Republic of Macedonia 2000-2016



Source: Authors' presentation of data from State Statistical Office: <http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/?rxid=46ee0f64-2992-4b45-a2d9-cb4e5f7ec5ef>, Accessed date May 9, 2017

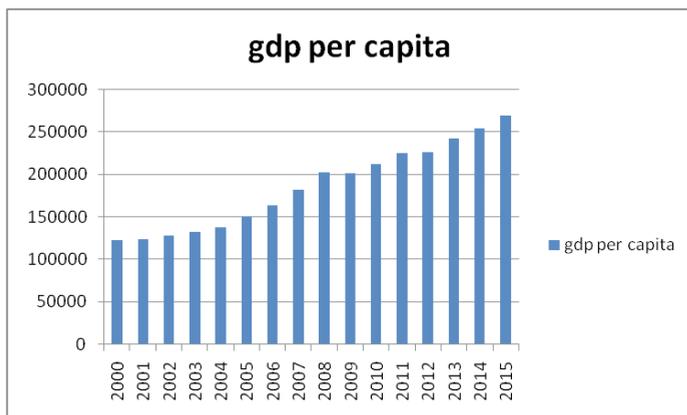
Such decreasing of youth population in the Republic of Macedonia can be explained with lower fertility rates and decrease of the population in Macedonia in general. Figure 2 present youth share in the total population ratio. Youth share in the total population is approximately same each year between 2000 and 2016, around 6%. GDP per capita is constantly increasing for the selected period. From 122706 denars in 2000 to 269514 denars in 2016 (See figure 3).

Figure 2: Youth share in total population 2000-2016



Source: Source: Authors' presentation of data from State Statistical Office: <http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/?rxid=46ee0f64-2992-4b45-a2d9-cb4e5f7ec5ef>, Accessed date May 9, 2017

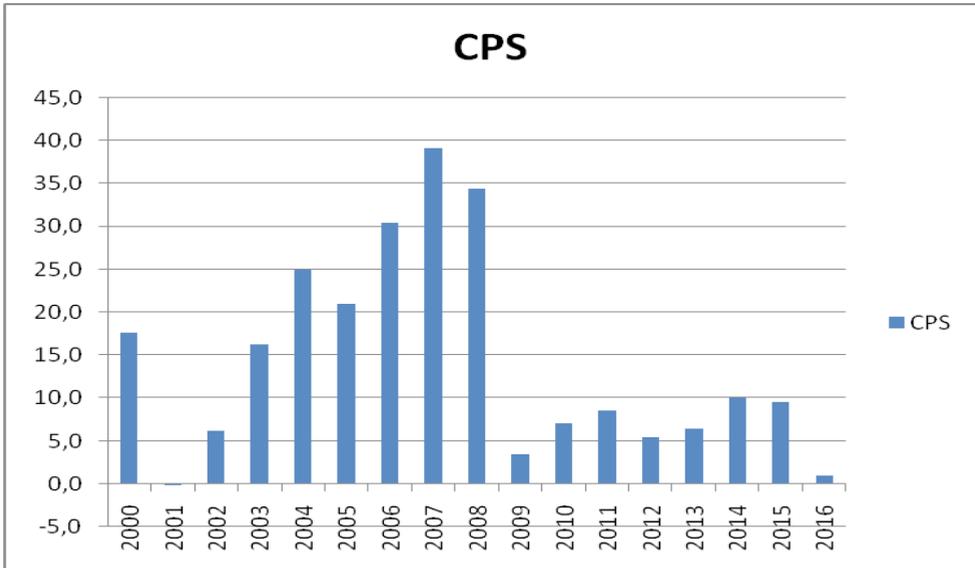
Figure 3: Gross Domestic Product per capita 2000-2016



Source: Source: Authors' presentation of data from State Statistical Office: <http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/?rxid=46ee0f64-2992-4b45-a2d9-cb4e5f7ec5ef>, Accessed date May 9, 2017

Credit to private sector by banks and thrifts vary within selected period (see figure 4). This can be explained by the political and economic instability for the period between 2000 and 2016 in the Republic of Macedonia.

Figure 4: Credit to private sector from banks and thrifts



Source: Source: Authors' presentation of data from State Statistical Office: <http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/?rxid=46ee0f64-2992-4b45-a2d9-cb4e5f7ec5ef>, Accessed date May 9, 2017

The variable employment rate for young individuals in the period between 2000 and 2016 was used as dependent variable. Macroeconomic indicators: gross domestic product per capita, gross domestic investments, credit to private sector from banks and thrifts, foreign direct investments, export, import, inflation rate, total youth population were used as independent variables. More detailed explanation of the variables used in the study is presented in Table 6.

Table 6: Description of the variables

Name of the variable	Explanation of the variable	
Rate of young individuals employed (RY)	Rate of young individuals employed in the period between 2000 and 2016	Continuous variable (dependent variable)
Gross domestic product per capita	Gross domestic product per capita in the period between 2000 and 2016	Continuous variable Unit: denars
Gross domestic investments	Gross domestic investments in the period between 2000 and 2016	Continuous variable Unit: denars
Credit to private sector (CPS)	Percentage of the credit to private sector from banks and thrifts for the selected period from 2000 to 2016	Continuous variable
Inflation rate (IR)	Annual rate of inflation in the period between 2000 and 2016	Continuous variable
Import	Import of goods and services for the period between 2000 and 2016	Continuous variable Unit: denars
Foreign Direct investments (FDI)	Foreign Direct investments in Republic of Macedonia for the period 2000 – 2016	Continuous variable Unit: denars
Total youth population	Total youth population in Republic of Macedonia in the period between 2000 and 2016	

We apply linear regression, which is defined as:

$$RY = c + \beta_1 \ln(gdppc_i) + \beta_2 \ln(imp_i) + \beta_3 \ln(inv_i) + \beta_4 (IR_i) + \beta_5 (CPS_i) + \beta_6 \ln(FDI) + \beta_7 (YP_i) + \varepsilon ; \quad i = \overline{2000, 2016} \quad (1)$$

, where *RY* stands for youth employment rate, *gdpc* for gross domestic product per capita in denars, *imp* for import in denars, *inv* for gross domestic investments in denars, *IR* for annual inflation rate, *CPS* for credit to private sector in percentage, *FDI* for foreign direct investments in denars and *YP* for total youth population, all for selected period from 2000 to 2016.

We use natural logarithm of gross domestic product per capita, foreign direct investments, export, import and gross domestic investments in order to reduce variability of the data.

To examine whether variables used in equation (1) are stationary we conduct Dickey-Fuller test (see appendix A for results). In order to avoid spurious regression we use first difference of: youth employment rate, gross domestic investments, credit to private sector and gross domestic product per capita and second difference of import and total youth employment. Therefore equation (1) is now transformed:

$$RY = c + \beta_1 \ln(gdppc_{i-1}) + \beta_2 \ln(imp_{i-2}) + \beta_3 \ln(inv_{i-1}) + \beta_4 (IR_i) + \beta_5 (CPS_{i-1}) + \beta_6 \ln(FDI) + \beta_7 (YP_{i-2}) + \varepsilon_i \quad (2)$$

To test equation (2) for serial correlation we perform Breusch-Godfrey (LM) test. Detailed results presented in appendix B suggest presence of serial correlation. To avoid serial correlation we use AR(1) method.

In next section, findings from the study are presented.

4. FINDINGS

The coefficient of determination for the equation (2) is about 77 percent, meaning that 77 percent of the variability in the youth employment rates in Macedonia is explained by the independent variables/ regressors (See Table C1 in Appendix C).

As Table C1 (Appendix C) shows, following macroeconomic variables are found to have a significant influence on the employment rates of young individuals aged 15-24: credit to private sector from banks and thrifts, import, foreign direct investments, gross investments and gross domestic product per capita. Total population of youth in the Republic of Macedonia and inflation rate are found to have insignificant effect on employment rate of young workers aged 15-24.

Our study shows that inflation has no statistically significant effect on youth employment rate. This result is not in line with the finding from literature presented in section 2.

If credit to private sector from banks and thrifts increase for 1 percentage point, youth employment rate will increase for 0.12 percentage points, *ceteris paribus*. This result is in line with the findings in the literature; the positive effect of access to credit by the private sector is confirmed in our study as well.

In order to investigate how international trade influence youth employment in republic of Macedonia we included import as independent

variable. Import is statistically significant in this model suggesting that each increase of import of 1 percentage point will decrease youth employment rate for approximately 6 percentage points, *ceteris paribus*.

Increase of domestic gross investments for 1 percentage point will lead to increase in youth employment rate for around 21 percentage points, all other things being equal. This result is significantly different than findings from International Labour Organization (2011). The difference in results can be explained as difference in dependent variable. In our study we examine how domestic investment affects youth employment while study from ILO (2011) deals with employment in general. Foreign direct investments are seen as a major opportunity for job creations. Inflow of foreign capital will lead to growth in employment and consequently increase youth employment rate. 1 percentage point increase in foreign direct investments leads to approximately 3 percentage points in youth employment rate. This result is in line with the work of Oostendorp (2009) and Javorick (2013)

Each increase of gross domestic product per capita of 1 percentage point is expected to increase youth employment rate for 16 percentage points, *ceteris paribus*. This result is in line with the results from the literature; positive impact of economic growth on youth employment is confirmed. At the end, we are testing whether increase in youth population will affect youth employment rate. We found no significant effect of total youth population on youth employment rate.

Conclusion

The aim of this paper was to empirically test whether macroeconomic variables have influence on youth employment in the Republic of Macedonia. We employed similar approach as the one used by Anyanwu (2013) in which we regress youth employment rate on a set of macroeconomic variables: Inflation rate, credit to private sector from banks and thrifts, gross domestic product per capita, export, import and gross domestic investments. We also include total youth population as independent variable. Our findings reveal that despite our expectations, some macroeconomic variables like inflation rate is found to be statistically insignificant for youth employment in the country. Gross domestic product per capita, gross domestic investments, foreign direct investments, access to credit by the private sector have positive effect on youth employment rate in the country, while import is found to have

negative effect on youth employment rate. This research suggest that in order to increase employment rate for young people, policy makers should continue pursuing foreign direct investments and in the same time to continuously increase domestic investment especially in domestic companies.

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Appendix A

Variable	p-value-Dickey-Fuller test	p-value-Dickey-Fuller test after first difference	p-value-Dickey-Fuller test after second difference
CPS	0.4080	0.0140	
IR	0.0392		
Ln(FDI)	0.0482__		
Ln(gdppercapita)	0.9469	0.0445	
Ln(import)	0.2403	0.4344	0.0008
Youth employment rate	0.1678	0.0014	
Gross domestic investments	0.9647	0.0001	
Total youth population	1.0000	0.9997	0.0002

Test showed that variables youth employment rate, import, gross domestic investments, credit to private sector, total youth employment, gross domestic product per capita are non-stationary variables.

Appendix B

Ho: no serial correlation

H1: serial correlation

Running the estimated regression (2) we perform Breusch-Godfrey (LM) test with following result:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.138321	Prob. F(2,2)	0.4677
Obs*R-squared	6.388120	Prob. Chi-Square(2)	0.0410

Since p-value is $0.041 < 0.05$, we must reject the null-hypothesis that there is no serial correlation. Results suggest presence of serial correlation.

Appendix C

Dependent Variable: YE

Table C1: Results from regression (2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-78.40108	16.53047	-4.742821	0.0417
IR	0.157167	0.163712	0.960018	0.4383
GDP	16.20262**	9.244008	7.161680	0.0189
FDI	3.008614**	0.644953	4.664861	0.0430
CPS	0.127946*	0.033810	3.784290	0.0633
IMP	-6.306596*	1.411741	-4.467247	0.0466
INV	21.94130*	5.577279	-3.934052	0.0590
YT	0.001282	0.000601	2.133857	0.1664
AR(1)	-0.722252	0.081887	-8.820105	0.0126
R-squared	0.954393	Mean dependent var		0.040909
Adjusted R-squared	0.771966	S.D. dependent var		1.299388
S.E. of regression	0.620495	Akaike info criterion		1.815018
Sum squared resid	0.770029	Schwarz criterion		2.140569
Log likelihood	-0.982601	Hannan-Quinn criter.		1.609804
F-statistic	1.231641	Durbin-Watson stat		2.002304
Prob(F-statistic)	0.000322			

*, ** and *** indicate significance at the 10, 5 and 1% level, respectively