Specification of the key unused potentials of working-age population: The case with Macedonia

Abstract

This paper provides a theoretical and empirical analysis of unused potentials of working-age population in terms of level of employment rate in the State of Macedonia. By examining data about employment and unemployment categories from LFS in Macedonia during 1996-2017 it was found that large part from the working-age population is not employed. The estimation with the OLS HC5 estimator indicates that the female employment (at 5% level) and youth unemployment (at 10% level) have both positive significant impact on the employment rate. Hence, the effect of these variables has increased the employment rate in Macedonia during this mentioned period. R-squared and adjusted R-squared measures indicate that about 90% of the variation in the employment rate is explained by variations in the selected explanatory variables. The rest of about 10% of the variations are not explained by this model, i.e., due to some other factors. Both the non-robust F-statistic and the robust Wald F-statistic show that the non-intercept coefficients are jointly statistically significant. The results from the influence statistics, point to observations of 1997, 2003, 2015 and 2017 as being an outliers. The leverage plot results support the standpoint that observations of 2001 and 2003 years have high leverage in the relationship between employment and all explanatory variables included in the model.

Key words: unused potentials; working-age population; OLS HC5 method; LFS; Macedonia

1. Introduction

The European Union is noted for the lowest employment levels of all industrialized countries. European labour markets are characterised by high rates of unemployment among older workers and early retirement. Developments of labor supply and labor force participation in Europe have been widely analyzed recently, not least because of the expected decline in the number of workers in the future due to the shift in the populations' age composition toward older ages (Loichinger and Prskawetz, 2017). If economic activity levels remain at current levels while the share of the non working population increases significantly, during the next decades as predicted, problems are anticipated, particularly for social security systems that rely on pay-as-you-go schemes. Sustained demographic change in Europe is however calling for "unused capacity" to engage in active work (Engelhardt and Schmidt, 2013). According to the European Commission's special review on demographic trends in 2013, the EU-27 is projected to have a large shortfall of well-educated (ISCED 5-6) workers. Although their number will grow by virtue of rising education levels in the population, this projected growth will be slower than the increase in demand. As regards high-skilled workers, the time-window for growth is more limited, even the best activation policies can only palliate and delay the onset of shortages for just a few years (European Commission, 2013). In order to make the economy more competitive and also to cope with social security financing, the 1999 Lisbon Summit fixed objectives of a 70% overall employment rate and 60% for women by 2010 (Feld, 2006). The Stockholm Summit on March 2001 added a 50% objective for the 55-64 year-old potential working population. In order to produce the volume of labor corresponding to a 70% employment rate in the whole of the EU, it was necessary to considerably increase the number of persons employed. To succeed in this, there were 3 possible means: increase 15 to 64 year old male and female labor-market participation, decrease the unemployment rate or drastically increase labor immigration. The new Europe 2020 strategy defines three mutually priorities: smart, sustainable and inclusive growth

(Eurostat, 2012). In this respect, the EU headline employment rate target of 75% for the population aged 20-64 is the most outstanding illustration of the EU's ambitions in the field of employment[1]. Sustainable development aims at improving human well-being, particularly by alleviating poverty, increasing gender equality, and improving health and human resources. The enlargement countries will be associated with initiatives taken at EU level to meet the goals of the Europe 2020 strategy, including EU employment rate target. The Lisbon Strategy of the European Union admitted that a shortage of economically active women is a major weakness of the European labour market. Given that women constitute half of working-age population, closing gender gaps could narrow the deficits in the labour force caused by demographic factors. The aim of this study is to identify the unused potentials[2] of working-age population in Macedonia, as one of the EU candidate accession country. Furthermore, the paper aims to indicate several aspects concerning the degree of utilization of labour force and to highlight the labour potential of the country. The paper is structured as follows: in section 2 is provided the theoretical background of the research and the main research hypothesis. Section 3 outlines the volume and the features of unused potentials of working-age population in Macedonian context. Section 4 describes the data and methods. Section 5 and 6 presents and discusses the results that came out from the application of our OLS H5 estimator. The last section 7 sums up the main conclusions of the research.

2. Theoretical research background and the key hypothesis

Labour market structures, such as unemployment rates, the extent of part-time work or the amount of service jobs influence individual participation and the transition to inactivity. Economic theory dedicates great attention to the available labor force, as a potential factor of development. Within the context of deteriorating demographics it is appropriate to focus on two issues: past trends of 'participation' indicators, current differentials and a potential for balancing the demographic decline (Ivanov, 2009). Labour market participation decisions can be analyzed from the stand point of the traditional theory of labour supply, as well as the theory of job search (Kane, 2013). The labour supply theory anticipates only two possible states: activity and inactivity. While, the job search theory presumes from the very beginning that people participate in the job market and can be either unemployed or employed. But, despite that, it is possible to anticipate a combined model, one that takes into account decisions made about three statuses: inactivity, unemployment and employment. In our case, it is worth noting that there are various theoretical frameworks within which to consider economic transition from a centrally planned to a market economy. Anyway, the most widely used approach is describing economic transition as "essentially a regime change from an allocation system based on central planning to one based on market forces: a systemic

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[1] Europe 2020 targets promote lower school drop-out rates, higher rates of tertiary education and higher employment. Source: European Commission, 2013

[2] Dimitrieva and Stančevski (1985) point out about that there are two categories of the unused potentials: visible and hidden. The first *visible* category consists of registered job seekers and persons temporarily working abroad, both coming from the contingent of a working population. According to them, there are three types of *hidden* unused potentials of working population: The first one of these types exists within the structure of the sector of activities, and these are regularly employed people whose work and working time are not using sufficiently rational and productive. The second type of hidden unused potentials exists in individual agricultural holdings and these are active persons in agriculture whose work is used occasionally or not used at all. And, the third case of hidden unused potentials consists of working-age persons not included in the public or private sector. In this type are included the unemployed women, then students and students preparing for being economic active and unregistered job seekers. In the hidden unused potentials of working-age population can be included also female housewives.

process of liberalization affecting the formation of prices, the rules of national and international trade and private initiative drives this change" (Ferragina and Pastore, 2008, pp.77). Mainly economic research shows that business cycles influence job opportunities by shaping the demand for labour. According to Okun's law: "There is a negative relationship between unemployment and economic strength" (Engelhardt and Schmidt, 2013, pp.942). From a theoretical point of view, numerous determinants are linked to crossnational variance in labour force participation rates. Demand-side driven arguments consider participation rates as a result of economic constraints depending on business cycles. Supply-side oriented literature focuses on the individual choice to withdraw from the labour market. Individual decisions in this framework are made on the basis of individual and institutional factors. On the aggregated level, these individual choices add up to different participation rates across countries (Engelhardt and Schmidt, 2013). Furthermore, as stated by Kane (2013) the analyses of the process of integrating people into the labor market have traditionally been based on their individual characteristics as the explanatory factors, such as age, gender, education, and experienced gained in the job market. When Kane (2013) addresses to the difficulties that certain populations encounter in the labor market he relies on the Becker's theory of human capital. Accordingly, the interpretations regarding these difficulties originated from lack of adequate education: e.g. general education that is inadequate for people with lower qualifications, specialized education that is outdated for older people and lack of experience in the job market for the youth (ibid, pp.3).

Unemployment is important aspect of the current labour market situation. Engelhardt and Schmidt (2013) point out about two aspects of the effect of the long-term unemployment as a pathway into retirement. According to them the long-term unemployment should not be correlated with an increased risk of exit or the chance of labour force participation. Accordingly, on the one hand, it is expected a negative effect of long-term unemployment if unemployment is completely involuntary and on the other hand, it is assumed that there will be a non-negative effect on individual labor force participation if as long-term unemployment is at least to some extent voluntary.Thus, in this context too, higher levels of long-term unemployment of older people indicate poor employment opportunities as well as a prevalent bridge strategy[3], leading to different effects on individual labour force participation.The persistence of large numbers of people excluded from work represents a key challange for the objective of social cohesion."The longer a period of unemployment for an individual, the more entrenched that person generally becomes in social exclusion through their inability to afford material goods, services and housing, while their social contacts are often reduced (in part due to a lack of money for going out socially, or due to the stigma of being unemployed) and this may lead to a lack of confidence and a reinforced sense of isolation" (Eurostat, 2010, pp. 63)[4]. According to Piecha and Wescott (2014), the performance of the economy as a whole is maybe the most critical determinant of youth unemployment. A successful transition from the education to work in these times in a context of prolonged educational trajectories and fragmented labor markets has been a challenge for youth (Çelik and Lüküslü, 2018; Arifi and Marmullaku, 2019). As mentioned, the issue of youth unemployment and employment

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[3] So called "bridge jobs" means a well established correlation between the relative cohort size of the young and the labour force participation by the aged and only holds true under the assumption that younger and older workers can substitute one another at least to some extent. However, there is little or no evidence that younger and older workers are completely interchangeable. Source: Engelhardt and Schmidt, 2013.

[4] Eurostat defines that persons are considered to be long-term unemployed after 12 months of unemployment and very long-term unemployed after 24 months. The unemployment rate for EU-28 rised from 8.2% in 2006 to 10.9% in 2013 and fell to 7.6% in 2017.While the long-term unemployment rate was 4.0% in 2005, then rise to 5.1% in 2013 and then fell proportionally to 3.4%. In 2017, the long-term unemployed in the EU-28 represented just around one in two of all unemployed persons. Source: Eurostat, 2018.

has gained much attention in the last period. Thus, many young people go through difficult transition periods until they find a job. Among other things, Arifi and Marmullaku (2019) have noted that many studies point out that youth unemployment is more affected by economic cycles than general unemployment due to the fact that young people have less experience and less advantageous contracts than older people. In the conclusion of the research results of Arifi and Marmullaku (2019) for Macedonia, Serbia and Montenegro, using data from ILO's survey on the transition from education to work and the Probit Regression, it turned out that females were less likely to be employed in comparison to males. In addition, being older meant that one has more chances of being employed.

Gender inequality refers to "unequal treatment" or perceptions of individuals based on their gender and arise biologically or from differences in socially constructed gender roles. Gender equality in labor market is a multidimensional issue including, e.g. labor force participation, employment, payments and job quality in terms of benefits, rights and opportunities for skills development (Anastasiou et al, 2015). Rising levels of female employment are widely considered to be an important component of economic development, enlarging demand, improving the effectiveness of investment in education and for the encouraging economic innovation (Andreotti et al. 2013). The main argument of Andreotti et al. (2013) is that the 'revolution' in gender roles has not yet been accomplished, causing profound social tensions. Thus, they deliberate that the previous 'equilibrium' concept based on the adult male 'breadwinner' model and a rigid gender division of labor inside and outside the home has been dumped out, but has not been replaced by a new balance.
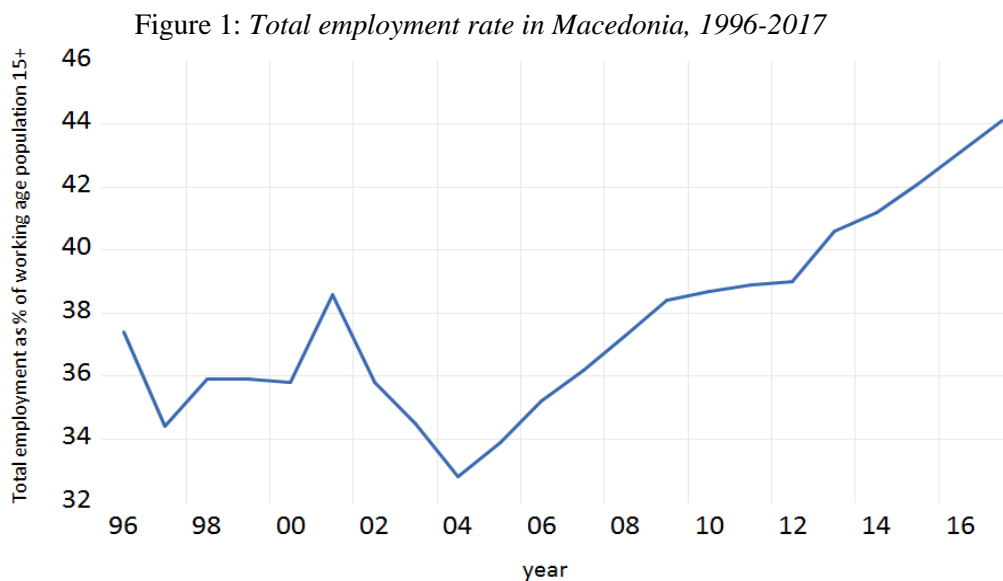
Schoenmaeckers (2005) notices that the negative effects of the proportional decreases of the working-age population - in general the population aged 20-64 years, can be largely overcome by increased labor force participation (of both men and women) and by increased labor productivity and hence increased GDP per capita. Apart from contributing to workers' productivity and financial reward to work, Myck (2015) emphasizes also that training may also be an element of broader job quality, expressed through the potential for personal development and professional advancement. This, according to him, in turn, may be an important factor contributing to longer employment. Commonly, social security policies have an impact on both statistical and legal definitions for "older" workers, which in most industrialized societies are generally accepted to be by 65 years of age at maximum. As a result, as stated by Ghosheh Jr et al. (2006), the concepts for "older" workers have reasonably focused on the age groups in the years before retirement, typically those aged 55-64. Conventionally, labor market participation by those in this age groups has been a bit of a mixed base, with some countries reporting high rates of participation and others lower rates, affected to some extent by social security scheme, social policy, workplace culture, cultural expectations and mandatory retirement ages (ibid, pp.7). Although the valid definition of "older" workers, as mentioned previously, is 55-64 years of age, Ghosheh Jr et al. (2006) emphasizes that with the changes of socio-economic or policy circumstances in the near future, in order for the definition to accurately reflect the realities of "older workers" participating in the paid labor market a re-definition of "older" workers may need to be expanded to include those 55-70 years of age.

At the end, our key research hypothesis, claims that there are yet specific country characteristics which are associated with labour market participation in Macedonia. Based on this hypothesis, the research attempts to figure out whether these specific characteristics as long-term unemployment rate (measurement as those who are waiting to be employed for more than 4 years), high levels of youth unemployment (20-29) and low levels of female

employment and older employment (55-64) offer the needed potential to be used when it comes to increasing the lower level of employment rate in Macedonia.

3. The volume and features of unused potentials of working population in Macedonia

In the pre-transition period, the Republic of Macedonia was characterized by a high but stable unemployment rate, ranging between 21.5% and 23.9%. The main reason for the high unemployment rate was the unplanned construction of the country's economic structure after the Second World War. According to Risteski and Tevdovski (2008) the process of rapid urbanization and the lack of adequate infrastructure in the rural areas lead to massive migration from villages into cities, and accordingly, the rural exodus have changed the country's economic structure. Therefore, the influx of labor in cities was unplanned. Labor demand was maintained artificially and without economic logic. Many enterprises were characterized by overemployment. The transition (since 1991) period leads to a significant increase in the unemployment rate. The highest unemployment rate was achieved in 1995 (39.1%). There were two main reasons for the growth of unemployment in the transition period: "First, low economic activity of the country, which means that many production facilities were completely or partially closed, and their employees were out of work, and second, the imbalance in the labor market"(Risteski and Tevdovski, 2008, pp.299). Unemployment was decreasing in the period 1995-2001 as a result of the improvement of the Macedonian economy. In 1995, for the first time, a positive rate of real GDP growth was achieved. The positive trend continues until 2001. The 2001 military conflict significantly reduces the economic activity of the country. Unemployment rises again in 2005 and reaches a maximum value of 37.3%.

Figure 1: *Total employment rate in Macedonia, 1996-2017*

Source: Author's design in EViews 11 software

In order to see in more detail the trends in the utilization of the labor potentials of the population in Macedonia, furthermore is presented the volume and features of the unused potentials in Macedonia. In the period 2003-2017, the rates of activity and employment in Macedonia show slight changes or slight increase from year to year and stable decrease of the unemployment rate. The data from LFS indicates a very small tendency to increase the participation of the working-age population in the total population, and this is probably a consequence of the shift of the age structure of the population by increasing its participation in the upper age groups. The participation of employed population in working-age population

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for the mentioned period from 2003 to 2017 has been increasing in Macedonia (from 34.51% to 44.10%).The highest employment rate of 44.1% was recorded in 2017, while the lowest unemployment rate of 22.4% was also recorded in 2017 (SSO, 2018).

A higher employment rate in this period is noticeable in men, which reflects higher participation of men in the total number of employees. The employment in Macedonia is characterized by a very unfavorable gender structure. This structure has remained unchanged over a longer period of time due to: unstable economic and social conditions in the country and imbalance between the available and required profiles on the labour market (SSO, 2017, pp.57). The employment rate among women during the period (2002-2017) increased by 6.5 percentage points (LFS,2017a; LFS, 2007b). However, according to the LFS data, the employment rate for women in Macedonia in 2017 was 34.6, which is significantly still lower than the employment rate of 53.6 for men[5]. Furthermore, the portion of 55 to 64 year old men working and the share of 55 to 64 year old women working in the last two decades have been increased equally for almost 15 percentage points. Thus, the employment rate, which measures the proportion of persons in employment among the population of the age group 55-64, is higher if we compare 2017 to 2002 (respectively 25.8% in 2002 and 41.4% in 2017). And of course the lower participation is noticeable for women than that of men. This gender gap was for more than 22 percentage points in 2002, i.e., more than twice lower, but it was even increased in 2017 between men and women to 26 percentage points (respectively 37.4% for men, 14.7% for women in 2002 and 54.5% for men, 28.5% for women in 2017).

Unemployment is the other important aspect of the current labour market situation. In Macedonia this group is still represented in large numbers but there is a slight tendency towards their constant decrease. According to LFS, observed for the period 2003-2017, their absolute number has decreased from 315863 in 2003 to 213564 in 2017 (i.e., from 36.7% to 22.4%), or decrease by 14.3 percentage points. According to LFS released data by the SSO in 2018, the unemployment rate for women was 21.8% and for men 22.7% in 2017. In addition to the scope also the structural characteristics of the unemployed point to the unfavorable situation of this type of unused potentials, which is manifested through higher participation of young people, long-term unemployment within men, constant increase of higher education persons as unemployed, etc. According to the LFS data, the participation of long-term unemployed persons, i.e., those who are waiting to be employed for 4 years and longer[6], reaches 63.6% in 2003 and 67.1% in 2008. This percentage was about 60.1% in 2012 and 56% in 2017 of the total unemployed persons. For the whole period the participation of men is more than double, so, their participation is 68% in 2008, 64% in 2012 and 65% in 2016. Also, long-term unemployment in Macedonia is especially widespread among the younger cohorts and for the middle-aged groups. Thus, higher levels of long-term unemployment of younger adults indicate poor employment opportunities. This extremely high long-term unemployment in Macedonia is a clear sign on the structural characteristics of the unemployment phenomenon and insufficient creation of new jobs (UNDP, 2004). A worrying tendency towards unemployment growth is also noted for highly educated unemployed persons, i.e., for those with University level education. Their share in the total unemployment
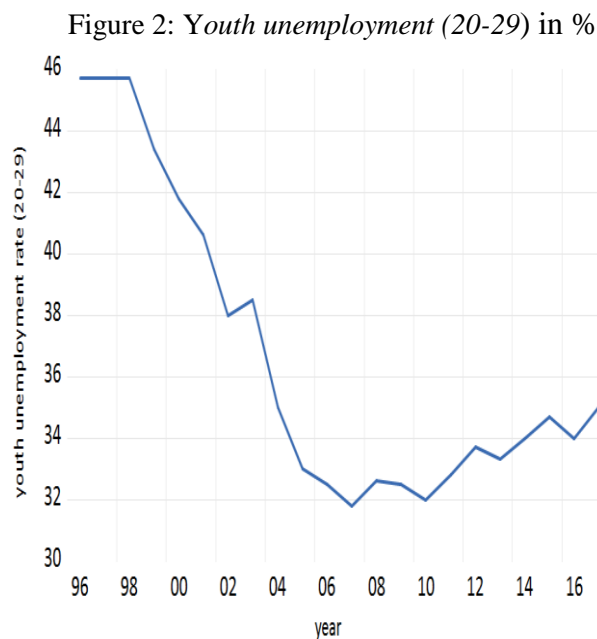
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[5] Employment rate is defined as participation of the number of employed in the working age population aged 15 years and over (according to the recommendations of the International Labour Organization - ILO)

[6] According to the official definition of Eurostat, the long-term unemployment rate is calculated as a share of unemployed persons for one year or more in the total number of unemployed persons. However, this definition has been also adopted within Macedonian LFS, but we also want to point out to the unique phenomenon for Macedonia. Therefore, the indicator that was provided here was for measuring the long-term unemployment as those who are waiting to be employed for more than 4 years, because their share in the total unemployment is largest in the years behind and definitely it is worth including for our research purposes.

by the level of educational attainment has doubled from 5.6% in 2003 to 13.4% in 2011 and reached 19.2% in 2017.Within this group of unemployment categorization; the share of women unemployed with higher education is higher than men's for the whole period.

4. Data and methods

The collected data for our research analyses are obtained as yearly officially published data from the LFS dataset and Statistical Yearbooks by the State Statistical office of the Republic of Macedonia referring to 22 year period (1996-2017) for Macedonia. It includes statistical data about the employment rate; female employment rate, long-term unemployment rate, youth unemployment rate (20-29) and older employment rate (55-64). The data for the four explanatory variables for the period 1996-2017in Macedonia can be seen in the figures (2-5):
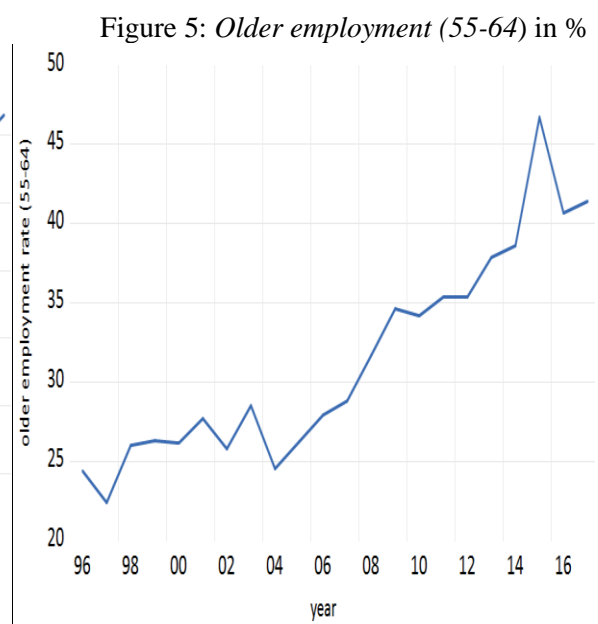
Figure 2: Y*outh unemployment (20-29)* in %

Source: Author's design in EViews software

Figure 3: *Long-term unemployment in %*

Source: Author's design in EViews software

Figure 4: *Female employment in %*

Source: Author's design in EViews software

Figure 5: *Older employment (55-64)* in %
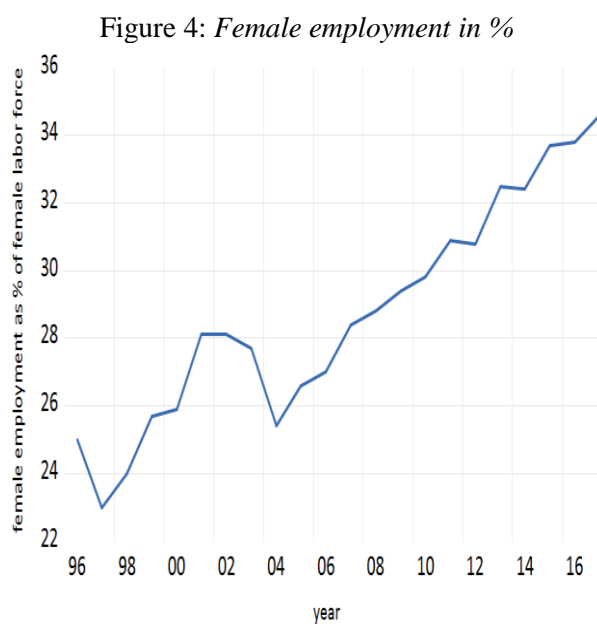
Source: Author's design in EViews software

The newest version of EViews software offers support for several new heteroskedasticity robust coefficient covariances in least squares regression. These alternative coefficient covariance estimators provide different approaches to accounting for bias in finite samples by adjusting the weights given to residuals on the basis of leverage (IHS, 2017b). The general class of heteroskedasticity consistent sandwich covariance estimators is expressed in eq.(1):

$$\widehat{\Sigma}HC = (X'X)^{-1}(\sum_{t-1}^{T}(d_t\hat{\epsilon}_t)^2 X_t X_t')(X'X)^{-1} \qquad (1)$$

where d_t are observation-specific weights that are chosen to improve finite sample performance. Our software allows to estimate the covariances using several choices for d_t[7]. Additionally to the standard White covariance estimators (HC0, HC1), the newest version of EViews supports the bias-correcting HC2, pseudo-jackknife HC3 and the leverage weighting HC4, HC4m, and HC5 (IHS, 2017b, pp.47). It should be noted that HC4, HC4m, and HC5 all depend on an exponential discounting factor δ_t that differs across methods. After performing common used OLS estimation for a heteroscedasticity of unknown form, then a heteroscedasticity consistent covariance matrix (HCCM) estimator denoted as HC5 was applied. The proposed HC5 method was used, in which the exponent used in HC4 is modified to consider the effect of maximal leverage (Habshah et al. (2018). Since the modification of the exponent $(1 - h_i)$ of HC4 has been made to control of the level of maximal leverage, the new estimator is called HC5. Thus, this research provides a better algorithm for estimating model parameters in linear regression in case heteroscedasticity and high leverage points exist in a data set. Even though the OLS method provides unbiased estimates in the presence of heteroscedasticity, it is consider as not efficient. Hence, two weighting functions based on RMD and DRGP[8] were proposed to be incorporated in the weighted least squares and Robust HCCM (HC4 and HC5) based estimators, (ibid, pp.22). Since in our case an alternative HC5 estimator was used, so it is shown in eq. (2):

$$\delta_t = \min(Th_t/k, \max(4, k\,Th_{max}/k)) \qquad (2)$$

HC5 is similar to the HC4 version of δ_t, but with observation specific truncation that depends on the maximal leverage and a pre-specified parameter k (IHS, 2017, pp.37). In our model, a default value of $k = 0.7$. was employed. Finally, to have a maximum flexibility, our software allows providing user-specified d_t in the form of a series containing those values. Accordingly, each of the weight choices modifies the effects of high leverage observations on the calculation of the covariance. It can be seen more at IHS (2017) for discussion of the effects of these choices. Also it should be noted that the full set of HC estimators is only available for linear regression models. The leverage based methods are not available for nonlinear regression models and only user-specified may be computed.

5. Application of OLS HC5 method on employment in Macedonia and main results

The estimation was made of employment equation for Macedonia. The equation uses four explanatory variables to examine effects on employment rate: youth unemployment (YUN), long-term unemployment (20-29) (LTUN), female employment (FEMEMP), and the old employment (55-64). After specifying of the equation variables, the Covariance method was used and then selected HC5 method, retaining the default value of $k = 0.7$. The results of the estimated model with these settings are given in table (1).

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[7] The full range of these estimators is available for equations that are estimated by linear least squares.
[8] Robust Mahalanobis Distance and Digital Representation of Graphic Products

Table 1: *Regression results for the alternative HC5 estimator*:

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Dependent Variable: LOG(EMP)
Method: Least Squares
Date: 07/28/19   Time: 10:49
Sample: 1996 2017
Included observations: 22
Cribari-Neto et al. (H5) heteroskedasticity-consistent standard errors &
      covariance (k=.7)
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Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.846294	0.237628	11.97794	0.0000
YUN	0.004852	0.002457	1.974813	0.0648
LTUN	-0.001986	0.001543	-1.286942	0.2154
FEMEMP	0.022053	0.007289	3.025303	0.0076
OLDEM	0.002872	0.003987	0.720361	0.4811

R-squared	0.922598	Mean dependent var		3.627043
Adjusted R-squared	0.904386	S.D. dependent var		0.080246
S.E. of regression	0.024813	Akaike info criterion		-4.358169
Sum squared resid	0.010467	Schwarz criterion		-4.110205
Log likelihood	52.93986	Hannan-Quinn criter.		-4.299756
F-statistic	50.65843	Durbin-Watson stat		1.481053
Prob(F-statistic)	0.000000	Wald F-statistic		97.95128
Prob(Wald F-statistic)	0.000000			

Source: Author's calculations in EViews 11 software

The effects on statistical inference resulting from a HC5 estimator are quite interesting, however the effect of FEMEMP (female employment) is most significant at conventional test levels. As can be noticed, the heteroskedasticity standard errors for this specification are smaller than their conventional coequals. Furthermore, it can be noticed that the results in table (1) present both the conventional *F*-statistic and associated probability and the Wald test statistic and *p*-value for the hypothesis that all nonintercept coefficients are equal to zero. As known the familiar residual *F*-statistic for testing the null hypothesis depends only on the coefficient point estimates, and not to their standard error estimates, and it is valid only under the sustained hypotheses of no heteroskedasticity or serial correlation. When has ordinary least squares estimation with conventionally estimated standard errors, this statistic is numerically identical to the Wald statistic. But, when robust standard errors are used, as does in our model, the numerical equivalence between the two collapses, thus our software reports both the non-robust conventional residual and the robust Wald *F*-statistics. In our case, both the non-robust *F*-statistic and the robust Wald show that the non-intercept coefficients are jointly statistically significant.

Figure 6: *HC5 estimator for employment rate in Macedonia (1996-2017) - Influence statistics:*

Source: Author's design in EViews software 11

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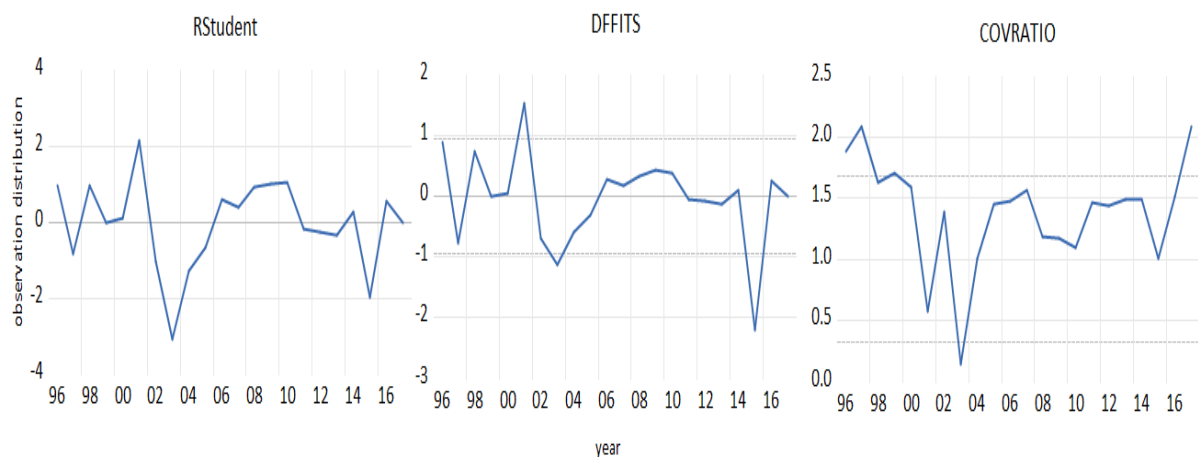
Figure 7: *HC5 estimator for employment rate in Macedonia (1996-2017) - Leverage plots:*
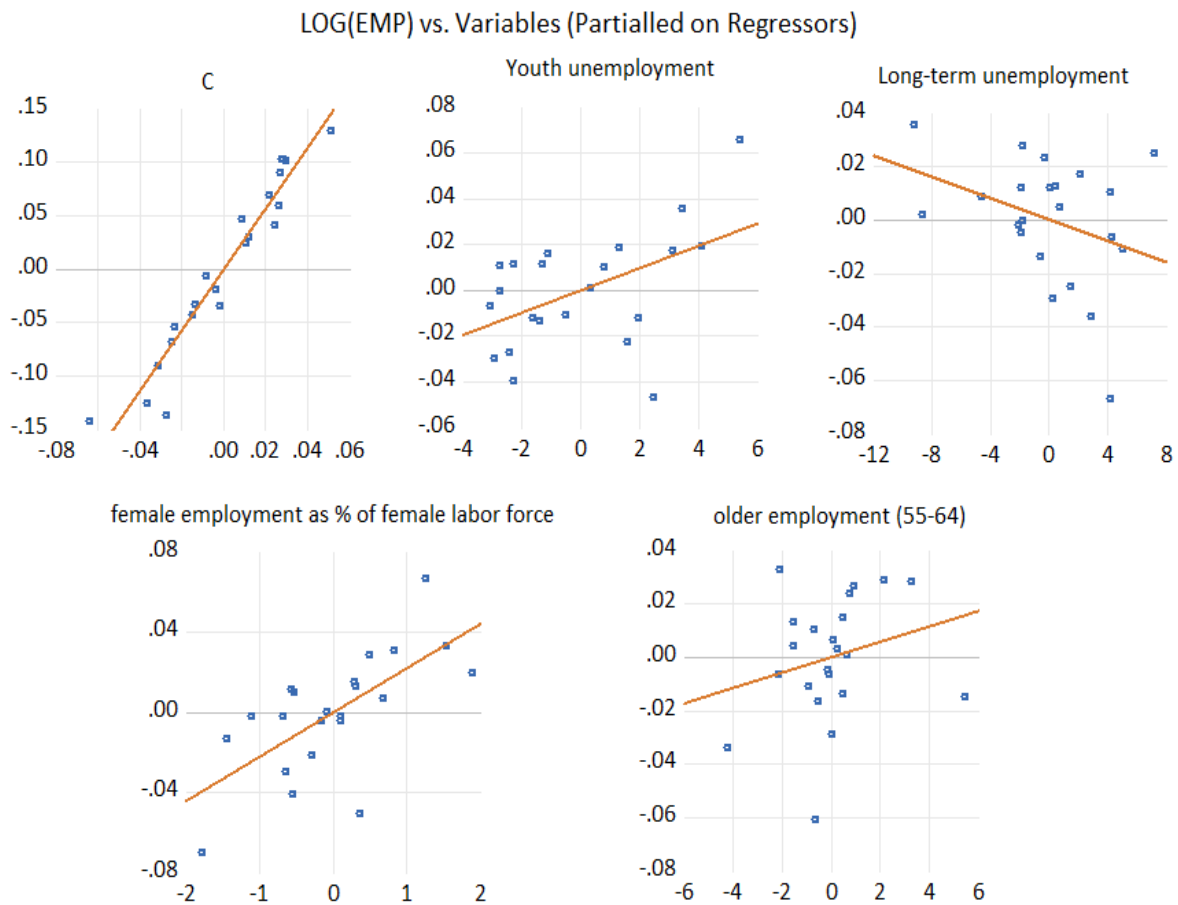
Source: Author's design in EViews software 11

Influence statistics are a method of discovering influential observations, or outliers. They are a measure of the difference that a single observation makes to the regression results, or how different an observation is from the other observations in an equation's sample (IHS, 2013). A plot of the influence statistics of RStudent and DFFITS clearly shows that observation of 2001 year is an outlier (figure 6). The spikes in the graphs for all three influence measures, including COVRATIO statistics, point to observations of 1997, 2003, 2015 and 2017 as being an outliers as well.

Leverage is a measure of how much each data point influences the regression. Leverage plots are the multivariate equivalent of a simple residual plot in a univariate regression. Like influence statistics, leverage plots can be used as a method for identifying influential observations or outliers. From our figure (7) it can be observed that there are a lot of observations that have more leverage on (i.e., the potential to influence) the regression line (either in a positive or negative direction). And, according that, they tend to be closer to the regression fit with a large influence on the analysis. Thus, the influential points have a large influence on the fit of the model. The findings for the influence statistics in figure (6) for many observation years are confirmed by the leverage plot view of figure (7) as well. The graphs in figure (7) support the view that observations of 2001 and 2003 years have high leverage in the relationship between employment and all explanatory variables included in the model: youth unemployment (20-29), long-term unemployment, female employment and older employment (55-64). Observation year of 1996 has high leverage only in the relationship between employment youth unemployment (20-29). Observation year of 2015

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have high leverage in both the relationship between employment and female employment and the relationship between employment and older employment (55-64). Finally, the observation years of 2002 and 2004 have high leverage only in the relationship between employment and older employment (55-64). The mentioned years, such as 2001 and 2003 are characteristic for some specific turbulent political and hence economic turmoil in the country. The other mentioned years, especially 2015 and 2002 are representing a specific periods for Macedonia since a takeover of political executive establishment from one dominant ruling party to another was made. In 1996, the highest percentage of youth unemployed was recorded and the process of restructuring of state-owned enterprises began, i.e., the so-called transition process enters the most painful phase. At the same time, many people are fired and a great deal of discontent is occurring in society, leading to further stratification of the population and great poverty that deepens in the years to come. However, it is undoubtedly that these developments have had a greater or lesser impact on socio-economic processes and movements in Macedonia. The most pronounced influence was probably on the labor market situation and trends (e.g., shocks on employment and rising unemployment).

6. Discussion of the results

The results from ordinary least squares regression and HC5 estimator clearly show a positive significant effect of the female employment to the employment level in Macedonia for the mentioned period (1996-2017). The results estimate that the effect of youth unemployment (20-29) is also positive but statistically significant at the 10% level. Thus, the effect of both the female employment and youth unemployment has increased the employment rate during this period. The coefficient of older employment (55-64) has also a positive sign but it was insignificant. Only long-term unemployment has negative effect on the employment rate but it has shown to be insignificant as well. With these results, undoubtedly there is some clear evidence indicating that the employment rate in Macedonia within the period 1996-2017 is largely influenced by the different circumstances of employment and unemployment conditions. These results confirmed our key research hypothesis that the specific characteristics within the State of Macedonia, as long-term unemployment rate (measurement as those who are waiting to be employed for more than 4 years), high levels of youth unemployment (20-29) and low levels of female employment and older employment (55-64) offer the needed unused potential to be used when it comes to increasing the lower level of employment rate in Macedonia.

Female employment has some rapid trend toward increasing since 2000s until the recent dates but their percentage is still very low compared with the EU countries or some other neighbouring countries as well. As mentioned at the beginning, the Lisbon Summit fixed objectives of a 70% overall employment rate and 60% for females by 2010 (Feld, 2006). The current Macedonian percentage of about 35% for female employment is far away from this objective that was set up even for 2010. The available female working age population shows the potential possibilities of resources while the extent of its actual utilization depends on its economic performance and/or activity. Additionally, the economic conditions in the country may affect their activity on the labor market. This group might be pointed as visible unused potentials of working population, as many of them are registered as unemployed persons. It is well known that not everyone of working age is able to work, wishes to enter the labor market, or actually has a job. Anyhow, the data for female participation in the working-age population and the data for their participation as employed persons in the working-age population best show the degree of their lower utilization as labor potentials within working-age population.

Given the high share of youth unemployed in our society and its significance (at 10%) on the employment rate shown in our model, it is worth discussing this phenomenon as well. This phenomenon could be explained at least through two important facts or circumstances that are existed within the country. Firstly, it is a known fact the greater part of this youth population is involved within the educational process in higher education and since it is therefore known that the highest percentage of young people that are enrolled and studying higher education and do not actively looking for a job during their studying. The second circumstance in relation to this reality may be the fact that many of the young people of this age are only registered as unemployed, but do not actively seeking work in the country, and many of them have been emigrated from the country after looking for better education or decent work. Unfortunately, the State of Macedonia do not possess an adequate and reliable migration statistics on which we could lean on and to know how many people, including how many young people at this age are being emigrated annually for temporary or permanently from Macedonia. In addition, labor market institutions are probably to impact employment dynamics for youth differently than for their adult counterparts. Presuming different levels of productivity for new-arrivers and experienced workers, rigidness in labor market regulation might cause negative relative employment effects for youth. The strict hiring and firing regulations might adversely affect youths' job admission prospects but also the inflexibility of the wage negotiating process may have a negative effect for the youth.

The negative (insignificant) effect of long-term unemployment on employment rate could be explained as discouraged workers that do not believe that there is work for them and are thus not registered as job seekers or do not seek for job actively. Another explanation for this proportion of the population might be that a number of these people work in the informal sector without receiving unemployment benefits.

7. Concluding remarks

According to our results the potential to increase labor supply is mainly argued to come from women and youth people, since their labor market involvement is lower than that of adult men. Also it should be admitted that a shortage of economically active women is a major weakness of the Macedonian labour market as well. Given that women constitute a half of working age population, closing gender gaps could narrow the deficits in the labour force caused by demographic factors, but in the long-term perspective could not eliminate them. The data for the unused potentials of working population show that large part from the working-age population is outside of the labor market. The mentioned percentages regarding employment rate in Macedonia are very lower compared with the developed countries, for example with the majority of EU countries whose employment rates range from 60-70%, and in some of them they exceed 70%. Such a difference of about 25 percentage points indicates to a large unused part of about 250 000 persons from the working-age population in our country that should be a part and included within the Macedonian labor market.

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