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CONTENT

DEFLATION IN THE EURO ZONE: OVERVIEW AND EMPIRICAL ANALYSIS

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Abstract: Two main issues, closely related to each other, have occupied the European Central Bank in recent years: the sovereign debt crisis and the possibility of deflation in the euro zone.In this paper we discuss the causes, the consequences and the policy options regarding deflation. In addition, we assess the magnitude of the risk of deflation in the euro zone. For this purpose, we will employ the methodology of Kilian and Manganelli (2007). Our results suggest that the threat of deflation in the euro zone is related to the international financial crisis and to the sovereign debt crisis in Europe. Thus, the probability of deflation in the euro zone increased in recent years. Nevertheless, it appears to have subsided in 2017, justifying the view taken by the ECB's Governing Council,according to which deflation is no longer a problem for the euro zone.

Key words: deflation, debt crisis, euro zone, GARCH model.
JEL classification: E31, F45, F47.

Introduction

The stagflation of the 1970s made inflation the number one enemy of central banks in advanced economies. However, the Japanese experience since the late 1990s and the international financial crisis initiated in the United States of America in 2007 have made deflation emerge as the main concern of monetary policymakers.Consequently, an interest in measuring the risk of deflation has developed (see, e.g., Fleckenstein et al., 2013).

The phenomenon of deflation occurswhen general price levels fall for a prolonged period of time, with goods and services becoming cheaperin money terms. This may be the outcome of higher efficiency in production or improvements in supply. However, it may also be the result of demand-deficiency or a symptom of an increased risk of 'secular stagnation' (see, e.g.,

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Pagano and Sbracia, 2014). More disturbingly, it could pave the way for a deflationary spiral in the euro zone, leading it into a new Great Depression.

The aim of this paper is to provide an overview of deflation and to present an empirical analysis of deflation in the euro zone. Our preliminary results suggest that the risk of deflation in the euro zone is related to the international financial crisis and to the sovereign debt crisis in Europe. However, the uncertainty concerning the appropriate model for forecasting inflation/deflation is large. To measure the risk of deflation in the euro zone we employ the methodology of Kilian and Manganelli (2007). This methodology has the advantage of requiring macroeconomic data that can be easily obtained. Important alternative methodologies exist (well represented by Fleckenstein et al., 2013), but require financial data which is much harder to obtain, and assumptions allowing the extraction of inflation expectations from that data.

The remainder of the paper is organised as follows. First we present anoverview of issues raised by the possibility of deflation in the euro zone, giving particular emphasis to the main causes and consequences of deflation, and to the policy measures that may be used to combat deflation. Then we describe the methodology and data used in the empirical analysis.Next we discuss the results produced by the empirical model. Finally we present our conclusions.

1. The Threat of Deflation

One of the consequences of the international financial crisis that began in 2007 in the USA was the heightened concern about deflation in other regions of the world. These concerns were especially acute in the euro zone after the beginning of the sovereign debt crisis. In 2009, Ireland's consumer price inflation was negative 4.5 per cent recorded; in 2010 it was negative 1 per cent. In 2011, inflation rebounded (2.6 per cent) but it then went on a declining, turning negative again in 2015 (0.3 per cent) and 2016 (0.2 per cent).

The possibility of deflation in the euro zone has been presented as an impending menace to the well-being of Europeans. However, the basic macroeconomic models do not describe deflation as something different from inflation. In fact, a well-known model in monetary economics, due to Milton Friedman, predicts that the optimal rate of inflation is actually negative (Friedman, 1969). Maintaining a certain rate of deflation is the optimal course of monetary policy according to that model. Nevertheless, in ordinary media reports, avoiding deflation appears to be a more pressing concern than avoiding inflation.

When discussing deflation, typically reference is made to the ongoing – since the early 1990s – crisis in Japan, deflation being a key characteristic of that crisis since the late 1990s (see, e.g., Williams, 2009). Despite the efforts of successive governments to revive the economy, Japan

appears have been trapped in a low-growth/low-inflation equilibrium. On the other hand, it should be noted that the fear of a deflationary spiral of the sort described by Fisher (1933) did not materialize.

The debt-deflation spiral by Irving Fisher is more likely to occur in countries where the private sector is highly indebted and attempts to deleverage quickly, to that end cutting consumption and investment aggressively – the result may be an overall slump caused by lack of demand. This was the scenario most feared in Europe, given the extraordinary accumulation of debt in the years leading to the crisis. In such an environment, policy options would be limited by the high debt levels of both the public and private sectors, and by the "zero lower bound" on interest rates. Namely, it was feared that fiscal policy would be severely restricted by the need to reduce public debt at the same time that a "liquidity trap" would come into operation and render monetary policy ineffective – unable to stimulate the economy by lowering the interest rate and encouraging lending and spending.

In this case, the prospects would be dire not just for the countries most affected by the sovereign debt crisis but also for the rest of the euro zone and of the European Union, given the disruption and increase in uncertainty that a large-scale crisis in several members, albeit small, of the euro zone would surely cause. Therefore, the perspective of a deflationary crisis in the whole of the euro zone was viewed as a worrisome possibility by policy-makers and business leaders.

1.1.Causes and Consequences

As we mentioned above, it is common to think of deflation as an event that is closely related with poorer economic performance. However, a decline in prices does not always have to be associated with inferior economic performance. For example, as noted by Bordo et al. (2004), in the late 19th century, new technological and policy innovations allowed a vast expansion in the exploitation of America's abundant natural resources, leading to both falling prices and rapid economic growth. In this case, we are in presence of what is usually known in the economic literature by 'good deflation', brought about by a positive supply shock in the economy. In contrast, when prices decline for a long period of time as the result of a negative demand shock, countries are facing a 'bad deflation' (Saxonhouse, 2005; Hicks and Wani, 2014).

Although many other factors have been discussed in the economic literature (e.g., Brooks and Quising, 2002; Rogoff, 2003; Hicks and Wani, 2014; Horwitz, 2014; IAGS, 2014; Tasos and Stamatiou, 2014; Micossi, 2015 and Ciccarelli and Osbat, 2017), the main cause of deflation in the euro zone is probably weak demand coupled with reduced effectiveness of monetary policy (see, e.g., Eijffinger, 2009, and Claeys, 2014). A major contributor to the weakness of demand is the set of fiscal austerity measures implemented in the wake of the sovereign debt crisis.

Public spending cuts propagate throughout the economy, leading to spending cuts by the private sector, aggravating the lack of the demand and creating the possibility of a recessionary spiral.
Besides internal factors to the euro zone, there are also several outside risks, such as monetary policy tightening in the United States, geopolitical shocks (e.g. Ukraine), and the growth slowdown in emerging and developing countries (Atradius, 2014).
These potential negative effects of a deflationary environment in the euro zone are of particular concern in the case of the peripheral countries – Portugal, Greece, Spain and Ireland – that are currently working to recover their economies from the international financial crisis. The combination of low inflation and high sovereign debt levels will make economic recovery in those countries more difficult and vulnerable to negative demand shocks, possibly leading to continued instability in the euro zone.

1.2. Policy Measures

Policy measures to avoid deflation must venture into unconventional areas, for conventional monetary policy transmission may cease to work in a low-inflation, liquidity-trap environment. As argued by Rogoff (2003), it is better to prevent deflation than to try to cure it, and monetary policy must take the lead. Expansionary fiscal policies can also play an important complementary role. The case for expansionary fiscal policies to combat deflation is strengthened by the larger multipliers that operate at the zero lower bound (Christiano et al., 2011). Structural reforms, particularly those improving credit intermediation, could similarly be useful (Rogoff, 2003), especially given that many countries lack the 'fiscal space' necessary to be able to expand government spending. This was the case of the countries most affected by the euro zone crisis, namely Portugal and Greece. The implementation of structural reforms is a lengthy process with an uncertain outcome; expansionary fiscal policy coordination at the euro zone level might have been helpful to reduce the impact of the crisis while implementing structural reforms, but the public opinion in the surplus countries appeared to be clearly against that sort of action.
The specter of a deflationary environment represents, consequently, an important menace to financial stability since debt problems, financial crises, and low inflation may deepen the economic problems in the countries most affected by the sovereign debt crisis. Traditionally, a central bank counteracts inflationary pressures by raising interest rates and deflationary developments by cutting interest rates. However, if the central bank has lowered its interest rates to almost zero, it can no longer use it to stop the price decline. A central bank will then only have unconventional measures at its disposal to raise prices and/or to create inflation expectations in the economy (Bernoth et al., 2014).

Under these circumstances, and coinciding with a period in which the European Central Bank (ECB) reduced its base interest rates without restoring confidence to the markets, the ECB started buying sovereign and private sector bonds in very large amounts, pushing cash into the markets – the strategy known as Quantitative Easing (QE). In theory, QE increases the supply of money in the economy, increasing spending and potentially inflating prices. The main objective of these QE programs was to improve credit conditions, with the added benefit (possibly, the main benefit) of supporting the market for bonds issued by the countries hit by the sovereign debt crisis (see Bernoth et al., 2014 and Illing, 2014).

However, despite the United States having gone through three big QE programmes, the inflation rate did not rise above the 3 per cent. The Japanese economy has also stagnated for more than a decade, while interest rates went to zero and the Bank of Japan implemented a QE programme. Thus, it is unclear how successful QE programs have been, namely in the euro zone – see Driffill (2016). Nevertheless, the Governing Council of the ECB declared in March 2017 that deflation had ceased to be a concern. In the remainder of the paper we analyze the evolution of the probability of deflation in the euro zone.

2. Econometric Model and Data

2.1. The General Econometric Approach

Our empirical approach to the measurement of deflation risk in the euro zone follows Kilian and Manganelli (2007). Kilian and Manganelli use a GARCH(1,1) model for the conditional variance of inflation shocks. The general model can thus be written as:

$$\pi_t = \mu_t + u_t \tag{1}$$

$$u_t = \varepsilon_t \sqrt{h_t}, \quad \varepsilon_t | I_t \sim N(0,1) \tag{2}$$

$$h_t = \alpha_0 + \alpha_1 u_{t-1}^2 + \beta_1 h_{t-1} \tag{3}$$

where I_t is the information set (containing the series μ up to time t and the lags of $u$andε), π_t is inflation, μ_t is the conditional mean of inflation and u_t is the inflation shock, which is written as the product of its conditional variance, given by h_t, and a Gaussian innovation, ε_t.

The conditional mean of inflation is determined by a forecast model. Kilian and Manganelli consider three alternative specifications of this forecast model for inflation. The first forecast model uses only inflation lags. The second forecast model includes lagged percent changes of the oil price besides inflation lags. The third forecast model replaces the oil price changes with

money supply growth rates. Besides the oil price and the money supply, we will also consider nominal unit labour costs, real GDP, the output gap and the nominal effective exchange rate. These variables are commonly used in the literature on inflation forecasting (see, e.g., the surveys in IMF, 2015, and Moccero et al. 2011). Additionally, we will also consider models in which lags of the above mentioned variables (in combinations of two) are used alongside inflation lags.

The basic idea underlying the framework described above is illustrated in Figure 1.

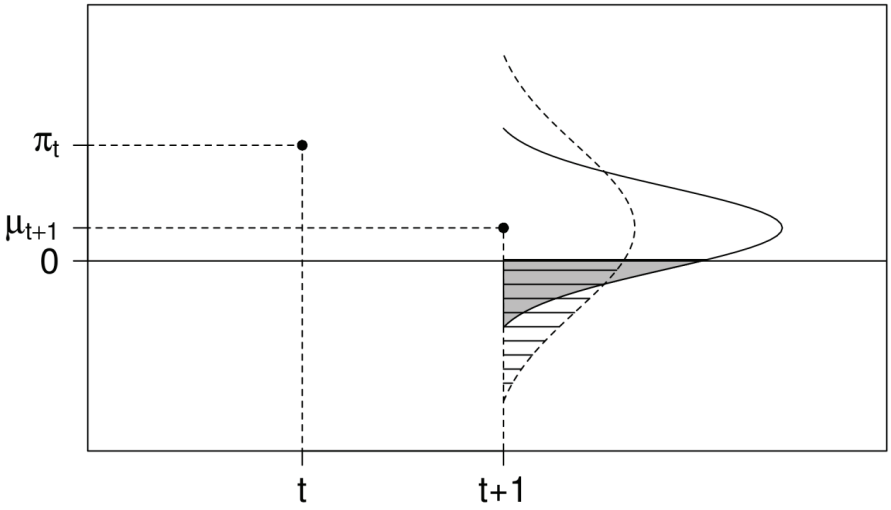


Figure 1: Illustrating deflation probabilities.

In Figure 1, it is assumed that at time *t* inflation was positive ($\pi_t > 0$). At time *t+1*, the conditional mean of inflation is still positive ($\mu_{t+1} > 0$). However, inflation at time *t+1* will equal its conditional mean plus a shock (u_{t+1}). The shock may be such that inflation at time *t+1* is actually negative (i.e., there is deflation). For deflation to occur, the shock will have to be sufficiently negative, the threshold being the symmetric of the conditional mean of inflation ($-\mu_{t+1}$). The focus of our empirical analysis is therefore on the computation of the probability that the shock to inflation is

$$u_{t+1} < -\mu_{t+1} \qquad (4)$$

which is equivalent to

$$\varepsilon_{t+1} < -\frac{\mu_{t+1}}{\sqrt{h_{t+1}}} \tag{5}$$

The GARCH specification for the inflation shock allows its variance to change over time. Therefore, the same conditional mean may be associated with different deflation probabilities, since the shape of the density of the shock is evolving. In Figure 1, two inflation (shock) densities are plotted to the right of *t+1*, with both densities centred at μ_{t+1}. Thus, Figure 1 shows an example where the increase of the conditional variance of the inflation shock (giving rise to the dashed density depicted) implies a larger deflation probability (the shaded area is smaller than the area with horizontal stripes).

The procedure employed for estimating the GARCH model[3] assumes that the innovations (ε_t) are normally distributed. Nevertheless, one should test that assumption and attempt to adjust the estimate of the probability if the normality assumption is rejected. To do so we employ the following procedure. We first estimate the density of epsilon. This gives us the points identified by a cross in the example represented in Figure 2. The x-coordinates of the points are equally spaced, i.e., $x_2 - x_1 = x_3 - x_2 = \cdots$, where $x_1 < x_2 < x_3 < \cdots$ We then assume that the y-coordinate of point (x_i, y_i) represents the probability that the innovation takes a value between the mid-points of $[x_{i-1}, x_i]$and $[x_i, x_{i+1}]$– this corresponds to the rectangles shown in Figure 2. In Figure 2, the probability of deflation is thus given by the area of the shaded rectangles to the left of the threshold $(-\mu_{t+1}/\sqrt{h_{t+1}})$.

[3] All computations were performed using Gretl 2016d.

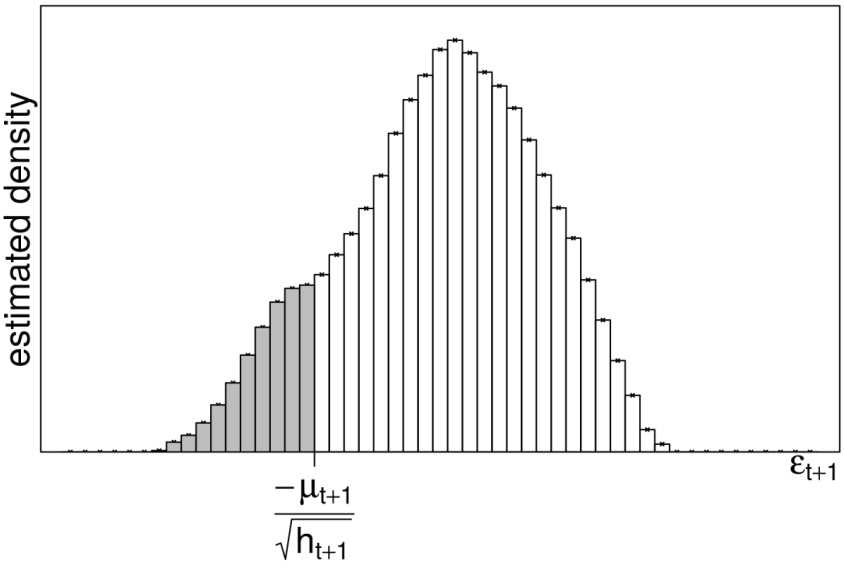


Figure 2: Estimating deflation probabilities under non-normality.

The models to be estimated are of the form:

$$\pi_t = \beta_0 + \sum_{i=1}^{l} \beta_i \pi_{t-i} + u_t \tag{6}$$

$$\pi_t = \beta_0 + \sum_{i=1}^{l} (\beta_i \pi_{t-i} + \theta_i x_{t-i}) + u_t \tag{7}$$

$$\pi_t = \beta_0 + \sum_{i=1}^{l} (\beta_i \pi_{t-i} + \theta_i x_{t-i} + \varphi_i y_{t-i}) + u_t \tag{8}$$

In the first form, the forecast model (conditional mean of inflation) includes only l lags of inflation. In the second form, there are also l lags of another variable (one of those mentioned above). In the third form, the conditional mean depends on l lags of inflation and of two other variables. The combination of lagged inflation and seven other variables gives a total of 29 alternative formulations of the forecast model. As in Killian and Manganelli (2007), the number

of lags (l) is chosen (among $l = 1,2,3$) so as to optimise the value of the Bayesian Information Criterion.

2.2. Data

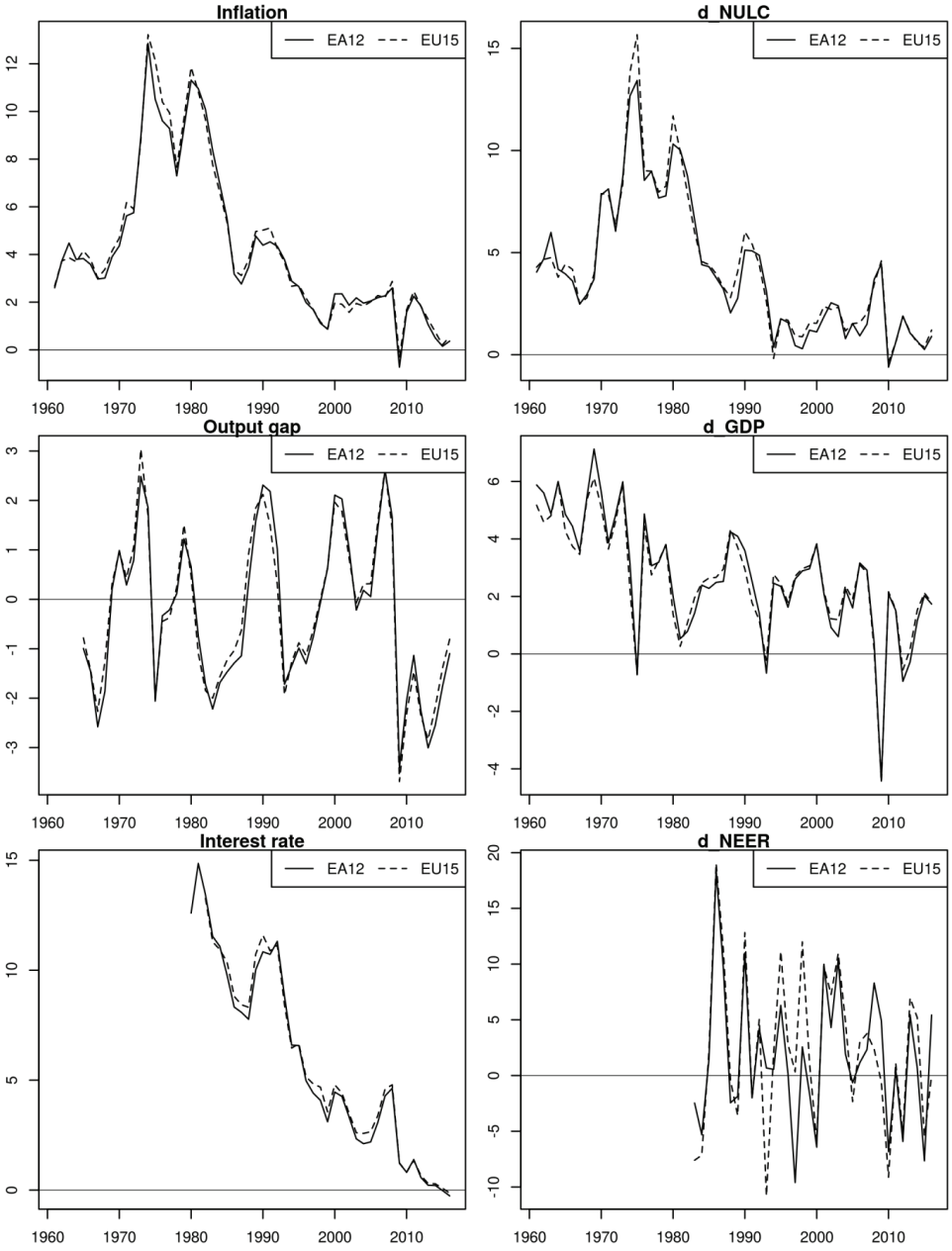
We use the following data from AMECO for the euro area (12 countries – EA12) and for the European Union (15 countries – EU15):

- Price deflator of private final consumption expenditure;
- Gross domestic product at constant market prices;
- Gap between actual and potential gross domestic product at constant market prices;
- Nominal unit labour costs (total economy);
- Nominal effective exchange rates (performance relative to the rest of 35 industrial countries; double export weights);
- Nominal short-term interest rates (weighted average, using GDP for the weights).

When needed, we linked series that include only West Germany until 1991, to series beginning in 1991 that include reunited Germany. Namely, this procedure was required for GDP, the output gap and the interest rate.

We constructed an oil price series with series provided by FRED (Federal Reserve Bank of St. Louis economic data) for the West Texas Intermediate oil price. To convert the oil price series from US dollars to euro we used the USD-EUR exchange rate data from AMECO. For the money supply, we used Germany's M1 aggregate (from the IMF's International Financial Statistics) and the OECD's broad money (M3) indicator for the euro area (19 countries). The two series were linked in 1970, which is the earliest date for which data is available for the OECD's indicator.

Most of the series span the period 1960-2016. The exceptions are the output gap (which begins in 1967), the nominal effective exchange rate (which begins in 1982) and the interest rate (which begins in 1980 for EA12 and in 1982 for EU15). Growth rates (including inflation) were computed as the first difference of the logarithm of the levels. Figure 3 shows the behaviour of the series for which we have data for both EA12 and EU15. The differences appear to be very small. For completeness, Figure 4 shows the (log) growth rate of the oil price and of money supply in Europe.



Note: "d_x" represents the (log) growth rate of variable *x* in percentage. Inflation and the output gap are also in percentage. NULC: nominal unit labour costs. NEER: Nominal effective exchange rate.

Figure 3: Time series for the euro area (12 countries) and the European Union (15 countries).

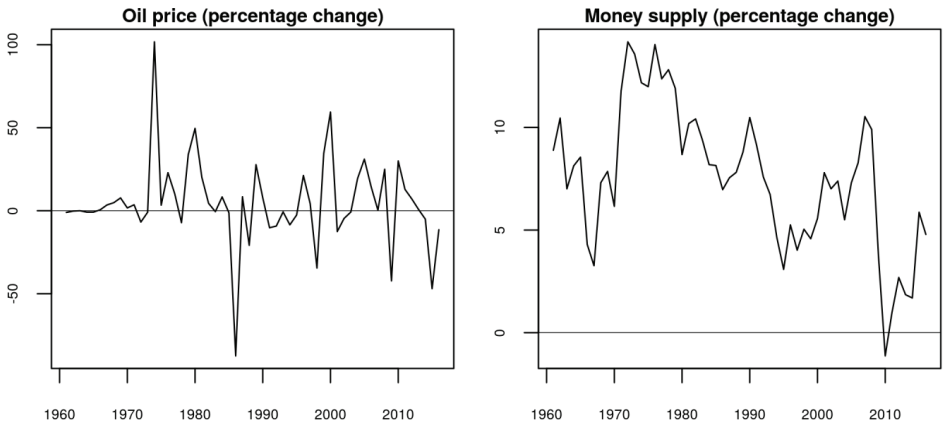


Figure 4: Oil price and money supply growth.

The time series plots reveal that deflation has only once been recorded in our sample: in 2009, the year in which the international financial crisis was at its height, as the behaviour of GDP in that year confirms.

3. Results

As mentioned above, we combine lagged inflation and six other variables in 29 different models. The list of the models is given in Table 1.

Tables 2, 3, 4 and 5 present a selection of the results obtained from estimating those models, both for EA12 and for EU15, in the sample 1984-2016, where all models can be estimated, and in a longer sample (1969-2016 in the case of EA12; 1968-2016 in the case of EU15), where we lack data to estimate 13 of the models. For comparison, Table 6 shows the result of applying our procedure to the dataset used by Kilian and Manganelli (2007).

Several results stand out. First, the preferred number of lags is almost always one, according to BIC, especially when we use the most recent sample. A small number of lags appears to be enough to account for the dynamics of inflation: only a few models show signs of autocorrelation in the residuals. Second, the root mean squared error (RMSE) is smaller in the most recent sample. This is not surprising, since this sample covers the period known as "the great moderation"– see, e.g., McConnell and Perez-Quiros (2000) and Stock and Watson (2003). Third, at the 10 per cent significance level, almost all models fail to pass the Quandt likelihood ratio (QLR) test, i.e., almost no model appears to be have constant parameters over the sample period. Conspicuous exceptions are the models estimated with Kilian and Manganelli's data for Germany. This should be related to the fact that inflation in Germany has been much more stable than in other countries, namely in the period of the oil shocks. Fourth,

ARCH effects are largely absent from the more recent sample. Evidence of conditional heteroskedasticity becomes clearly visible only when one extends the sample to include the oil-shocks period. Kilian and Manganelli associate the existence of heteroskedasticity with the failure of the models to pass the structural stability tests. Fifth, the assumption of normality is almost always rejected, except in the Kilian and Manganelli dataset. Therefore, one may want to place higher weight on the probability of deflation computed using an estimated density (recall the section describing the methodology) rather than the probability obtained with the normal distribution (probabilities reported in the final two columns of the tables).

Besides the results just discussed, the interest of analysing the estimation output lies in being able to say something about deflation in Europe in 2017. The results make it difficult to choose one model. In fact, if we use BIC as the criterion for choosing the best model, we would choose – forboth EA12 and EU15 – model1 (purely autoregressive model) in the shorter sample and model 11 (which includes also GDP growth and labour costs) in the longer sample. However, model 1 fails the QLR test in both samples, whereas model 11 fails the QLR test in the shorter sample and passes (at the 5 per cent significance level) in the longer sample. Restricting the choice in the shorter sample to models that pass the QLR test at the 5 per cent significance level would lead to choosing model 29 (which includes the interest rate and the nominal effective exchange rate) for EA12 and model 8 (which features the interest rate) for EU15. We will thus focus our discussion on models 1, 8, 11 and 29.

These models produce forecasts for inflation in 2017 between 0.28 and 0.61 per cent for EA12 and between 0.51 and 0.87 per cent in for EU15. The dispersion of the forecasts is not large. The dispersion concerning the probability that inflation will be negative in 2017is also relatively small: for EA12, the probability varies between 13 and 20 per cent (using the estimated density); for EU15, the range is not very different, going from 7 to 18 per cent (again using the estimated density). Thus, our models put the probability of deflation occurring in Europe in 2017 at less than20 per cent. However, the estimates obtained on the larger sample lead to bigger probabilities. This increase derives from the fact that the MSE is bigger in the larger sample. Note that the models (in general, not just the ones selected above) seem unable to anticipate changes in the trend of inflation, which were especially pronounced in the earlier part of the larger sample – seeFigures 5 and 6. This inability to anticipate trend changes is not surprising for the purely autoregressive models, but it has the implication that the other variables bring no useful information in that regard.

However, how do the deflation probabilities produced by our models look like? Until 2009, they were always very low, rarely exceeding 10 per cent. After 2009, they became much larger – seeFigure 7. However, in our sample, 2009 is the only year in which there was deflation. The models completely failed to anticipate deflation in 2009, but then produced high (in some cases

above 60 per cent or even 80 per cent) deflation probabilities for 2010, a year in which the inflation rate returned to the normal (according to the stated monetary policy goal) 1.5-2 per cent range. Nevertheless, inflation probabilities have been increasing in recent years (a period of declining inflation), approaching or even surpassing 20 per cent. The current year of 2017 appears to mark a change in that trend.

Table 1: Models to be estimated.

Model	The conditional mean depends on *l* lags of:
1	Inflation
2	Inflation and money growth
3	Inflation and oil price growth
4	Inflation and the change in nominal unit labour costs
5	Inflation and GDP growth
6	Inflation and the output gap
7	Inflation and the change in the nominal effective exchange rate
8	Inflation and the interest rate
9	Inflation, money growth and GDP growth
10	Inflation, oil price growth and GDP growth
11	Inflation, the change in nominal unit labour costs and GDP growth
12	Inflation, the output gap and GDP growth
13	Inflation, the change in the nominal effective exchange rate and GDP growth
14	Inflation, the interest rate and GDP growth
15	Inflation, oil price growth and money growth
16	Inflation, the change in nominal unit labour costs and money growth
17	Inflation, the output gap and money growth
18	Inflation, the change in the nominal effective exchange rate and money growth
19	Inflation, the interest rate and money growth
20	Inflation, the change in nominal unit labour costs and oil price growth
21	Inflation, the output gap and oil price growth
22	Inflation, the change in the nominal effective exchange rate and oil price growth
23	Inflation, the interest rate and oil price growth
24	Inflation, the output gap and the change in nominal unit labour costs
25	Inflation, the change in the nominal effective exchange rate and unit labour costs
26	Inflation, the interest rate and the change in nominal unit labour costs
27	Inflation, the change in the nominal effective exchange rate and the interest rate
28	Inflation, the interest rate and the output gap
29	Inflation, the change in the nominal effective exchange rate and the interest rate

Table 2: Statistics from the estimated models using the sample 1969-2016 for EA12.

Model	BIC	Lags	RMSE	BG	QLR	ARCH	DH	$\hat{\mu}_{2017}$	$P_N(\pi_{2017} < 0)$	$P_E(\pi_{2017} < 0)$
1	170.2	1	1.315	1.65	25.9***	6.82***	18.4***	0.19	41	28
2	169.9	1	1.258	1.23	20***	2.57	23.4***	0.51	31	20
3	172.9	1	1.299	5.34**	27.4***	5.04**	14.4***	0.39	35	28
4	171.4	2	1.179	1.21	24.1***	6.15**	5.2*	0.53	19	15
5	166.6	1	1.215	0	16.6**	8.33***	16.8***	0.35	34	30
6	171.9	1	1.285	0.47	26.3***	7.94***	31.5***	0.31	39	30
9	168.6	1	1.193	0.09	18.5**	9.04***	6.2**	0.67	18	22
10	168.2	1	1.188	1.07	20.5***	6.91***	13.4***	0.4	32	28
11	164.0	1	1.136	0.18	14.3*	8.98***	16.8***	0.49	27	17
12	170.4	1	1.215	0	19.9**	8.57***	15.4***	0.36	34	29
15	173.3	1	1.252	3.17*	22***	1.98	20.9***	0.54	29	20
16	172.6	1	1.243	1.32	19.4**	1.4	20.9***	0.49	31	22
17	173.5	1	1.255	1.46	31.1***	3.6*	3.4	0.65	19	22
20	174.1	2	1.119	1.12	22.4**	4.63**	5*	0.51	21	16
21	173.1	1	1.25	2.17	38.4***	5.55**	20.5***	0.64	26	26
24	171.2	2	1.086	0.71	22**	6.49**	8.4**	0.9	9	8

Notes: BIC: Bayesian Information Criterion. Lags: the number of lags chosen for each model by BIC. RMSE: square root of the mean of the squared residuals. BG: Breusch-Godfrey test statistic (null hypothesis: no autocorrelation of order one). QLR: Quandt likelihood ratio test statistic (null hypothesis: no structural break). ARCH: LM-ARCH test statistic (null hypothesis: no ARCH effect of order one). DH: Doornik-Hansen normality test statistic (null hypothesis: normal distribution).$\hat{\mu}_{2017}$: the estimated conditional mean of inflation in 2017. $P_N(\pi_{2017} < 0)$: the estimated probability of deflation in 2017 using the normal distribution in the computation.$P_E(\pi_{2017} < 0)$: the estimated probability of deflation in 2017 using an estimated density in the computation. ***: significant at the 1 per cent significance level. **: significant at the 5 per cent significance level. *: significant at the 10 per cent significance level.

Table 3: Statistics from the estimated models using the sample 1984-2016 for EA12.

Model	BIC	Lags	RMSE	BG	QLR	ARCH	DH	$\hat{\mu}_{2017}$	$P_N(\pi_{2017} < 0)$	$P_E(\pi_{2017} < 0)$
1	90.9	1	0.863	0.03	14.8**	0.62	13.3***	0.61	22	13
2	94.4	1	0.862	0.04	34.1***	0.53	10.2***	0.55	23	14
3	94.2	1	0.86	0	15.8**	0.46	5.5*	0.8	15	15
4	93.9	1	0.857	0	16.2**	0.08	13.6***	0.63	22	12
5	93.4	1	0.85	0.65	16.9**	2.85*	12.7***	0.61	19	10
6	94.3	1	0.861	0.19	26.3***	0.84	16.4***	0.64	21	10
7	94.2	1	0.86	0.01	16.8**	0.77	11.8***	0.56	24	15
8	91.6	1	0.827	0.05	14.1**	0.23	8.5**	0.35	26	17
9	96.9	1	0.849	0.71	39.2***	2.72*	10.5***	0.56	21	12
10	96.4	1	0.843	0.45	17.4**	2.91*	11.6***	0.66	18	11
11	93.9	1	0.813	1.04	29.6***	0.97	15.2***	0.72	16	7
12	96.9	1	0.849	0.55	26***	2.96*	11.3***	0.62	19	10
13	96.8	1	0.848	0.59	22.1***	2.93*	12.3***	0.59	20	11
14	94.5	1	0.82	0.54	18**	1.45	12.4***	0.52	23	13
15	97.7	1	0.86	0	33.2***	0.41	13.1***	0.8	20	10
16	97.4	1	0.857	0	32.9***	0.08	14.5***	0.78	21	10
17	97.8	1	0.861	0.3	33.3***	0.82	16.4***	0.75	22	11
18	97.5	1	0.857	0.03	32.4***	0.67	11.7***	0.53	25	16
19	95	1	0.826	0.03	30.8***	0.27	4.3	0.36	24	18
20	97.4	1	0.856	0.01	17.4**	0.08	10.6***	0.41	27	13
21	97.4	1	0.856	0.09	24***	0.68	6.1**	0.77	14	16
22	97.2	1	0.854	0.1	18.2**	0.52	9**	0.74	22	15
23	95.1	1	0.827	0.1	15.6*	0.24	8.1**	0.45	11	10
24	97.2	1	0.854	0.13	24.3***	0.14	16.2***	0.57	24	11
25	96.5	1	0.845	0.06	16.2*	0.01	12.3***	0.59	23	15
26	95.1	1	0.827	0.07	13.7	0.18	8.2**	0.37	22	14
27	97.4	1	0.857	0.21	25.5***	1.12	15.4***	0.54	24	13
28	95.1	1	0.827	0.07	21.6***	0.21	9.8***	0.33	27	17
29	93.8	1	0.811	0.01	12.3	0.34	6.8**	0.28	30	20

Notes: BIC: Bayesian Information Criterion. Lags: the number of lags chosen for each model by BIC. RMSE: square root of the mean of the squared residuals. BG: Breusch-Godfrey test statistic (null hypothesis: no autocorrelation of order one). QLR: Quandt likelihood ratio test statistic (null hypothesis: no structural break). ARCH: LM-ARCH test statistic (null hypothesis: no ARCH effect of order one). DH: Doornik-Hansen normality test statistic (null hypothesis: normal distribution). $\hat{\mu}_{2017}$: the estimated conditional mean of inflation in 2017. $P_N(\pi_{2017} < 0)$: the estimated probability of deflation in 2017 using the normal distribution in the computation. $P_E(\pi_{2016} < 0)$: the estimated probability of deflation in 2017 using an estimated density in the computation. ***: significant at the 1 per cent significance level. **: significant at the 5 per cent significance level. *: significant at the 10 per cent significance level.

Table 4: Statistics from the estimated models using the sample 1968-2016 for EU15.

Model	BIC	Lags	RMSE	BG	QLR	ARCH	DH	$\hat{\mu}_{2017}$	$P_N(\pi_{2017} < 0)$	$P_E(\pi_{2017} < 0)$
1	173	1	1.305	2.18	27.2***	2.86*	9**	0.5	25	15
2	172.9	1	1.254	1.78	21.5***	0.61	14.4***	0.5	23	12
3	175.6	2	1.191	0.32	31.1***	7.77***	6.5**	1.49	2	2
4	175.3	1	1.285	1.72	26.1***	1.94	11.7***	0.54	24	14
5	166	1	1.168	0.13	21.9***	3.9**	1.3	0.31	33	34
6	171.5	1	1.236	0.51	38.5***	4.87**	24.2***	0.51	31	21
9	168.4	1	1.151	0.3	23.7***	5.01**	7.8**	0.41	27	26
10	168.6	1	1.154	1.26	20.6***	3.74*	4.7*	0.44	24	25
11	162.5	1	1.084	0.6	14.1	4.48**	8.1**	0.87	21	18
12	169.2	1	1.16	0.02	28.9***	5.28**	3	0.47	23	25
15	176.7	1	1.253	3.3*	24.2***	0.52	14.4***	0.79	25	24
16	176.1	1	1.245	1.68	21.4***	0.26	19.1***	0.7	22	13
17	174.8	1	1.229	1.41	39.4***	2.94*	6.7**	0.78	11	13
20	179	1	1.282	3.43*	27.9***	1.62	11.8***	0.5	27	16
21	173.2	1	1.209	1.79	43.3***	3.82*	19.6***	0.58	28	19
24	171.8	2	1.058	0.89	28.7***	4.18**	0.2	1.19	5	6

Notes: BIC: Bayesian Information Criterion. Lags: the number of lags chosen for each model by BIC. RMSE: square root of the mean of the squared residuals. BG: Breusch-Godfrey test statistic (null hypothesis: no autocorrelation of order one). QLR: Quandt likelihood ratio test statistic (null hypothesis: no structural break). ARCH: LM-ARCH test statistic (null hypothesis: no ARCH effect of order one). DH: Doornik-Hansen normality test statistic (null hypothesis: normal distribution). $\hat{\mu}_{2017}$: the estimated conditional mean of inflation in 2017. $P_N(\pi_{2017} < 0)$: the estimated probability of deflation in 2017 using the normal distribution in the computation. $P_E(\pi_{2017} < 0)$: the estimated probability of deflation in 2017 using an estimated density in the computation. ***: significant at the 1 per cent significance level. **: significant at the 5 per cent significance level. *: significant at the 10 per cent significance level.

Table 5: Statistics from the estimated models using the sample 1984-2016 for EU15.

Model	BIC	Lags	RMSE	BG	QLR	ARCH	DH	$\hat{\mu}_{2017}$	$P_N(\pi_{2017} < 0)$	$P_E(\pi_{2017} < 0)$
1	87.8	1	0.823	0.09	14.7**	1.23	6.1**	0.72	9	7
2	91.2	1	0.822	0.12	32***	1	5.2*	0.73	8	6
3	90.9	1	0.819	0.01	16.2**	0.95	6.6**	0.64	14	9
4	90.1	1	0.809	0.03	14.1**	0.09	5.4*	0.67	12	6
5	90.2	1	0.809	0.74	18.7***	4.42**	6.5**	0.59	14	8
6	91.1	1	0.82	0.37	33.9***	1.46	11.6***	0.6	14	6
7	91.3	1	0.823	0.08	19.7***	1.18	3.6	0.89	3	3
8	88.8	1	0.793	0.05	14*	0.73	3.5	0.51	16	12
9	93.6	1	0.809	0.78	44.3***	4.13**	4.2	0.77	9	9
10	92.9	1	0.8	0.43	19.8**	4.73**	4.7*	0.52	18	15
11	89.5	1	0.76	0.59	29.8***	1.34	11.3***	0.84	9	6
12	93.7	1	0.809	0.66	35.6***	4.56**	2.6	0.55	11	12
13	93.5	1	0.807	0.86	25.1***	4.37**	15.6***	0.95	15	6
14	91.7	1	0.786	0.4	21.5***	3*	4.8*	0.61	10	9
15	94.4	1	0.818	0.02	30***	0.79	5.7*	0.61	15	12
16	93.6	1	0.808	0.01	30.2***	0.1	4.8*	0.77	8	6
17	94.6	1	0.82	0.73	33.9***	1.51	7.5**	0.55	20	14
18	94.6	1	0.821	0.1	36.5***	0.87	5.7*	0.7	11	7
19	92.2	1	0.792	0.03	29.2***	0.92	3.1	0.56	10	8
20	93.6	1	0.808	0	15.4*	0.09	6.6**	0.72	11	6
21	93.9	1	0.813	0.22	30.4***	1.15	11.3***	0.66	19	9
22	94.2	1	0.816	0	20.9***	0.72	3.8	0.77	5	4
23	92.3	1	0.793	0.03	14.8*	0.67	2.5	0.46	19	16
24	93.5	1	0.807	0.22	29.9***	0.13	6.8**	0.71	11	8
25	93.4	1	0.806	0.01	17.7**	0.04	6.5**	0.73	10	7
26	92	1	0.79	0.03	13.9	0.17	2.2	0.55	11	9
27	94.5	1	0.819	0.42	42.6***	1.38	9.1**	0.66	9	5
28	92.3	1	0.793	0.06	28.1***	0.7	13***	0.66	13	6
29	91.5	1	0.783	0.01	16.6**	0.37	1.6	0.59	6	6

Notes: BIC: Bayesian Information Criterion. Lags: the number of lags chosen for each model by BIC. RMSE: square root of the mean of the squared residuals. BG: Breusch-Godfrey test statistic (null hypothesis: no autocorrelation of order one). QLR: Quandt likelihood ratio test statistic (null hypothesis: no structural break). ARCH: LM-ARCH test statistic (null hypothesis: no ARCH effect of order one). DH: Doornik-Hansen normality test statistic (null hypothesis: normal distribution). $\hat{\mu}_{2017}$: the estimated conditional mean of inflation in 2017. $P_N(\pi_{2017} < 0)$: the estimated probability of deflation in 2017 using the normal distribution in the computation. $P_E(\pi_{2017} < 0)$: the estimated probability of deflation in 2017 using an estimated density in the computation. ***: significant at the 1 per cent significance level. **: significant at the 5 per cent significance level. *: significant at the 10 per cent significance level.

Table 6: Statistics from the estimated models using the dataset of Kilian and Manganelli (2007).

Model	BIC	Lags	RMSE	BG	QLR	ARCH	DH	$\hat{\mu}_{2003}$	$P_N(\pi_{2003} < 0)$	$P_E(\pi_{2003} < 0)$
USA										
1	164.1	3	1.644	0.02	18.5**	0.62	2.5	2.06	5	3
2	166.9	1	1.786	3.67*	32.4***	3.13*	4.5	2.23	12	11
3	168.0	1	1.811	4.77**	15.6**	3.27*	5.2*	2.50	7	5
15	170.5	1	1.784	4.09*	30.4***	3.41*	3.8	2.22	11	11
Germany										
1	138.1	1	1.190	1.14	5.9	2.44	0.5	1.44	12	14
2	139.9	1	1.163	0.89	5.3	2.02	1.5	1.28	12	20
3	141.3	1	1.184	1.05	6.9	2.11	1.0	1.52	11	12
15	143.0	1	1.155	0.68	6.4	1.87	2.0	1.20	13	20
Japan										
1	203.8	1	2.819	1.41	17.1***	12.16***	13.9***	-0.44	64	72
2	191.0	2	2.093	0.86	17.9*	1.78	2.4	-0.67	73	77
3	207.5	1	2.819	1.40	31.8***	12.31***	13.8***	-0.43	64	72
15	197.3	1	2.368	3.96*	24.3***	1.33	1.5	-0.40	63	67

Notes: BIC: Bayesian Information Criterion. Lags: the number of lags chosen for each model by BIC. RMSE: square root of the mean of the squared residuals. BG: Breusch-Godfrey test statistic (null hypothesis: no autocorrelation of order one). QLR: Quandt likelihood ratio test statistic (null hypothesis: no structural break). ARCH: LM-ARCH test statistic (null hypothesis: no ARCH effect of order one). DH: Doornik-Hansen normality test statistic (null hypothesis: normal distribution). $\hat{\mu}_{2003}$: the estimated conditional mean of inflation in 2003. $P_N(\pi_{2003} < 0)$: the estimated probability of deflation in 2003 using the normal distribution in the computation. $P_E(\pi_{2003} < 0)$: the estimated probability of deflation in 2003 using an estimated density in the computation. ***: significant at the 1 per cent significance level. **: significant at the 5 per cent significance level. *: significant at the 10 per cent significance level.

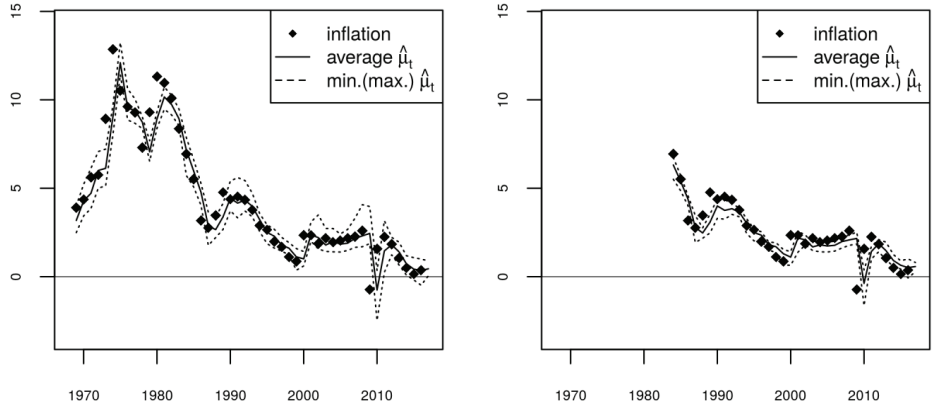


Figure 5: Maximum, minimum and average estimated conditional mean of inflation in EA12 using (when available) the sample 1969-2016 (left) or just 1984-2016 (right).

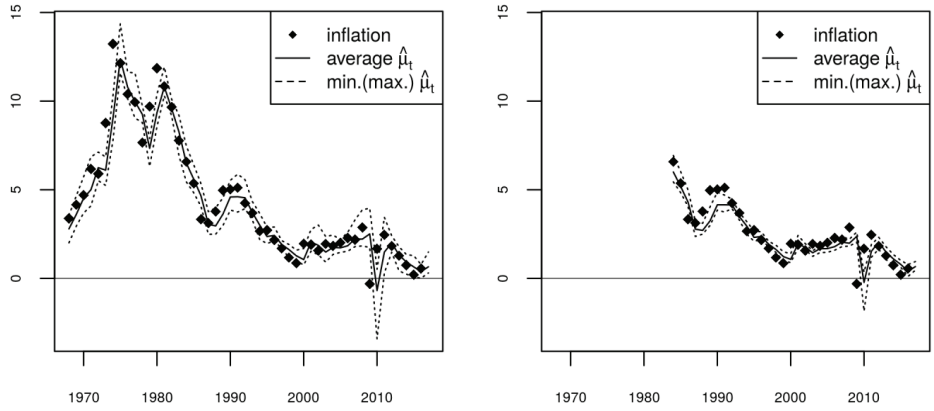


Figure 6: Maximum, minimum and average estimated conditional mean of inflation in EU15 using (when available) the sample 1968-2016 (left) or just 1984-2016 (right).

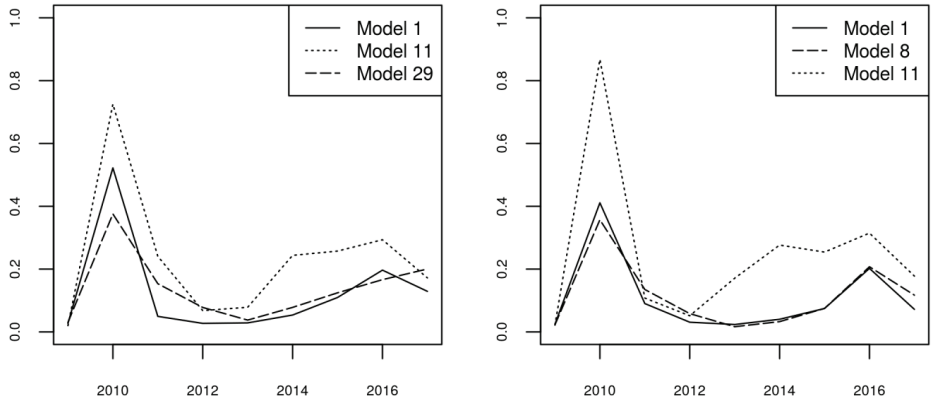


Figure 7: Probability of deflation in EA12 (left) and EU15 (right).

4. Conclusion

The main objective of this paper was to estimate the probability of deflation occurring in the euro area (12 countries – EA12) and in the European Union (15 countries – EU15). For this purpose, we applied the methodology developed by Kilian and Manganelli (2007). The results show an increase in deflation probabilities after 2009, when the international financial crisis was giving way to the sovereign debt crisis in the euro area. Deflation probabilities were approaching 20 per cent, but in 2017 that trend seems to have been reversed. This corroborates the ECB's Governing Council's view.The models analyzed in the paper put the probability of deflation occurring in Europe in 2017 between 7 and 20 per cent.However, the uncertainty concerning the appropriate model for forecasting inflation in the euro zoneis large, thus these conclusions should be taken with some caution.

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DOES ICT IMPACTS` THE ECONOMIC TRANSFORMATION OF EMERGING COUNTRIES?

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Abstract

The rapid development of Information and Communication Technology - ICT in the last century, has caused major changes in the economic activities. The effects of these changes are considered to have impacted the developed and developing countries in different levels. Therefore, the study is focused on analyzing the effect of ICT on economic transformation of Kosovo. Comparison analysis of the economic indicators are used from the world countries which are divided in the 3 sub-groups to compare with Kosovo: a) Balkan countries; b) countries that shares similar number of population as Kosovo and c) countries that have GDP per capita expressed in Parity Purchase Power – PPP almost same as Kosovo. The article reviews the most recent data from The World Bank Group, UN data, OECD, Kosovo Agency for Statistics and Ministry of Labour and Social Welfare of Kosovo for the factors that affect the economic transformation. The study analyzes changes of employment level in the economic sectors of world countries in: agriculture, industry and servicesthat are affected as a result of the new developments on ICT and digitalization during the period of 2005-2015. Therefore it attempts to assess this impact in the transformation of economy and its significance in the economic growth.

Key words: ICT, economic transformation, ICT development impact, emerging countries, economic growth.

JEL classification: L16; O13; O14.

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1. Introduction

The impact of the technology in the development and economic growth is indisputable. Innovative technology continues to remain among the most important factors of business growth, consequently positively impacting the economic growth. Digital technology is becoming more and more inevitable especially for the collaboration of economic agents. It is a key driver of development and economic growth (UNDP, 2017). Additionally, it is highly influencing the economic agents' collaboration: people seek opportunity, influencing how firms operate, and citizens interact with governments. The Digital transformation is augmenting factors and consequently transforming products by overcoming information barriers and making the developments more efficient, inclusive and innovative(The World Bank, 2016).On the other hand, it becomes more complex though, since it links the variety of information in the economic process. Therefore, economic progress over time can be related to the changes occurred in the economic activities among others, also due to the Information and Communication Technology – ICT developments and digitalization.

In the recent developments, where technology is rapidly developing, the evolutionary theories support the importance of the digitalization and innovation in economic growth. In the report published by OECD, (Verspagen, 2001), it is examined that OECD markets are adjusting for high-technology content goods, like: pharmaceuticals, hardware equipment and instruments. During 1990s, according to this analysis, markets were suggesting technological divergence in competences and trade performance. Therefore, emerging technologies are seen to have positive impact and accelerate the economic development by contributing on the high-technology sectors resulting also form the innovations (Saviottia & Pyk, 2004), referred as "New Economy", that determines future growth path.

This way, the impact of the technology is seen on the economic transformation as well, referring asstructural changes that are identified to be caused as result of the new developments mainly in ICT and innovations. The economic development in general is seen as focused and dedicated to the interrelation of structural changes that in one way, foster the economical capacity of the country to enhance economic growth (Dudzevičiūtė, Mačiulis, & Tvaronavičienė, 2014), which progress is due to the technology development.According to the modern developed and modified theory of economic structure, it divides the economy in three main so called 'sectors' that are wide and includes every economic activity. Consequently, an economy of a country could be analyzed by its components/sectors. These sectors are composed of groups of industries (Griffith & Wall, 2004). According to the authors, structural changes are often discussed and are known to be dividedthree main sectors: 'primary' sector - referring to agriculture mainly, 'secondary' sector - industry and 'tertiary' sector, known for the services.

In the case of Kosovo, as a lower medium income country, it is facing major economic and social problems. Generally, the national economy is driven by the Small and Medium Enterprises- SMEs, that accounts of 99.8% of active businesses.Furthermore, since the economy was reliant on remittances in general, from the year of 2008, remittances were expected to decline due to the global financial crisis, that was intensified in the year of 2009 (OECD, 2009).Thus, in order to keep the same "stability" there was a need for higher productivity within country and increase of competitiveness abroad (World Bank, 2017). Considering the composition of the economy mainly SMEs` based, the impact of the ICT in changing the output level per worker as well as quality(Griffith & Wall, 2004) is seen as crucial for the development of the country.

Kosovo`s, structural sectors of economies are basically unbalanced. Businesses are mainly service based and focused on wholesale and retail. Despite the globalization, where trading

across the boarder is becoming increasingly important, and is making trade easier between economies of different countries (World Bank, Doing Business 2017, Equal opportunity for all, Economic Profile for Kosovo 2017, 2017), due to inadequate infrastructure that leads to extra costs, also privatization played a role in the changing of the economic structures that can stifle trade potential. Law number of employment by the private sector, which in a way should have been the major employer, is leading to the high unemployment rate. From 2008 the unemployment islittle softened for almost a decade, being 43.6 % (Kosovo Agency of Statistics K. , 2009) to 27.5% (Kosovo Agency of Statistics K., 2017). Furthermore, in 2015 Kosovo had the highestunemployment rate (32.9%) also in comparison to other Balkan countries, followed byBosnia and Herzegovina with the level of 27.7 % of unemployment in 2015, and FYROM Macedonia, 26.3% and the other three countries stands almost in the same level of around 17%, respectively Montenegro 17.8%, Serbia 17.7% and Albania 17.5 % of unemployment (Kosovo Agency of Statistics K., 2016). The recent developments of ICT as in the many developed countries is having impact also in the Kosovo's economy. The diffusion of ICT in general is considered to have been extended also in the Kosovo economic activities: production and services. In Kosovo, even the market is very small comparing to the European countries as well as most of the region countries, according to the recent report: "IT Barometer Kosovo 2016" by the STIKK- Kosovo Association of Information and Communication Technology (STIKK, 2016), ICT plays a crucial role in the development and economic growth. Additionally "ICT also acts as a impeller of social development and transformation through improvement of access to basic services, enhancement of connectivity, and creation of employment opportunities.
Consequently, since the Information and Communication Technology and digitalization have impact in the economic transformation and growth, the aim of the paper is to analyze this effect on the economic transformation. In order to have comparison, there are used economic indicator data from the world countries which are divided in the 3 sub-groups to compare with Kosovo: a) Balkan countries; b) countries that shares similar number of population as Kosovo and c) countries that have GDP per capita expressed in Parity Purchase Power - PPP almost same as Kosovo. And in the last part shows the status quo of the economic transformation of Kosovo. The article reviews the most recent data from The World Bank, International Monetary Fund, Ministry of Labour and Social Welfare of Kosovo and OECD for the factors that affects the economic transformation of the countries. Analyses are made for the level of employment in each economic sector for the period of 2005-2015, its change and the change in the GDP per capita expressed in Purchase Parity Power of all countries. Therefore, paper gives an insight of the effect in other countries to compare its impact in Kosovo.

2. Theoretical framework

2.1 Economic transformation

The evolution of the economic growth and transformation was subject of the studies since sixteenth and seventeenth centaury until nowadays (Smith, The Wealth of Nations, 1778), (Dosi & Nelson, 1994), (Keynes, 1873, 2007, 2013) (North, 2005), (Pasinetti, 1993), (Saito, 1975), (Schumpeter, 1935), (Krugman, 1991), (Nelson & Winter, 1982). Therefore, the economic evolutionary theory in general is well explored with analysis and models, where well-known economics worked and contributed on this field (Dosi & Nelson, 1994).Author (Clark, 1988), described the economy as most of them were dominated by subsistence agriculture, mercantile trade and craft-based, while the industrial production was seen as still rudimentary. The economic fluctuation during years is analyzed by (Schumpeter, 1935), where among the

business cycle changes, Schumpeter described the industrial change, where main emphasis the author put to the *cycle*, that considered as historical and statistical form referred also as "economic progress". The composition of economic system changes appears at all levels during the economic progress. Therefore, the growth models for the emerging new goods and services were evident (Saviottia & Pyk, 2004), in which all industries were impacted, and awareness created (Avgerou C. , 2003), where as a result, ICT applications are diffused in all sectors.

There were theories developed in different periods, aiming to explain and measure the economic growth, like 'General Equilibrium Theory', developed by French economist, Leon Walras, explains the general functioning of economic markets. The most influential theories developed to measure the economic growth caused by the changes presented were: Neoclassical Theory of Growth and Evolutionary Theory of Growth which both include the technological changes. **Neoclassical Theory**by Robert Solow in 1956, the Nobel Prize winner economist, designed a long-run model of growth, by composition of the factors of production: labour and capital and presentation of the technological aspect (Solow, 1956). In general, the neoclassical growth theory explains that there can be reached the economic growth rate driven by the three forces: labour, capital and technology; one sector and capital accumulation (King, Prosser, & Rebelo, 1988). Additionally, the theory also argues that major influence in the economy have the technological changes, as well as the economic growth will continue with advances in technology. The model presents the technological process as labour input multiplies by increasing function of time (Solow, 1999). Another theory developed was the **Evolutionary Theory of Growth** by (Nelson & Winter, 1982) and (Dosi & Nelson, 1994). Co-authors, (Nelson & Winter, 1982), explain the developed evolutionary theory of growth. The evolutionary model of economic growth is able to explain what the neoclassical theory explains: aggregate inputs, outputs and factor prices. The key ideas of the theory laid out are the combination of the processes of technical change and the integration of the micro level and macro levels. Moreover, the authors have emphasized the importance of the technology on both orthodox and evolutionary theory.

2.2 Definition of the Economic structure

From the theoretical point of view, the economic transformation has taken much attention to the scientist, and thus the theory is quite significant. Nobel laureate W. Arthur Lewis have initially elaborated the transformation of the structure in the years of the 1950s, were this was later modified by John Fei and Gustav Rains (Todaro & Smith, 2009). The developed theory of the structural change by (Lewis, 1954), is based on dual economy, where according to the author, dual sector theory take into consideration the assumption that the economy of many developing countries is based on traditional - agriculture sector and the modern - industrial sector. To better understand the composition of these sectors and their value, in terms of employment, productivity and income, the sector of agriculture is characterized with high unemployment, low productivity and low income, whereas technologically advanced industrial sector, characterized with high level of investments (Dudzevičiūtė, Mačiulis, & Tvaronavičienė, 2014). The economic development in general is seen as focused and dedicated to the interrelation of structural changes that in one way, foster the economical capacity of the country to enhance economic growth (Dudzevičiūtė, Mačiulis, & Tvaronavičienė, 2014), which progress is due to the technology development. As the economic activities were very simple and not that complex to be defined,the traditional neoclassic theory explains that, socio-economic organization even cannot be compare to the nowadays complexity and problems facing now where not

apparently(Clark, 1988). In this sense, (Keynes, 1936) in his book "The General Theory of Employment, Interest and Money", refers to industry as: capital- goods industries and consumption-goods industries.

The economy of a country is explained to be composed of the economic sectors. The modern developed and modified theory of economic structure is divided in three main so called 'sectors' that are wide and includes every economic activity. Consequently, an economy of a country could be analyzed by its components/sectors. These sectors are defined as following: "The primary sector – includes activities directly related to natural resources, e.g. farming, mining and oil extraction. The secondary sector – covers all the other goods production in the economy, including the processing of materials produced by the primary sector. Manufacturing is the main element in this sector which also includes construction and the public utility industries of gas, water and electricity. And the tertiary sector – includes all the private-sector services, e.g. distribution, insurance, banking and finance, and all the public-sector services, such as health and defense (Griffith & Wall, 2004)". Therefore, the changes of the industrial sectors are studied as part of the structural change.

2.3 Structural changes analysis- Theoretical approaches

Structural changes are identified to be caused as result of the new developments and innovations. Authors (Dudzevičiūtė, Mačiulis, & Tvaronavičienė, 2014) find out that, according to (Karnitis 2011, Smaliukienė etal. 2012; Miškinis etal. 2013), the economic sector changes can be measured based on the share of the output or employment. (Pasinetti, 1993)The proportion result of evaluation of each sector, in terms of the current product or employment remains unchanged. On the study of "Structural Change and Productivity Growth in the Japanese Manufacturing Industry", by (Tanuwidjaja & Thangavelu, 2007), they gave broader explanation and more ways on analyzing the structural changes. According to them, there is wide range of indicators that economic structure changes could be analyzed. Beside the employment concentration and added value, there are other approaches such as: income-elasticity, productivity growth, share of output in GDP, total spending cross-sectors etc. (Sah & Stiglitz, 1985) in their study, based on positive and comparative approach, have been focused on setting out the framework for the economic systems alternatives, that can be evaluated and compared through performance. They concluded that; the optimum economic system is set by a set of external circumstances, thus the optimal organizational form of activities is chosen by the society.

In this aspect of economic sectorial development, by many authors was mentioned technological changes implication on the employment. In another study, (Stiglitz E. J., 1988), emphasize the role of the technology adoption in the economic development. The author mentions that the intention for technology adoption should be paid for the current or perspective profitability. Thus, aiming to the benefits by the adoption of the future technologies.

In the study of "Increasing Returns and Economic Geography", by (Krugman, 1991), the author used "A Two-Region Model" that assume agriculture and manufactures.The model illustrated the tools drowned from industrial organization theory that, in a way can help to formalize the insights of the neglected fields. Technological importance in the employment was emphasized also by John Meynard Keynes (Keynes, 1873, 2007, 2013), where he pointed out that for long-term expectations, the replacement of the equipment will result in the highest level of employmentand the opposite, if in the long-term equipment are not changed, will reduce the

employment level until it was worn out. In terms of the adoption, productive change is dependent on the institutional structure and efforts by the firms on the level of effectiveness and flexibility to adapt new technologies (Nelson, 2008).

2.4 ICT impact in Economic transformation and Economic Growth

The economy is undergoing though fundamental structural changes, due to the revolution of the Information and Communication Technology and business globalization. The relation of the ICT and so-called "New Economy" is measured to have impact and contribute to the increase of the GDP growth. In the study, (Pohjola, 2002) evaluates the ways in which ICT can enhance the economic growth. In his study, the author among others explains the benefits from the ICT development. According to him, the recent improvements in the labour productivity, about two-thirds are attributed to ICT, where the benefits are extended to the benefits of production. Impact on the economic growth is expected to have the ICT through labour productivity gains and total factor productivity (Wangwe, 2007).Therefore, all influential reports consider the ICT as an instrument for social and especially economic gain (Avgerou C., 2003). Additionally it stimulates growth though e.g. economic structure changes; increase of capacity, access to information, while previously it was the different situation with the dominance of the agriculture as main sector and low income, low production capacity, inadequate trade mechanisms, ineffective allocation were evident.Beside the changes occurred in the structure, the role of ICT is much more extended. (Avgerou C., 2003)It also varies depending on the level of the country`s market economy and capacities development to enter and compete with global-market and to sustain competitive.

ICT development and diffusion impact are explored in the report by the World Bank, in the study using a panel of 120 countries, results showed that '10 percent point increase in broadband penetration results in a 1.38 percent increase in annual GDP growth in developing countries. McKinsey & Company also estimated that —a 10 percent point increase in broadband household penetration delivers a boost to a country's GDP that ranges from 0.1 percent to 1.4 percent' (WorldBankGroup, June 2012). Furthermore, according to the strategy for ICT development, ICT can be seen as an engine for inclusive growth: social well-being; create opportunities for developing countries- job creation; reduction of business costs; accelerate trading all over the world and stimulate innovativeness leading to the globalization,increase of competitiveness and improve internal management of government and private sector as well. Another research (Vu, Measuring the ICT Investments Impact in the Economic Growth) measures the impact of the ICT and the results for the impact of ICT in the developed and developing countries are evident to variety of economies. Therefore, it can be concluded that the ICT changes the labour productivity and activities, which will be further analyzed in this study for the countries subject of the study.

2.5 Development of ICT in Kosovo

The transition from the social system through one of the mechanism -privatization in the economic aspect, had negative effect on the employment level so far. Firstly, the number of employees was higher than needed before the company was privatized. Secondly, high percentage of the privatized companies are inactive, nearly one-third of those privatized (Mustafa, et al., 2008) are not operating anymore.

Taking into consideration national accounts, where export level in Kosovo is very low and the import is very high, the ICT sector is quite well developed and can be seen as future potential. In 2016, ICT companies increased the percentage of the businesses they do with the international clients by 31.2 % in comparison to the previous year of 2015 (STIKK, 2016).Therefore, there is an increasing trend of the ICT not only offering services and products for the domestic market, but also increasing the GDP by exporting, where 77.8 %of the ICT companies export. The comparative analysis of these achievements is because of the price, technical know-how and quality offered. Furthermore, according to the reports, it is expected ICT to substantially grow in the future, particularly"Internet Service Providing, Software development/programming, maintenance and repair, vendor sales, engineering services, training/certification, information services and web development" (STIKK, 2016). Anyways, there is enough space for improvements; one of the weaknesses identified for the ICT sector in Kosovo is the lack of objective data and benchmarking, even its diffusion is well extended and plays crucial role in the development and economic growth. As Kosovo has the youngest population in Europe, the impact of the new developments in the relation to the economic transformation and digitalization is of importance.

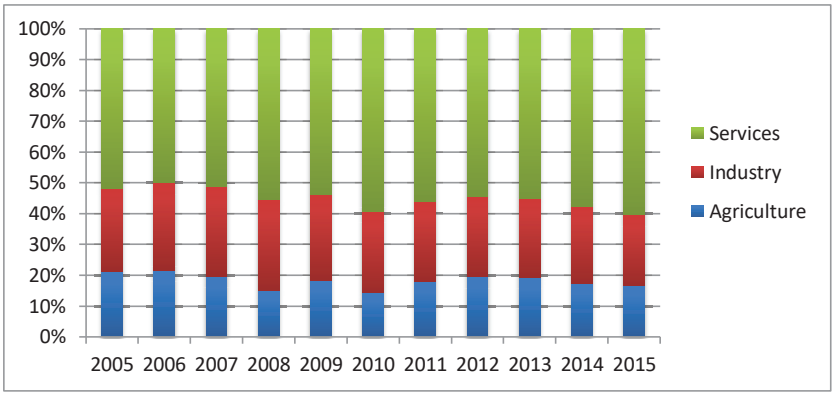
3. Methodology and Data Analysis

Among the methodologies used tomeasure the economic transformation is participation of labor in each sector. In order to analyze the economic transformation, descriptive comparative method was used. There were analyzed economic indicators: number of employees in each economic sector for the period: 2005-2015and GDP real for the same period of the world countries, which have been divided in three sub groups of the countries that in a way shares similarities with Kosovo. For comparison analysis, there are taken in total 30 world countries, in order to estimate the impact of the economic transformation in the emerging countries. Therefore,10 countries for each sub-group are analyzed: a) Balkan countries; b) countries that shares similar number of population as Kosovo and c) countries that have GDP per capita expressed in Parity Purchase Power – PPP almost same as Kosovo.Data for the countries subject of analysis of this research paper have been taken from The World Bank Group database, UN data, OECD, Kosovo Agency for Statistics and Ministry of Labour and Social Welfare. In order to have a comparison and see the transformation, for the group of countries is taken the average of employment in the economic sectors: Agriculture, Industry and Services and is observed how it has changed in the following years compared to the year of 2005. Additionally, in order to see the impact of this transformation in the economy, average GDP real of each sub-group is also compared to the base year of 2005. The list of the countries subject of analysis is attached as Appendix 1.

3.1 Economic transformation of Balkan countries

The economic transformation is analyzed based on the share of the percentage of the employees in the economic sectors: agriculture, industry and services. Average data are taken from the 10 Balkan countries that are shown in the following table for comparison:

Graph 1.Average Employment participation in Economic Sectors in Balkan Countries

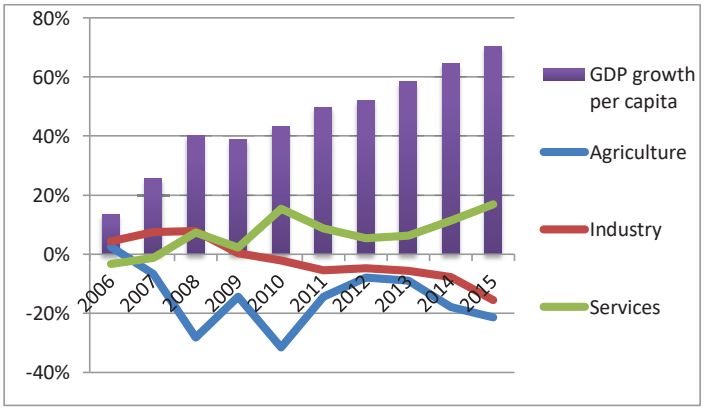


Source: The World Bank

The data shows that from the year of 2005, the major employment percentage is on the services, where agriculture and industry shares similar percentage, respectively on 2005 agriculture employs 21.08 % of the total employment, while industry 27.24 %.For a decade, year of 2015 the data shows that there is a decreasing trend in the employment in both sectors: agriculture and industry for almost same percentage, around 4%, whereas, the increasing trend is on the sector of services for the same percentage of 4%, reaching in total 60.42 % of the total employment.

In the comparison with 2005, the graph below shows the changes in three sectors, and average GDP growth per capita compared with the year of 2005 of all 10 Balkan countries.

Graph 2.Average change in Balkan Countries in Economic Sector and GDP Growth per Capita in PPP



Source: The World Bank

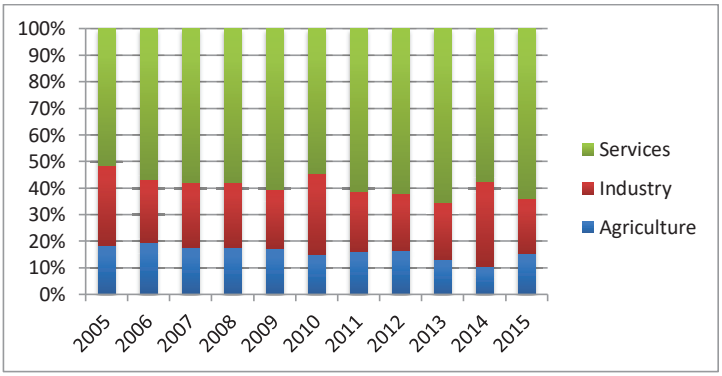
The literature review showed the impact of the ICT was seen to be evident in the economic transformation. Therefore, the changes in the economic sectors impacted the economic growth. The average GDP per capita expressed in Purchase Parity Power for ten Balkan Countries, have been increased. It was increased in 2006 compare to 2005for 13.59 %, whereas data for ten years later shows a drastic change of average GDP per capita expressed in PPP increase up to 70.46% compare to base year of 2005.

3.2 Economic transformation of the countries with small number of population (1-3 million)

The secondcategory of the countries taken for analysis are 10 world countries that have approximately same number of the population with Kosovo. The average employment distribution among economic sectors is similar to the Balkan countries, with slightly less decrease of the employment participation in the two-first sectors.

The current data shows that there is a decreasing trend on the percentage of labour force in the primary sector – agriculture and secondary sector – industry, while increasing in the third sector - services. Major change is caused especially in the tertiary sector, which is services based sector. As in the first category, in order to better analyze the effect, the average data per each year are compared to the year of 2005.

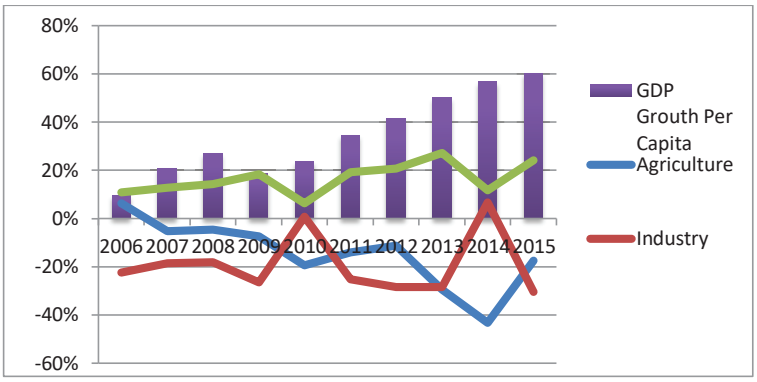
Graph 3.Employment participation in Economic Sectors – Average of the countries with similar number of population with Kosovo



Source: The World Bank

Agriculture in the countries that have between 1-3 billion inhabitants, in 2005 had 18.51 % employees in the agriculture sector, while in 2015 the employment is decreased to 15.26%. The industry employed in average 30.12% of the total employment in these countries, while in 2015 it decreased to 20.95%. The service sector seems to be quite attractive and potential for the future also for the small world countries, since even it was the biggest sector in 2005 by sharing the percentage of employment of 51.33, it continued increasing and reaching 63.77% of employees in 2015.

Graph 4. Average change in Economic Sector and GDP Growth per Capita in PPP – Countries with similar no. of population with Kosovo



Source: The World Bank

Also for these countries category is shown the economic transformation impact in the GDP per capita expressed in PPP. Positive relation seems to have the services sector, as it is the only sector to have been grown for the analyzed decade of 2005-2015. The impact in the GDP per capita in PPP is also evident, from being increased for one year (2005-2006) for 9.59 %. In 2015 the increase reached level of 60.07% in comparison to 2005.

3.3 Economic transformation of Countries sharing same GDP per capita in PPP

Data from the world's countries that shares similar GDP per capita expressed in Purchase Parity Power shows the following situation regarding the economic transformation: Agriculture sector used to share more employment percentage than the Balkan countries and small countries that had population between 1-3 million.

Graph 5. Employment participation in Economic Sectors – Average of the countries with similar GDP per capita in PPP with Kosovo

Source: The World Bank

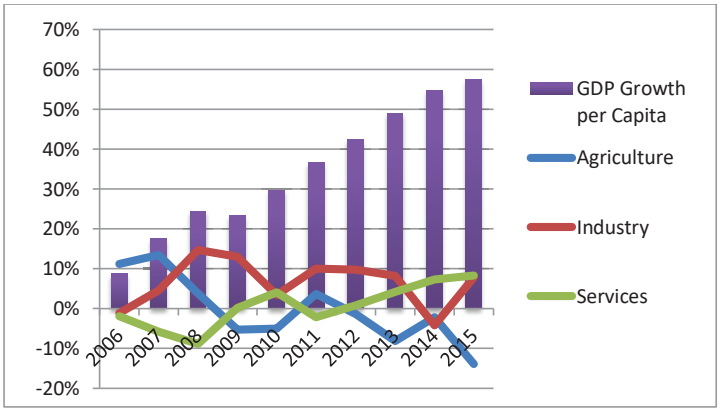
In 2005, level of employment in agriculture sector was 26.56%, industry employed the lowest number with share of 21.25 % of total employment and service sector share 49.95 %. In 2015, two first sectors: agriculture and industry shared almost same level, 22.86 agriculture and 22.92 industry. Changes occurred, while employment in the agriculture was decreased, in the industry

was slightly increased, as well as the service industry marked an increase from being 49.95 in 2005, it increased in 54.09 in the year of 2015.

Regarding the transformation percentageand economic growth, also in these countries, which can be considered to be low-medium countries, the relation of economic transformation and GDP growth per capita in PPP is positive.

The increase of GDP per capita in PPP was not that high in 2006, by having increased only 8.7% form 2005. The growth was higher in later years, where it was increased by 57.42 % in 2015 compared to 2005. In anyways, the third categories had the lowest level of increase in comparison to the two-first group of countries, where the data showed the increase of GDP per capita in PPP up to 70.46 % of Balkan countries and 60.07 % countries with population of 1-3 million. The increase of the employment in the service sector, which impacts the economic transformation, seems to be closely related to the ICT development and digitalization.

Graph 6. Average change in Economic Sector and GDP Growth per Capita in PPP – Countries with similar GDP Growth per Capita in PPP with Kosovo



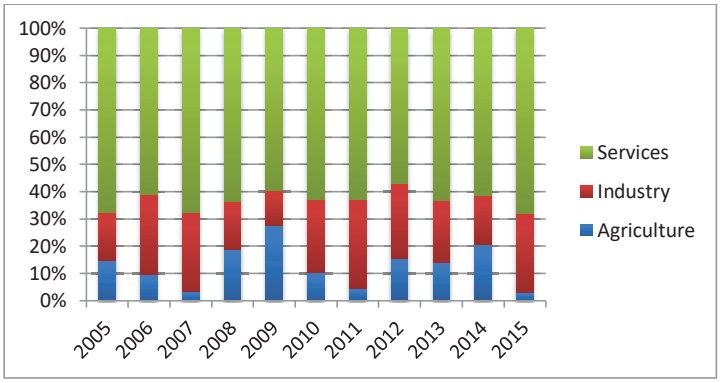
Source: The World Bank

Consequently, according to the analysis, it could be considered that ICT impacts the economic transformation by stimulating and improving the service sector and contribute to economic e growth.

3.3 Economic transformation of Kosovo

Theoretical framework offers different approaches that could be used to measure/analyze the changes in the economic structural changes in a country. The available data in Kosovo offered by Kosovar Agency for Statistics, the distribution of the employers on the sectors measured by KAS that could be useful for the purpose of the study had constrains on provision of the data for the employees on the agriculture sector, as one of the main economical sectors. Same sources as for other analyzed countries - World Bank data, had no data available for Kosovo for the employment in the economic sector. Therefore, the only data available for the Kosovo were yearly reports from Ministry of Labourand Social Welfare (Ministry of Labour and Social Welfare, 2005). According to these reports the following situation with regard to economic transformation is evident in Kosovo:

Graph 7.Kosovo employment distribution in economic sectors in %

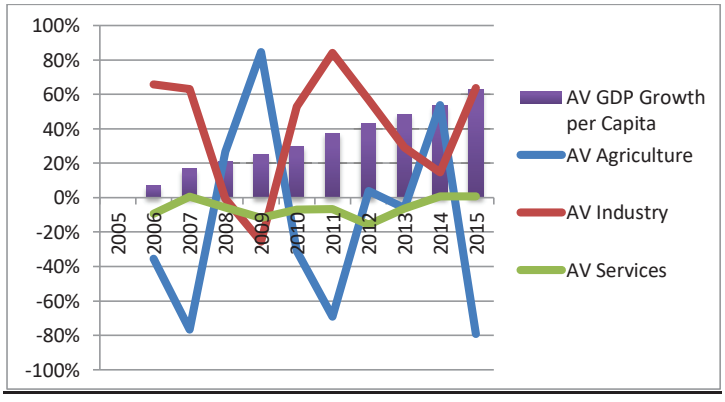


Source: Ministry of Labour and Social Welfare

Revealed data shows major changes to have been caused during the decade in two sectors: agriculture and industry mainly. In the year of 2005, the employment in agriculture was 14.9% of the total employment in Kosovo, with a decrease in the passing year of 2006 up to 5%. Different to agriculture, the industry sector employed 17.60 %in 2005, while for the passing year of 2006, it increased for 11.6 %, reaching the share of employment to 29.20%. The service sector is the major sector by sharing 67.5% of total employment, with a decrease in the passing year -2006 up to 6.3 %. No linear trend is seen throughout the analyzed period. Also, after the declaration of independence in February 2008, the employment was decreased in a sector of industry and services, while increased in agriculture. Drastic change of employment in agriculture sector is also seen in the years of 2014 to 2015, where in 2014, this sector shared 22.9 % and in 2015 only 3.1 %. The industry heeded changes by increasing from 20.02 in 2014 to 28.8% in 2015. The service sector seems to be more sustainable, causing changes throughout the analyzed period.

Regarding to comparison of GDP growth per capita in PPP and changes in the economic sector, the following data are shows the impact of these indicators:

Graph 8. Average change in Economic Sector and GDP Growth per Capita in PPP – Countries with similar GDP Growth per Capita in PPP with Kosovo



Source: Ministry of Labour and Social Welfare and World bank

Despite the frequent changes in the employment in two economic sectors: agriculture and industry by increasing and declining, the GDP Growth per capita in PPP did not have that fluctuation. From the year of 2005, it was constantly increased from the increase in 2006 for 6.85 % in comparison to 2005, in the last analyzed year it was increased for 63.02 %.

4. Conclusions

The study shows the recent trends on the labour participation in the economic sectors that are divided in three main sectors: agriculture -known also as primary sector, industry - secondary sector and services – tertiary sector of the emerging countries. Considering the impact of the ICT development and digitalization, as was explored in the first part of the literature review of the study, its impact in the labour is considered to be of high importance and its effects are seen on the changes of the economic activities as well. From the economy mainly based on the agriculture and industry, the transformation is becoming to the "New Economy", that is service based mainly. Therefore, from the data revealed, it is evident that the third sector – services, is constantly increasing during the analyzed period of 2005-2015 in all three categories of the countries: a) Balkan countries; b) countries that shares similar number of population as Kosovo and c) countries that have GDP per capita expressed in Parity Purchase Power – PPP almost same as Kosovo. Same effect is also in Kosovo, where the major increase of the sectors is services. The available data shows a fluctuation of the employment of increasing and declining in the agriculture and industry sector, whereas, the employment of the services growth is the major one and continues its increase with almost the same trendthroughout the analyzed period.

The effect of this transformation is related to economic growth. The average change in the GDP per capita that is expressed in the Purchase Parity Power is analyzed for countries, in order to see the effect of the economic transformation on the economic growth. The data shows a positive relation of the increase of the services, there is also increased the GPD per capita in PPP in all three categories of the countries, as well as same effect gave this increase in Kosovo. Consequently, the ICT impacts the economic transformation, by increasing of the productivity and concentrating the labor force to services mainly, which leads to the economic growth.

5. Managerial implications and research limitation

Based on the results, the study can contribute to the policy-makers to develop policies that contribute on increasing of the employment and investments on the Information and Communication Technologies within countries. The study gives an insight on the new developments and new trends in the field of ICT and digitalization. Additionally, it provides information's on the growth rates of the emerging countries that shows a path toward the economic transformation and therefore economic growth as well.

The study is focused on the data from the world countries, that can show and be compared to Kosovo. Since the available data in Kosovo were only rough data from the Ministry of Labour and Social Welfare on the labour, detailed data should be collected and analyzed, also by including the diffusion of ICT to get a deep understanding and shows the real impact of the ICT in the economic transformation of the country, employment declining sectors and lobour mobility challenges and analysis on the tendency toward technological unemployment and technical progress.

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Appendix 1. The list of the countries in three categories of analysis- data for 2016

No.	Country	Population	GDP in bil. Current US$	GDP per Capita (in PPP) Current International $	Continent	Comparative indicator
1	Kosovo	1,816,200	6.65	10,066.39	Balkan Country- Europe	
2	Albania	2,876,101	11.93	11,928.53	Balkan Country- Europe	Location/ Population
3	Macedonia	2,081,206	10.9	15,121.25	Balkan Country- Europe	Location/ Population
4	Serbia	7,057,412	37.75	14,511.79	Balkan Country- Europe	Location
5	Croatia	4,170,600	50.43	23,596.24	Balkan Country- Europe	Location
6	Bosnia and Herzegovina	3,516,816	16.56	12,074.75	Balkan Country- Europe	Location
7	Montenegro	622,781	4.17	16,853.83	Balkan Country- Europe	Location
8	Greece	10,746,740	194.56	26,783.02	Balkan Country- Europe	Location
9	Bulgaria	71,127,822	52.39	19,199.07	Balkan Country- Europe	Location
10	Romania	19,705,301	186.69	23,626.37	Balkan Country- Europe	Location
11	Slovenia	2,064,845	43.99	32,884.53	Balkan Country- Europe	Location/ Population
1	Latvia	1,960,424	27.68	26,031.00	Europe	Population
2	Swaziland	1,343,098	3.73	8,342.71	Africa	Population
3	Lithuania	2,872,298	42.74	29,966.13	Europe	Population
4	Mongolia	3,027,398	11.16	12,220.39	Asia	Population
5	Jamaica	2,881,355	14.03	8,834.82	North America	Population
6	Equatorial Guinea	1,221,490	10.18	25,535.11	Africa	Population
7	Cyprus	1,170,125	19.8	32,580.35	Europe	Population
8	Armenia	2,924,816	10.55	8,817.95	Asia	Population
9	Gabon	1,979,786	14.21	18,107.60	Africa	Population
10	Estonia	1,316,481	23.14	29,364.72	Europe	Population
1	Paraguay	6,725,308	27.44	9,576.56	Latin America	GDP per Capita - in PPP
2	Georgia	3,719,300	14.33	9,996.93	Euroasia	GDP per Capita - in PPP
3	Ecuador	16,385,068	97.8	11,286.17	Latin America	GDP per Capita - in PPP
4	Morocco	35,276,786	101.44	7,837.90	Africa	GDP per Capita - in PPP
5	Tunisia	11,403,248	42.06	11,598.55	Africa	GDP per Capita - in PPP
6	Jordan	9,455,802	38.655	9,050.07	Asia	GDP per Capita - in PPP
7	El Salvador	6,344,722	26.78	8,619.07	North America	GDP per Capita - in PPP
8	Ukraine	45,004,645	93.27	8,271.78	Europe	GDP per Capita - in PPP
9	Sri Lanka	21,203,000	81.32	12,316.16	Asia	GDP per Capita - in PPP
10	Egypt	95,688,681	336.28	11,131.72	Africa	GDP per Capita - in PPP

Source: The World Bank

EDUCATION AND INCOME INEQUALITY: EXPLORING EVIDENCE FROM EMERGING COUNTRIES

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Abstract: This paper analyses the relationship between education and inequality for 24 emerging economies during 1980-2010. The results obtained from the estimation of a regression with an income inequality indicator as the dependent variable and average years of schooling (total and by schooling levels) as the main explanatory variable using the fixed effects panel estimator indicate increasing educational attainment levels, especially secondary and tertiary, will lead to further increases in inequality.As better-educated workers enter the labour market, apparently the demand for educated workers outpaces supply and thus the wage compression effect that predictably would lead to a reduction in income inequality is not yet taking place.On the contrary, real GDP per capita reveals a non-linear inverted U relationship with income inequality, supporting the Kuznets (1955) hypothesis.

Keywords: Schooling, Inequality, Emerging Countries

JEL Classification: C23, H52, I24, O15, O57

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Introduction

Inequality in income distribution in emerging economies has remained at very high levels in recent decades and has even increased, alongside a good performance in terms of output growth. For example, in Brazil in 1980 the Gini index of income distribution was 56% decreasing to 53.96%: in 2009, but remaining at high levels. In South Africa, inequality increased, with the Gini index going from 49% in 1980 to 57.37%, while in China over the same period the Gini index increased from 23.40% to 44% and in India from 33.81% to 34.65% (OECD, 2011). At the same time, average years of total schooling for the population aged 15 and above increased in all these emerging economies over the period 1980-2010: in Brazil from 3.04 to 7.89 years; in South Africafrom 5.11 years to 9.69 years; in China from 5.31 to 7.95 years; and in India from 2.3 years to 6.24 years.

The previous data motivates the main research question of this paper, whether the behaviour of inequality in income distribution is associatedwith educational attainment levels in emerging countries. According to some authors (Knight and Sabot, 1983 *apud* De Gregorio and Lee, 2002, p. 396) the relationship between education and income inequality is best described by an inverted U curve, with income inequality increasing at low levels of education as the population gets more schooling but reaching a maximum after which further increases in education lead to a reduction in income inequality. However, inequality can also be influenced by other factors such as globalization, that does not benefit all segments of the population in the same way (Vieira, 2012); public spending on social protection (De Gregorio and Lee, 2002); the type of political regime (Abdullah, Doucoliagos and Manning, 2011) or productive specialization (Chusseau and Hellier, 2012). Kuznets (1955) poses that, as a country goes through an industrialization process, with industrial wages higher than agricultural wages due to higher productivity, in the initial stages there will be an increase in inequality since an important part of the labour force still remains in agriculture and rural areas. However, after a certain level of industrialization is achieved, with an important share of the labour force employed in industry and the reduction of the labour supply in agriculture pushing the respective wages up, there will be a reduction in inequality as industrialization proceeds. This relationship is referred to as the Kuznets (1955) inverted U-curve describing the relationship between a country's level of income and the respective income inequality levels. An associated research question of this paper is thus how important is education in explaining the behaviour of income inequality given these other determinant factors.To investigate the education-inequality nexus in emerging countries this paper applies an econometric analysis with panel data over the period 1980-2010, with educational attainment levels (total, primary, secondary, and tertiary) as the main explanatory variables.

This paper is organized as follows. After the Introduction, the following section gives a brief overview of previous research on the relationship between schooling and inequality in income distribution, with a focus on emerging economies. Next, we describe the data for our sample of emerging economies, followed by the presentation ofthe empirical methodology used and the results obtained. Finally, we summarize the main conclusions.

Is there a correlation between schooling and income inequality? Literature overview

In this section we review the main theoretical predictions and relevant empirical studies on the correlation between schooling and inequality in emerging economies. The studies reviewedwere chosen because they consider the same type of data structure (panel) and/or focus on a sample of emerging economies.

Education is a fundamental source of human capital, which in turn influences income at the individual level due to its impact on labour productivity, and hence education can be an important determinant of inequality (Petcu, 2014). This relationship has been widely studied in the literature (Checchi, 2000; Rodriguez-Pose and Tselios, 2009;Petcu, 2014), confirming schooling as a factor that increasesincome at the individual level and in this way influences the behaviour of inequality at the aggregate level. While at low levels of education an increase in schooling is likely to be positively correlated with inequality, after a certain threshold further increases in education potentially lead to a reduction in inequality in the distribution of income (Knight and Sabot, 1983 *apud*Petcu, 2014: 7). The positively sloped part of the inverted-U curve describing the relationship between education and inequality is explained by the composition effect according to which, as education reaches more workers but the better-educated still represent a low share of the workforce, the higher productivity of the more skilled translates into higher wages which in turn increases income inequality. However, as the supply of better-educated workers increases, all other things constant, their relative price (wage) will decrease leading to a reduction in income inequality, known as the wage compression effect that explains the negatively sloped part of the inverted-U curve. However, as stated by Rodriguez-Pose. and Tselios (2009, p. 415): "(…) the effect of education on income inequality is based on a balance of [labour] supply and demand." And "With respect to the demand side ofskilled labour education, if the demand for unskilled labour is either contractingor growing at a slower rate than the demand for skilled labour, then earnings inequalitieswill increase." For instance, due to skill biased technological change, an increase in skilled labour supply will be met by an increase in the respective demand and so the skilled workers wages will not decline as they become a higher share of the workforce.

The conclusions from empirical studies on the correlation between schooling and inequality are not consensual (De Gregorio and Lee, 2002). The meta-analysis carried out by Abdullah, Doucoliagos and Manning (2011) covers studies that consider as dependent variable a measure of inequality in the distribution of income (usually the Gini index) and as main explanatory variable a measure of educational attainment levels. Overall the different studies cover the period 1964-2005, corresponding to 64 studies. Variables included to control for the differences in the results on the education-inequality nexus obtained by the different studies include the type of publication (if the study was published and where), whether it was published in an economics or sociology scientific journal, geographical coverage (Latin America, Asia, Africa, developed countries, socialist countries), type of estimator (OLS or not), data structure (cross-section or panel) and other social and economic control variables included in the inequality regression, as well as political variables (such as democracy, political stability and others). The authors conclude that schooling reduces the gap between the highest and the lowest income earners, but does not appear to affect the middle class. The results also indicate that regional differences influence the results on the impact of schooling on inequality and suggest that for African countries and developed countries schooling plays a greater role in reducing inequality than in Asian countries. In any case, the vast majority of the sample of studies analysed for Asia show that there is a positive relationship between schooling and inequality, not the other way around.

Coady and Dizioli (2017) is a recent paper that using dynamic panel estimation techniquesfind a positive relationship between income inequality and average years ofschooling, consistent with constant or increasing returns to additional years ofschooling. However, this positive relationship is small and not always statistically significant, although the authors find a statistically significant negative relationship with years of schooling of younger cohorts. The dependent variable is the Gini coefficients at five-year intervals from 1980 to 2010 and the sample comprises 103 countries: 35Advanced Economies; 12Emerging Europe; 25 Latin America & the Caribbean; 23 Asia & Pacific; 18Middle East & North Africa; and 29Sub-Saharan Africa. The explanatory variables include average education, the gini of education (total, young cohorts, old cohorts), GDP and its square, openness, social protection, population over 65, population less than 15, inflation, urbanization, capital account openness and credit growth.

In light of the different results obtained we now focus on studies that consider specific emerging countries that we include in our broad sample. For instance, Ning (2010) investigates whether expanding schooling in China helped to decrease income inequality, based on an inequality regression by quantiles with data on schooling and individual incomes corresponding to 14,399 observations between 1997 and 2006. Control variables considered include work experience, gender, family, labour mobility and type of occupation. The results obtained suggest that the increase in schooling resulted in a widening of the income distribution. Ferreira et al. (2000) consider data for urban areas in Brazil between 1976 and 1996

and estimate a panel data regression with inequality as the dependent variable and as explanatory variables schooling and its square, experience and its square, as well other individual features like gender. The authorsconclude that schooling positively affects income, even though Brazilians above the 15thincome percentile would have to acquire two additional years of schooling and decrease fertility to overcome low returns in the formal and self-employment market. Pieters (2009) analyses 16 states in India over the period 1987-2004 considering inequality in the distribution of monthly per capita expenditure of families as dependent variable and as explanatory variables: household level of education, number of children per household, type of household, religion, social status, occupation and main employment industry. From his analysis, it can be observed that, between 1987 and 1993, schooling slightly decreased inequality, while between 1993 and 2004, the increase in schooling promoted an increase in inequality. Finally, Battistón et al. (2014) focus on 18 Latin American countries (between 1990 and 2009) and conclude that increasing years of schooling in the region during the 1990s and 2000s promoted an increase in inequality and this is expected to continue if educational policies do not target the population with lower educational levels.

Some authors (De Gregorio and Lee, 2002; Ning, 2010, Rodriguez-Pose and Tselios, 2009; Keller, 2010) also tried to identify differentiated impacts of specific schooling levels (classified as primary, secondary and tertiary) in terms of thedistribution of income. The main argument is that the impact of different types of schooling on income inequality depends on the balance between thecomposition effect and the wage compression effect. The composition effectstates that an increase in tertiary schooling has initially an inequality promoting effect because it increases the relative size of the group of workers with higher schooling levels. On the other hand, the wage compression effectposes that, as the supply of workers with tertiary education increases and the relative supply of workers with primary and secondary schooling decreases, wage differences decrease (Knight and Sabot, 1983 *apud* De Gregorio and Lee, 2002: 396).

The study on the relationship between education and income inequality conducted by Rodriguez-Pose and Tselios (2009) for 102 European Union regions, between 1996 and 2000, considers a great diversity of explanatory variables and estimation methods for panel data (fixed effects; dynamic panel; spatial econometrics), concluding that the short and long term impacts of secondary and tertiary education on inequality are positive, with secondary schooling presenting the strongest relation with inequality.A more recent study by Keller (2010) aims at investigating whether schooling policies can lead to more equality in income distribution. For this purpose the author collected panel data for 99 countries between 1970 and 2000 and uses the pooled OLS estimation method. The dependent variable considered is the Gini index and the explanatory variables include levels of schooling, school enrolment ratesand public expenditure on education per student. The results obtained indicate that the expansion of primary

schooling reduced the wage premium, increasing expenditure per student in primary schooling reduces income inequality, public expenditure in secondary schooling also reduces inequality while higher enrolment ratesin tertiary education causes an increase in inequality. The author highlights that when resources are insufficiently distributed, they produce poor quality education that does not provide enough knowledge to increase income and improve its distribution.

A feature that stands out from the previous literature overview is that schooling is not the only factor that can affect income inequality. Besides schooling, there are other international and national factors that contribute to inequality. At theinternational level, a main factor that can influence inequality is globalization (trade integration), which has mostly benefited manufacturing workers, increasing income inequality between occupations. Financialintegration allows access to finance by the poorest, but still only a small part of the population benefits from this access. Finally, skill biased technological progressthat benefits higher education and qualifications, also widens the distribution of income. At the national level, changes in taxes and transfers can also affect income distribution (Vieira, 2012).

This literature review indicates that regional differences influence the impact of schooling on inequality and thus developed and developing countries are affected differently by increasesin schooling. On the other hand, the inequality impact of increasing specific schooling levelsdepends on other factors, such as the level of globalization or industrialization and national policies.

Data and empirical model

In order to define our sample of emerging countries, the criteria of four international organizations were used: the International Monetary Fund (IMF), the Morgan Stanley International Capital (MSCI), the Financial Times and the London Stock Exchange (FTSE) as well as the countries income group classification of the World Bank. The IMF identifies 152 emerging markets and developing economies. However, this sample is too broad and does not distinguish between emerging markets and developing economies. In order to obtain a representative sample of emerging economies only, the MSCI classificationwas used, which applies three criteria, with emerging economies having to respect at least two:domesticmarketsize; market accessibility, namely, significant openness to foreign ownership, ease of entry / exit of significant amounts of capital, good operational and tested structure efficiency, high competitive landscape and modest stability of the institutional framework. The FTSE classification reinforces the MSCI analysis. All the countries considered by the FTSE as emerging economies are also in the MSCI classification. To the sample of emerging economies obtained from the MSCI classification we added the countries that belong to the upper-middleincome group of the World Bank. We excluded

from the sample oil producing countries (OPEC member countries), some transition economies that do not have data prior to 1990 and countries with less than one million inhabitants. The resulting sample is composed of 24 countries: Botswana, Brazil, Chile, China, Colombia, Costa Rica, Egypt, Hungary, India, Indonesia, Jamaica, Jordan, Malaysia, Mauritius, Mexico, Namibia, Paraguay, Peru, Philippines, Poland, South Africa, Thailand, Tunisia and Turkey.

To investigate the existence of a correlation between schooling and inequality in income distribution in our sample of 24 emerging countries we used data for the period between 1980 and 2010, estimating the empirical model described by equation (1). For some periods and countries there is no data available for the Gini index, so the panel is not balanced. The total period was divided into 5-year periods, so our empirical model is similar to that in De Gregorio and Lee (2002). Both variables, dependent and main explanatory variable, show persistence, that is, they change slowly over time, so the analysis for 5-year periods allows to better capture their evolution and, in particular, the influence of the main determinants.

$$gini_t = \alpha + b_1 Edu_{t-1} + b_2 Edu_{t-1}^2 + b_3 logGDPpc_{t-1} + b_4 logGDPpc_{t-1}^2 + b_5 Glob_t + b_6 GC_{t-1} + b_7 Dem_{t-1} + b_8 Valadd\_ind_t + \varepsilon_{i,t} \quad (1)$$

In equation (1), the dependent variable, *gini*, corresponds to the Gini index of income distribution, considered as the average for each of 5-years period. The main explanatory variables of the model areEdu_{t-1} that represents the initial level schooling (for each 5-years period), total or by schooling level (primary, secondary and tertiary). The proxy used corresponds to average years of schooling (total or by level) of the population age 15 and above andwe consider the initial value to better capture the effect of schooling on inequality due to the time it takes, for example, to enter the labour market, as well as to avoid problems with the potential endogeneity. The level of inequality can influence the education level of the population by preventing, for example, the poor gainingaccess to the education system (Coady and Dizioli, 2017). We expect a negative sign for this variable in the linear formulation, but we also includeas explanatory variablethe squareof schooling, Edu_{t-1}^2, to capture thepotential inverted U relationship between schooling and inequality, provided that the estimated coefficient for the square is negative. $\varepsilon_{i,t}$is the error term of the model with the usual properties, iid (independent and identically distributed). The data for the Gini index of income distribution for the 24 emerging countries in our sample was not available from the same data source for all countries and years needed. The complete data was obtained combining data from the CANA database (Castellacci and Natera, 2011) and the World Development Indicators. From the Barro-Lee database (Barro and Lee, 2013) we retrieved all the necessary data for the schooling variable, average years of total schooling and by levels (primary, secondary and tertiary).

The remaining variables present in equation (1) are control variables: $logGDPpc_{t-1}$ (and its square) is a measure of the level of development and corresponds to the natural logarithm of real per capita GDP; $Glob_t$ is a measure of globalization proxied by the KOF index globalization; GC_{t-1} is a measure of state intervention through social protection proxied by public consumption as a percentage of GDP; Dem_{t-1} is a measure of the political regime proxied by the level of democracy; and, finally, $Valadd\_ind_t$, is a measure of structural change or productive specialization proxied byindustry value added as a percentage of GDP. For more details on the variables, proxies and data sources see table A.1 in the Appendix.

The control variables were selected taking into account their importance for the explanationof the behaviour of income inequality according to the literature reviewed in the previous section (De Gregorio and Lee, 2002; Rodriguez-Pose and Tselios, 2009; Vieira, 2012;Petcu, 2014; Coady and Dizioli, 2017).We expect an inverted U-relationship between GDP and the Gini index supporting the Kuznets hypothesis (1955). This author predicts that as a country or region becomes more industrialized (thus able to increase its output) it will employ more workers in industry, with higher wages than agriculture, sincethe former sector is more productive. Thus, initially when workers in the industrial sector are still a relatively small group of the total population, inequality in income distribution will increase because the income gap between a large number of individuals receiving a low wage and a small group of individuals receiving a high wage will increase. However, as the group of industrial workers grows (and consequently the group of agricultural workers decreases) this distance between the two groups decreases, while the change in the relative supply of workers in the different sectors will narrow wage differences.Globalization data were obtained from the KOF database. The KOF index uses three different dimensions to calculate the degree of globalization: economic (long-distance flows of goods, capital and services, etc.), political (e.g. diffusion of government policies) and social (diffusion of ideas, information, images and people). According to Vieira (2012), as globalization increases inequality in income distribution also increases. Globalization deepens financial integration and technological progress, which benefit only small groups of individuals or particular industries, widening the income gap.The variable used as proxy for social protection expenditure by the state is public consumption as a percentage of GDP. The expected sign for the estimated coefficient is negative, because when the state's social expenditure grows, inequality is expected to decrease due to transfers from the state to the poorer families and investments in schooling and health (De Gregorio and Lee, 2002, p. 411).As a proxy for the political regime we use an indicator of democracy. Data on this variable were taken from the CANA 2011 database (Castellacci and Natera, 2011). This variable goes from +10 (democratic) to -10 (autocratic), where democracy corresponds to full and competitive political participation, executive recruitment is done by means of elections and the limitations to governmental power are substantial. Autocracy restricts

or avoids political participation. A more democratic political regime promotes a more egalitarian society so that inequality in income distribution will be lower and we expect a negative effect of democracy on the Gini index (Rodriguez-Pose and Tselios, 2009; Petcu, 2014). Productive specialization is proxied by the industry value added share in GDP, included to consider Kuznets (1955) explanation for the relationship between income and inequality. According to Kuznets (1955), as industrialization proceeds and employs an important part of the workforce, the higher relative wageswhen compared to agriculture, less productive, will lead to a reduction in inequality. Thus, we expect a negative signbetween productive specialization and inequality. This variable can also be capturing other explanations for the behaviour of inequality such as urbanization.The control variables GDPpc, GC and Dem are taken as the initial values for each 5-year sub-period since their impact on inequality may take some time to produce effects. The variables concerning globalization and productive specialization correspond to average values for each 5-year sub-period assuming in this way that changes in these variables have a contemporaneous effect on inequality.

Table A.2 in the Appendix contains descriptive statistics for the variables included in the empirical model.

Methodology and results

The empirical model described in equation (1) is a static panel data model that can be estimated assuming three different hypothesis, pooled OLS, fixed effects, or random effects. Pooled OLS is appropriate in the presence of samples of countries that present some similarities in their structural characteristics and therefore the constant and slopes in the model will be the same. Fixed effects is more adequate when, although there are common variables that affect the behaviour of the countries under analysis, there are also characteristics intrinsic to each country that influence the respective behaviour and that are different across countries, while remaining constant over time. Random effects is used when random variation is expected around a representative mean intercept for the sample of countries. To determine the appropriate estimation method we apply the usual diagnostic tests, the F test, the Breusch-Pagan test (Breusch. and Pagan, 1980)and the Hausman test (Hausman, 1978). The F test assumes as null hypothesis that there is homogeneity in the constant (and slope) and, in this case, the most appropriate estimation method will be pooled OLS, against the alternative hypothesis that fixed effects is the most appropriate. The Breusch-Pagan test considers as the null hypothesis that the variance of the error term is zero, favouring in this way the use of pooled OLS, against the alternative hypothesis that random effects should be used. If the null hypothesis of both tests are rejected we should also perform the Hausman test that considers as the null hypothesis that random effects is valid against the alternative that fixed effects

should be used. If we reject the null hypothesis for this test then the most appropriate estimation method is fixed effects. The econometric package used was GRETL 1.9.9. Tables A. 3 to A.6, one for each schooling variable, in the Appendix contain the results of estimating equation (1) with the three static panel data models and the statistics for the diagnostic tests. The results for the latter indicate that fixed effects is the preferred method: the results for the F test (p-value<5%) lead to the rejection of the null hypothesis so fixed effects is preferable to pooled OLS method; the results for the theBreusch-Pagan test (p-value<5%) lead to the rejection of the null hypothesis so random effects is preferable to pooled OLS method; and, finally, the results for the Hausman test(p-value<5%) lead to the rejection of the null hypothesis so fixed effects is preferable to random effects.In the main text wethus show only the results obtained with the fixed effects method, Tables 1 and 3, introducing alternatively in the empirical model total, primary, secondary, and tertiary schooling, respectively.In each table the results in column I refer to the linear model in terms of the influence of education on inequality whilecolumn II contains the results of the estimation of the quadratic model.

Table 1 contains the results obtained with the fixed effects method. The control variables *Glob*, *GC* and *Dem*present the expected positive estimated coefficients but are not statistically significant. The findings confirm the expected quadratic influence of the income level, with the coefficients of *logGDPpc* and its square statistically significant and negative for the latter, supporting in this way theinverted-U relationship predicted by Kuznets (1995). Regarding schooling, the estimated coefficient for the linear model in column I is not statistically significant. In column II, the square of total schooling,edu_total^2, is added as explanatory variable in order to capture a potential inverted-U relationship between schooling and the Gini index. Both coefficients of the total schooling variables are statistically significant but the estimated coefficient for the quadratic term is positive. Thus, the relationship between total schooling and inequality in emerging countries is described by a Ushaped curve. This suggests that the increase in the average number of years of total schooling reduces inequality for low levels of schooling but after a certain threshold further increases in schooling promote inequality. We return to the interpretation of these results when we compute the turning point for the education-inequality relationship. The values of the information criteria (AIC, BIC and HQ) are smaller for the quadratic model, column II, compared to the linear model, so this is the best model to explain the relationship between total schooling and inequality.Table 1, columns III and IV,contain the results of the estimation of equation (1) with the fixed effects method replacing total schooling by the primary schooling level as the main explanatory variable. The sign of the estimated coefficients for the schooling variable and real GDP per capita remain the same as for the estimation with total schooling indicating a U relationship in the first case and an inverted U one in the second case. For the preferred model, the non-linear model, based on the lower figures for the information criteria, none of the estimated coefficients for the control variables is statistically significant.

Table 1: Summary of the results with fixed-effects and total or primary schooling. 24 countries. 1980-2010

Explanatory variables	Dependent variable: *gini*			
	I	II	III	IV
constant	−167.87** (−2.3)	−337.85*** (−2.77)	−168.45** (−2.31)	−300.87*** (−3.96)
Edu_total	0.45 (0.68)	−4.89*** (−2.46)		
Edu_total_educ^2	-	0.43*** (3.29)		
Edu_prim			−0.6 (−0.53)	−12.10*** (−3.87)
Edu_prim^2			-	1.49*** (3.91)
logGDPpc	49.35*** (2.9)	92.55*** (3.26)	49.77*** (2.91)	85.04*** (4.65)
logGDPpc^2	−2.88*** (−2.88)	−5.37*** (−3.32)	−2.87*** (−2.87)	−4.89*** (−4.59)
Glob	0.06 (0.85)	0.03 (0.24)	0.12* (1.7)	0.07 (1.12)
GC	7.79 (1.11)	11.71* (2.03)	6.45 (0.93)	7.59 (1.18)
Dem	−0.07 (−0.65)	−0,01 (−0,08)	−0.03 (−0.29)	0.01 (0.09)
Valadd_ind	−0.12 (−1.47)	−0.14* (−1.68)	−0.15* (−1.82)	−0.10 (−1.44)
LSDV R^2	0.92	0,93	0.92	0.93
R^2 within	0.16	0,27	0.16	0.28
AIC	679.21	665,21	679.46	662.44
BIC	766.64	755.46	766.88	752.69
HQ	714.73	701.88	714.97	699.1
No.	124	124	124	124
F Test (p-value)	2.35 e^{-30}	1.85 e^{-32}	5.14 e^{-30}	3.80 e^{-32}

Note: In columns I and III the square of the schooling variable is not considered as an explanatory variable. In columns II and the square of the schooling variable is considered as an explanatory variable. The values in parenthesis correspond to the t statistic. ***. **. * indicate statistical significance at the 1%. 5% and 10% level, respectively.
Source: Own elaboration using Gretl.

Based on the results foraverage total and primaryschooling levels and real GDP per capita for the average country in our sample, Table 2 presents the information on the turning points for each relationship, the point beyond which the relationship between schooling and inequality turns positive and the point beyond which the relationship between income and inequality becomes negative. The turning point for total schooling corresponds to 5.69 average years. For this value all the geographical regions under analysisare on the positively sloped part of the curve in the year 2010. The turning point for primary education corresponds to4.06 average years of primary schooling. Again, for this value all the geographical regions under analysisare on the positively sloped part of the curve in the year 2010.Thus, the relevant mechanism relating education to inequality at the moment seems to be the one suggested by Rodriguez-Pose. and Tselios (2009) according to which in spite of the increase in the supply of workers with higher schooling levels their relative demand has grown faster than that of unskilled workers so that the wage premium to education has not declined, leading in this way to an increase in inequality. Besides no wage compression effect taking place, possibly the wage compensation effect might also play some role in terms of secondary and tertiary education since the proportion of workers with secondary or tertiary education is still quite low. We next look in more detail at the results of the regressions considering these schooling levels as education variables.

Table 2: Turningpoints for the quadratic relationships, total or primary schooling

Variables	*Estimated coefficients*	*Turning point*
Edu_total	−4.89	5.69 years
Edu_total²	0.43	
logGDPpc	92.55	5526.55 USD
logGDPpc²	−5.37	
Variables	***Estimated coefficients***	***Turning point***
Edu_pri	−12.10	4.06 years
Edu_pri²	1.49	
logGDPpc	85.04	5974.74 USD
logGDPpc²	−4.89	

Source: Own elaboration based on the information fromTable 1.

Table 3, columns I and II, contains the results of the estimation of equation (1) with the fixed effects method replacing total schooling by the secondary schooling level as the main explanatory variable. Now the preferred model with secondary schooling according to the information criteria is the

linear model (column I). For this model, none of the estimated coefficients for the control variables is statistically significant. The estimated coefficient for the secondary education variable is positive and statistically significant suggesting that an increase in the average years of secondary education of the population always leads to an increase in inequality. Columns III and IV, contain the results when using tertiary education as the schooling variable. In this case and for the control variables only the estimated coefficient for the industry value added share is statistically significant and negative as expected. The preferred model is the one on column IV, where we observe a positive and statistically significant estimated coefficient for the linear term in education, while the estimated coefficient for the quadratic term is not significant. This suggests that an increase in the average years of tertiary education of the population always leads to an increase in inequality. Again in both cases (secondary and tertiary education) the results obtained point to an inverted U relationship between inequality and income with the coefficient of the linear term and the coefficient of the quadratic term of real GDP statistically significant and negative for the latter.The results concerning secondary and tertiary education are not surprising since in emerging countries the proportion of workers with secondary and tertiary schooling is still relatively low and thus a wage composition effect on inequality dominates: these workers earn higher wages because they are more productive, which leads to an increase in inequality as they enter a labour market characterized by a relative strong demand for these workers while supply is still relatively weak.

Table 3: Summary of the results with fixed-effects and secondary or tertiary schooling. 24 countries. 1980-2010

Explanatory variables	Dependent variable: *gini*			
	I	II	III	IV
constant	−178.95** (−2.47)	−225.14*** (−2.68)	−175.55** (−2.4)	−162.69** (−2.23)
Edu_sec	2.09* (1.68)	−0.98 (−0.32)		
Edu_sec^2	-	0.66 (1.08)		
Edu_ter			5.96 (1.1)	17.23* (1.93)
Edu_ter^2			-	−12.7 (−1.59)
logGDPpc	52.41*** (3.09)	63.86*** (3.2)	51.68*** (3.02)	48.81*** (2.86)
logGDPpc^2	−3.08*** (−3.08)	−3.74*** (−3.2)	−3.02*** (−3)	−2.87*** (−2.86)

glob	0.02 (0.24)	0.03 (0.35)	0.08 (1.25)	0.06 (1.08)
GC	9.8 (1.4)	10.66 (1.51)	6.89 (1.01)	5.27 (0.77)
Dem	−0.05 (−0.52)	−0.03 (−0.32)	−0.08 (−0.75)	−0.09 (−0.88)
Valadd_ind	−0.11 (−1.43)	−0.13* (−1.68)	−0.15* (−1.96)	−0.15* (−1.93)
LSDV R^2	0.92	0.92	0.92	0.92
R^2 within	0.18	0.19	0.17	0.19
AIC	676.15	676.58	678.22	676.88
BIC	763.58	766.83	765.65	767.13
HQ	711.67	713.24	713.74	713.54
No. Observations	124	124	124	124
F Test (p-value)	5.88 e^{-31}	2.23 e^{-29}	2.34 e^{-30}	2.45 e^{-30}

Note: In columns I and III the square of the schooling variable is not considered as an explanatory variable. In columns II and IV the square of the schooling variable is considered as an explanatory variable. The values in parentheses correspond to the t statistic. ***. **. * indicate statistical significance at the level of 1%. 5% and 10%, respectively.
Source: Own elaboration using Gretl.

In summary, the results presented in Table 1 indicate that there is a non-linear quadratic relationship between total/primary schooling and inequality, but not an inverted-U relationship, as expected. In fact, the quadratic relationship can be described by an U-shaped curve with a turning point (minimum) at 5.69 average years of total schooling (4.06 average years of primary schooling). These turning points imply that all the countries in the sample were already in the positively sloped part of the curve by the year 2010 so further increases in schooling will lead to an increase in income inequality. The positive relationship detected between total schooling and inequality is probably the result of the influence of secondary and tertiary schooling since the results obtained point to a linear positive relationship between both schooling levels and inequality (see table 3). Our results thus indicate that despite the high inequality levels faced by emerging countries, increasing the share of government spending on education in these countries to address this issue will not produce the desired results, at least for some time in the near future. At the present the balance between supply and demand of skilled workers (with higher educational attainment levels) seems to impede the verification of the wage compression effect: the supply of skilled workers is increasing, which should lead to a decrease in the

relative wages (and at the same time the supply of unskilled workers is decreasing raising the respective wages) and a reduction of inequality, but in reality the demand for skilled workers as increased preventing their wages from decreasing. In any case, other structural transformations associated with an increasing GDP per capita/level of development are contributing to a decrease in inequality levels in emerging countries, evident in the inverted-U relationship we uncovered and the fact that in the year 2010 all the countries in the sample are located in the negatively sloped part of the curve. Other usual determinants of inequality, globalisation, social expenditures, political regime, do not, according to our results, influence the level of inequality in emerging countries.

Conclusion

In recent decades, the interest in thebehaviour of income (and wealth) inequality has increased and has been associated with a fear that it might compromise future growth, while others pose that it is a necessary condition for innovation to occur, in turn a main driver of growth in endogenous growth models (Mankiw, 2013; Aghion at al. , 2015)). The mechanisms associated with the negative inequality-growth nexus can prevent emerging economies, which have until recentlyrecorded impressive economic growth rates, to continue growing at the same speed. Those mechanisms include the idea that,in more unequal societies: the median voter will vote for higher levels of taxation and government expenditure introducing in this way distortions which will hinder economic growth (see (Alesina&Rodrik, 1994); (Persson&Tabellini, 1994)); only those individuals that have a high enough initial level of wealth (the collateral) will able to invest in human capital, an essential ingredient for higher growth (see (Galor&Zeira, 1993)); and individuals are more likely to be involved in activities (e.g. violent protests, coups or criminal activities) that hinder capital accumulation and thus growth (see (Alesina&Perotti, 1996)). A policy instrument that is often identified as an effective way of fighting income inequality is the expansion of education. In this paper we investigate the role played by schooling in explaining income inequality in emerging economiesrelative to other factors that may also affect it. We consider a sample of 24 emerging countries over the period 1980-2010, at 5-years intervals, and estimate a fixed effects regression with total schooling as the main explanatory variable as well as taking into account education composition.

Our results suggest that in the medium term increasing average educational attainment levels but especially secondary and tertiary education will lead to further increases in inequality as better-educated workers enter the labour market, where apparently the demandfor educated workers outpaces supply and thus the wage compression effect that predictably would lead to a reduction in income inequality is not yet taking place. For instance, if technologicalprogress occurring in emerging countries is skill-biased it

can offset the supply effect.The theoretical mechanism works asfollows: a greater proportion of workers with secondary and higher education will likely decrease the income gap relative to those with primaryeducation, unless demand keeps pace with supply, in which case the returns to secondary and higher educationmay remain constant, or even increase, potentially leading to greater inequality (Shimeles, 2016). Additionally, according to Shimeles(2016, p.7) : "Considering the fact that in most developing countries the majority of people whocomplete secondary or tertiary education come from families already in the top 20% wealthbracket, it may be that more secondary or tertiary education could lead to even greaterinequality, particularly in the short term." Nevertheless, Ahmed et al (2017) predict, using a general-equilibrium macro-micro simulationframeworkfor realistic education and demographic scenarios, conditioned by what will happen to the demand for labour (due for instance to what happens to technologicalchange),that a wave of more educated workers from emerging and developing countries can, by 2030, lead to a decrease in the Gini index for most countries relative to thecase of no education wave.

When attempting to extrapolate policy advice from this study, we cannot ignore thatthere are important unresolved conceptual and methodological issues involved in assessingthe education-inequality nexus that create uncertainty in the interpretation of the results obtained. Investigating 24 emerging countriesusing an empirical approach with results for the average country in the sample presents significant challenges due to the diversity found among the various countries that make up the group of emerging economies. The heterogeneity among these countries makes it difficultto apply the results for a specific country.The timespan under consideration may also matter, since in a 5-years framework such as ours we are in reality capturing a short- to medium-term effect of the expansion education that mayinitially lead to higher inequality, while in the long termtheoretical predictions and forecasts (Ahmed et al (2017)) seem to suggest that an expansion of education can help reduce inequality. At the conceptual level, considering the Gini index of income distribution as oursole measure of inequality does not allows us to adequately capture inequality at different parts of the income distribution and in particular at the left tail where the poorest are located. A carefully targeted education expansion may be the most important way to increase opportunities for poor households to rise out of poverty and in this way reduce existing inequality. Empirically identifying this association demands the use of more detailed inequality measures. Finally, the econometric analysis should be expanded to address key estimation challenges regarding the endogeneity of the education and incomeinequality relationship and the persistence of education and income inequality over time.

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Appendix

Table A.1: Variables in the empirical model and respective sources

Variables	Description	Units	Source
gini	Gini index: measure of inequality in income distribution	percentage	CANA Dataset and WIID3
Edu_total	Average years of total schooling of the population aged 15 and over	years	Barro-Lee Dataset
Edu_pri	Average years of primary schooling of the population aged 15 and over	years	Barro-Lee Dataset
Edu_sec	Average years of secondary schooling of the population aged 15 and over	years	Barro-Lee Dataset
Edu_ter	Average years of tertiary education of the _er	years	Barro-Lee Dataset
GDP*pc*	Real GDP per capita: GDP per capita at constant 2011 prices in PPP	dollars	Penn World Table *9 .0*
Glob	Globalization index	percentage	KOF Dataset
GC	Public consumption as a percentage of GDP	percentage	Penn World Table *9.0*
Dem	Index of political regime	-10 (democratic) to +10 (autocratic).	CANA Dataset 2011
Valadd_ind	Added value of manufacturing industry as a percentage of GDP	percentage	WDI World Bank

Source: Own elaboration using the CANA databases, World Income Inequality Database (WIID) 3.4, Barro-Lee dataset, Penn World Table 9.0, KOF, WDI.

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Table A.2:Descriptive statistics, 24 countries, 1980-2010

	Average	Maximum	Minimum	St. deviation
Gini	44.915	74.30	16.420	11.070
Edu_total	6.5810	11.660	2.3400	1.8875
Edu_pri	4.4092	7.9200	1.5500	1.2640
Edu_sec	1.9310	4.1200	0.34000	0.78549
Edu_ter	0.24111	1.1100	0.010000	0.18487
l_GDPpc	5886.99 USD	19102.99 USD	1034.01 USD	1.82
Glob	50.753	86.364	23.274	12.322
GC	0.18479	0.53055	0.059869	0.078170
Dem	3.3750	10.000	-10.000	6.5438
valadd_ind	34.326	63.253	13.292	7.4481

Source: Own elaboration using Gretl.

Table A.3:Results with total schooling. 24 countries. 1980-2010

Explanatory variables	**Dependent variable:** $gini$					
	I (*pooled* OLS)	II (EF)	III (EA)	IV (*pooled* OLS)	V (EF)	VI (EA)
constant	−626.27*** (−5.59)	−167.87** (−2.3)	−221.74*** (−2.88)	−631.85*** (−4.68)	−337.85*** (−2.77)	−337.63*** (−3.75)
Edu_total	−0.56 (−0.85)	0.45 (0.68)	0.07 (0.10)	−0.76 (−0.28)	−4.89*** (−2.46)	−3.77** (−2.17)
Edu_total²	-	-	-	0.02 (0.07)	0.43*** (3.29)	0.31** (2.39)
logGDPpc	153.95*** (5.82)	49.35*** (2.9)	61.34*** (3.41)	155.42*** (4.70)	92.55*** (3.26)	91.2*** (4.2)
logGDPpc²	−8.66*** (−5.54)	−2.88*** (−2.88)	−3.48*** (−3.29)	−8.75*** (−4.49)	−5.37*** (−3.32)	−5.22*** (−4.11)
Glob	-0.17 (−1.62)	0.06 (0.85)	0.02 (0.22)	−0.17 (−1.59)	0.03 (0.24)	0.001 (0.02)
GC	-10.69 (−1.04)	7.79 (1.11)	4.32 (0.6)	−10.85 (−1.03)	11.71* (2.03)	6.04 (0.86)
Dem	0.56 *** (3.89)	−0.07 (−0.65)	0.05 (0.5)	0.56*** (3.88)	−0.01 (−0.08)	0.09 (0.82)
Valadd_ind	0.1 (0.96)	−0.12 (−1.47)	−0.11 (−1.32)	0.10 (0.94)	−0.14* (−1.68)	−0.12 (−1.59)
R^2 adjusted	0.38	-	-	0.38	-	-

LSDV R^2	-	0.92	-	-	0.93	-
R^2 within	-	0.16	-	-	0.27	-
AIC	878.33	679.21	925.38	880.33	665.21	932.15
BIC	900.89	766.64	947.95	905.71	755.46	957.53
HQ	887.5	714.73	934.55	890.64	701.88	942.46
Observations	124	124	124	124	124	124
Test F (p-value)	-	$2.35\ e^{-30}$	-	-	$1.85\ e^{-32}$	-
Breusch-Pagan (p-value)	-	-	$8.90\ e^{-20}$	-	-	$9.6\ e^{-20}$
Hausman (p-value)	-	-	$2.34\ e^{-05}$	-	-	$6.8\ e^{-07}$

Note: OLS pooled model - columns I and IV; Fixed effects static model - columns II and V; Static method of random effects - columns III and VI. The values between the parentheses correspond to the t statistic. ***. **. * indicate statistical significance at the level of 1%. 5% and 10%.respectively.
Source: Own elaboration using Gretl.

Table A.4: Results with primary schooling, 24 countries, 1980-2010

Explanatory variables	Dependent variable: $gini$					
	I (*pooled* OLS)	II (EF)	III (EA)	IV (*pooled* OLS)	V (EF)	VI (EA)
constant	−637.95*** (−5.72)	−168.45** (−2.31)	−229.27*** (−2.97)	−519.42*** (−3.93)	−300.87*** (−3.96)	−267.76*** (−3.21)
Edu_prim	−1.57 (−1.59)	−0.6 (−0.53)	−1.12 (−1.09)	4.37 (1.17)	−12.10*** (−3.87)	−4.93 (-1.6)
Edu_prim²	-	-	-	−0.64 (−1.64)	1.49*** (3.91)	0.46 (1.33)
logGDPpc	156.39*** (5.95)	49.77*** (2.91)	63.35*** (3.5)	125.53*** (3.9)	85.04*** (4.65)	74.13*** (3.69)
logGDPpc²	−8.78*** (−5.65)	−2.87*** (−2.87)	−3.56 (−3.35)	−6.98*** (−3.69)	−4.89*** (−4.59)	−4.19*** (−3.58)
Glob	−0.15 (−1.63)	0.12* (1.7)	0.05 (0.8)	−0.14 (−1.49)	0.07 (1.12)	0.06 (0.87)
GC	−7.58 (−0.72)	6.45 (0.93)	4.07 (0.57)	−4.13 (−0.39)	7.59 (1.18)	3.63 (0.52)
Dem	0.61*** (4.15)	−0.03 (−0.29)	0.1 (0.9)	0.59*** (4.08)	0.01 (0.09)	0.1 (0.94)
Valadd_ind	0.12 (1.14)	−0.15* (−1.82)	−0.13 (−1.6)	0.1 (0.95)	−0.10 (−1.44)	0.46 (1.33)
R^2 adjusted	0.39	-	-	0.40	-	-
LSDV R^2	-	0.92	-	-	0.93	-
R^2 within	-	0.16	-	-	0.28	-
AIC	876.42	679.46	922.34	875.54	662.44	933.33
BIC	898.98	766.88	944.91	900.92	752.69	958.71
HQ	885.58	714.97	931.51	885.85	699.1	943.64
Observations	124	124	124	124	124	124
Test F (p-value)	-	5.14 e^{-30}	-	-	3.80 e^{-32}	-
Breusch-Pagan (p-value)	-	-	1.14 e^{-19}	-	-	8.03 e^{-21}
Hausman (p-value)	-	-	1.41 e^{-05}	-	-	2.52 e^{-08}

Note: OLS pooled model - columns I and IV; Fixed effects static model - columns II and V; Static method of random effects - columns III and VI. The values between the parentheses correspond to the t statistic. ***, **, * indicate statistical significance at the level of 1%, 5% and 10%, respectively.
Source: Own elaboration using Gretl.

Table A.5: Results with secondary schooling, 24 countries, 1980-2010

Explanatory variables	Dependent variable: *gini*					
	I (*pooled* OLS)	II (EF)	III (EA)	IV (*pooled* OLS)	V (EF)	VI (EA)
constant	−618.58*** (−5.52)	−178.95** (−2.47)	−226.82*** (−2.99)	−709.34*** (−6.3)	−225.14*** (−2.68)	−293.88 (−3.39)
Edu_sec	0.01 (0.01)	2.09* (1.68)	1.64 (1.33)	−13.41*** (−2.86)	−0.98 (−0.32)	−2.93 (−0.92)
Edu_sec²	-	-	-	3.21*** (2.98)	0.66 (1.08)	1 (1.56)
logGDPpc	152.37*** (5.76)	52.41*** (3.09)	62.81*** (3.53)	177.08*** (6.58)	63.86*** (3.2)	79.50*** (3.85)
logGDPpc²	−8.57*** (−5.47)	−3.08*** (−3.08)	−3.59*** (−3.44)	−10.02*** (−6.3)	−3.74*** (−3.2)	−4.56 (−3.77)
Glob	−0.22** (−2.24)	0.02 (0.24)	−0.04 (−0.50)	−0.24** (−2.52)	0.03 (0.35)	-0.02 (−0.37)
GC	-12.38 (−1.22)	9.8 (1.4)	6.64 (0.91)	−12.05 (−1.23)	10.66 (1.51)	7.87 (1.09)
Dem	0.52*** (3.79)	−0.05 (−0.52)	0.05 (0.48)	0.56*** (4.17)	−0.03 (−0.32)	0.08 (0.75)
Valadd_ind	0.09 (0.82)	−0.11 (−1.43)	−0.09 (−1.21)	0.04 (0.38)	−0.13* (−1.68)	−0.12 (−1.56)
***R²* adiusted**	0.38	-	-	0.42	-	-
LSDV *R²*	-	0.92	-	-	0.92	-
***R²* within**	-	0.18	-	-	0.19	-
AIC	879.10	676.15	929.32	871.9	676.58	925.48
BIC	901.66	763.58	951.89	897.28	766.83	950.86
HQ	888.26	711.67	938.49	882.21	713.24	935.79
Observations	124	124	124	124	124	124
Test F (p-value)	-	5.88 e^{-31}	-	-	2.23 e^{-29}	-
Breusch-Pagan (p-value)	-	-	4.07 e^{-20}	-	-	2.57 e^{-18}
Hausman (p-value)	-	-	6.13 e^{-05}	-	-	9.31 e^{-05}

Note: OLS pooled model - columns I and IV; Fixed effects static model - columns II and V; Static method of random effects - columns III and VI. The values between the parentheses correspond to the t statistic. ***, **, * indicate statistical significance at the level of 1%, 5% and 10%, respectively.
Source: Own elaboration using Gretl.

Table A.6: Results l with tertiary education, 24 countries, 1980-2010

Explanatory variables	Dependent variable: $gini$					
	I (*pooled* OLS)	II (EF)	III (EA)	IV (*pooled* OLS)	V (EF)	VI (EA)
constant	−600.64*** (−5.36)	−175.55** (−2.4)	−223.49 (−2.92)	−607.02*** (−5.34)	−162.69** (−2.23)	−256.25*** (−3.27)
Edu_ter	5.76 (1.28)	5.96 (1.1)	3.99 (0.80)	5.13 (1.07)	17.23* (1.93)	0.55 (0.1)
Edu_ter^2	-	-	-	0.13 (0.39)	−12.7 (−1.59)	0.44* (1.65)
logGDPpc	147.82*** (5.58)	51.68*** (3.02)	62.0*** (3.46)	149.55*** (5.55)	48.81*** (2.86)	70.27*** (3.81)
logGDPpc^2	−8.29*** (−5.28)	−3.02*** (−3)	−3.53*** (−3.36)	−8.39*** (−5.25)	−2.87*** (−2.86)	−4.04 (−3.72)
Glob	−0.27*** (−3.05)	0.08 (1.25)	0.01 (0.14)	−0.28*** (−2.88)	0.06 (1.08)	−0.05 (−0.66)
GC	−11.52 (−1.14)	6.89 (1.01)	4.54 (0.64)	−11.66 (−1.15)	5.27 (0.77)	7.93 (1.1)
Dem	0.49*** (3.55)	−0.08 (−0.75)	0.03 (0.31)	0.5*** (3.55)	−0.09 (−0.88)	0.05 (0.51)
Valadd_ind	0.10 (0.97)	−0.15* (−1.96)	−0.12 (−1.52)	0.09 (0.88)	−0.15* (−1.93)	−0.11 (−1.37)
R^2 adjusted	0.39	-	-	0.38	-	-
LSDV R^2	-	0.92	-	-	0.92	-
R^2 within	-	0.17	-	-	0.19	-
AIC	877.36	678.22	926.04	879.2	676.88	930.72
BIC	899.92	765.65	948.6	904.58	767.13	956.1
HQ	886.52	713.74	935.21	889.51	713.54	941.03
Observations	124	124	124	124	124	124
Test F (p-value)	-	2.34 e^{-30}	-	-	2.45 e^{-30}	-
Breusch-Pagan (p-value)	-	-	3.74 e^{-40}	-	-	1.7 e^{-19}
Hausman (p-value)	-	-	0.02	-	-	0.0003

Note: OLS pooled model - columns I and IV; Fixed effects static model - columns II and V; Random effects model - columns III and VI. The values in parentheses correspond to the t statistic. ***, **, * indicate statistical significance at the level of 1%, 5% and 10%, respectively.
Source: Own elaboration using Gretl.

AGRICULTURE SECTOR IN KOSOVO: PRODUCTION, TRADE AND A COMPARISON WITH SEE COUNTRIES

Rineta Hoxha[1]

Abstract:The role of a highly productive agriculture sector as a catalyzer of economic development has been in the center of many studies in development economics. Moreover, its role in eradication of poverty was deemed to be relevant in many today's developed and developing countries. The role of agriculture on economic growth has mainly been explained through structural transformation: the idea that a high productive agriculture sector will release resources and create the basis for industry to emerge. There is certainly plenty of evidence that agriculture productivity growth and economic growth are correlated; however, causality is surrounded by a lot of debate especially with some of Asian countries industrializing without undergoing much of agricultural reform. Nevertheless, an era of agriculture renaissance in the theory of development and in policy-making has emerged and agriculture is regaining a lot of attention. In a fast-changing world, the growth of agriculture is not only a matter of income growth but also of food security, diversified demand, environmental sustainability, and a globalized food sector that involves trade. For Kosovo and its development, agriculture is a sector of high relevance and one that faces many challenges. As such, this paper aims to give an overview of the current situation of agriculture sector in Kosovo in comparison to other South-Eastern European countries. Moreover, it emphasizes agricultural production and trade as important factors impacting the growth of this sector. That said this overview might trigger further in-depth research in assessing Kosovo's potential to utilize agriculture for its own economic growth.

Key words: Agriculture Productivity, Trade, Kosovo vs. SEE countries

JEL Classification: O13, Q10, Q17

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1. Introduction

The role of the agriculture sector as a catalyzer for economic growth and development has been in the center of many theoretical and empirical studies in the development economics. Moreover, its role in eradication of poverty was deemed to be relevant in many today's developed and developing countries. Most of the researchers agree that there is a correlation between the increased productivity in agriculture and economic growth; however, the direction of causation is not as well evidenced. As a result, this topic is still surrounded by a vivid debate in the literature, which goes back to the 1950s. This paper discusses at least two different streams of thought from the early literature, both of which agree that agriculture plays a role in the economic growth; however, disagree fundamentally on how this role is displayed. Lewis (1954) and many other scientists regard agriculture as a sector in possession of abundant and cheap resources in disposal of industry sector, but it is the industry sector that induces the real growth (Rosenstein-Rodan, 1943; Scitovsky, 1954; Hirshman, 1958, Fei and Ranis, 1964). However, Schultz and others (e.g. Johnston and Mellor, 1961; Johnson, 1997, Mellor, 1995; Mellor, 1996), advocate for the idea of agriculture as a lever that would empower the poor, who spend most of their income in food, by enabling them to fulfill their subsistence needs. Both these streams are theories of structural transformation, which maintains that the bridge between developing and developed is crossed as a reallocation of economic activities occurs. Apart from that, there are a group of economists who, based mostly on evidence from East Asian countries, do not believe that agriculture has a role to play in the growth; according to them, growth can occur even without a developed agricultural sector, and mainly through manufacturing.

With that being said, is agriculture still relevant even in this era of a fast changing world? Many authors argue that it is, and more importantly, they point out a few channels, through which agriculture can impact development. As such, a renewed interest and comprehension on the role of agriculture in the economic development has taken place. Pingali (2010) names this renewed interest in agriculture the 'Agriculture Renaissance' and the focal point related to this concept is that operationally it implies different approaches to different levels of country's development. Further, many development-relevant international organizations have put agriculture on top of their agenda, The World Bank and Food and Agriculture Organization of the United Nations among them. According to the WB's World Development Indicators, although the trend is decreasing, the employment in the agriculture still remains high at an average of 30 percent worldwide, while the value added is around 3 percent. This is even more significant amongstlower income and low and middle-income countries where agriculture employs around 45 percent and 30 percent, respectively, and where the real agriculture value added is around 10 percent and 17 percent, respectively (2016). This data may be seen as indicators of the importance of agriculture in the world today, especially for these two groups of countries. Additionally, when it comes to channels through which agriculture impacts development in the modern world, among many stands trade of agricultural products as well. While researchers such as Anderson (2010) advocate for a liberalized trade pointing out many of the benefits that it can bring for growth and development, authors such as (Fleming & Abler, 2013) give empirical evidence from Chile where agricultural trade positively impacted its agricultural productivity.

Given the vast literature on the topic, this paper based on the arguments of many researchers, regards as relevant to offer an overview of the agriculture sector in Kosovo. To achieve that, information has been drawn from recent data available from the Kosovo Agency of Statistics, World Development Indicators of the World Bank, and the Food and Agriculture Organization of the United Nations and as such key indicators of Kosovo's agriculture are presented in comparison to other South-Eastern European Countries, and to itself in different years. The sectors of this paper are organized as follows: The first sector reviews literature since 1950s and gives an overview of the most famous theories related to agriculture's role in growth, development, and poverty reduction. The second sector discuses data in general, their source and use for the purpose of this paper. The third sector displays the data mainly organized in charts for an easier comparison of time series and countries included. Finally, the fourth section gives the concluding remarks in the tendency to summarize the findings from the data.

2. Literature Review

The quest to assess how agriculture impacts economic growth and development and, even more so, poverty reduction, was (and still is) one of the biggest quests in the literature of development economics. Many economists have contributed to this issue through theory and empirical work producing evidence from countries all over the world. As it often happens in economics, the evidence is not unanimous and as a result, in one hand, there are economists who agree fully or to an extent that the development of agriculture is a pre-condition to economic growth or poverty reduction, at least for many of the developing countries; on the other hand, there are agro-pessimists who based on evidence from some countries and their development history, doubt the crucial role of agriculture in this process. The following section presents ideas and studies of some of the lead economists of 20th and 21st century regarding agriculture and its impact on economic growth. Moreover, it tries to identify some of the challenges that are faced by agriculture today and also some areas that modern literature lists as new channels through which agriculture can impact economic growth in a fast-changing world. Finally, some works that assess the role of trade and trade openness in agricultural productivity will also be discussed.

2.1. The importance of agriculture for economic growth and poverty reduction

Probably the most typical concept that links agriculture to economic growth is the surplus of resources that agriculture possesses and the ability that this sector has to release those resources to other sectors of economy (such as industry and services) once agricultural productivity grows. In this regard, works of many well-known analyst of the 20th century, such as Rosenstein-Rodan, 1943; Lewis, 1954; Scitovsky, 1954; Hirshman, 1958, Fei and Ranis, 1961, corresponded and built to this concept. Pingali (2010) analyzing works of authors such as Johnston and Mellor, 1961; Ranis et al., 1990; Delgado et al., 1994; Timmer, 2002, came to the conclusion that the most common approach to assessing the agriculture's role in development is focused on agriculture's following nexuses: "(i) providing labor for an urbanized industrial work force; (ii) producing food for expanding populations with higher incomes; (iii) supplying

savings for investment in industry; (iv) enlarging markets for industrial output; (v) providing export earnings to pay for imported capital goods; and (vi) producing primary materials for agro-processing industries" (p.3869).

In this regard, Gollin (2010) claims that it is important to focus in agriculture and its role in economic development because according to the data available, more than half of the world's active population earn income primarily from agriculture and even more than that live in rural areas (p. 3826). Additionally, agriculture is one of the most important sectors of developing economies, comprising a relatively big share of their GDPs (Gollin, 2010, p.3826). In this regard, Gollin (2010) sees agricultural productivity as an important channel to catalyze economic growth in many developing countries (p. 3827). Agricultural productivity becomes even more relevant when considering the data showing that agriculture in most developing countries utilizes a big share of total employment; however, the share of output is small nonetheless. According to Gollin (2010) this is an indicator that the agricultural worker productivity (output/worker) remains low (p. 3834). While this author uses low productivity as an argument to advocate for the importance of agriculture in economic development, he claims that beyond productivity there are other arguments that tell why it is important to focus in agriculture, for instance, agriculture's role in providing food for the poor (p. 3835). While one could argue that a country could meet the demand for food by imports, Gollin presents data that show that the poorest countries, produce most of what they consume and as he puts it "with low productivity in agriculture, relatively few imports, and low incomes [considering that most of the income of poor people is spent on food], people in developing countries face high food costs relative to incomes" (p.3836).

While these are some of the typical ideas that link agriculture with economic growth, it would be useful to deepen this discussion by looking into some of the theories that have followed debate on economic growth, and also on agriculture's role, since Adam Smith. Since then, economists believed that economic growth had to do with structural transformation, the concept that economy transforms through movement of resources (labor, capital, etc.) from agriculture to industry and that is how it grows (Gollin, 2010, p. 3837). Certainly, while evidence shows that increase in agricultural productivity and economic growth are correlated, causation has always been a 'hot-pot' of debates. Questions about whether agricultural productivity induced Industrial Revolution or other questions that seek a decision whether to prioritize agriculture or industry through development policies and so on, have been addressed by a plethora of research and conclusions are indeed diverse. However, structural transformation has been documented by important works such as Kuznets (1966) who utilized cross-sectional and time-series data to do that (Gollin, 2010, p. 3837). Also, in their work for the World Bank titled "Patterns of Development 1950-1970", Chenery & Syrquin (1970) used cross sectional and times-series data of twenty years in order to assess the transformation of a country from a less developed to a developed economy. To do that they replaced the contrast in the level of economic development between developed and less developed countries with the concept of structural transformation and concluded that "the hypothesis that continuous structural change is related to the growth of income is better supported by statistical analysis than is the alternative hypothesis that different structural relations characterize developed and developing countries,

however defined" (p.135). This once again confirms the relevance of agricultural productivity growth as an initial point in the process of structural transformation.

Having discussed that, some of the most important theories and studies that consider economic growth, and inevitably the role of agriculture in the process, can be grouped in two separated views: the one that identifies growth with industrialization (Lewis, 1955; Rosenstein-Rodan 1943; Rostow, 1960; Fei and Ranis, 1964) and the other that sees agriculture as the main source of fulfilling the poor's subsistence need for food – a precondition to begin with the economic growth (Schultz, 1953; Johnston and Mellor, 1961; Johnson, 1997, Mellor, 1995; Mellor, 1996). Scientists who hold and advocated for the former view, saw agriculture's role in economic growth only as the provider of resources to other economic activities, specifically industry. In their view it was industry that would drive growth while agriculture was a pool of cheap labor from which industry, and also services, would absorb employers. According to Gollin (2010), in such models, there were issues related to how labor market dynamics were defined as "[i]t was assumed that wage differences could and would arise between the modern sector and the traditional sector, with some kind of efficiency wage story […] accounting for the high wages paid in the modern sector" (p.3844). In this regards, other economists, believed that with the transition, there would be more incentives for employers to work in urban settings, meaning industry, as compared to rural settings, meaning agriculture, but the assumption was that industry (the modern sector) would limit job places by increasing the wage above the equilibrium wage that would clear the market (Harris &Todaro, 1970). Thus, to summarize this idea, Lewis and others who followed this view, believed that development would happen if conditions would allow the transition of employers from a sector with low-productivity (i.e. agriculture) to a sector with high-productivity (i.e. industry). As such, this view for a long-time was used to support policies that favored industry and taxed agriculture but both the theory and such policies have largely been discredited by later theoretical work (Cervantes-Godoy & Dewbre, 2010, p.4).

Even in the early literature of development, there were many economists who hold a stand towards agriculture's role in economic development different from the one presented above. If for Lewis and other economists with similar perspective, agriculture was the sector with abundant resources to provide for the industry, for Theodor Schultz (1953) agriculture was the lever that would power economic growth, since it would provide food. Briefly, Schultz claimed that in the poorest of nations, the biggest share of income is spent on food, and as a result, these countries should be able to produce most of their food demand for two simple reasons: because imports are costly and there are no many goods that these countries can export in exchange for food imports. As such, Schultz claims that it is a precondition for these countries to fulfill their subsistence needs before being able to begin growth, and that is achieved through agriculture surplus (i.e. increased agriculture productivity) (Gollin, 2010, p. 3844). These arguments were presented in 1953, in his book titled "The Economic Organization of Agriculture"; however, another book published by the same author in 1964, titled "Transforming Traditional Agriculture" was the one with the highest merits for granting the Nobel Prize to Theodor Schultz, according to Falcon (1988, p. 199). Walter P. Falcon published a review of this book in 1988 in the Journal of Agricultural Economics where he claimed that Schultz has revolutionized the way economics thinks about one of its core themes – economic growth (p.198). Despite the many critics that Schultz received pointing out that his conclusions were more based on beliefs rather than rich data and also that case studies that he used to support his findings were hardly representative of third world countries, history showed his "basic insights to have

been correct" (Falcon, 1988, p.199). If nothing, Schultz inspired a vast research on this perspective and authors such as Johnston & Mellor (1961), Johnston (1970), Johnston &Kilby (1975), and Johnson (1997), and later Mellor 1995, Mellor, 1996; Eswaran and Kotwal, 1993; Mundlak, 2000) have built on it. For instance, in his book "Agriculture in the Road of Industrialization" (1995), John W. Mellor and other authors analyze the cases of eight developing countries in the world (i.e. Taiwan, Punjab, Philippines, Thailand, Argentina, Kenya, Costa Rica, and Colombia) and based on the data from these countries he concludes that when examining the relationship between agricultural growth and structural change and their links with development, the focus is on the "domestic aspects of development" (p.325). From this examination, Mellor (1995) concludes with four reminders, two of which show how agriculture induces the structural transformation, i.e.:

> "Employment increases arising from accelerated agricultural growth are broadly distributed throughout rural regions—that is, they are not concentrated in the capital city and the employment intensity of the firms stimulated by agricultural growth tends to be fairly high, either because of generally high employment elasticities or sufficiently high cross-elasticities of demand, and thus it is eventually able to shift consumption to employment-intensive activities for which demand is elastic" (p. 328-329).

2.2. A more pessimistic view about the role of agriculture in economic growth and development

The preceding paragraphs mostly covered literature that in a way or another agrees that agriculture has a positive role to play in the quest of economic growth. However, there is another group of scientists who doubt the role of agriculture in the economic growth or poverty reduction. Matsuyama (1992) assessed the role of agriculture in economic growth, by also considering the concept of comparative advantage. He employed a two-sector model of endogenous growth and applied that under two situations: closed economy and small open economy. In the closed economy case, (in accordance with the literature discussed above) the model predicts that "an increase in agricultural productivity releases labor to manufacturing and immediately increases output and accelerates its growth" (p. 322). However, Matsuyama's model predicted that when economy opens to trade, the relation between the growth of agriculture productivity and growth of economy is negative (p. 326). Nonetheless, in the conclusion remarks, Matsuyama claims that one should be careful when interpreting the results as the model is 'extremely special' and is based on some strong assumptions, such as absence of spillover effect between countries and also that of agricultural productivity being determined entirely exogenously (agriculture may also exhibit some learning-by-doing) (p. 330). Other authors who doubt the role of agriculture in economic growth base their arguments on the example of East Asia economies that experienced a phenomenal growth during past two decades and whose growth was not necessarily induced by a big growth in agricultural productivity. For instance, Amsden (1989) gives the example of South Korea, a country that went through industrialization without an impressive agricultural growth preceding it. However, the case of China shows different results. The Rural Reform of 1979 that took place together with market reforms, have been tremendously successful in increasing China's agricultural productivity (Xu, 1999). Today, China is the world's biggest producer of agricultural products (Lopez, He, & De Falcis, 2017). Therefore, although China's growth is mainly based in manufacture, agriculture was an important part of the process.

Additionally, Dercon (2009) suggests the possibility that the direction of causation goes from economic

growth to agricultural productivity growth and not the other way around (In Gollin, 2010, p. 3856). As a result he proposes that the agenda for development be focused in other economic activities while creating conditions for rural poverty reduction. Dercon suggests that policies that aim the improvement of health and education services will make this process easier. Similarly, Ellis and Harris (2004) propose that policies should be drafted to make the rural-to-urban migration smoothers rather than to develop agriculture. Moreover, Collier (2008) recommends that investment should be directed to commercialization of large-scale farms since small-scale farms, although primarily providers for most of the poor, do not have potential to increase productivity (p. 72).

While there is a vast theoretical and empirical literature that take different perspectives on the role of agriculture to the economic growth and development, as discussed above, according to Gollin (2010) there are historical examples that might have implications when this issue is being considered (p. 3855). Among economic historians, a lively "egg or chicken" debate is still present with regards to agriculture productivity and Industrial Revolution. Which came first? Certainly there are opposing views. On the one hand, economists such as Crafts (1985) think that was agricultural productivity growth that happened and served as a precondition for Industrial Revolution. Other scientists have followed this view by providing different arguments and examples, such as Huffman & Orazem, (2007) or Bezemer&Headey (2008) (cited in: Gollin, 2010, p. 3854). On the other hand, those who contradict this view argue that most probably other ingredients served as precondition for Industrial Revolution since there were other countries with higher agriculture productivity than Britain but still Industrial Revolution occurred in Britain (Dercon 2009; Allen, 1999; Clark, 2002).With that said, what are the implications of this historical example for the today's world? Certainly, if agricultural productivity growth did not help the occurrence of Industrial Revolution in that time, in today's more accessible world, the agricultural productivity would be even less important so the focus would rightfully be oriented towards industry, but if it was a precondition for the Revolution, then it would imply that focus should first be towards development of agriculture. Independent of their perspective, however, the economists who study this event, do not claim that agriculture was an irrelevant sector; in contrary, with its role of providing food for the cities, agriculture had a crucial impact. Also, as Gollin (2010) claims: "whether or not it came first, the agricultural revolution seems to have made a significant contribution in determining the pace of modern economic growth" (p. 3856).

2.3. Agriculture Today: Challenges it Faces and Opportunities to Contribute to Economic Growth

While the preceding sector of this paper tended to present some of the early dominant perspectives in the economics literature, sector 2.3 aims to present a brief summary of the modern research conducted on the links between agriculture, economic growth, and poverty reduction, which inevitably concerns challenges that are faced by agriculture growth in the modern world but also the channels through which agriculture can serve as a catalyzer for economic growth and poverty reduction. In his 2010 paper, Pingali claims that agriculture is gaining a lot of attention recently, something it did not have since late 1960s (p. 3868). This attention comes mainly by the policy-makers and major international organizations that deal with development and who apparently see agriculture as a means to this end. Pingali (2010) named this renewed attention about agriculture "The Agriculture Renaissance" and as he claims "[it] means the renewed understanding and recommitment to the fundamental role of agriculture in the development process" (p. 3869). The focal point related to this concept is that operationally it implies different

approaches to different levels of country's development: "for the least developed countries of the world, it could mean re-engaging agriculture's potential as a driver of overall economic development. While for the emerging economies, it could imply policies and strategies that help sustain past productivity gains and focuses efforts on addressing the needs of marginal regions and populations left behind" (p. 3869). The reasons why this agricultural renaissance is emerging are mainly related to the fact that the world is changing fast and the technological change that is inducing it, is also impacting the transformation of agriculture from a traditional one to a more industrialized one; a transformation already observed in many developing economies but not necessarily in the least developed ones where the performance of agriculture is still slow (Pingali, 2010, p. 3872-73). On the one hand, the issues that are holding agriculture back in these countries are mainly related to the low demand because of the poor market conditions and low population density; to the absence of adequate rural development policies; to the absence of Research & Development processes that are relevant to the needs of the poor; to the institutional barriers that would induce the growth of productivity and finally to the "high share of agro-climatically[4] constrained land resources" (p. 3873). On the other hand, the factors that are driving the structural change of agriculture in developing world are fast income growth, globalization, and trade liberalization, accessible technology development and the risks sourcing from the climate change (p. 3873).

Certainly, the factors that are driving structural change in agriculture have different implications for different countries, based on their stage of development. Agriculture transformation is a process and not a prompt event and as such different countries still find themselves in different stages of this transformation. Naturally, the above-mentioned factors do not impact all these countries on the same manner. According to Pingali (2010), economies of countries that are at the low-end level of this transformation process, (e.g. countries in the Sub-Saharan Africa), are based mainly on agriculture. In these countries, there is a high share of population whose primary activity is agriculture; they produce only a small proportion of world's GDP; and poverty prevalence is about a third of the total population (World Bank and FAO data). However the economic indicators, the development prospects for these countries may not be as negative. With respect to demand there are favorable developments extended beyond domestic markets and to the regional ones. More specifically, with the increase of income and population, the projection is that the demand will double by 2020. Other than that, there are positive trends prevailing with regards to trade with sub-regional markets and also government policies are changing into producing a more favorable environment for productivity growth (Pingali, 2010, p. 3878).

Emerging economies are the second group in the process of transformation of the agriculture and they have managed to utilize this sector as a catalyzer for economic growth. Typically, the share of agriculture sector in these countries ranges from 10 to 30 percent while the agriculture labor force accounts for 15 to 50 percent of the total labor force (McCullough et al., 2008). They are in the process of modernizing agriculture and as a result, the share of agriculture is getting smaller in while growth 'responsibility' is transferring to other sectors of the economy (Pingali, 2010, p. 3879). Asian and Latin American countries

[4]Here it means: designating geographical areas defined by their climatic and agricultural characteristics (Oxford Dictionary).

are considered as part of this group and in most of these countries agriculture productivity growth will most likely occur through improvement of competitiveness, enhancement of productivity even in the most isolated parts of the country, continuation of productivity growth in small farms etc., which are also the challenges that remain to be addressed by this group of countries. Finally, the developed countries comprise the group at the end of this transformation process. The U.S.A., EU, Australia, South Korea, Japan, etc. are some of the countries listed in this group. Typically agriculture accounts for 10 percent or less of the total economy and 15 or less is the share of labor force engaged in this activity. The challenges for these countries where agriculture is well-commercialized are the following: they have to work on the trade-offs between liberalizing trade with developing countries for the products on which the latter have comparative advantage, while working to develop further their own rural areas; also they have to commit in preserving rural and landscape areas by producing policies that enable environmental services (Pingali, 2010, p. 3883).

The division of the world based on the agriculture stage of transformation of Pingali (2010) coincides to the division that The World Bank, (2008) presents in its World Development Report. Moreover, the WB claims that because of this division and of distinguished characteristics of these countries, there cannot be a "one-size-fits-all" agenda for development through agriculture. Such agenda should be compiled to fit the context of the specific country (p. 1). Additionally, the WB suggests that more developing countries could benefit form the implementation of domestic policies that favor agriculture as it has happened with many other countries that have utilized agriculture to grow their economy and to reduce poverty. According to the same report, agriculture has features that could beneficially be utilized by these governments to make this sector an adequate instrument for development. (p. 2). As such an instrument, agriculture contributes to the economy in many ways:

As an economic activity – i.e. induce growth, provide investment prospects for private sector, and serve as basis for development of agricultural industries

As a livelihood – i.e. for the majority of world's rural population agriculture is a way of life and as such is the biggest contributor for alleviation of poverty in those areas.

As a provider of environmental services: i.e. being the largest user of many natural resources. Agriculture can impact the environment both positively and negatively (p. 4).

As such, considering the aforementioned ways in which agriculture can contribute to the development, there are a number of channels or instruments through which this potential can be better utilized: make access to land, water resources, education, and health easier for rural populations and also help small farms increase their productivity and become sustainable. The latter could be achieved by improving price incentive, enhancing public investment, regulating input and output markets for better functionality, and improving access to finances, supporting research and innovation, and making agriculture sustainable and a platform of environmental services (The World Bank, 2008, p. 8-15).

As a summary of this sub-sector, agriculture still remains a strong instrument for growth, development, and especially poverty reduction. According to some authors and relevant international organizations, albeit the different agriculture-related challenges that countries face depending on their transformation stage, there are positive prospects that source in the agriculture potential to serve as an adequate

instrument for inducement of economic growth in these economies. The key is to discovering a policy that fits the context of a specific country.

2.4. Trade and Agricultural Productivity Growth

Increased level of trade in agricultural products, specifically of exports, is one of the factors that many agree would positively impact the growth of agricultural productivity. In general, the impact of trade liberalization is an important topic heavily discussed in the literature, and as often happens in such debates, there are different perspectives with regards to its impact. One of the perspectives holds that the trade openness is positively related to the growth of productivity in different sectors and it helps improve the performance of economy; another perspective is mainly concerned with how trade liberalization would impact locals, their development, and equity (Estrades& Terra, 2012). In particular, outcomes of trade openness have been studied for specific sectors, such as agriculture. Analysis of aggregate national productivity data of researchers such as Coe et al. (1997), Edwards (1998) and Badinger (2007) have found that countries with higher level of trade openness, i.e. less trade barriers, experienced a faster growth in productivity. Also, analysis of firm-level data conducted by researchers such as Hay (2001), Ferreira & Rossi (2003), Amiti&Konings (2007), also showed that trade liberalization positively impacts productivity. The reasons that the theory mentionsfor this positive impact are mainly the following: intensive trade is commonly accompanied by international spillovers, especially in Research & Development and innovation and as a result better practices in agriculture are employed; international trade also means a large competition and this may pressure farmers to increase productivity; trade may induce specialization in products where countries have comparative advantage and specialization often leads to higher productivity; finally, trade may increase demand for certain products which require intensification of production and as such learning-by-doing may result (Fleming & Abler, 2013, p. 11).

Aside from that, there are other researchers who do not find clear links between trade openness and productivity growth, for instance Krishna &Mitra, (1998); Matsuyama (1992), Winters et al. (2004). One of the concerns is that trade openness may induce more competition and following that some domestic firms may increase productivity; however, this may also cause the exit of some less competitive domestic firms. Other than that, trade openness may affect domestic Research & Development and innovation as domestic firms may rely more on international R&D after openness. Nevertheless, with regards to the first concern, while that might be more relevant for manufacturing exports, for which transportation costs are usually higher and only bearable by large firms; the case is different for agricultural exports where transportation is usually carried on by large, multinational firms, which are specialized in transportation and usually cover these costs by entering in contracts with a large number of farms (Fleming & Abler, 2013, p.12). Moreover, farms often join in cooperatives for input supply and international trade, and this helps surpass the burden of transportation costs as well.

With respect to positive links between trade openness and productivity growth, there are many empirical works that build on that perspective. For instance, the OLS etimation of the farm-level dataabout Chilean agriculture of Fleming & Abler (2013), showed a positive and statictically significant trade exposure index. Specifically, the coeffcient of this index showed that a 1 percent increase in the farm-level trade

openness, would results in a 0.5 percent increase in the crop yields, or ceteris paribus, if this index would increase for 0 to 1, that would result in a 20 percent increase in crop yields (p. 15-16). Also, assessing the role of trade in agriculture in the United States, Gopinath and Kennedy (2000) found a similar relationship. Finally, Anderson & Winters (2006) used large international agriculture and trade data to build CGE models which showed that African agriculture and food exports would increase by 38 percent and imports would increase by 29 percent if multilateral trade reforms would be implemented. With unilateral reforms these variables would not significantly change (p. 61). To summarize, many agree that trade liberalization will expand the set of opportunites for farmers, such as specialization, learning-by-doing, R&D spillovers, and so on, which may induce the productivity growth. However, there are risks such as competiton that may harm small-farmers, price instability or R&D reducement. Due to these risks, Sarris, (2001) argues that trade oppenes should be matched by domestic policies that ensure that positive aspects of trade openness prevail (p. 31).

3. Data

This paper uses the most recent published data by The World Bank, specifically World Development Indicators (WB-WDI), The Food and Agriculture Organization of the United Nations (FAO), and Kosovo's Agency of Statistics (KAS). The latter has conducted a census in Agriculture in 2014 and every year since 2004 it conducts the Agriculture Survey on a sample of about 7000 respondents; as such, there is relatively sufficient information on the key factors of agriculture sector in Kosovo. The FAO, in its Statistical Yearbook, publishes data on the main agricultural factors for the majority of countries in the world, among them all the South-Eastern European countries (SEE countries) except Kosovo; however, the most recent data available by this organization are those collected in 2014. Finally, the World Bank publishes annual data on all countries of interest for this paper and on various variables; as such, data for macroeconomic variables for all countries in the study such as annual GDP, annual GDP growth, population growth and alike are drawn from this organization covering a time span of six years. All the data used for the comparison analysis are aggregated data for respective years and not farm-level data. Although micro-data could provide deeper insight on the current situation of farms in Kosovo as compared to other countries and to itself in different time periods, aggregated data will enable us to build an approximate perception on the overall performance of Kosovo's agriculture sector.

To facilitate readability, data used for this study are displayed in charts, interpreted separately and discussed in details in the following section. This section is divided in three main sub-sections: the first one mainly displays comparison data for Kosovo and selected countries, i.e. Albania, Bosnia & Herzegovina, Croatia, Montenegro, Serbia and Former Yugoslav Republic of Macedonia. These countries were selected as a benchmark for this study due to geographical proximity with Kosovo, which many times can become a factor in determining productivity in one country as a result of conditions created in inputs and outputs market, as such as in international trade market. This comparison is done through key indicators such as real GDP annual growth, poverty rates, GDP per capita, population growth, agriculture employment, surface area and its structural division, and finally the output and yields for the main agriculture products such as cereals, vegetables, fruits, and also the number of livestock. The second sub-

section provides a more detailed overview of agriculture sector in Kosovo, comparing different variables for different time periods. This includes data on output and yields for all the main cultures, main inputs used in production, and developments on agricultural labor force and farms. More importantly, this sub-sector presents a comparison betweenthe real Total Agriculture Product Value (TAPV) and real GDP for Kosovo, from 2009-2016, in absence of a more adequate measure of agricultural productivity to be compared to the GDP. Finally, the last sub-sector presents data on agricultural exports and imports, and another relationship between annual total trade and GDP is explored. To sum up, the following sector has been structured having in mind the structure of the literature that addresses the issue of agriculture as a channel for growth, as such it attempts to correlate variables for which literature suggests a positive correlation, namely between TAPV (as a proxy for productivity) and GDP (as an indicator of economic growth) and also TAPV and agricultural trade.

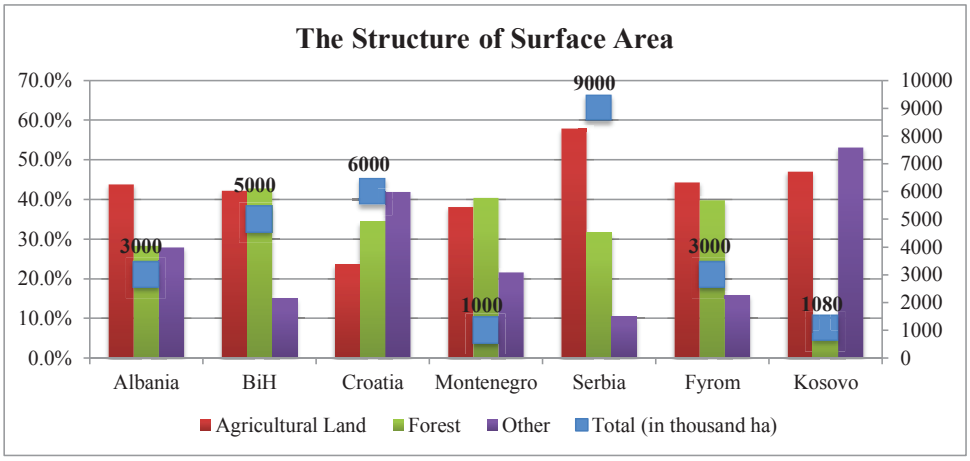
4. Kosovo's Agriculture – A story told through data

4.1. A comparison of Agriculture Sector between SEE countries and Kosovo

4.1.1 Key Indicators

The structure of land is an important indicator about the potential of a country to develop agriculture as an economic activity. Figure 1 below shows the structure of surface area for Kosovo and other SEE countries. The right axis of this chart displays a total surface area scale expressed in thousand hectares; while in the plot area this variable is represented by the respective blue square for each of the countries. In this respect, Serbia has the largest surface area of about 9 million hectares, followed by Croatia and BiH; while Kosovo has the second smallest one with a little more than 1 million hectares. The share of agricultural land, forest, and other type of lands on total surface is read on the left axis of the chart displayed on percentage scale. Kosovo has the second largest share of agricultural land (47 percent), after Serbia, while Croatia's agricultural land has the smallest share. In contrary, Kosovo's forests only make-up for about 6 percent of the total surface, the smallest share in all seven SEE countries in the study.

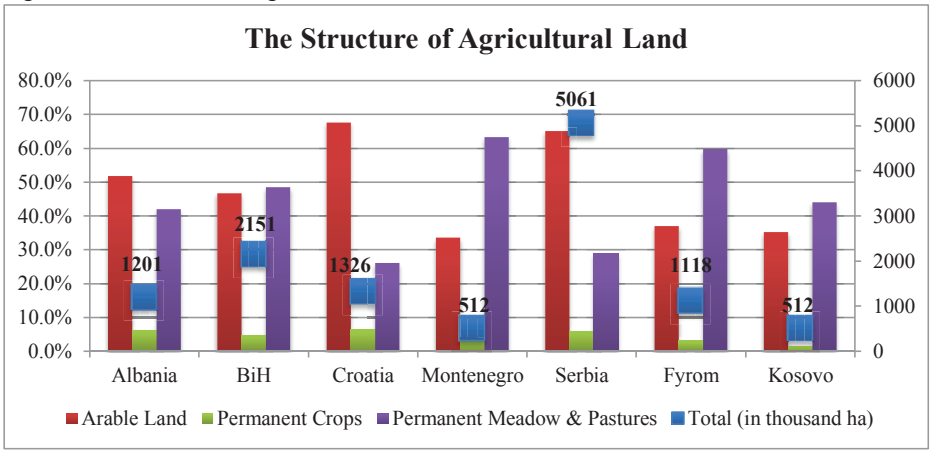
Figure 1: The Structure of Surface Area of Kosovo and other SEE countries



Source: Food and Agriculture Organization (2014); Kosovo Agency of Statistics (2014)

While the above chart showed the structure of the total surface area, the next chart concerns only the structure of agricultural land of all the seven countries. When speaking about agriculture, it is interesting to see what is the structure of that specific share of surface where agriculture is conducted. Similarly to the first chart, the total agricultural area (in thousand hectares) can be read from the right axis and is indicated with the blue squares. While in terms of percentage, Kosovo has the second highest share of agriculture land, in terms of total agriculture land, Kosovo is in the end of the list along Montenegro with only 512 thousand hectares. The one with the largest agricultural land is Serbia with a total of 5 million hectares. In Kosovo, from the total agricultural land, about 44 percent are permanent meadows and pastures, 35.2 percent is arable land and 1.5 percent is permanent crops land. Except for Serbia, Croatia, and Albania, all other countries have a higher share of permanent meadows and pastures compared to arable land, while permanent crops have the lowest share of agricultural land in all of the countries. The shares are read from the left axis.

Figure 2: The Structure of Agricultural Land of Kosovo and other SEE countries

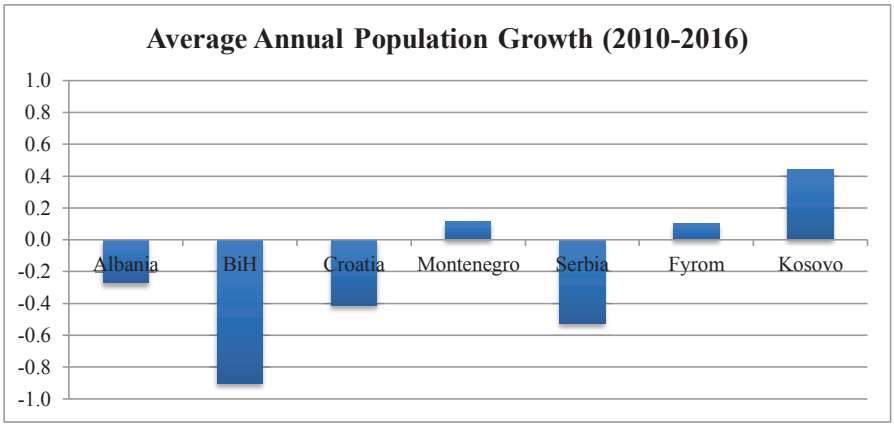


Source: Food and Agriculture Organization (2014); Kosovo Agency of Statistics (2014)

Despite land, it is relevant for an agriculture sector to analyze the structure of population, employment as a share of labor force, and even more so, the agriculture employment as a share of total employment. There is a consensus in literature that as agriculture productivity increases, the share of employment in agriculture shrinks because with the employment of new methods and capital, each worker can become more productive (Lewis, 1955; Rosenstein-Rodan 1943; Rostow, 1960; Fei and Ranis, 1964; Schultz, 1953; Johnston and Mellor, 1961; Johnson, 1997). Figure 3 below exhibits average annual population growth for the period 2010-2016[5]. As expected Kosovo has the highest average growth rate of population at about 0.4 percent, followed by Macedonia and Montenegro, while BiH, Serbia, Croatia, and Albania had negative annual population growth rates, on average. As discussed in the literature review, population growth may be an important factor for the agricultural productivity, as it indicates the potential of future demand (Dias Avila, Romano, & Garagorry, 2010, p. 3719)

[5] A simple average was calculated using the annual population growth from 2010-2016

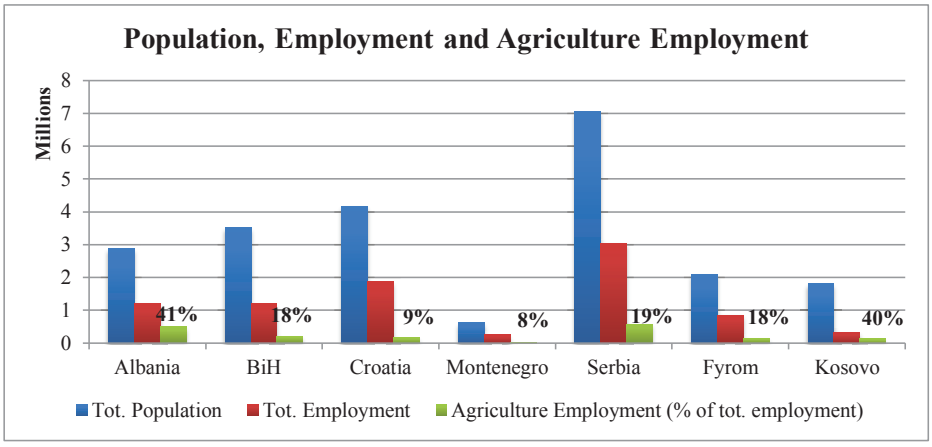
Figure 3: Average annual population growth for Kosovo and other SEE countries



Source: World Bank (2016)

Contrary to the negative annual growth, Serbia has the largest population with around 7 million people, followed by Croatia with more than 4 million and BiH with more than 3 million. Kosovo has the second lowest total population with little less than 2 million, followed only by Montenegro with around 600 thousand people. In all of the countries, the total employment is a little below 50 percent of the total population, except for Kosovo where according to the KAS labor survey, only about 18 percent of the population are employed. To clarify, this is a comparison to population and not the labor force; nonetheless, the employment share in the labor force of Kosovo is not high either. More importantly, when it comes to the share of agricultural employment in the total employment, the chart shows that Albania and Kosovo have the highest share with about 41 percent. Calculations about Kosovo's agriculture employment should be taken with caution since there is not an agreement between different sources. The current percentage was calculated combining data from the KAS labor survey of 2014 and Agriculture Census 2014 (only the number of agriculture holders and regular employees) since every other source that had data on this variable, displayed a very low percentage of this share, which was not consistent with the agriculture census where the number of people engaged in agriculture, in one form or another, was around 300 thousand (KAS, 2014). Additionally, a country report of the World Bank for Kosovo published in 2016, stated that about 20 percent of the employed are engaged in agriculture. Whichever the true number, the share is as high as to not be neglected.

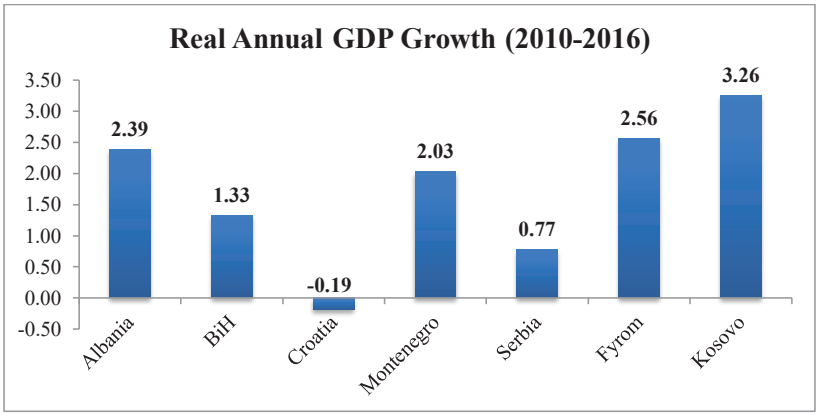
Figure 4: Population, Employment, and Agriculture Employment in Kosovo and other SEE countries



Source: World Bank (2014), KAS agriculture census (2014), KAS labor survey (2014)

The three following charts show data on the main economic indicators for these countries as compared to one another. Figure 5 shows the average real annual GDP growth rate of these countries for the 2010-2016 period. On average for the past six years, Kosovo has experienced the highest GDP growth rate followed by Macedonia and Albania. Croatia's economic growth on the other hand has been negative for the same period, on average. When talking about the economic growth, real GDP is the main indicator, nevertheless, this comparison does not show the whole picture of development of the individual country or the different levels of development that these countries have.

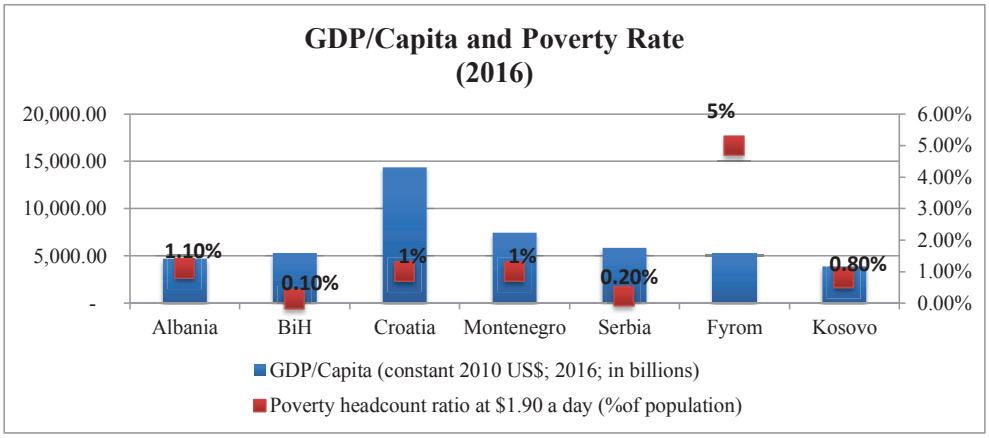
Figure 5: Average real annual GDP growth (2010-2016), for Kosovo and SEE countries



Source: World Bank (2016)

An interesting comparison is the one presented below. Figure 6 compares real GDP per capita to poverty rates prevailing in SEE countries in 2016. The percentage scale on the right side axis enables reading of the poverty headcount ratio of these countries (percentage of population living below $1.90 a day); while the monetary scale on the left axis enables the reading of GDP per capita in U.S. dollars. Contrary from what one could expect, Kosovo although with the lowest GDP per capita, does not have the highest poverty headcount ratio. This ratio is even lower than the one of Croatia, which has the highest GDP per capita in all SEE countries. The case of Kosovo, specifically its lower poverty ratio, can be explained on the basis of different factors, one of them being the high level of remittances it receives each year, or the social assistance that provides a little bit more than 2 EUR per day for those in need. Nevertheless, this may be subject for another study.

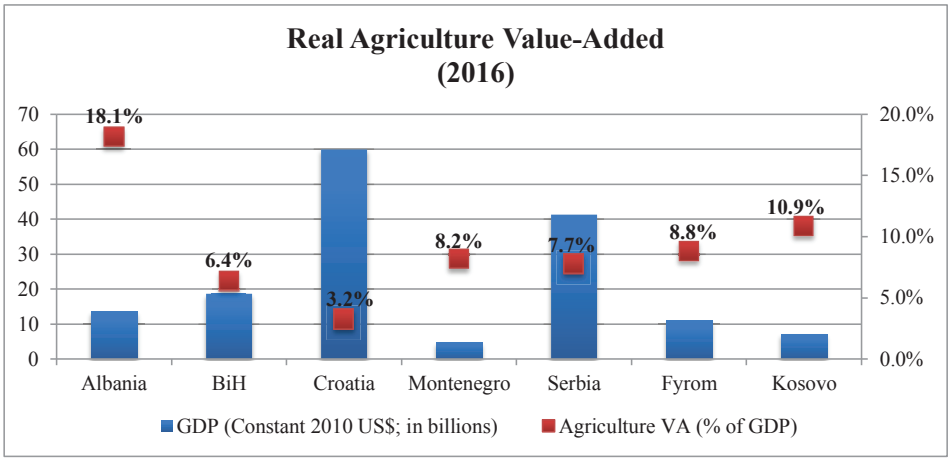
Figure 6: GDP per capita and poverty rates for Kosovo and other SEE countries



Source: The World Bank (2016)

Finally, the chart below shows the importance of agriculture as an economic activity in these countries. The data are displayed in real terms and were calculated by the author as such they may differ from the data on this variable published by the World Bank or KAS. Nevertheless, these data show that the share of agriculture in the economy in all these countries is not trivial. Agriculture value added as percentage of total GDP is read in the right axis, while values for the total GDP are read in the left axis. In Kosovo, agriculture is second only to wholesale and retail trade and comprises more than 10 percent of the whole economy. The highest real agriculture value added is that of Albania with 18.1 percent followed by Kosovo and Macedonia (8.8.%).

Figure 7: Real Agriculture Value-Added for Kosovo and other SEE countries

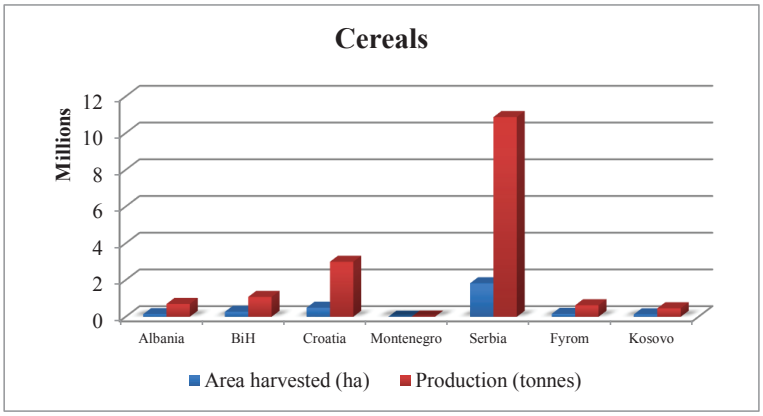


Source: The World Bank (2016)

4.1.2. Production of the main agricultural crops

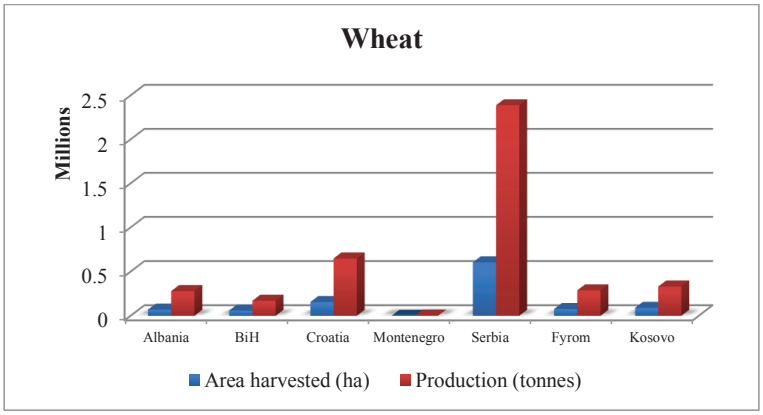
The following charts reveal the production differences between the seven countries in the study with regards to the main agricultural groups, i.e. cereals, with a focus on wheat, vegetables, fruits, and livestock. Also, differences in the yields (t/ha) will be discussed in more details. Figures 8 and 9 below show the production of cereals and wheat in tonnes, as compared to the area harvested by these two cultures. Serbia is the dominant country in the production of cereals in general, and also of wheat in particular, followed by Croatia. Kosovo follows these two countries with regards to production of wheat; but in the production of cereals, Kosovo falls behind BiH, Albania, and Macedonia as well. Nevertheless, these data do not reveal much information about the agricultural productivity of these countries itself, as they show only the total output.

Figure 8: Production of Cereals and Area Harvested in Kosovo and other SEE countries



Source: FAO (2014); KAS (2014)

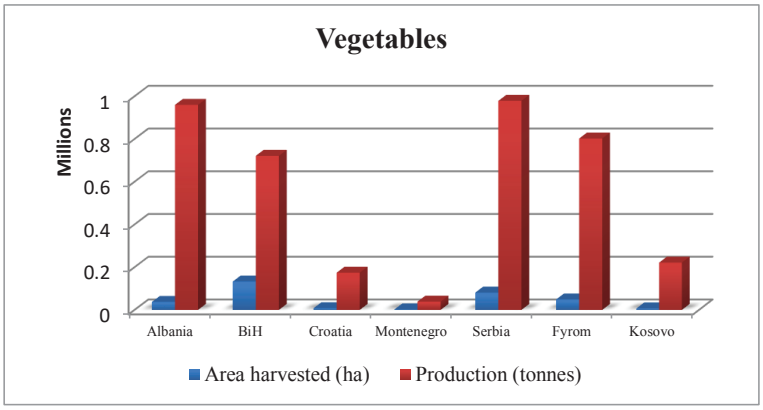
Figure 9: Production of Wheat and Area Harvested in Kosovo and other SEE countries



Source: FAO (2014); KAS (2014)

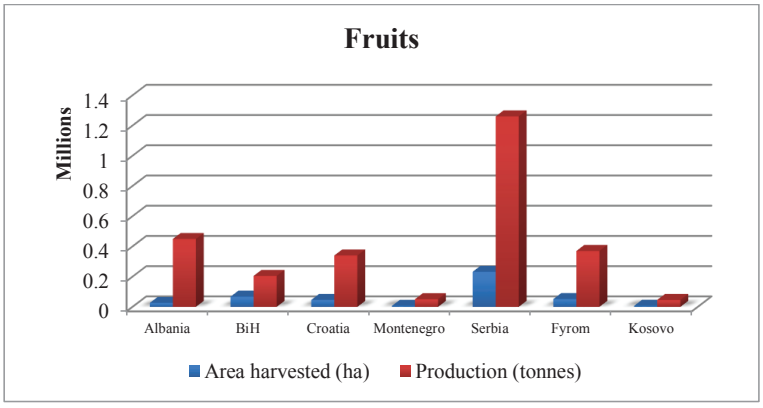
In the total production of vegetables, Kosovo stands in a better position than Croatia and Montenegro, but falls behind all other countries, out of which Serbia and then Albania produce the biggest amount. The case of fruit output is similar. Serbia produces the highest amount of total fruits and there is a larger gap between its amount and Albania's, which is the second biggest producer. Kosovo's total output of fruits is the lowest of all the SEE countries.

Figure 10: Production of Vegetables and Area Harvested in Kosovo and other SEE countries



Source: FAO (2014); KAS (2014)

Figure 11: Production of Cereals and Area Harvested in Kosovo and other SEE countries

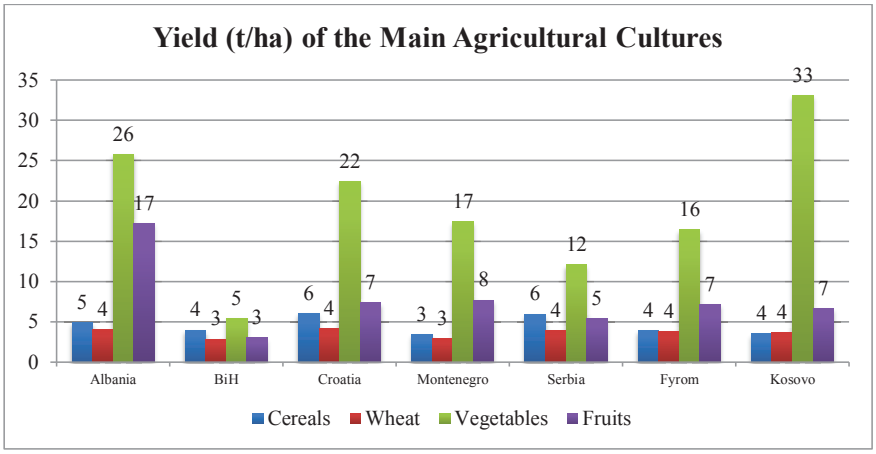


Source: FAO (2014); KAS (2014)

In absence of a more precise measure, yields of the main agricultural products could be used as a proxy indicator for the efficiency of production in relation to only one resource – land. The total output that a country can harvest for a specific group of products may depend on the area available for harvesting, the number of population, etc., and as such it is not an accurate indicator of productivity. As seen from above charts, Kosovo is commonly in the end or close to the end of the list when total production in different groups of products is compared. However, the graph below shows another side to this. As seen, Kosovo is more efficient in production of vegetables. Farmers in Kosovo yield about 33 tonnes per hectare, while in Albania they only yield about 26. Interestingly, Serbia, the one who had the largest total production, only yields 12 tonnes per hectare. In production of fruits, Albania yields about 17 tonnes per hectare

followed by Montenegro with 8 tonnes and Kosovo, Macedonia, and Croatia with 7 tonnes. BiH has the lowest yields of fruits, with only 3 tonnes per hectare. The yields of wheat and cereals do not differ significantly from one country to another.

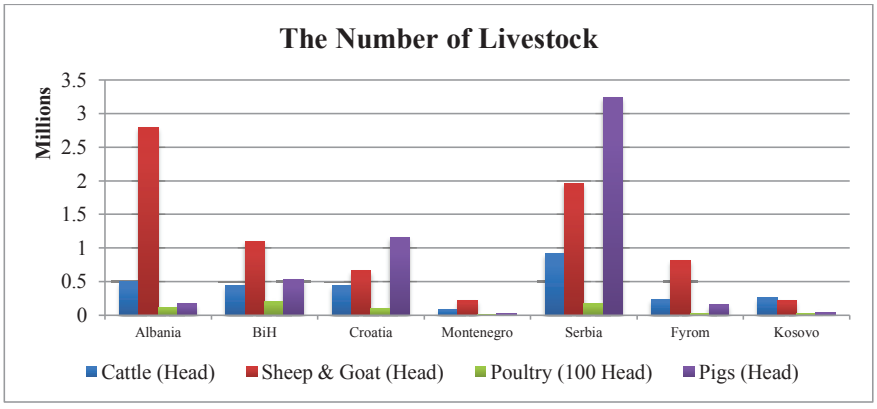
Figure 12: Yield of the Main Cultures in Kosovo and other SEE Countries



Source: FAO (2014); KAS (2014)

Finally, the following chart shows the number of four types of livestock cultivated in each of the countries, i.e. cattle, sheep & goat, poultry, and pigs. Albania possesses the highest number of sheep & goat, followed by Serbia, which is the biggest cultivator of pigs and cattle. BiH on the other hand, is the biggest cultivator of poultry. Kosovo cultivates more poultry and cattle compared to Macedonia and Montenegro, and is second from the last in sheep & goat, and pigs.

Figure 12: The Number of Livestock in Kosovo and other SEE countries



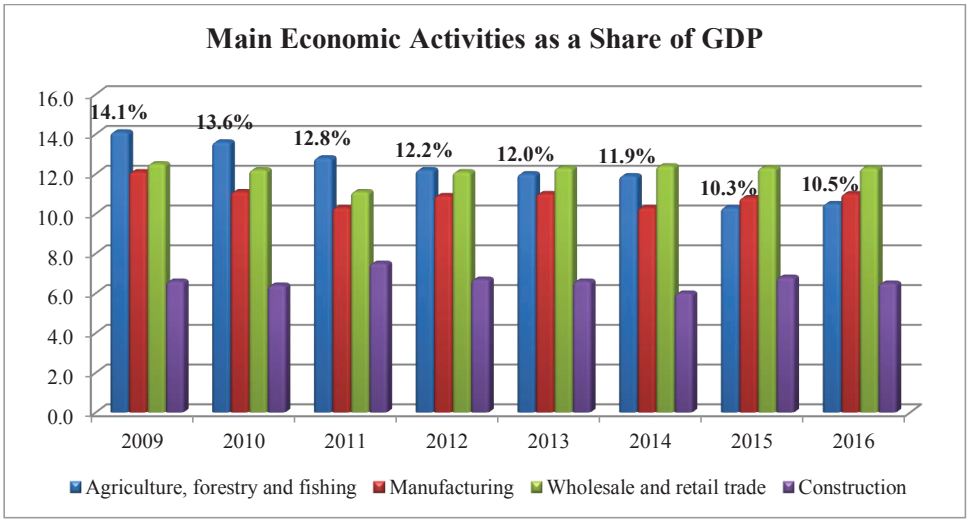
Source: FAO (2014); KAS (2014)

4.2. Kosovo's agriculture: an overview of the time period 2009 – 2016

Additionally to the comparison analysis in the preceding sub-section it is important to overview some economic aspects that characterize Kosovo's agricultural sector and how these characteristics have changed during a certain time period. As such, the following sub-sector will display data on the real contribution that agriculture has had in country's GDP, its gross added value, intermediate consumption and inputs used in production, farm size and agro-businesses, and also total output and yields of the most important products. Finally, as a simpler and partial measure of productivity, it uses the realTotal Agriculture Product Value (TAPV) and compares it with thereal GDP of the country to see the similarity between the trends that these two variables have followed from 2009 to 2016.

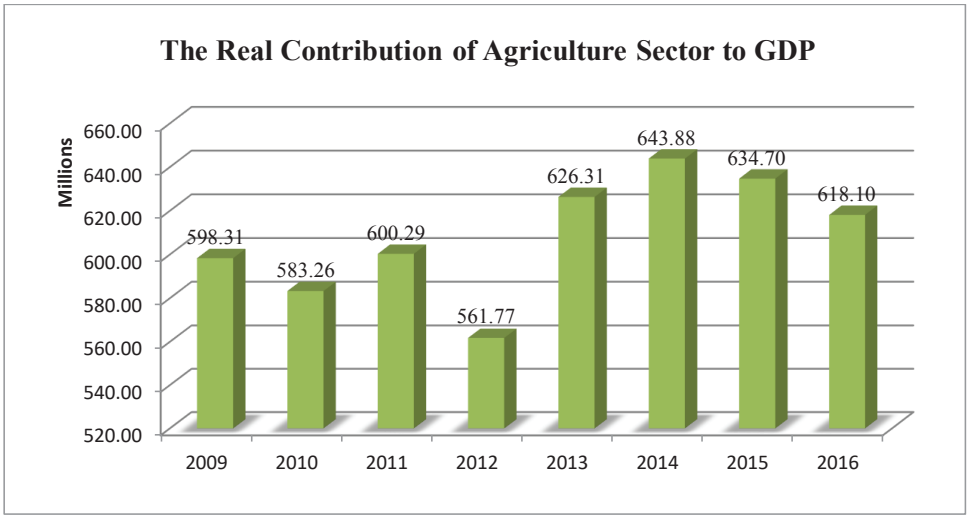
The following picture shows the participation of four major economic activities in the real GDP of Kosovo. It is noticeable that until 2012 agriculture maintained the biggest share of real GDP ranging between 14 percent and 12 percent. However, since then it has started to lose importance first to wholesale and retail trade and then to manufacturing as well. According to data available for 2016, agriculture is the third most important economic activity after trade and manufacturing, however, the difference between the three is rather small. Figure 14, then presents agriculture's real contribution in GDP in absolute values for the same time period. The contribution has been volatile during these years, characterized by a deeper drop in 2012 and a sharp rise immediately the following year; however, it has experienced an overall increase since 2009. Currently, agriculture's contribution is declining which coincides with its lower share of GDP as compared to other economic activities.

Figure 13: Main Economic Activities as a Share of Real GDP (2009 – 2016)



Source: Kosovo Agency of Statistics

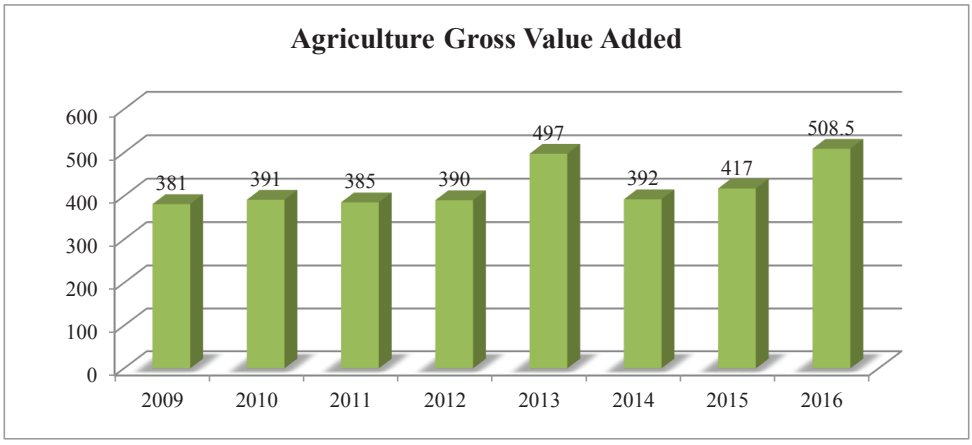
Figure 14: The Real Contribution of Agriculture Sector to Kosovo's GDP (2009-2016)



Source: Kosovo Agency of Statistics

Figure 15 shows trends in agriculture Gross Value Added (GVA) in Kosovo since 2009. This is the difference between Total Production of Agriculture Industry and Total Intermediate Consumption of Agriculture. Total Production of Agriculture Industry in return is the sum between Total Agricultural Production and non-Agricultural Secondary Activities; the former being the biggest part of it (about 98 percent). With that said, this variable could be considered as an indicator for the efficiency of agriculture sector in Kosovo. As shown, the agriculture's GVA has experienced a drop in 2014; however, its overall trend is increasing and in 2016 it has reached a value of more than 508 million EUR.

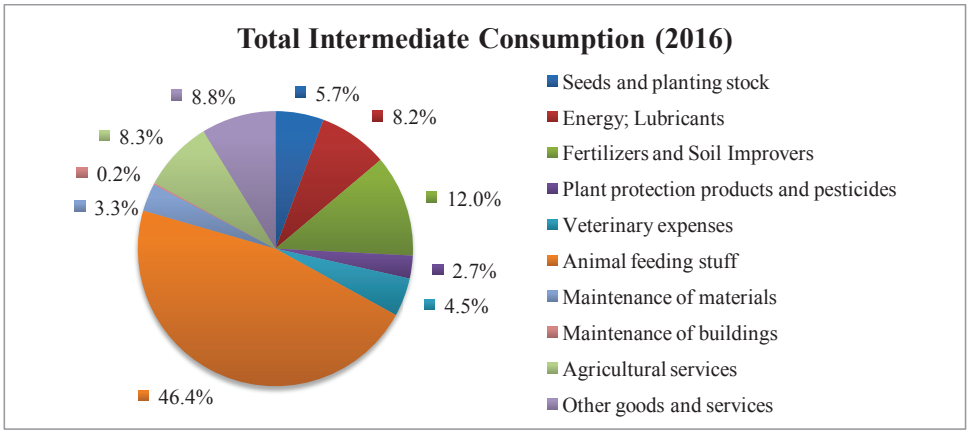
Figure 15: Kosovo's Agriculture Gross Value Added (2009 – 2016)



Source: Kosovo Agency of Statistics

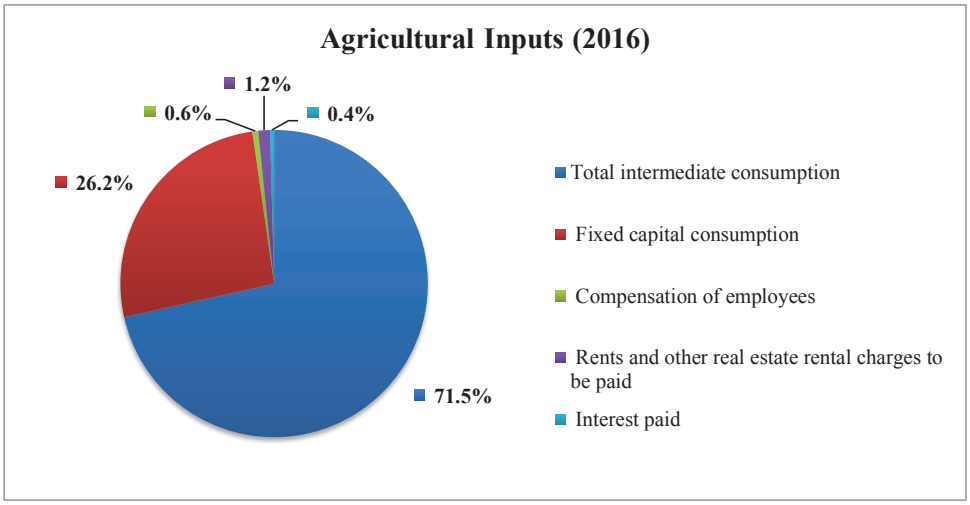
Related to the above figure, the following two graphs display the structure of Total Intermediate Consumption and Inputs of Kosovo's agriculture in 2016. The biggest share of Total Intermediate Consumption goes to animal feeding stuff (46.6 percent); while the remaining is attributed to fertilizers and soil improvers (12 percent); agricultural services (8.3 percent); Energy and Lubricants (8.2 percent); and so on. As seen in Figure 17, the biggest share of agricultural Inputs is acquired by Total Intermediate Consumption (71.5 percent), followed by Fixed Capital Consumption (26.2 percent). Subtracting these two from the Total Production of Agriculture Industry, we get the Net Value Added of Agriculture, which for 2016 was 410.4 million EUR.

Figure 16: The Structure of Total Intermediate Consumption in Kosovo's Agriculture (2016)



Source: Kosovo Agency of Statistics

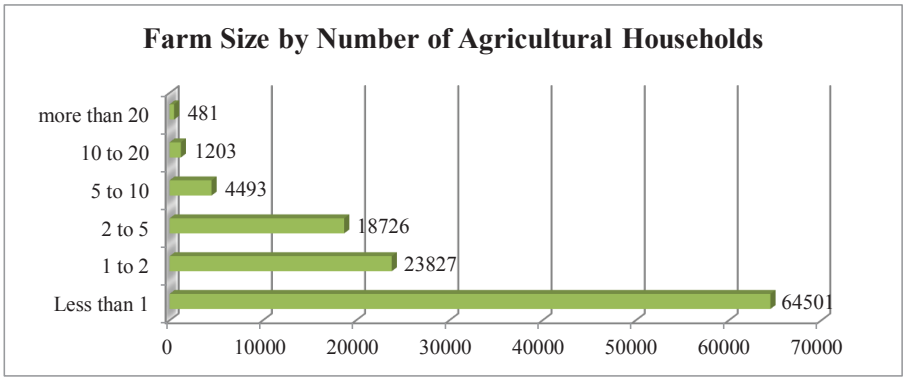
Figure 17: The Structure of Agricultural Inputs in Kosovo (2016)



Source: Kosovo Agency of Statistics

Further in this sub-sector, data on farm size and agribusiness are considered in order to provide a better picture of the overall structure of agriculture sector in Kosovo. Figure 18 shows the number of agricultural households grouped according to farm size as reported in Kosovo's Agriculture Census of 2014. There are more than 113 thousand agricultural household registered by the Kosovo's Agency of Statistics in 2014 and the majority of them, more precisely 64,501, possess a farm smaller than 1 hectare, while only 481 households possess a farm bigger that 20 hectares. This indicates that farms in Kosovo are mostly small, and that the arable land is quite segregated. Moreover, it means that the average farm size cultivated by an agricultural household is 1.6 hectare and that is 8 times smaller than the average of EU countries; however, this average is not much different from the neighboring countries (MAFRD, 2016).

Figure 18: The Number of Agricultural Households grouped by Farm Size (2014)

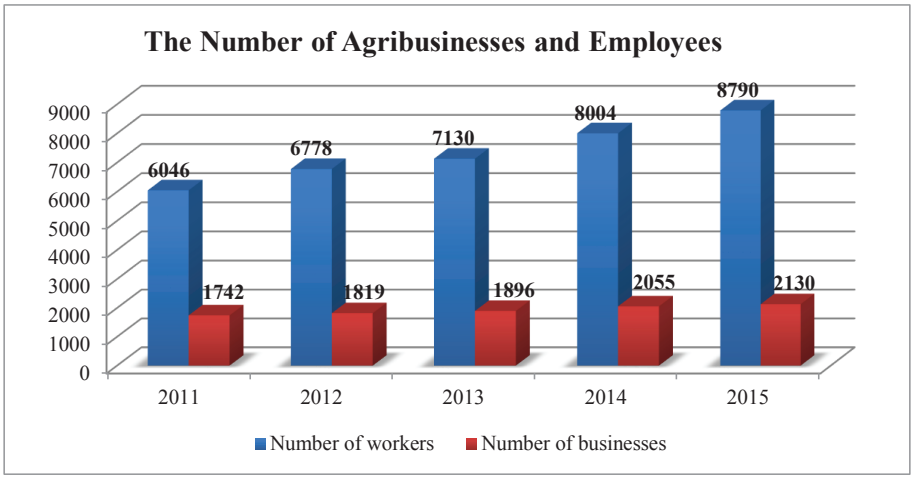


Source: Kosovo Agency of Statistics, Green Report of MAFRD (2016)

In this regard, it is interesting to see the trend in the number of active businesses that are officially registered as agribusinesses in Kosovo. Figure 19 shows that the number of businesses but also that of the employed in agriculture has increased in the time period 2009-2015. In 2015 this number is 8790 for businesses and 2130 for employees. This may serve as an indicator that agriculture is becoming an attractive sector to run businesses, which might be induced by subsidies or other policies that have aimed development of this sector; however, that is subject for another study.

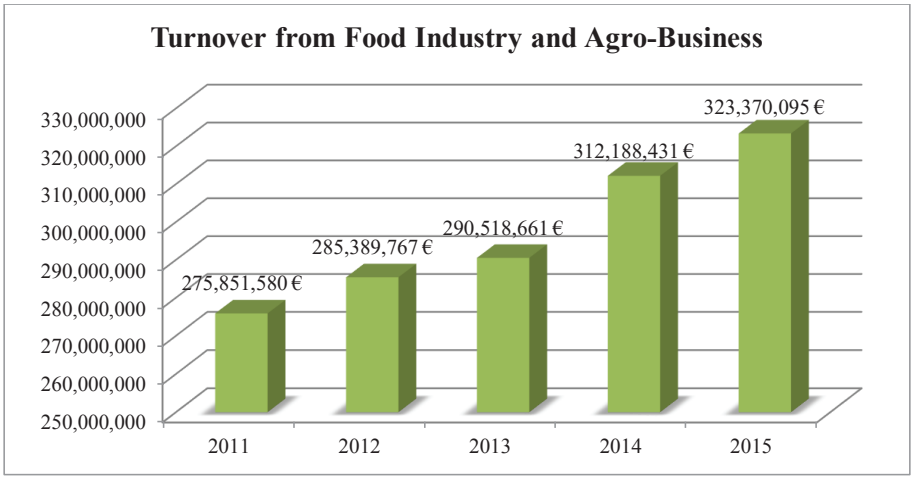
In this regard, the annual turnover of these businesses has also increased for the same time period; while in 2009 the food industry and agribusiness generated a turnover of about 276 million, the same has increased to 323 million in 2015.

Figure 19: The Number of Active Agro-Businesses and Employees in Kosovo (2011-2015)



Source: Kosovo Agency of Statistics, Green Report of MAFRD (2016)

Figure 20: Annual Turnover from the Food Industry and Agro-Business in Kosovo (2011-2015)

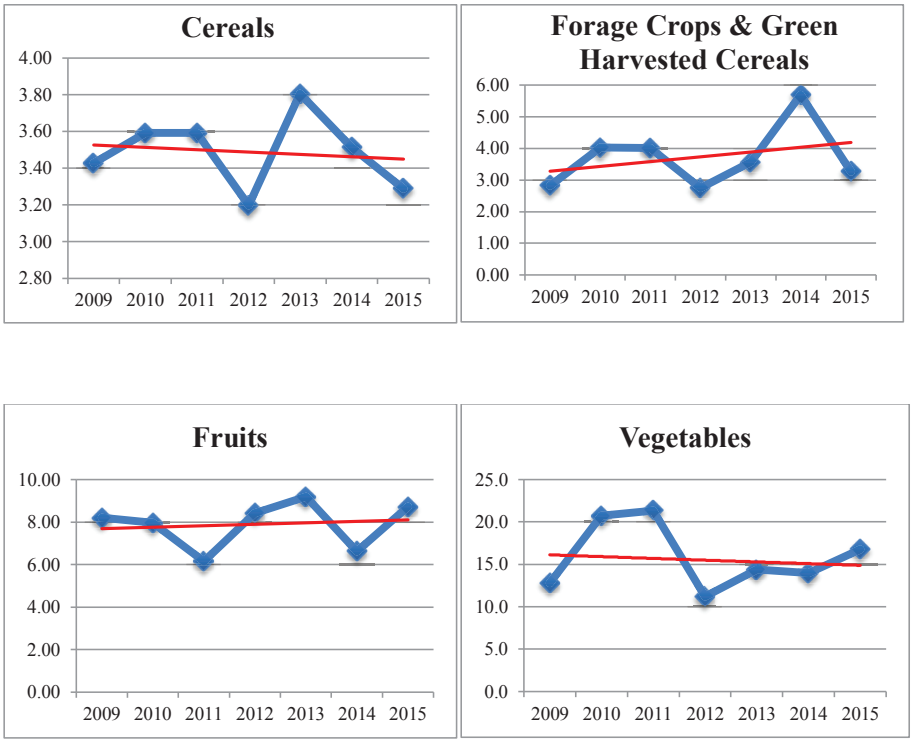


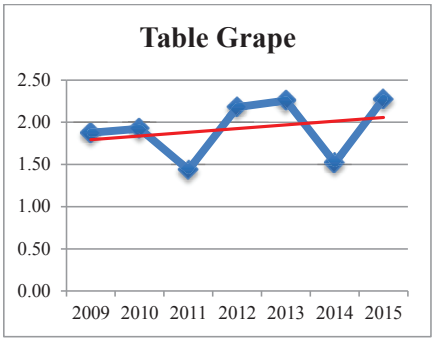
Source: Kosovo Agency of Statistics, Green Report of MAFRD (2016)

The next five figures show data on the yields (t/ha) of cereals, table grapes, fruits, vegetables, and forage crops & green harvested cereals. Although grouping all kinds of products harvested in Kosovo within one

category may overgeneralize the reality, this is a simplified method that serves to formulate an idea about the output trends of these cultures. In these figures, we could see that the trend of yields is decreasing in cereals and vegetables, while increasing in all other groups; albeit the fluctuations that characterize these yields from one period to another. It is interesting the fact that the trend of yields of vegetables in Kosovo is decreasing although it had the highest value compared to other SEE countries.

Figure 21: Yield of Cereals, Forage Crops, Fruits, Vegetables, and Table Grape (2009-2015)

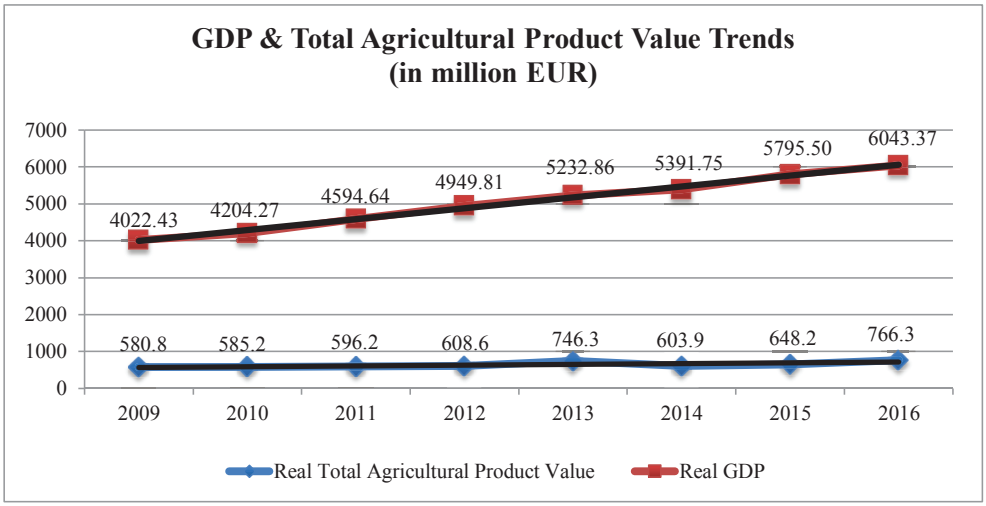




Source: Kosovo Agency of Statistics; Green Report of MAFRD (2016)

Kosovo Agency of Statistics calculates and publishes data on the value of total agricultural products in a year in Kosovo. The total agricultural product value is the sum of the values of total plants products, total livestock products, and total agricultural services for the same time period in EUR. In the following chart, Kosovo's real GDP and real Total Agricultural Productivity Value (TAPV) are drawn against each other in million EUR to provide for an assessment of how these two variables have moved for the same time period. As most of the literature suggests, there is a positive correlation between GDP and agricultural productivity; although, the direction of causality is still an issue surrounded by active debate (Gollin, 2010, p. 3825). In Kosovo's case, the real TAPV is being utilized as a proxy for the agricultural productivity growth in absence of a more accurate measure (e.g. Total Factor Productivity); however, this should be interpreted with caution since many factors are not being considered and also it was not possible to control for other factors that impact either of two variables. Considering that, it can be noticed from the Figure 22 below that for the same time-period, both GDP and TAPV, have moved in the same direction.

Figure 22: Real GDP &Real Total Agricultural Product Value Trends (2009-2015)



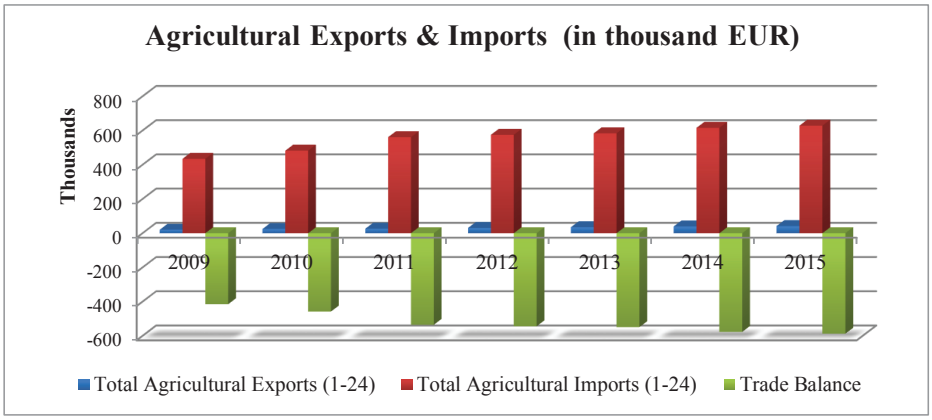
Source: Kosovo Agency of Statistics; Green Report of MAFRD (2016)

4.3. Trade trends in Kosovo's agriculture products

The third sub-section of the data description sector of this paper shows the movements in agricultural trade from 2009 to 2015. Kosovo Agency of Statistics publishes annual data on all exports and imports of Kosovo, which are organized in 98 chapters. The First 24 chapters are in a way or another related to agriculture; therefore, these chapters will represent agricultural products in the following charts. Figure 22 shows agricultural exports, imports, and the agricultural trade balance. As seen, Kosovo experienced a high gap between exports and imports during the whole time-period considered in this work. Moreover, both exports and imports are following a similar increasing trend, which leads to a deepening of the negative trade balance that characterizes this sector. This situation is not surprising considering that Kosovo's domestic production only partially covers its domestic demand for the majority of agricultural products[6], with exception of potato,which surpasses the domestic use, and plums, that almost entirely cover domestic demand. (MAFRD, 2016). Nevertheless, it could be concluded that both agricultural exports and imports are important for Kosovo's trade. As could be observed in Figure 23 below, Kosovo's agricultural exports make up for a roughly 12 percent of the total exports, while agricultural products take about a quarter of the total imports each year.

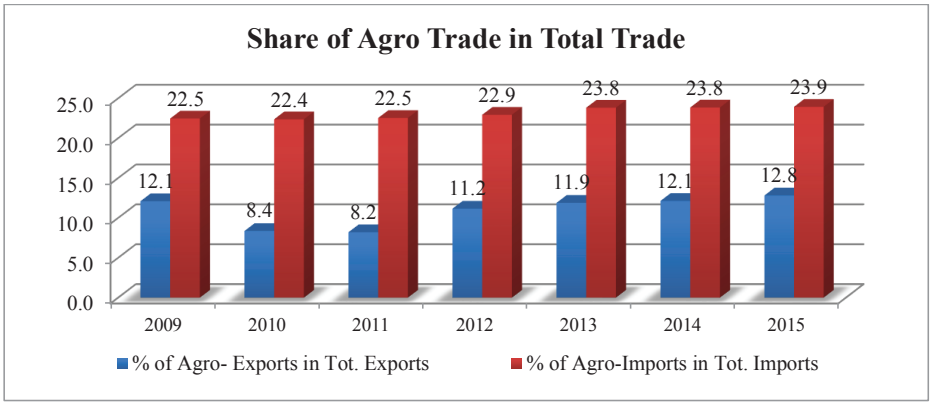
[6] A graph displaying Self-Sufficiency Rates for main agricultural products used in Kosovo can be found in the Appendix of this paper. Self-Sufficiency Rate is calculated by subtracting exports from total output and then dividing the outcome by domestic use.

Figure 22: Agricultural Exports & Imports, and Trade Balance of Kosovo (2009-2015)



Source: Kosovo Agency of Statistics

Figure 23: Share of Agricultural Trade in the Total Trade of Kosovo (2009-2015)



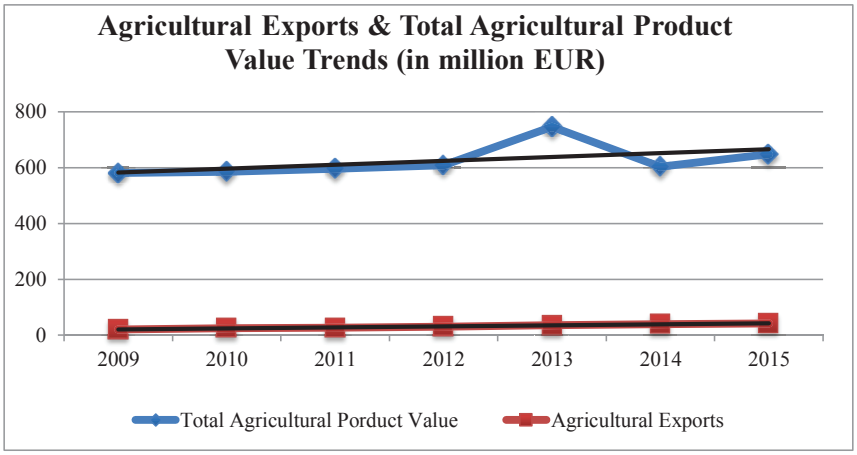
Source: Kosovo Agency of Statistics

Finally, based on the reviewed literature that suggested a positive impact of trade in agricultural productivity, both agricultural exports and imports values are compared with TAPV[7] to see the moving direction of all three variables. This is not to suggest that agricultural trade has impacted GDP growth in

[7] TAPV is only used as a proxy indicator, but is not to be mistaken for productivity measure of agriculture sector

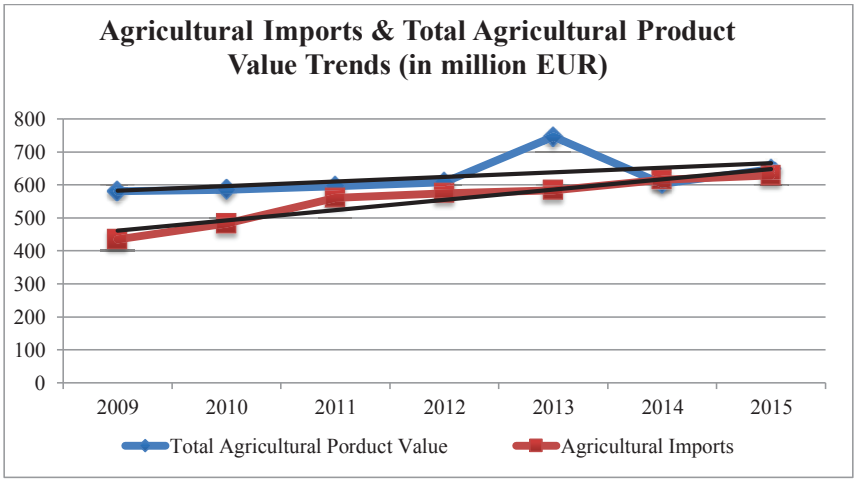
Kosovo; however, the trends that the variables have followed during this time period move in the same direction (all three are increasing).

Figure 24: Agricultural Exports & Total Agricultural Product Value Trends (2009-2015)



Source: Kosovo Agency of Statistics

Figure 25: Agricultural Exports & Total Agricultural Product Value Trends (2009-2015)



Source: Kosovo Agency of Statistics

5. Conclusion

This paper has two main building blocks that contribute to the fulfillment of its aim in providing an overview of the current situation of agriculture sector in Kosovo in comparison to other South-Eastern European countries, by focusing on agricultural output and trade as important factors impacting the growth of this sector. The first block discusses the different perspectives that researchers have maintained from early 1950s to today with regards to the impact of agriculture in the economic growth, economic development, and poverty reduction. This review of literature revealed the importance that has been given to agriculture by many economists independent of what their views were in this regard. Many think that industrialization in a country cannot occur without a productivity growth of agriculture; however, there are other researchers who think that countries can develop their industry without developing the agriculture sector first. Even today this topic is vastly debated and recently, an increased interest has been noticed in theory as well as in policy-making. In Kosovo, development of agriculture is among the priorities of the government, while many international organizations are helping in the process.

The second block of this paper compares Kosovo's economy and agriculture sector with that of six other SEE countries as displayed by data. In this simple comparison, Kosovo seems to produce a smaller output of most of the agricultural products as compared to most of these countries; however, Kosovo is either equal or better in the yields that it harvests for the same products. Moreover, this sector displays time-series data on Kosovo's agricultural sector, which show increasing trends in Gross Added Value, efficiency, number of agribusinesses, and yields ofsome of the main groups of products. Also, this sector compares trend directions between real GDP and real TAPV to see that the direction is similar. Finally, a simple analysis of the trade of agricultural products shows that both imports and exports have increased almost proportionally following the same trade of annual GDP growth of Kosovo's economy. Although a simplified methodology was used to extract some insights about the potential of this sector in Kosovo, this overview may serve as an indicator that agriculture is relevant for Kosovo's economic growth and as such could motivate conduction of other more in-depth analysis. The latter could certainly be much more informative for the path that Kosovo needs to follow in this regard.

5.1. Further Research

Although agriculture sector is considered to be a highly relevant sector for the economic growth of Kosovo, there are only a few studies that address its challenges and potential. While this overview may serve as an indicator that this sector is important for Kosovo and there is potential for growth of productivity, further in-depth research is crucial to understand better how this sector functions and how it may be utilized to catalyze the economic growth of Kosovo. Advised from the literature, the following analysis are proposed:

- A more accurate measurement of productivity of agriculture – there are different measures that authors have used to measure the productivity of different sectors of economy. Measuring the productivity of agriculture is rather complex but it is not impossible and in the case of Kosovo such a study would fill an important gap in the quest to determine the true potential of this sector.
- Measuring comparative advantage of agricultural sector in Kosovo – while this overview compares Kosovo with the other SEE countries, it tells little about the comparative advantage of agriculture sector in Kosovo. Comparative advantage is one of the main concepts in the field of economics that relates to specialization and trade. If trade is a positive factor in the productivity

of agriculture, then it is relevant to focus on identifying the products for which Kosovo is comparatively better in producing and then trading.

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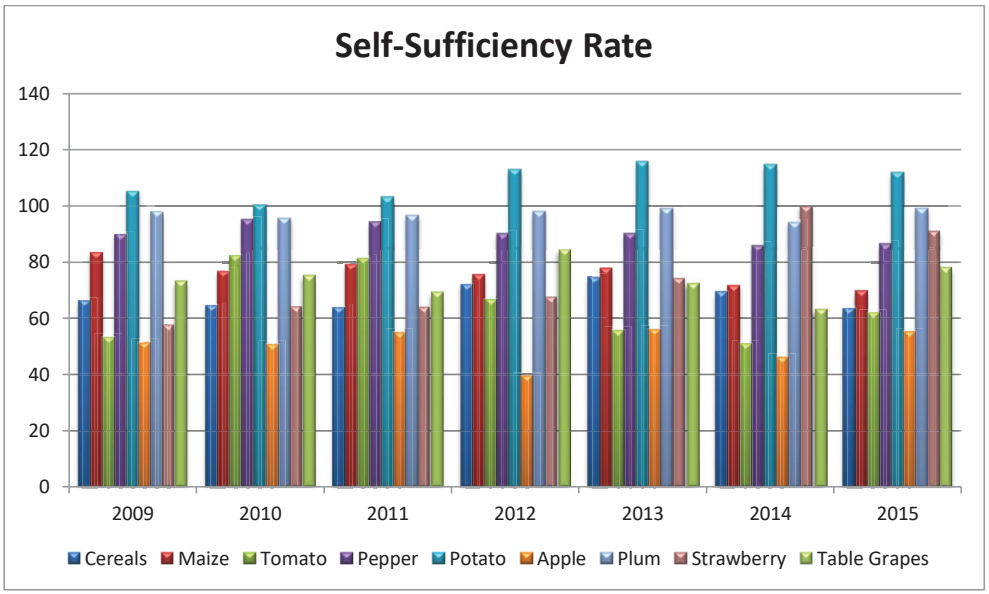
Appendix I

Figure 23: Self-Sufficiency Rates for some of the main products used in Kosovo



Green Report of MAFRD (2016)

AN ASSESSMENT OF STUDENTS' TEST PERFORMANCE: A STUDY OF KOSOVO RESULTS IN PISA 2015

Lorëz Qehaja[1]

Programme for International Student Assessment (PISA) assessed for the first time, Kosovo 15-year-old students' mathematics, reading, and science literacy in 2015. This paper aims to estimate the correlation of students' background home inputs & teacher incentives, and schooling resources with students' test performance in Kosovo. The analysis is performed on the individual level, which allows the estimation of within-country variation on science scores. This paper disentangles test scores from student and school background data, and as such allows for the measurement of students' performance on the tests alone. The dataset used in this study comes from PISA 2015 published results, filtered to represent Kosovo data, and multilevel regression analysis is used to analyze the data. According to empirical results in this paper, parents' education, access to educational resource, teacher clearness, and schooling resources have a positive impact on students' test scores. As a conclusion, investing in teaching methodology and school inputs and resources, among other things, would be beneficial in improving students' learning outcomes.

Key words: PISA, Kosovo, education quality, student performance

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Introduction

This paper analyses the impact of family background and school resources on the performance of Kosovar students' test scores in science in PISA 2015. Since this is the first time a study is being conducted on the importance of family and school variables on students' test scores in Kosovo, this study aims to offer a bigger picture on the factors that influence students' test performance. As such, the results of this paper can be used a reference point for education policy reforms in Kosovo.

The Programme for International Student Assessment (PISA) assesses 15-year-old students' mathematics, reading, and science literacy. The assessment started in 2000, and every three years, students of more than 70 different countries take exams on three core subjects, science, mathematics, and reading, and fill a questionnaire on background data on family, school, and teachers. In 2015, Kosovo became part of PISA for the first time. The ajor focus was given to science, while reading and mathematics were also assessed through a paper-based exam. On average high school students in Kosovo scored below the OECD countries in the three subjects, with a mean of 378 in science, 347 in reading, and 362 in mathematics (PISA Results 2015). To generate these scores, PISA used Plausible Values (PVs). PVs are imputed values used to report student's performance in cognitive tests(Analyses with Plausible Values 2009). PVs are used to predict students' responses when there is missing data due to lack of response, technical problems, or country-specific questions. As such the mean scores computed from PVs are not individual test scores; they are imputed values used to measure the average population performance in education based (Scaling PISA Cognitive Data 2012).

This study uses a multilevel regression analysis, accounting for student differences between schools and regions. In particular, this paper aims to estimate the influence of students' background &home inputs, teacher incentives, and schooling resources on students' test performance in Kosovo. The analysis is performed on an individual level, which allows the estimation of within-country variation on science score. Since science was the focus of PISA in the 2015 assessment, this paper uses test scores on science subject for regression estimation. This paper disentangles test scores from student and school background data, and as such allows for the measurement of students' performance on the tests alone. The findings of this paper suggest that both home and in-school resources matter to students' performance in science, and investment in books and other educational material at home and school is positively and significantly correlated with students' test scores. Furthermore, investment in teaching methodology that includes the newest technology and ensures students' participation in class is positively and significantly correlated to students' test scores.

The remaining of the report is organized into the theoretical rationale behind the research question, the data description and methodological approach for the study, discussion of results and policy recommendations, to conclude with a summary of main points and limitations of the study.

Theoretical Approach

Economic theory suggests that family background and institutions are core determinants of students' educational performance. According to Lundborg, Nilsson, and Rooth (2014), mother's education is statistically significant and positively related to children' cognitive and non-cognitive outcomes. These results imply that returns to education are higher than expected and maternal education has a higher beneficial effect across generations; thus, investing in educational reforms is worth, especially in women' education since the benefits remain for a long time. In addition to family structure and home inputs, various researchers have focused on establishing the importance of in-school resources to students' test scores. According to, Ammermüller, Heijke, and Wößmann (2005) students'age, grade, and gender, parental education, and the number of books at home are statistically significant and positively related to students' math and science scores. Furthermore, shortage of materials in schools and large class size are negatively related to students' test scores. Ferguson (1991) points out the importance of class size, school size, and teacher quality to students' learning. According to him, although background factors, such as parents education, nutrition, socioeconomic status, and parental involvement are crucial to students' performance in school, school-level factors are also shown to have a considerable impact on students learning, as well. Of the school-level factors, teacher characteristics have the most substantial effects on students' learning (Barton and Coley 2009).In this regard, teachers that include students on class discussion, organize activities for student involvement, and design a creative curriculum specific to students' needs, were shown to have a higher positive impact to students' test scores. However, such teaching methodologies go vice a vice with investments in school resources, offering teachers the opportunity of realizing their in-class teaching objectives. With these factors in mind, particular attention should be given to providing access to educational resources, e.g., smaller class size, better infrastructure, higher quality teachers, and higher expenditures per students.However, according to Hanushek and Zhang (2009), for these resources to have the highest impact, they should be used and efficiently distributed. Focusing only on increasing investments in school resources without putting in place educational policies that incentivize teachers to perform better and address students' challenges in a particular class or school, will not produce the intended result, which increases students' performanceAs such, adequate in-school resources and investments in teaching methodologies are essential in providing students with high-quality learning environment.

Data and Methodology

Data Description

The dataset used in this study comes from PISA 2015 published results for Kosovo. PISA has published raw cognitive, student background and school background data for Kosovo, and are easily accessible for download in PISA 2015 webpage. There are three different data sets used to estimate the results: cognitive, school background, and student background data. For analyses purposes, student cognitive and student background datasets were merged into one dataset, and student cognitive and school background datasets were merged into another dataset. 4,826 students aged 15-16 years old were assessed in 223 schools. Forty-seven percent of the selected sample were females, and 53 percent were males. Ninty-seven percent of the chosen schools were public, and only three percent private. Seven major cities of Kosovo were part of the assessment, both rural and urban areas. For the student cognitive and family background dataset, the unit of observations are students; while for the school background dataset, schools are the unit of observation.

Data Processing

Missing data are divided into three main categories: no response missing values, which are questions that students did not answer because they did not know the answer or they did not understand what the question was asking; not reached missing values, which are questions that students were not able to answer because of lack of time; and system missing values, which are data that the computer was not able to read, or they were removed because of other technical problems (Scaling Procedures and Construct Validation of Context Questionnaire Data 2012). As such, for data analysis purposes, no response and not reached missing values were replaced with zero. System missing data are not included in the calculation of test scores because they do not come as a result of students not answering test questions. The first variable created is Science Questions, which calculates the number of questions asked in exams for science subject, ignoring system missing values. The second variable created is Science Count, which counts the number of questions students answered correctly in the science subject. Finally, Science Score variable was computed, which represents the percentage of questions that were answered correctly by students in science subject Science Score represents the outcome of interest, and it follows a

normal distribution, skewed to the right.[8]R-squared between ScienceScore and PVs for science is 77.4 percent.

Table 1: Percentage of questions answered correctly by students

Summary Statistics

	Observations	Mean	Std. Dev.	Min	Max
Outcome of Interest					
SCIENCE_SCORE	4,826	27.837	14.604	0	92.593

This paper estimates the correlation of background factors with science test scores. According to the table above, students in Kosovo correctly answered on average 28 percent of science questions. The highest score was in the science subject, where a student answered correctly 93 percent of the questions in science.

Table 2: Number of questions asked in exams

Summary Statistics

	Observations	Mean	Std. Dev.	Min	Max
Number of Questions Asked					
SCIENCE_QUESTIONS	4,826	27.715	4.965	15	35

On average students were asked 27 questions for the science section. Exams were designed in different forms to avoid cheating, and some of the students were asked a higher proportion of questions in science compared to the other students. Not all of the students answered the same set and number of questions per subject. Since science was the focus of PISA 2015 assessment, all students were tested on the science section.

Methodology

[8]Normal distribution graphs for each variable are presented in Appendix II.

Regression analysis is used to explain the relationship between the dependent and independent variables. Multilevel linear regression model, in this case, accounts for differences in students' test scores in different levels, namely school (one level) and region (another level). The equation below presents the reduced regression equation:

$$S_{isj} = \beta_0 + \beta_1 B_{isj} + \beta_2 I_{isj} + \beta_3 S_{isj} + \varepsilon_{isj} \quad (1)$$

where $S_{isj}$is the science test scoreof student *i*in school *s*in region j.*B* is a vector of student background data (including family background, regions, and home inputs such as books and educational resources);*I*is a vector of teacher incentives, such as, exam compilation, class debate, extracurricular activities, etc.; and *S*is a vector of school background data, such as whiteboards, computers, laboratories, etc.The standard error is clustered at the school and region level.

Because of data formulation of questions and content of the exam, the level of clarification and understanding of questions from students cannot be measured, and as such the error term can be larger than expected. Furthermore, even though a significant number of variables are included in the regression model, there might be omitted variables that are important in explaining students' test scores. Some of these variables might be culture-related, job market related, plans (academic or non-academic), perceived importance of high school, and age-related (psychological – adolescence). Some of the independent variables might not be independent of each other; an example is the class size, and teacher explaining the material clearly and encouraging discussion. Class size can impede teacher's ability to follow the curriculum and be able to answer and discuss each question. Finally, the correlation can also go the other way for variables like community school location; students in bigger cities tend to have better test scores; however, test scores can also increase because students are from a particular place. For example, in Prishtina, the capital city, there are more learning resources, quality of schools and the number of teachers are perceived to be higher, and because of higher competition and difficulty to be accepted in high school and university compared to other cities, there are more students with higher scores. In conclusion, these analyses provide only correlation between variables and not causality.

Empirical Results

Student and Teacher Background

Table 3:Empirical Results – Family Background and Teacher Incentives

Student and Teacher Background	SCIENCE SCORE	
Mother's Education	0.454	(0.316)
Father's Education	1.255***	(0.274)
Books at home	1.645***	(0.209)
Home Educational Resources	1.753***	(0.247)
Kindergarten	0.534	(0.474)
Family Economic Status	0.945**	(0.317)
Class Debate	0.345	(0.494)
Discussion	4.593***	(0.544)
Performance Improvement	1.570*	(0.653)
Teacher Comment	1.637*	(0.604)
Express Opinion	3.511*	(1.438)
Perform Investigation	-3.537	(0.610)
Laboratory Equipment	1.185*	(0.576)
Constant	17.8	(1.639)
Observations	3998	
R-squared	0.12	

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table 4: Empirical results: Parents' Occupation and its Effect on Students Test Scores

Student Background	SCIENCE SCORE	
Mother's Occupation	0.111***	(0.013)
Father's Occupation	0.0949***	(0.011)
Constant	20.33	(0.646)

Observations	4007
R-squared	0.05

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Student and teacher background assesses the correlation of students' test scores with three main aspects, namely parents' education and occupation, home inputs, and teaching methodology.

On average, holding other variables constant, fathers' education is positively and significantly related to students' test scores, while mothers' education is not statistically significant. In other words, the higher father's education, student test score increases by 1.25. Based on economic theory, it is expected that mother's education is significantly correlated with students' test scores. In this case, such result might come because of self-reported data from the students. For different reasons, while filling the section of the questionnaire about their family demographics, students might have had different incentives while answering the questions, which in return can affect the correctness of data and the correlation. Parent's education and occupation are separated into two different regressions because of multicollinearity, since the higher parent's education, the higher would be the rank in which parents are professionally employed. On average, the more professional the occupation of the parents, the better scores the student has in the test. Both parents' occupation is positively and significantly related to students' test scores; however, mother's occupation has a higher impact (0.11) compared to father's occupation (0.09).

In other words, the educational resources a student has at home; the better are her scores by 1.75 points. Another factor that matters to students' test scores is the economic stability of family. A student who comes from a family with better economic status has higher test scores for 0.95 compared to a student who comes from a family with lower economic status.

Incorporating newest teaching methodologies in classroom and involving students in teaching process is positively correlated with students' test scores. As seen from table 4, if teachers initiate class discussion with the students, then this helps students perform better in science since their test scores are better for 4.6 points compared to the scores of students who are not exposed to class discussion during their learning process in class. If the teacher tells students how they can improve their performance, then these students; performance in test is better for 1.57 points compared to a student whose teachers have not provided such information.Furthermore, all other variables constant, if the teacher gives feedback to

students on their strengths, then their test scores are improved for 1.64 points. Students also benefit from teaching methodologies that allow them to express their thoughts on science subjects. As such, if the teacher gives the student the opportunity to express her opinion, her test score is better for 3.5 points compared to a students who lacks such opportunity. Lastly, to the science department, having enough laboratory equipment that students can work with is positively and significantly related to students' test scores. A student who has access to laboratory equipment has better test scores for 1.18 points compared to a student who does not.

School Background[9]

Table 5: Empirical Results – School Background

School Background	**SCIENCE**	
Class Size	0.479	(0.043)
Whiteboards for students	0.181***	(0.043)
Computers per student	0.188	(1.090)
Lack of Educational Material	-4.313***	(0.947)
Lack of Teaching Staff	-1.052*	(0.450)
Creative extra-curricular activities	0.507*	0.226)
Student-Teacher Ratio	0.00472	(0.018)
Community School Location	1.311***	(0.247)
Teachers Participation	-0.179	(0.190)
Students' Test Assessment	0.250	(0.275)
Constant	13.76	(1.672)
Observations	4072	
R-squared	0.06	

Standard errors in parentheses

[9]Explanation of codes are presented in Appendix I

* p<0.05, ** p<0.01, *** p<0.001

School background assesses the correlation between students' test scores and two main aspects, namely in-school resources and class environment. As it can be seen from table 5, holding other variables constant, having whiteboards for students, on average improves students test scores. In other words, the more whiteboards are placed in classes, students' performance in test scores increases by 0.18 points. The results show that a lack of educational material (e.g., textbooks, IT equipment, and library or laboratory material) is negatively correlated with students' test scores this relationship is highly significant. Students who attend schools that lack educational materials perform poorer in science by 4.31 points compared to students who attend a school that does not have such constraints.

Academic staff shortage, more specifically low number of teaching staff, is negatively related to academic performance of students. Overall, holding other variables constant, students who attend a school that has a low number of teaching staff perform poorer by 1.05 points compared to students who attend a school without such constraints. A creative teacher who spends time designing extra-curricular activities for students has a positive and significant effect on students test scores. On average, creative extra-curricular activities increase students test score in science by 0.50, compared to students who are not subject to these kinds of activities.

Type and location of the school also matter in student test scores. For instance, if a student is in a school in an urban area, his/her science test score is higher for 1.3 compared to a student in a school in the rural area.

Discussion and Policy Recommendations

Existing literature suggests that home and in-school resources, e.g., educational materials at home and school, class size, school infrastructure, textbooks, and laboratory equipment play a crucial role in students' test performance and in providing students with overall high-quality opportunities to learn. Therefore, it is of utmost importance for Kosovo specifically to provide research-based information that helps schools improve and offer a high-quality education to students. The education sector has been proved to be the essential sector leading the society to develop, and as such, it is an important sector that needs continuous investment and improvement.

Below are presented some recommendations based on the results of this paper:

In order to assess the knowledge of students in high school, it would be better to design an educational

study specifically for Kosovo. Exams should be designed in cooperation with teachers and educational policy makers to test the knowledge of high school students. The sample of students should be selected based on the total number of students in high school in Kosovo, weighted by region so that data can be representative of population and conclusions could be drawn from the results. Mathematics, Reading, English language, Physics, Chemistry, and Biology can be core subjects that students would be assessed on. Exam questions should be of the same difficulty, but questions should be arranged differently to have more types of exams to avoid cheating. This process is costly; however, if administered correctly it can give accurate results on students' knowledge and provide insights for improvement of education in Kosovo.

Based on the estimated results of this paper, focusing on teachers, curriculum, and school inputs would be beneficial in improving students' knowledge. On average, there are 36 students per class in Kosovo, with one teacher teaching per course (Krasniqi 2016). Given these circumstances, it is hard for a teacher to explain every question and help based on student's need. Lowering the number of students per class would enable teachers to explain the subject better, have more time to help each student, and encourage debate among students, which all are positively and significantly related to students' test scores. However, to do this is necessary to build more schools to meet the demand. Schools that give computers per student have whiteboards in class, and have better appliance also have a positive impact on scores; thus, schools should be built to meet such conditions so that students can benefit from them.

Moreover, the curriculum being taught at classes and the books students use are important not only for achievement scores but also for setting up a way of learning where students comprehend the material and do not only memorize it by hard for better scores. Better book quality, more teacher effort in providing feedback, and more creative-extra-curricular activities provide highly positive results for students test scores. Internal evaluation from teachers is also important for students. By including practical and logic questions in monthly exams develops students' creative intellect, which in turn improves their test performance. Hence, concentrating on methods of teaching and including more practical work would be beneficial to students' knowledge enhancement.

Finally, the student-centered approach is a change through which Kosovo education system would benefit. Given that Kosovo's education system for an extended period was teacher-centered, this education system did not give the needed space to students to state their opinion or apply new ideas to the learning process. A student-centered approach shifts the instruction and focus from teacher to the students, giving as such the student the opportunity to propose new teaching methods, lead learning activities, suggest topics of interest and design learning projects based on them, participate in the

discussion, and engage in extracurricular activities. Furthermore, through this approach students are encouraged to participate in volunteer work, internships, community work, online classes, or independent projects. Having in consideration that changing education system is challengeable, a good start would be the adaptation of this method from teachers on the individual basis, in the classroom setting. The application of this method in smaller instances would be beneficial to students since it will encourage discussion, and at the same time would be valuable change to teachers since they would have the opportunity to assess the difference and attract students' attention in class.

Research Limitations and Conclusion

Exams designed and used by PISA to measure educational outcome for students are standardized so that comparisons between countries can be drawn from the results. However, education system changes from one country to another, and the content of the exam might not adequately measure what students learn at school. PISA assesses students' cognitive ability as well as background data. Because of a significant amount of missing data and a small sample size, PISA uses plausible values to estimate mean test scores and compare countries with each other on educational outcomes. Not all students answer all the questions. The majority of the questions were not answered by a high percentage of the students, and there are cases when the question is not answered at all; however, based on mean estimation and weights assigned, data are imputed for all these types of questions. This paper tends to measure the influence of other factors in test scores, only those that were answered by students. For this purpose, questions that had no answers were dropped, and missing data were not included in the regression. As a result, regression coefficients are based on a smaller sample of students. The R-square is fairly small; however, given the nature of this study that tries to establish only correlation between variables and also takes into consideration background data that are not directly connected to the performance of students, R-square is there to establish a correlation, but it does not necessarily mean that is too low for the overall impact of the study.

Despite data limitations, regression results have provided insights into the areas where investment is highly recommended and would provide positive results for students test scores. In particular, fathers' education is positively related to students test scores, which enforces the economic theory that investing in education has multiple effects in future generations. School outputs, such as whiteboards, laboratory equipment, books, and infrastructure positively affect students test scores. Investing in human resources remains an important feature. Well-prepared teachers, with new ideas, who design extra activities for students, and are willing to provide extra help for students are crucial to students' test scores. Teachers

being prepared for the class, willing to teach students new and practical lessons, and encouraging student involvement motivate students to learn more and improve their exam scores.

For the future, the model can be improved by using an instrumental variable to address endogeneity. When addressing this issue, the paper can also be structured into index measures for independent variables, and control for more variables that might have an impact on the results.

Furthermore, a comparison can be performed between the regression results aggregated by using plausible values as the dependent variable and using raw test scores as the dependent variable. The differences and impact of data imputation can be evaluated through this comparison, and it will also provide the opportunity to see the differences in R-squared.

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Appendices

Appendix I – Code Explanation for Regression Variables

Variable	Question	Code
Mother's Education[10]	Does your mother have this level of education (ISCED 4,5,6); 1-Yes 2-No	0-No education; 1-Primary education; 2-SecondaryeEducation; 3-Tertiary education; 4-PhD
Father's Education	Does your father have this level of education (ISCED 4,5,6); 1-Yes 2-No	0-No education; 1-Primary education; 2-SecondaryeEducation; 3-Tertiary education; 4-PhD
Books at home	How many books are there in your home?	1 0-10 books 2 11-25 books 3 26-100 books 4 101-200 books 5 201-500 books 6 More than 500 books
Home Educational Resources	Weighted (number to be stated)	
Kindergarten	Did you attend <ISCED 0>?	0-No 1-Yes
Family Economic Status	Index of economic, social and cultural status (WLE)	
Class Debate	When learning <school science>? There is a class debate about investigations.	0 – No 1 - Yes
Laboratory Equipment	When learning <school science>? Students spend time in the laboratory doing practical experiments.	0 – No 1 - Yes
Discussion	How often does this happen in <school science>? A whole class discussion takes place with the teacher.	0 – No 1 - Yes
Performance Improvement	How often does this	0 – No

[10]Parent's education has been calculated by creating a new variable to represent the highest level of education for mother and father separately. If mother has PhD, then it is assumed that mothers has also primary, secondary and tertiary education. Parent's education was coded as 1 "parent has the specific level of education" and 2 "parent does not have the specific level of education". As such, if father's education (and similar to mother's) is equal to 8 it means no education; if equal to 4 it means highest level of education.

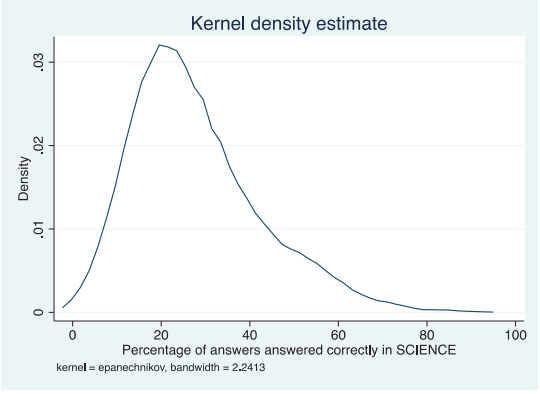
	happen in <school science>? The teacher tells me in which areas I can still improve.	1 - Yes
Teacher Comment	How often does this happen in <school science>? The teacher gives me feedback on my strengths <school science>	0 – No 1 - Yes
Express Opinion	How often does this happen in your <school science>? Teacher gives an opportunity to express opinions.	0 – No 1 - Yes
Perform Investigation	When learning <school science>? Students are asked to do an investigation to test ideas.	0 – No 1 - Yes
Mother's Occupation	14-89	From Elementary Occupations to managers
Father's Occupation	14-89	From Elementary Occupations to managers
Class Size	Number stated	Number
Whiteboards for students	Total No. of interactive whiteboards in the school altogether	Number
Computers per student	How many computers are available for students for education?	Number
Lack of Books	A lack of educational material (e.g. textbooks, IT equipment, library or laboratory material).	0 – No 1 - Yes
Lack of Teaching Staff	School instruction hindered by: A lack of teaching staff.	0 – No 1 - Yes
Creative extra-curricular activities	Creative extra-curricular activities	Number
Student-Teacher Ratio	Student-Teacher Ratio	Number
Community School Location	Which of the following definitions best describes the community in which your school is located?	1 A village, hamlet or rural area (fewer than 3 000 people) 2 A small town (3 000 to about 15 000 people) 3 A town (15 000 to about 100 000 people) 4 A city (100 000 to about 1 000 000 people) 5 A large city (with over 1 000 000 people)

Teachers Participation	Teachers Participation in professional development programmes (WLE)	
Students' Test Assessment	How often are students assessed? Mandatory <standardized tests>	1 Never 2 1-2 times a year 3 3-5 times a year 4 Monthly 5 More than once a month

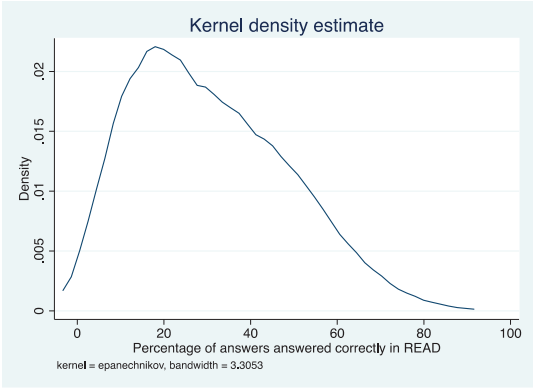
Appendix II – Distribution of Test Scores

In order to ensure that the scores used in this report as dependent variable represent students' test scores, two main methods have been used: data distribution of science score (normal distribution) and the variation in science score explained by plausible values in science. As seen in the graph below, Science score variable follows a normal distribution, skewed to the right, which comes as a result of missing data. If the scores follow a normal distribution, it is a sufficient reason to believe that these scores are actual students' test scores in reading. R-squared between the science score and plausible values for science is 77.4 percent. An R-square between these two variables higher than 50 percent, is the other reason to believe that these scores are actual students' test scores in reading.

Same data analysis was performed for reading and math score.



Distribution for Science Test Scores



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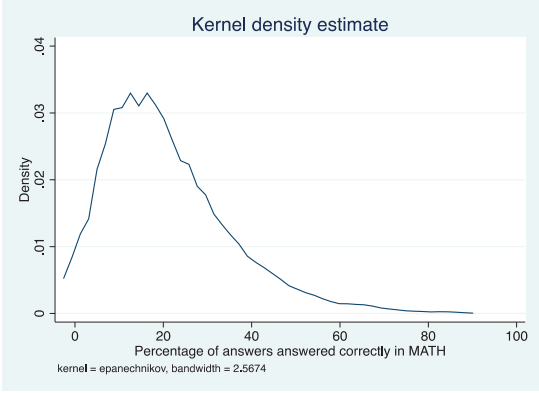

Distribution for Math Test Scores

SCHOOL TO WORK TRANSITION IN KOSOVO

Fitor Murati[1]

Young people face many problems in the transition from school to work. Unemployment, long-term unemployment, and inactivity comprise some of the major consequences of an ineffective transition for young people. The problems associated with youth unemployment are not confined to economic consequences such as the loss of income or increased experience gap, but also with social costs in terms of the overall well-being of youth and their social-standing. This paper presents a theoretical overview of the problems facing young people in the process of finding a job after completing education through the lenses of school-to-work transition regimes. Considering differences between countries, researchers have grouped EU countries in different regimes of the school to work transition. The aim of this paper is to present an overview of Kosovo's youth un/employment problems, and analyze Kosovo's school-to-work regime within the context of the above-mentioned concepts and bring light to the relationship between labor markets and educational institutions and the consequences of this relationship for employment perspectives of young people. The focus of the paper is to identify the advantages or disadvantages that specific labor and educational institutions/policies have on the ability of young people to find a job. The article concludes that a lot of work, efforts, and resources are needed to make the transition from completing education to work smother in Kosovo. Meanwhile, considering Kosovo's share of youth in total population it would be a huge mistake to ignore these issues which can lead to major economic and social consequences.

Key words: labor market, education, youth Unemployment, school-to-work transition.

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Introduction

The performance of young people in labor markets is essential for the well-being of young generations as well as for improving the productive potential of the economy. Providing young people with a smooth transition from school to work is a common objective for most advanced and emerging economies. Unfortunately, young people are one of the most sensitive groups when it comes to remaining unemployed or inactive. The same holds true for Kosovo where youngsters face a particular risk of unemployment and joblessness. Hence, this is a "global" problem facing both the developed and less developed countries (ILO, 2013, 2014). After the economic crisis in EU, unemployment rates reached as high as 23% in 2012 (European Commission, 2017), while new heights of 22.5% were reached in 2015 across Europe. These numbers led to raising concerns over a widening gap between labor market outsiders and insiders, which apart from economic consequences, would lead to the alienation of labor market outsiders from the social and political life (Ferragina, Feyertag, & Seeleib-kaiser, 2016). The well-being of young people is an important part of the social cohesion of a country, thus policymakers and researchers have been eager to find solutions to youth unemployment problems.

These numbers show that the school-to-work transition is a universal problem. Every country faces this problem within their own specific context leading to different outcomes in terms of youth and graduate unemployment. While a significant part of the youth unemployment story can be explained by macroeconomic factors, it is very important not to ignore structural factors like education, labor market, institutions, culture etc. Accordingly, this paper is focused mainly on the labor markets, education and their interactions. Studies show that the variance in outcomes in different countries comes from differences in labor market and educational institutions and their interaction. I will refer to this interaction as the school-to-work regime. A school-to-work regime is identified by the set of institutions that affect the ability of new entrants to smoothly move from education to the world of work, namely the educational system itself and its links to the labor market, the legal arrangements existing in the labor market, active labor market policies, security and flexibility of labor markets as well as different schemes of passive or proactive support offered to young people.

The aim of this paper is threefold. First, it looks at the academic literature with the aim of finding evidence on causes, consequences and possible solutions to youths' problems in the labor markets. Second, it attempts to provide an overview of the available evidence on the youth disadvantage in the

labor markets in Kosovo Third, it analyzes Kosovo through the lenses of different school-to-work transition regimes as identified in the literature review.

Further, the focus of the paper will be the education system, considering it as a necessary precondition for enabling a smooth school-to-work transition for young people. General education and vocational education and training (VET) are crucial in making young people employable and more productive. Evidence shows that good education system, tailored to the needs of labor markets, raises young people's chances of finding good and stable job employment opportunities, which is essential for their economic and social well-*being*. By looking at evidence, I will show that the old emphasis on labor markets and more specifically on increasing flexibility and reducing hiring and firing costs, has shifted towards a more holistic approach. This new approach acknowledges the importance of starting the fight against youth unemployment while young people are at school. Meaning that education systems should be better tailored to labor market needs: they should not only aim at providing general education but rather marketable skills, the ones that will enable young people to find a job once entering the labor markets. Moreover, the role of public institutions is not only to make sure that labor markets are flexible enough to provide easy to get jobs (e.g. temporary contracts) but also to provide young people with training opportunities, advice, security, and support in acquiring the skills that would offer them long-term employment opportunities.

Literature review

Defining youth unemployment

In order to be able to analyze youth unemployment and school-to-work transition, it is important to take a look at some of the definitions and indicators related to these issues. To begin with, we can look at the Youth Unemployment Rate which is the most common measure of absolute disadvantage (ADy) of youth – by measuring youth unemployment (Uy) relative to youth Labor Force (LFy):

$$\mathrm{AD}_Y = u_Y = \frac{U_Y}{E_Y + U_Y} = \frac{U_Y}{\mathrm{LF}_Y}$$

Meanwhile, it is well known that unemployment rate does not tell the whole story, therefore authors suggest to focus more on joblessness which includes those that are unemployed and as well as those that are inactive, not searching for a job (Rees, 1986). A more popular concept used in recent times is the Not in Education Employment or Training (so-called NEET) rate which is considered a better indicator of the youth unemployment problem. International Labor Organization goes one step further by looking at the school-to-work transition as the passage of a young person (aged 15 to 29 years) from the end of

schooling to the first decent job (fixed term contract and suitable job). In other words, the transition to employment has not been completed at the point where young people find a job that does not fit with her ambition and does not benefit her economic status (e.g. fixed term contract, decent salary) and its general well-being (e.g. heightened sense of self-worth, social standing) (Matsumoto & Elder, 2010). Another important indicator is the Relative Disadvantage, which makes it possible to distinguish the disadvantage of young people in comparison to other groups, more specifically to adults.

$$\mathrm{RD}_{Y,A} = \frac{u_Y}{u_A}$$

RD < 1 if young people' disadvantage is lower than that of adults; the opposite is true if RD > 1. The importance of understanding AD and RD is related with policy measures which can be used to tackle them. Understandably, macroeconomic measures are more effective in tackling AD, while reducing RD requires more specific measures, meaning that RD is more resistant to the business cycle as compared to AD (Pastore, 2015). Research in general shows that youth unemployment rates are quite sensitive to macroeconomic shocks. For example, Choudhry, Marelli, & Signorelli (2012) show that financial crises have stronger impact on the youth unemployment rate than on overall unemployment. Similarly, Jimeno and Rodriguez-Palenzuela (2002) and De Freitas (2008) argue that youth unemployment rates have a strong cyclical component. This means that macroeconomic shocks lead to more youth unemployment, while in terms of magnitude it is hard to argue in support of the reverse, because of the youth experience gap in general. Caroleo & Pastore, (2007) argue that youth experience gap, especially in comparison with adults who are expected to have more experience in labor markets, is one of the key factors explaining why youth unemployment rates are so much higher than the adult unemployment rate.

Causes of youth unemployment

One of the main features of youth unemployment and joblessness problem is the transition from school-to-work. A lot of things can go wrong while switching from school to employment, and researchers have looked in details to identify the factors that lead to failure during this transition. While the problems of youth unemployment are associated with macroeconomic deterioration, it is obvious that these macroeconomic factors (e.g. recessions) cannot account for the entire problems that youth face during their transition from school-to-work. For example, a study in a sample of European countries found that half of the variation in the youth unemployment rate observed across countries and over time can be explained by differences in output growth. These cyclical factors are related to the business cycle and

employment creation and destruction. In contrast, the other half is attributed to structural forces such as changes in labor and education policies, and most importantly an unexplained large residual related with structural factors, including institutions and norms (World Bank, 2016). On the other side, the majority of criticism towards school-to-work transition include but is not limited to: inadequate educational attainments, high joblessness, excessive job turnover, weak links between schooling and employment, pay inequality, schooling patterns, household attributes and labor market programs (Ryan, 2001).

Consequences of youth unemployment on individuals

In general, youth unemployment becomes more important in the presence of state dependency. This means that schooling and early labor market experiences have direct effect in the future working life of persons, and these effects are stronger for youth than for adults. There are two kinds of outcomes related to social well-being and economic prospects of young people. The lack of income combined with the absence of a paid work can hurt the social status and self-respect of young people (Ryan, 2001). Concerns related to joblessness in advanced Western economies have been constantly linked with the perception that social costs exceed economic costs. Employment is not considered only a source of income but also a provider of social relationships, identity, and self-esteem. Different studies in Europe and United States show the effects of youth unemployment on the well-being of young people. A study using panel data on life satisfaction for 1984-89 in Germany shows that unemployment has a significant and substantial negative impact on satisfaction, and social costs (e.g. social status, self-respect etc.) of unemployment exceed the economic cost (e.g. loss of income) (Winkelmann & Winkelmann, 1998). In terms of damaging effects of youth unemployment on labor market prospects literature highlights the damage to future employment prospects and lowering subsequent earnings (Becker, 1975; Pissarides, 1994; Manning, 2003; Card et al. 2007, Lalive 2007, Schmieder et al. 2014). Meanwhile, Gregg & Tominey (2005) examined the consequences of youth unemployment on wages for men up to 26 years later and found out that youth unemployment imposes a sizable wage scar which is followed by slow recovery in the labor market.

Mainstream approaches to solutions:

a. Liberalist approach – labor market flexibility

The typical liberalist approach towards solving the youth unemployment problem was to promote policies that increase labor market flexibility. According to this point of view, reducing hiring and firing costs, promoting temporary contracts and lowering minimum wages would smooth young people's transition to

labor markets and reduce the experience gap. An OECD (1994) report and Krugman (1994) identified labor rigidities as the main source of unemployment problem in Europe, leading to strong arguments in support of flexibility. Similarly Dolado et al., (1996) and Abowdet al. (1999) argue that minimum wages have adverse impact on youth unemployment rates in countries like France and Spain where taxes are high and there is little in the way of an age adjustment to the minimum wage, giving more support to liberalist approach.

In contrast, many researchers argue (see Heckman and Borjas,1980 and Heckman and Singer, 1984) that training programs and active labor market policies are more effective in dealing with the problem of youth unemployment in comparison to policies aimed at increasing flexibility in the labor markets. For example, Becker (2006) argues that temporary contracts have negative effect on human development of individuals because they give incentives to invest in generic skills, but not job-specific skills and experience risking future unemployment. Similarly, empirical research shows that temporary work leads to uncertainty in future labor market prospects for young people (Booth, Francesconi, & Frank, 2002; Güell and Petrongolo 2007; Berton, Devicienti, & Pacelli, 2011).

b. The Interventionist Approach – flexicurity and school-to-work transition

While labor market flexibility came under a lot of scrutiny, researchers and policymakers came up with a new concept, flexicurity, as an alternative to labor market flexibility. While there was a strong demand for further flexibilization of labor markets, especially in EU, an equally strong demand existed for providing security to employees - especially vulnerable groups – which would allow to preserve the social cohesion in society(Wilthagen & Tros, 2004). Flexicurity was seen as a model which would combine flexibility with security in an attempt to make labor market policies pro-active. The term was first used by Prime Minister of Denmark Poul Nyrup Rasmussen in the 1990s, meanwhile, flexicurity can be defined as follows:

> *"a policy strategy that attempts, synchronically and in a deliberate way, to enhance the flexibility of labor markets, the work organisation and labor relations on the one hand, and to enhance security – employment security and social security – notably for weaker groups in and outside the labor market on the other hand"* (Wilthagen & Tros, 2004).

Accordingly, in many countries the debate shifted towards increasing the degree of security for temporary workers, by providing passive income during unemployment spells, introducing active labor market policies to increase employability and to substitute job security with employment stability (Withagen and Tros, 2004). However, it is important to keep in mind that flexicurity requires more resources to provide the unemployed with passive income and to engage in active labor market, while most of the emerging economies lack the needed resources and public and private employment services to implement policies proposed by flexicurity supporters (Pastore, 2013)

Education

Understandably, many researchers have argued that focusing only on labor market policies such as flexibility and flexicurity is not enough, especially, when dealing with youth unemployment. Providing young people with the right tools to be successful in the labor markets is mostly an obligation of the education system. Pointing at the importance of this holistic approach, Cahuc, Carcillo, Rinne, & Zimmermann, (2013) argue that differences in youth unemployment result primarily from structural differences in labor and educational policies. In refereeing to the importance of the educational system they stress that education is highly related with the risk of becoming unemployed or inactive. Just in France, 85% of the NEETs have not continued education after secondary school and 42% stop after college. Beyond general education, studies show that vocational education (VET) and trainings have a strong role to play in smoothing the transition from school to work. In most developed countries schooling system is characterized by a duality between general and vocational education. The difference lies on the fact that general education equips students with academically oriented knowledge, while VET is focused more on practical knowledge and skills required in specific professions (Eichhorst, Rodríguez-Planas, Schmidl, & Zimmermann, 2012).

For example, Austria Switzerland and Germany have dual apprenticeship system in which work experience, on-the-job training, and classroom teaching is combined. This form of combining work experience with education is seen as the main feature of the school to work transition in these countries. In Germany, two-thirds of total youth completing general schooling each year enter dual apprenticeship system, and one fifth participate in vocational schooling; hence, the dual apprenticeship system is seen as the major reason behind low levels of youth unemployment in Germany (Zimmermann et al., 2013).

School-to-work transition regimes

Considering differences between countries, Pastore, (2015) proposed a grouping of EU countries in different regimes of school to work transition. Such classification tends to largely overlap the with the

Esping-Andersen (1990) classification of welfare systems into (a) liberal; (b) conservative; and (c) social democratic. According to Esping-Andersen, there are three distinct worlds of welfare capitalism in Western Europe and each of the three worlds of welfare capitalism is accompanied by distinctive labor market regimes governing entry into, absence during, and exit from employment. The first ideal type is referred to as neo-liberal and is a characteristic of free-market-oriented countries such as USA and UK. In this model, inequality is traded for fiscal discipline and high employment in the private sector. Hence, the intervention of the state in the economy should be as small as possible in order to allow the market to freely operate and allocate resources efficiently. The second model is referred to as the Christian Democrat model (also referred to as continental welfare state and/or Bismarckian system). Examples include countries such as Germany and Denmark. This model underlines the importance of fiscal discipline and income equality and less of the individual self-reliance and free markets. Free markets are seen as having dehumanizing effects; hence community, church, and family are the guardians against the negative effects of free markets. Social democrat model is the third ideal type of welfare capitalism identified by Esping-Andersen. This model combines an equal society with a work ethic that underlines employment as the most important element of the society; however, fiscal discipline receives less attention in this model. Thus, state has an important role to play in this model in order to produce high employment rates and equality.

In a similar fashion, Pastore (2015) argues that we can classify the school-to-work regimes in EU as follows: North European; Continental Europe; Anglo-Saxon System; South European System; and New Member States. This classification is somehow evident also when looking at the cluster of OECD countries in terms of youth unemployment rates, absolute unemployment rate, and relative disadvantage. In this case, Smyth et al. (2001) argues that these groupings are formed partly independent of economic conditions and compositional differences in young people's education. Accordingly, it can be suggested that each country belongs to a distinct school-to-work regime which produces a specific result in terms of youth unemployment. A school-to-work regime includes all institutions that affect the process of moving from education to the labor markets, including education and training system, labor market regulations, welfare state and family structure (Pastore, 2015). In the following paragraphs, I will present a summary of these distinct school-to-work regimes.

The *North European System* which is characterized by active labor market policies can be associated with the social democrat model, in which the focus lies on employment and equality. This is a typical model embraced by Scandinavian countries (Finland, Norway, Sweden and to some extent Denmark and Netherlands). In this system, the state has a responsibility for providing full employment, while unions play a strong role in designing income support schemes and active labor market policies (Skans, 2007).

Up to 1989 employment rates in Sweden were considered as a miracle compared to other developed countries. The unemployment rates in Sweden oscillated around 2 percent trend while the OECD average climbed to 10 percent. Since Swedish labor market policy was oriented toward maintaining high levels of employment, that was achieved through a loose fiscal policy and high spending on ALMP (Wood, 2001). Nevertheless, these policies were not effective in keeping unemployment rates as low as pre-1989 period, and compared to Germany youth labor markets have been facing severe hardship over the last decades.

The dual education system, which is a characteristic of *continental European regime* as presented above it is typical of countries like Germany, Austria and to some extent Belgium and Denmark. This model underlines the importance of fiscal discipline and income equality and less of the individual self-reliance and free markets. Free markets are seen as having dehumanizing effects; hence community, church, and family are the guardians against the negative effects of free markets. Nevertheless, a striking difference of this model is the dual education system which is considered responsible for the lowest youth-to-adult unemployment ratio worldwide. A vast literature is dedicated to explaining the success of this model, with a special focus on the dual educational system of Germany (for more see Steedman, 1993; Ryan, 2001; O'Higgins, 2001; and Ryan et al. 2013).

The third regime, characterized by high-quality education and labor market flexibility is associated with the Anglo-Saxon word of welfare capitalism. The lack of strong labor market regulations coupled with high-quality education assumes that individuals have to find their own way in the labor market. Income support is available only for the poorest, while unemployment benefits and apprenticeship are very low (Weishaupt, 2011). Interestingly, the length of the transition from school to work, and unemployment spells are lower than average in these countries. For example, school-to-work transition period is lower than in Scandinavian and South European countries, but higher than in Germany and Austria (Quintini et al. 2007).

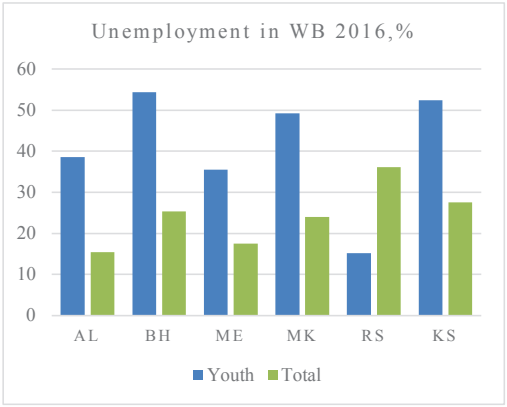
The fourth model is the South European System characterized by family networks and temporary work. This regime is typical for countries like France, Greece, Italy, Portugal, and Spain. The main features of this model can be summarized as follows: the role of the state in smoothing the school-to-work transition is less important than in Central European and Social Democrat regimes; the right to education is universal; passive income support is granted only to dismissed work; there is constant attempt to reform in order to decrease labor market rigidities towards more flexibility; informal networks (e.g. family, friends) are more important and have a stronger influence in finding a job as compared to formal networks (e.g. ex. Boss, colleagues); spending in ALMP is low and countries belonging to this regime score the highest youth unemployment rates in Europe (Pastore, 2015).

The final model tries to understand the new member states through the lenses of the process of transition from socialism. While the school-to-work transition regime is very different from country to country, all these countries share a socialist heritage and are characterized by high rates of youth unemployment. Beleva et al. 2001, Pastore (2012B) and Domadenik and Pastore (2006) find evidence of a huge disadvantage of young people as compared to adults in terms of unemployment. While education is valued highly as a result of old traditions, there exists a significant mismatch between the supply of the education system and labor market requirements. Meanwhile, as a result of low-quality education and inefficient national public policies, these countries are dealing with a significant brain drain (Ienciu & Ienciu, 2015)

Breaking down the problem of youth unemployment in Kosovo

Youth unemployment rates (YUR)

Based on the LFS 2016, 30.4% of the unemployed in Kosovo were young people (aged 15 - 24 years) with almost 12-point difference between males and females. A significant proportion of the young population is unemployed (52.4%) and youth unemployment among females is higher (65.4 %) compared to males (47.2%) (KLFS, 2016). The ratio of youth unemployment to adult unemployment rate (RD) is 2.3. Meanwhile, if we look at Western Balkan countries youth unemployment rates show a similar trend as in EU countries, at levels about twice as high as overall unemployment rates. While the relative gap is the same, in absolute levels young people in the Western Balkans are at a much greater disadvantage since the unemployment rate itself is much higher than in the EUcountries (World Bank 2016).



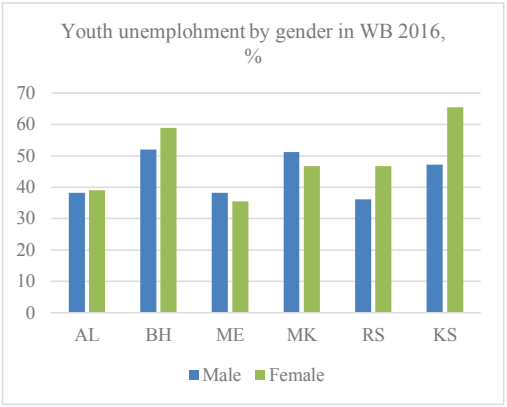


Figure 1 Source: SEE Jobs Gateway Database, National Statistical Offices

YUR according to age, gender and level of education

While many countries face rapid population aging, especially in the developed world this is not the case for the developing world and especially for Kosovo. As a result, providing good education and good job opportunities is a major challenge for countries where youth account for a large share of the working-age population. In order to illustrate differences around the world, we can point that youth aged 15-24 make up about a third of the working age population in South Africa while the same youth cohort is about half the size in Italy and Spain following major declines over the past half century (Quintini & Martin, 2014). Our region and especially Kosovo faces the same challenges as other developing countries around the world. Unlike most other countries in the Western Balkans, Kosovo has a young population, with 28% of the population less than 15 years old compared to 19% in Albania and 14% in Serbia. Meanwhile, the share of youth under 25 years old is still larger compared to any other country and it is around 42% (Figure 2).

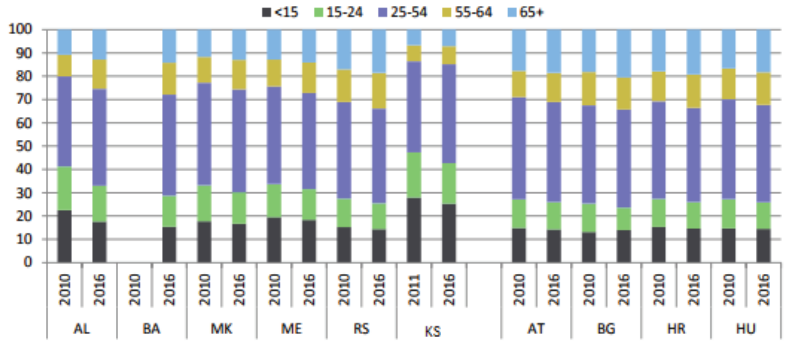


Figure 2 Population structure by age groups, 2010 and 2016, share in %

Source: Eurostat and Index Mundi

Additionally, the challenge becomes tougher when looking at the unemployment of recent graduates. A survey conducted in Kosovo finds that recent graduates unemployment rate in Kosovo is 49% (EC graduate survey), much higher than for all graduates and closer to the youth unemployment rate of 52.4% for 15-24 year old (and 37% for 25-34-year-old) (European Commission, 2016). The official statistics show that unemployment rates of Higher Education (HE) graduates in Kosovo is 18% (KAS, 2017), and while having a tertiary diploma reduces the chance of being unemployed by about a half in relation to less educated groups, the unemployment rate of HE graduates is more than three times as high as in the EU-28 (European Commission, 2016). In the following table, we can see that despite the fact that

unemployment rate for the whole population and youth in general fell, the unemployment rate of HE graduates remained the same.

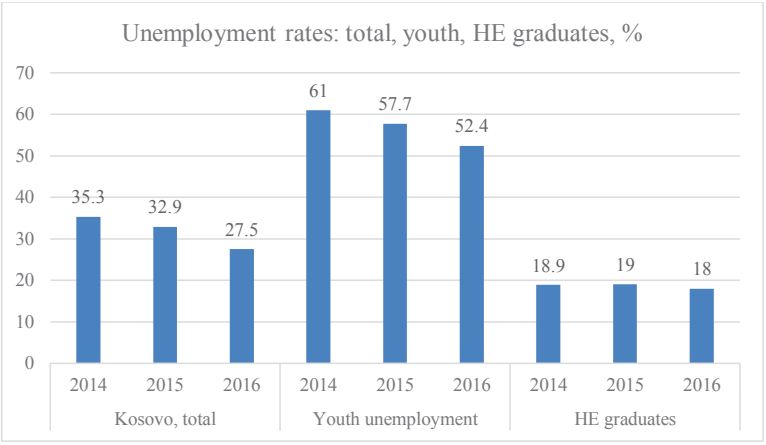


Figure 3 Source: Kosovo Labor Force Survey

In 2016 the unemployment rate for persons without official education was 47.2%; for those with primary education 32.6; meanwhile, for those with secondary education from gymnasium (grammar school) it was 24.3% and from vocational school 32.5%. In comparison, the unemployment rate of HE graduates was 18% (KAS, 2017). These numbers show the importance of higher education in finding a job since HE qualification reduces the chance of being employed in relation to less educated groups. Nevertheless, the unemployment rate for higher education graduates is still high in comparison to EU-28.

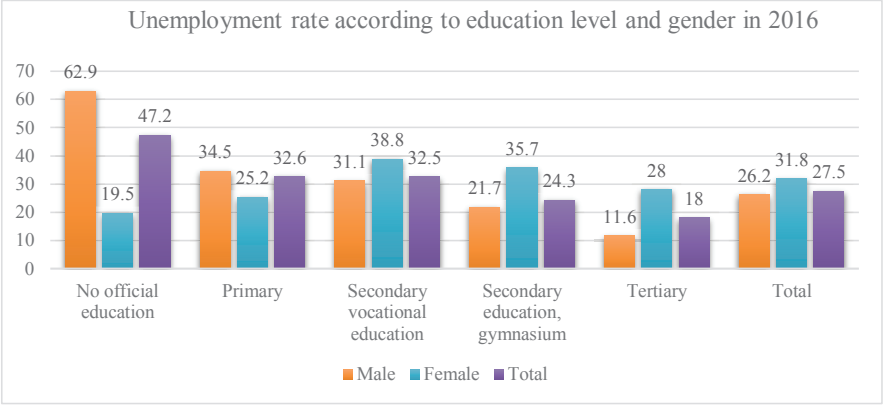


Figure 4 Source: Kosovo Labor Force Survey, 2016

Unemployment rate - only one part of the story

As discussed earlier, the unemployment rate – the ratio of unemployed youth to the total number of youth in the labor force – is the most widely used measure in presenting the difficulties faced by young people in the labor market. However, a very important distinction in young people employment analysis is that between unemployment and inactivity. When young people face employment difficulties they can decide to skip looking for a job in favor of studying, leisure, illicit activities or inertia (Ryan, 2001). Accordingly, the attention has turned to those who are out of the education system and not looking for a job, more precisely young individuals who are not in employment, education or training (NEETs). Youths out of education and employment represent a serious problem considering that in the future they will lack the needed experience, while at the same time they are not building their human capital either. In comparison with EU 28, Kosovo's NEETs number are particularly high. For example, in 2016, 103,843 of young people (aged 15 to 24) were out of education and labor markets accounting for 30.1 % of the young population. Meanwhile, the rate of NEET for females is 34.2% compared with 25.5% of males (KAS, 2017). Looking at EU 28, the share of NEET in 2016, for people aged 20–34[11], was 18.3%, with rates as low as 10% in countries such as Luxembourg, the Netherlands, and Sweden. On the other side, the highest rates were recorded in Italy and Greece, 30.7 % and 30.5 % respectively; there were also very high NEET rates in the former Yugoslav Republic of Macedonia (37.7 %) and Turkey (34.0 %) (Comission, 2017).

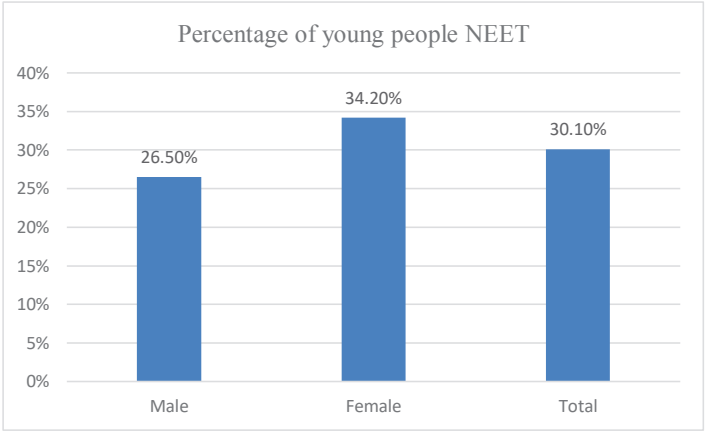


Figure 5 Source: Kosovo Labor Force Survey 2016

[11] "Given that the vast majority (90.2 %) of young people in the EU-28 between the ages of 15 and 19 continued to participate in some form of education and training (either formal or non-formal), the following analysis mainly focuses on the population aged 20 to 34" (Comission, 2017).

Meanwhile, the inactivity rate in the Western Balkans-6 was as high as 40 percent in 2015, significantly higher than in the EU (25-35 percent). The share of people outside the labor market was highest in Kosovo (61.8 percent) and Bosnia and Herzegovina (45.4 percent) and lowest in FYR Macedonia and in Albania, where it was close to 36 percent in each country. In some countries (FYR Macedonia, Kosovo and Bosnia and Herzegovina), female inactivity is twice as high as the male rate (World Bank, 2017). In Western Balkans in general, inactivity is a phenomenon touching mostly youth, women and less educated.

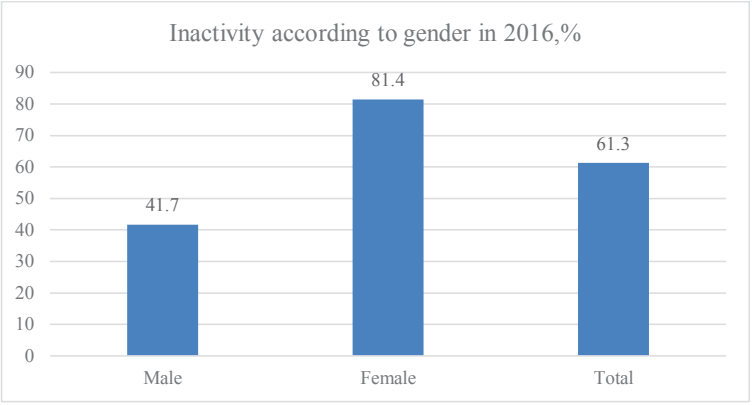


Figure 6 Source: Kosovo Labor Force Survey 2016

In summary, figures show that inactivity is high, gender disparities in participation and unemployment are significant, with youth and women continuing to be more excluded from the labor market.

The quality of youth entry jobs

A very important indicator of youth fortunes in the labor markets is the type of jobs held by them. For example, Manacorda et al.(2017) show that self-employment and unpaid family work are more prevalent in low-income countries and wage employment is less likely in low-income countries compared to high-income countries. The same applies for stable employment, defined as wage work with indefinite contract or a contract at least 12 months. Besides the low level of employment in Kosovo, 22.9% of employed persons worked in unstable jobs. Workers in unstable jobs are either self-employed people without employees or those who work without pay in a family business (KLFS, 2017). Overall, men are more affected by informal employment than women in (24.1% of employed males compared with 18.8% of employed females).

School-to-work transition regime

Following the grouping proposed by (Pastore, 2015) for school-to-work transition regimes I will try to present a brief overview of the context in which SWT plays out in Kosovo, consider some of the main challenges and consider whether Kosovo's interaction between labor and education institutions and policies can classify it in one of the aforementioned regimes.

While the discussion up to now shows clearly that the transition to work for young people is everything but smooth, we can now identify several structural factors that are responsible for a difficult school-to-work transition for young people: low quality education, lack of skills, weak links between schooling and employment, asymmetry of information on the side of employers with respect to the productivity of youth, attitudes, social norms, and lack of access to childcare services are serious barriers to youth, particularly women, entering the labor market (World Bank 2016). This represent a serious problem for a country with such a young population and a real waste of resources for a developing country like Kosovo. A European Commission survey shows that unemployed graduates remain unemployed on average for sixteen months, yet they have also been on average one year and three months in employment, having spent on average nine months to find their first job. This suggests an unstable attachment to the labor market that lasts for a considerable period of time after graduation and can have negative implications for the productivity and competitiveness of the economy that persist over time (European Commission, 2016). While having a HE degree offers some form of protection against unemployment (*see* Figure 4), the unemployment rate of recent graduates is still very high at 49%, similar to the general rate of unemployment for young people of the same age group.

Public spending in the Education Sector in Kosovo was 4.7% of GDP in 2014, while per capita spending in the Pre-University Education in 2014 was 477 EUR (or 16.1 % of per-capita GDP), whereas in Higher Education – 703 EUR (or 23.8 % of per-capita GDP). Considering the challenges in youth labor markets and the quality of education this is considerably low, meanwhile if compared to OECD countries, expenditure per student by educational institutions averages 21% of GDP per capita at the primary level, 26% at the secondary level and 41% at the tertiary level (MEST, 2016). Countries with younger populations such as Kosovo have the tendency to spend more on education as a percentage of total public expenditure than those with older populations. Therefore, it is important for Kosovo to utilize better the available resource, as well as to gradually increase spending in education, in order to make the necessary improvements in its education system.

Primary and lower secondary education is compulsory, leading to a participation rate of 96% in primary and 98% in lower secondary. Accordingly, enrolment rates in primary and lower secondary education can

be considered as almost universal, while upper secondary gross enrolments stand at 84.7%. An interesting observation is that around half of pupils in upper secondary education choose a vocational education profile. The number of students in higher education has increased to around 122,000, putting Kosovo at the top of European countries with 6,669 students for 100,000 inhabitants (MEST, 2016). While in previous sections we presented how countries like Germany use vocational schools in providing young people with a smooth transition to employment, by combining apprenticeships in firms and vocational education at a vocational school in one course, Kosovo institutions acknowledge[12] the fact that current VET do not comply with labor market needs (MEST, 2016). Whereas it is understandable that harmonizing education with labor market needs requires a lot of efforts, time and money, it is less understandable how VETs, whose reason of existence is to bring young people closer to labor markets, fail to comply with labor market needs.

In recent years there has been a rapid expansion of the HE system with 39 accredited and licensed HE institutions exceeding EU average with 20 HE institutions per 1 million inhabitants. The number of students in Higher Education in Kosovo has increased from about 40,000 in 2004 to 122,000 in 2015. The most frequent field of study is Business, Administration, and Law, attracting 52.1% of all new students while only 20 % enroll in Science, Technology, Engineering and Mathematics (STEM) subjects (European Commission, 2016). This statistic is suggestive of a skill mismatch between education and

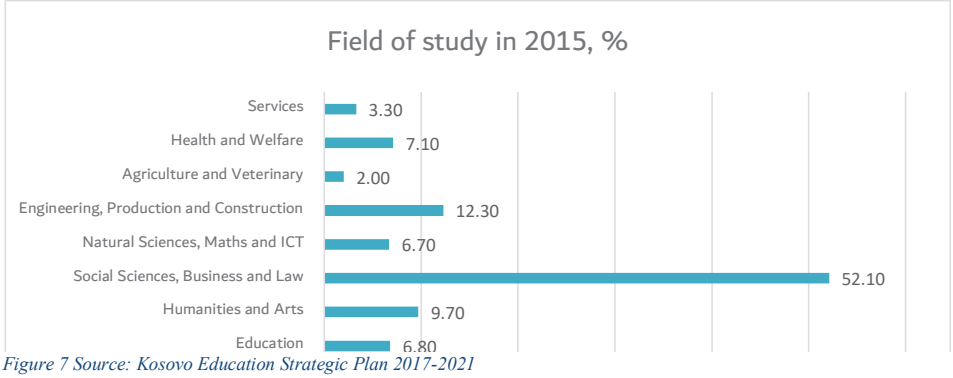


Figure 7 Source: Kosovo Education Strategic Plan 2017-2021

labor markets. A surplus of graduates from Business, Administration & Law and Arts & Humanities study programs is accompanied with an emerging shortage of graduates from STEM study fields,

[12] Harmonizing VET with labor market requirements is one of the strategic objectives of KOSOVO's EDUCATION STRATEGIC PLAN 2017-2021.

especially in Engineering and ICT. While the quality of education is a big factor in student's decision, future employment opportunities play a big part as well. For example in 2014 the government and State-Owned Enterprises (SOEs) employed about 78% of all individuals with tertiary education in Kosovo, and the private sector provides only half of all salaried jobs in Kosovo (Winkler, 2014). Usually, government and SOE occupations require general skills which can be mostly gained by following social sciences programs. Additionally, the lack of quality of VET plays an important part in creating this mismatch. Apart from low quality, weak links with labor markets and mismatch in skill supply Kosovo – corruption within the education system is another major problem. A UNDP study revealed that in more than 5% of the contacts that respondents had with education institutions, they were either asked for payment, a gift, or they gave "rewards" worth 50 Euros or more, in exchange for services (UNDP, 2015). Unfortunately, it is almost impossible to tackle all the aforementioned challenges in an educational system with corruption installed within the system.

On the side of labor market policies, the government has been limited in its attempts to deal with the issue of smoothing the transition from school to work. Most of the attempts at supporting entrepreneurship programs, on-the-job training and wage subsidy schemes have come through donors, even though they have been limited in scope. This means that active labor market policies which include training to start-up support, wage subsidies and public work should be designed better to target youth unemployment (World Bank, 2017).

As a summary of the discussion, we can argue that Kosovo fits better to the fifth SWT regime, where new member states are included and are characterized by high youth unemployment, low quality of education, significant mismatch between the supply of the education system and labor market requirements and inefficient public policies in the side of labor markets.

Conclusion

Young people face many problems in their transition from school to work. Unemployment, long-term unemployment, and inactivity comprise some of the major consequences of an ineffective transition for young people. The problems associated with youth unemployment are not confined to economic consequences such as loss of income or increased experience gap, but also with social costs in terms of the overall well-being of youth and their social standing.

This paper began with a thorough review of the available literature in an attempt to provide a theoretical framework to think about the youth unemployment and inactivity problems. While presenting and analyzing different school-to-work transition regimes it was obvious that one of the most successful is the dual-education system in Germany, where education and work experience are brought together. In contrast, Kosovo can be associated with new members states who face some of the toughest problems in reforming their education and labor markets in order to provide young people with a smooth transition. Therefore, a huge number of youth remain unemployed, inactive or migrate. Based on a brief overview it is obvious that Kosovo's school to work transition institutions are not well equipped to tackle youth unemployment and inactivity. Some of the major issues are related to the lack of quality education resulting in inappropriate skills, mismatch between labor market requirements and education, as well as corruption within the education system. A lot of work, efforts, and resources are needed to overcome these problems, nevertheless, when taking into account Kosovo's share of youth in total population it is important to understand that by ignoring these issues we can pave the way for major economic and social consequences in the future.

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ADOPTION, DIFFUSION AND USE OF E-GOVERNMENT SERVICES IN KOSOVO

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E-Government in the perspective of the citizens it is considered as an approach for improving government services in many countries. E-Government is the use of information and communication technologies (ICTs) to enhance the services of public sector organizations, through which citizens, businesses and the government itself will have more useful services. Kosovo is a developing country with a wide range of needs for improvement in the field of e-services, because while internet diffusion is pretty high the use of it for e-government is not that high. Therefore, the citizens' behavior in relation to their engagement with e-government should be analyzed in more depth. This study aims to explain the most important factors that determine the intention to adopt of E-government by citizens in Kosovo using the Unified Theory of Acceptance and Use of Technology (UTAUT). A survey was conducted regarding the perception of recent e-government services among Kosovo citizens. We collected data on a convenience sample of 461 citizens using Google Forms. Results show that Performance Expectancy, Social Influence and Facilitating Conditions have positive impact on Behavioral Intention. While, Effort Expectancy was found to not have any impact on intention to adopt E-government.

Key words: e-government, UTAUT, services, Kosovo, technology, adoption
JEL: L86; L88; L89.

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Introduction

ICTs and especially internet has revolutionized whole world society structure, values, culture and more importantly the way we communicate and conduct business. Following these developments governments all around the world have tried to take the advantages that ICTs offer and implement and adopt their E-government systems and services. They utilized ICT technologies to offer online services now called E-government with the aim to improve those services such as improving the processes and operations of government services and enhancing information sharing between the government and public. Furthermore, E-government also help increase the level of services and, securely, safely, conveniently, and all this could be done with a reduced cost. Therefore, E-government has been developed to improve the efficiency of the government and its agencies, improve public communication with the citizens and increase engagement in transactional processes with individual and organizational subjects. According to (Affisco & Soliman, 2006)the concept of using electronic government has made the usage of services more useful and available. Despite the obvious benefits of implementing e-government, its implementation is not that simple because it faces several restrictions from the end user, for instance it requires a certain level of technology competence that in some demographics may be problematic or more importantly the trust and value perception issue, the citizens must trust the providers and must believe that the services that they offer have the same value as non-online services in order to achieve the desired level of usage.

Kosovo is at its beginning stage to e-government implementation and adoption, it is ranked pretty low with respect to provision of online services to the citizens. Nevertheless, there is still a big disparity evident between the political agenda on one hand and the actual implementation and users' expectations on the other hand (Rexhepi, Rexha, & Dika, 2012).But, the Kosovo E-Government Strategy 2009-2015(It, 2008) has found the most important priorities and objectives that need to be met. In this study e-Government refers to use of all electronic equipment to implement public e-services, especially the use of computers and smart phones.

During the last decade some of the authors that studied e-government found out that different projects were identified and fully or partly implemented as a basis for the provision of online services, such as the central register of citizens, the register of economic entities and several registers of cadastre and immovable properties for land administration. Besides such important projects, for development and implementation there is now a need of new projects that will allow the provision of specific online services, on the basis of which the ordinary citizens can experience the expected benefits of e-government and the information society (Rexhepi, Rexha, & Dika, 2012). The Kosovo Government's E-Government

Strategy 2009-2015(It, 2008) was released by the Department of Information Technology of Ministry for Public Services in September 2008. According to this strategy it takes time and a lot of work to do online accessibility to develop further the public government services. Recently, governments in the South-East countries have started using electronic government services as a means to achieve a high level of performance while providing cost effective outcomes. In the Kosovo Government's Strategy 2009-2015 is explained that E-governance for citizens is in its beginning phase. Despite the fact, that the integration of E-government services in Kosovo through the governmental portal for both citizens and businesses is still in its first stage, there are some evident improvements, which were made by some institutions such as certain Ministries and municipal governments. However, most of them are primarily offering information to citizens, while the direct citizen interaction with the government is still in its development stage.

In this paper we identify the factors that influence Kosovar citizens to use E-government by applying the UTAUT Model. UTAUT is a widely used model that combines eight major models of technology acceptance. Therefore, the aim of this paper is to present try to assess the E-government usage in Kosovo with the proposed model in order to understand and explain more about the acceptance and use of e-Government among the citizens.

Literature Review

The term e-government has also other synonyms, including electronic government, e-governance, e-Gov, online government and digital government (Gronlund & Horan, 2005). There are different definitions for the term e-government from different authors. Dada (2006) defined e-government as the use of information technology to enhance the relationship between the government and citizens in different fields. E-government in the information revolution is a new field and wave. Numerous governments around the world in the public sector attend this phenomenon hoping to reduce costs, improve services delivery for citizens, and increase efficacy and efficiency (Alshehri, 2012).

E-governance in developing countries has not been studied sufficiently. There are aspects of it that need to be studied more deeply, especially in the perspective of adoption or intention to continue using the online government services. Many studies have investigated the adoption of e-government services in developed countries, whereas relatively little has been undertaken in developing countries (Suha & Morris, 2008). The problem of low-level of citizen adoption of e-Government services is still an issue in most developing countries (Alzahrani & Goodwin, 2012). The same pattern is observed among Kosovo citizens too. In general, there are very few studies that deal with e-governance adoption in Kosovo, but to authors knowledge no study has been done using the model that this paper uses (UTAUT model). Numerous models are used to understand users' adoption of new technologies and various models were developed including the Technology Acceptance Model (TAM) (Davis, 1989), the Diffusion of

Innovation (DOI) (Rogers, 1995) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venaktesh, Morris, Davis, & F.Davis, 2003). Each of these models has sought to identify the factors which influence a citizen's intention or current use of information technology. E-government offers different type of services electronically to all beneficiaries, such as government agencies, employees, citizens and business sectors. According to the World Bank (2010) relationship of government with recipients of its electronic services is characterized as: government to citizen G2C; government to business G2B; government to employees G2E; and government to government G2G. One of the most mentioned reasons for the creation of a e-government implementation strategy is that it allows transparency in public acts on information about income and expenses, in addition to providing a greater amount of available services, increasing the efficiency and responsiveness of Government (Brunetti & Weder, 2003). Thi & Thao (2017) explain that E-government can be widely defined as the utilization of ICTs and Internet to improve and enhance and improve the access, the delivery of all aspects of government services and operations for the benefit of citizens, employees, businesses and other stakeholders. The implementation of E-government is particularly important for developing countries as well as for Republic of Kosovo to narrow their gap with developed countries and to explore benefits more from the development of ICTs. Kosovo is a small country with a young population which needs a wide range of improvements for its development.

Research Model

The Unified Theory of Acceptance and Use of Technology (UTAUT) model aims to explain technology acceptance, which is known as one of the newest adoption technology theories or models. The UTAUT, is based on eight technology acceptance theories or models. Especially, the UTAUT draws on the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behavior (TPB), the combined TAM and TPB, the model of Personal Computer Utilization, the Innovation Diffusion Theory and the Social Cognitive Theory (Venkatesh, Morris, Davis, & Davis, 2003b).In this model are included these factors: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Behavioral Intention, which is shown in figure 1.

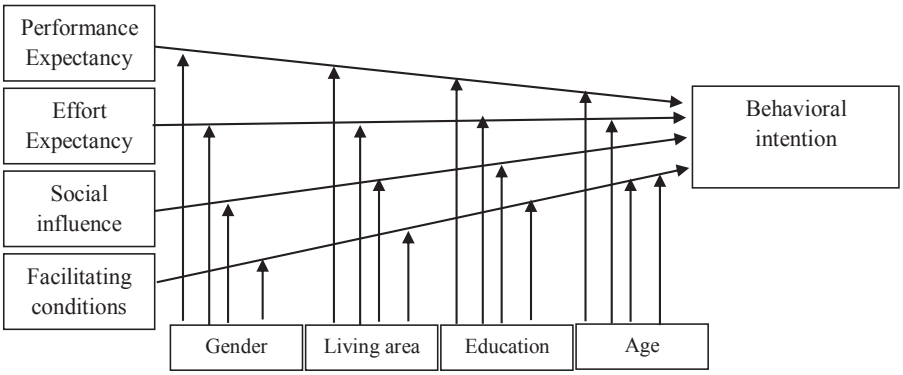

Figure 1. Research Model (Adapted from (Venkatesh, 2003)

Hypothesis development

Performance expectancy

Performance expectancy "*is the degree to which an individual believes that using the system will help him or her to attain gains in job performance"*(Venkatesh et al., 2003). According to Alshehri et al. (Mohamed Alshehri, Alhussain, Drew, & Alghamdi, 2012)Performance expectancy impacts intention to use e-government services Alwadhi and Morris in their research have found that performance expectancy is an important factor that has influenced behavioral intention of respondents to use e-government services. Performance expectancy is main predictor of behavioral intention to use e-government services (Rosen, 2005). Based on the research model and previous researches, the following hypothesis is developed:

H1: Performance expectancy has a positive influence on behavioral intention to use E-government services.

Effort expectancy

Venkatesh et al. (2003)defined effort expectancy as "*the degree of ease associated with use of the system*". Effort expectancy is measured by the perception of ease, which it can be taught, used, and become capable of using these system information technologies. Effort expectancy can be considered one of the most important factors of UTAUT model, which is used by many researchers in their studies. According to Mohammed Alshehri et al. (Mohammed Alshehri, Drew, & Alghamdi, 2012)effort expectancy has a positive impact on Behavioral Intention to use e-government services.(Alawadhi& Morris, 2008)in their study have found that exists direct relationship between effort expectancy and behavioral intention to use e-government services. Based on the research model and previous researches, the following hypothesis is developed:

H2: Effort expectancy has a positive influence on behavioral intention to use E-government services.

Social influence

Social influence is defined as "*the degree to which an individual perceives that important others believe he or she should use the new system*(Venkatesh et al., 2003).Social influence is considered as an important of UTAUT model. Alshehri et al. (Mohamed Alshehri et al., 2012) in their study have found that social influence does not have any impact in behavioral intention to use e-government services. According to Rosen (Rosen, 2005) social influence has no impact in behavioral intention to use e-

government services. Based on the research model and previous researches, the following hypothesis is developed:

H3: Social influence has a positive influence on behavioral intention to use E-government services.

Facilitating conditions

Facilitating conditions is defined as "*the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system* (Venkatesh et al., 2003). Alawadhi and Morris(Alawadhi & Morris, 2008)in their study have found that facilitating condition has significant impact on behavioral intention to use e-government services, whereas Rosen (Rosen, 2005) has found that facilitating condition has no impact in behavioral intention to use e-government services. Based on the research model and previous researches, the following hypothesis is developed:

H4: Facilitating conditions has a positive influence on behavioral intention to use E-government services.

Research Methodology

This study seeks to examine the effect of the factors that impact intention to adopt E-Government by individuals in Kosovo. Therefore, this study is based on Unified theory of acceptance and use of technology (UTAUT) proposed by (Venkatesh et al., 2003a),this model is modified to fit the context of our study. In this study, we measure intention of Kosovo's citizens to adopt E-Government, therefore, in the conceptual and econometric model, E-Government is represented as behavioral intention to adopt it. Individuals with tertiary education are used as sample because the adoption of technological innovations is perceived to be adopted faster that other education groups.

The quantitative method is used to conduct this study, which consists on collecting numerical data with a questionnaire-survey and analyzing those data statistically. The research instrument that we used in this study is a based on the existing literature and is a modification of them in order to fit the context of the study. All the items of the used in this study were first developed in English and then translated in Albanian by the researchers (items used in this study can be found in annex). The final version of the questionnaire is divided into two sections. The first section contains the demographic questions, the second section contains questions about UTAUT constructs. Five-point Likert scale type questions are used to measure all items of the proposed model, where (1) strongly disagree and (5) strongly agree. But the final variables that are used in the OLS regressions are arithmetic means of the items of each construct.

The target population of this study are Kosovo citizens above eighteen years old who have finished at least one degree of tertiary education, we used a convenience sample, because we couldn't obtain the sampling frame, but we made sure that all regions of the Kosovo to be represented according to the

population. Data were collected through a survey that took place over a one-month period in April 2017, the survey was administrated online via Google Forms. In total we collected a total of 461 usable responses students.

Model Specification

To estimate the impact of proposed factors intention to adopt E-government we used a multiple regression econometric model. As dependent variable, we used the intention to adopt E-government, which is an arithmetic mean of items that are used to measure this construct. As independent variables we used UTAUT model variables, and we further added four control variables which are dummies for gender where female is the reference group, area on which respondents live where rural is the reference group, education where bachelor is reference group and age dummies. Table 1 gives details about the variables of this study.

Our model can be formally expressed as follows:

$$\boldsymbol{EGOV\_IN_i} = \beta_0 + \beta_1 \mathrm{PE}_i + \beta_2 \mathrm{EE}_i + \beta_3 \mathrm{SI}_i + \beta_4 \mathrm{FC}_i + \delta_1 \mathrm{Male}_i + \delta_2 Urban_i + \boldsymbol{\theta' Education_i} + \xi' \boldsymbol{Age_i} + \varepsilon_i \quad (1)$$

Where the outcome EGOV_IN represent intention to adopt E-government, PE is Performance Expectancy, EE is Effort Expectancy, SI is Social Influence, FC is Facilitating Conditions. Further, β0 is a constant term, β1 to β4 are parameters to be estimated from the independent variables used in the model, Male_i if the respondent is male (female is used as reference group), Urban_iif the respondent lives in urban area (rural is used as reference group) $\mathrm{Education}_i$is a row vector of education dummies (with "bachelor" as the reference group), $\mathrm{Age}_i$is a row vector of age dummies (with "Age=18-25" as the reference group), and εi is error term.

Table 1. summarizes the variables of this model and gives their definition

Table 6: Definition of the variables

Variable	Definition		Measures
DEPENDET VARIABLES			
$EGOV\_IN_i$	*Intention to adopt E-government*		*Ordinal variable:* 1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree (Average of the items used in OLS)
INDEPENDENT VARIABLES			
Technology acceptance model (TAM) constructs			
PE	*the degree to which an individual believes that using the system will help him or her to attain gains in job performance.*		*Ordinal variable:* 1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree
EE	*the degree of ease associated with use of the system*		*Ordinal variable:* 1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree
SI	*the degree to which an individual perceives that important others believe he or she should use the new system*		*Ordinal variable:* 1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree
FC	*the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system*		*Ordinal variable:* 1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree
Control variables			
Gender: *Binary:* 0= Female; 1= Male	**Living area:** *Binary:* 0= Rural;1= Urban	**Education:** *Categorical:* 1= Bachelor; 2= Masters; 3= PhD	**Age***:* *Categorical:* 1= 18-25; 2= 26-35; 3= 36-50; 4= 51+

Results

Descriptive statistics

The purpose of this study is to identify factors that affect adoption of E-government. Table 1 indicates descriptive statistics of respondent characteristics such: gender, age, study level, employment, living area, most used equipment and e-government services usage.

Table 1.*Demographic profile of the respondents and e-government usage*

Respondent characteristics	**Frequency**	**Percentage**
Gender		
Female	272	59.0
Male	189	41.0
Age		
18-25	236	51.2
26-35	143	31.0
36-50	62	13.4
50+	20	4.3
Study level		
Bachelor	289	62.7
Master	128	27.8
PhD	44	9.5
Employment		
No	240	52.1
Yes	221	47.9
Living area		
Rural	221	48.7
Urban	233	51.3
Most used equipment		
Desktop	361	14.8
Laptop	379	33.4
Smartphone	417	50.3
Tablet	223	1.5
E-government services usage	**Yes**	**No**
Withdrawal of personal documents	138	323
Tax payment	88	368

Payment of home bills	112	349
Declaration of property	23	436
Declaration of income	27	434
Property tax payment	43	418
Pension contribution	85	376
Visa application	99	362
Fill in forms for personal docs	162	299

In the table above, from gender results we can see that 59% of respondents were female and 41% were male. From this we can understand that females are more likely to use e-government services than males. According to the age results, most of the respondents were in the age category of 18-25 years (51.2%), then in the age category of 26-35 years were 31% of respondents, 13.4% were between 36-50 years and only 4.3% of respondents were 50+ years. This leaves us to understand that new generation is more likely to adopt new technologies. Regarding to study level 62.7% of respondents have finished Bachelor degree, 27.8% of them have finished Master degree and 9.5% of them have finished PhD studies. Concerning the employment status 52.1% of respondents do not work, whereas 47.9% of them were working. In the terms of living area of respondents dominate people who live in urban area 51.3%, while only 48.7% of respondents lived in rural area. The most used equipment from respondents was smartphone and there are more respondents who do not use e-government services.

Econometric results

Table 2 indicates the results of multiple regression analysis. For this study is used UTAUT mode, where the independent variables are Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC) and the dependent variable is Behavioral Intention (BI). As control variables are used: gender, living area, study level and age of respondents.

Table 2: Multiple regression results

Variable/Model	*B*	*Std. Error*	*Beta*
Constant	0.504***	0.189	
Performance Expectancy (PE_i)	0.418***	0.057	0.381
Effort Expectancy (EE_i)	0.034	0.064	0.030
Social Influence (SI_i)	0.161***	0.053	0.152

Facilitating Conditions (FC_i)	0.202***	0.047	0.195
$Male_i$	0.110	0.080	0.051
$Urban_i$	0.208***	0.078	0.098
$Master_i$	0.154*	0.092	0.065
PhD_i	0.262*	0.140	0.073
Age_i (26-35)	-0.062	0.093	-0.027
Age_i (37-50)	-0.124	0.122	-0.040
Age_i (51+)	-0.402**	0.197	-0.078
N		641	
R Square		0.433	

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

The focus in this model is in main factors of UTAUT, to explain how they affect behavioral intention. The results of multiple regression analysis indicate that Performance Expectancy, Social Influence and Facilitating Conditions have positive impact on Behavioral Intention, whereas Effort Expectancy is found to not have any impact on Behavioral Intention. According to results the coefficient of regression for Performance Expectancy is 0.418, which indicates that if Performance Expectancy changes for one-unit Behavioral Intention will increase for 0.418 times. As it is mentioned above Performance Expectancy is statistically significant at the level 5%, which means that hypothesis H1 is accepted. Effort Expectancy is the second variable of this study which is found to not be statistically significant and do not have any impact in Behavioral Intention, so we can state that hypothesis H2 is rejected. Social influence is statistically significant at the level 5%, where the coefficient of regression is 0.161. Behavioral Intention will be increased by 0.161 times, if Social influence changes by one unit. Based on results hypothesis H2 is accepted. Regarding to Facilitating Conditions which is another factor of UTAUT model, coefficient of regression is 0.202 which is lower than the coefficient of Performance Expectancy and higher than the coefficient of Social Influence. Facilitating Conditions is found to be statistically significant, so hypothesis H4 is accepted.

Gender, living area, study level and age dummies of respondents are used as control variables on the model. The coefficient for male is 0.110 which means that the odds of adopting E-government increases by that coefficient. Regarding to urban living area the odds of adopting E-government increases by the coefficient 0.208. For the students in higher educations like Master and PhD the odds of adopting E-government increases by the coefficient 0.154 for Master and 0.262 for PhD. In the case of age, we can see that odds of adoption E-government services decreases by coefficients presented in the table.
Finally, R square has the value of 0.433 which indicates that the independent variables show 43% variability in behavioral intention to adopt e-government services.

Conclusion

The main purpose of this study was to show which factors of UTAUT model impact intention to adopt E-government by citizens in Kosovo. From the findings of our research, we can conclude that Performance Expectancy, Social Influence and Facilitating Conditions have positive impact on intention to adopt E-government services. Only Effort Expectancy was not statistically significant, which means that it does not have impact on adoption of E-government services.
Adoption and usage of E-government services facilitates work of people and it is important to know what services use citizens of Kosovo. From the results we have seen that there are more respondents who do not use e-government services and the most used e-government service was “Fill in forms for personal docs”.
Results show that that just one factor of UTAUT out of four has not a statistically significant impact on intention to adopt e-government services, all others have. Also, the level of usage of e-government services is low and maybe for these citizens are not yet conscious for the importance of using e-government services.
Findings of this paper provide the basis for several recommendations, it is very important to reduce the complexity of the e-government platforms and develop more user-friendly software that can be easily used for individuals who are less competent on using internet services. The level of complexity can be reduced by simplifying the design of the websites or software making navigation easy. Another problem with the adoption of E-government is that most non-users do not have information about its existence or they lack of awareness of e-government services benefits. Therefore, government should try to raise awareness of e-government existence and benefits. Therefore, it is recommended that the Kosovo government should launch information campaigns on the existence and benefits of e-government services and how to use the online services as well.

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Annex 1

Performance Expectancy
Using e-government services enables me to accomplish my needs from the public sector more quickly and more efficiently.
Using e-government services increases the equity between all citizens.
Using e-government services would save citizens' time.
Using e-government services increases the quality of services.
I think E-governance offers advantages over other forms of services.
In general, E-governance is a useful and usable form to perform the necessary municipal and wider services.
Effort expectancy
Learning to use the e-government services system is easy
Using the e-government services system is easy
It is easy for me to become skillful at using the e-government services system
By using the e-government system, I am able to get government services easily
Social Influence
People who are important to me think that I should use e-government services.
People who influence my behavior think I should use the e-government services.
I would use e-government services if my friends and colleagues used them.
Government sectors encourage citizens to use the e-government services system.
Facilitating conditions
I have the resources necessary to use e-government services
I have the knowledge necessary to use e-government services
There is a specific person or group available for assistance with any technical problem I may encounter
Behavioral intention
I intend to use the e-government services in a near future
I predict I will use the e-government services in the near future
I plan to use e-government services in the next 12 months

EXPORT AND IMPORT TRENDS AND IMPACT ON GDP– EVIDENCE FROM KOSOVO

Fitore Kostanica Vatovci[1]

Srdjan Redzepagic[2]

Abstract

The role of exports and imports as an engine of economic growth has been at the center of many theoretical and empirical studies in developed and developing countries. Historically the imports level was greater than the exports one, so to improve the balance of payment,a country would have to work towards increasing exports. In this context, Kosovo as a lower medium income country is lacking behind in terms of the level of exports in comparison to imports. The economy is mainly based on imports from European and CEFTA, respectively regional countries.

The article focus and gives an insight about exports and imports trends during the last decade, comparing Kosovo economy with Western Balkan Countries and European economies. Additionally, it analyzes and provides evidence on the level of changes of these economic factors, and their impact on GDP of Kosovo. Data analysismainly covers the period from 2006-2016.Also, it has been used data of two different sources, Kosovo Agency of Statistics and the World Bank Indicators.

Kosovo Economy is lacking behind the other regional countries mostly due to its political status. Kosovo as a nation has a lot of potential, which in some cases, due to the status, could not be used properly. On the other hand, those potential sectors, which Kosovo has targeted as national economic development pillars, are subject of different trade barriers. After the Declaration of the Independence of Kosovo in 2008, Kosovo exports decreaseddramatically. This situation reflected with a high perception of an unstable country, which is still trying to keep the positive trends. Despite many barriers and external factors influence, Kosovo managed to remain among economies with potential in regard to economic development trends.

Key words: Exports, Imports, GDP, Economic Growth

JEL classification: F19; O11

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1. Introduction

Exports and imports are two processes that directly affect economic development. The relationship between exports and growth, or imports and growth or also between exports, imports and economic growth is an important research issue,the focus of a large number of theoretical as well of empirical studies. There are several reasons for exports of goods and services to bealways considered as a key economic and social development generator. Exports require innovation and improvement from the companies in order to retain market share. Moreover, exports provide sales growth and profit. On the other hand, in the case of expansion on foreign markets, companies are less dependent on local markets;in turn this leadsto the increasing of their market, but the reduction of local customers. In addition, exports have the capability to minimize the influence of market instability,thus companies who work globally become more adaptive on economic changes, customers' demands changes, and to seasonal fluctuations in the local economy.

According to Khan and Kundu(2012), GDP, export of goods and services,andimport of goods and services are the most important macro-economic indicators for a country. Furthermore, above mentioned indicators are considered to be the integral partof national growth of all economies. Kosovo economy has faced difficult obstacles and has been subject of many trade barriers that have influenced the volume of exports. As highlighted by the World Bank report(2017), Kosovo has a lot of natural resources and fertile land, greater productivity, and sustainability in agriculture and mining sector which are also considered potential sectors by the National Strategy for Economic Development 2016 - 2021(Kosova, 2016).

Due to the trade barriers, Kosovo goods which were exclusively produced for exports were not able to be freely traded, even not in regional countries. Some authors might disagree, but due to the current figures presented by relevant institutions we have the feeling that goods and services of Kosovo were not equally treated and therefore Kosovo exports could not cover more than 10 percent of the total imports. Despite the negative influence of the external factors, Kosovo goods and services have met its fruitful times in the year of 2010, when exports increased significantly. In numbers according to the Agency of Statistics, the exports increase was 79%. Mainly manufacturing goods have driven this increase, followed by crude materials, mineral fuels, animal and vegetables, etc. On the other side, imports marked an increase in 2011, mainly driven by mineral fuels, cruel materials, commodities and transactions, chemical products, etc. Moreover, Kosovo imports in 2016 have reached the highest percentage in the last decade.

This study is structuredfollows. After the introduction, we will give an overview of the existing literature and relevant studies and sources for the topic selected as well as some relevant empirical results. The third

section discusses more on the background andKosovo trends of exports and imports, highlighting the huge trade deficit as one of the main obstacles to economic development. Section four discusses the method and the data used in this paper, which are mostly comparison data from different data sources. Section fivegivesa comparison analysis of export, import, and GDP of Kosovo. Comparison is made on trade statistics and GDP and that between Kosovo, the Western Balkan (i.e. CEFTA countries), and EUcountries.The final section displays the concluding remarks and summarizes the recommendations from the study.

2. Literature review

The relationship between exports, imports, and economic growth is an important subject frequently discussed among policy makers, economists, and researchers in different studies in which they aim to explain different levels of economic growth between countries. Adam Smith and David Ricardo have argued that the role of international trade is very important on economic growth. More specifically, their work promoted the idea that regardless of the fact that many potential factors contributes to economic growth, exports is key and tends to be the most essential contributor(Smith, 1776; Ricardo, 1817).

Many researchers who tested the effects of exports and imports on economic growth have confirmed that exports positively affect economic growth (Tyler, 1981;Balassa, 1985; Anne O. Krueger, 1990). In addition to them, some researchers also found that both exports and imports have positive effect on economic growth. For instance, Velnampy(2013) in his study investigated the extent to which exports and imports affect economic growth and found that both exports and imports have a significant influence on economic growth. Further, he found a strong positive relationship between exports and imports as well.Hamdan(2016)examined the effect of export on economic growth in the Arab countries. The study used static panel data models, Pooled regression model (PRM), fixed effect model (FEM) and random effect model (REM) and found that exports and imports have positive effect on economic growth. Additionally, they found that economic growth is strongly related to labor productivity, which can be achieved by increasing imports of technology, which in return can lead to improvement of living standards in the Arab countries.

Khan et al.,(2012)in their study investigated the nexus between exports, imports, and economic growth in Pakistan by using annual data for the period 1972 to 2009,by using Granger causality and Co-integration tests. The results based on Error-Correction Model showed the existence of long-run correlation among exports, imports and economic growth. They also considered both exports and imports as an essential part for the economic growth of Pakistan.

Adel Shakeeb Mohsen (2015) analyzed the effects of exports and imports on the economic growth of Syria over the period 1980-2010. The ADF unit root test, Johansen co-integration test, Granger causality test, impulse response functions (IRF), and variance decomposition (VD) analysis were used in this study. The Johansen co-integration test indicates that GDP is positively and significantly related to the exports and imports. The Granger causality test indicates bidirectional causality relationships between exports, imports and GDP in the short and long run.

Besides, Aydin and Sari (2014) investigated in their study the relatıonship between exports and GDP in Turkey and found that there is a unidirectional causal relationship from the GDP to the exports. Husein(2009) also found that real GDP, real exports and terms of trade are co-integrated. However, there is a bidirectional causality relationship between exports and GDP in the long run, while empirical evidence points out to a unidirectional causality running from exports to economic growth in the short-run. Saaed and Hussain(2015) investigated the impact of exports and imports on economic growth in Tunisia using data for the period 1977-2012 and found unidirectional causality between exports and imports and between exports and economic growth. According to the authors, imports are seen as the source of economic growth in Tunisia.

However, some researches also argue that there is not such a relation among exports, imports, and the growth rate. Bakari and Mabrouki(2017) did not find any relationship between exports, imports and economic growth in a study conducted for Panama. However, they found that there is a strong evidence of bidirectional causality from imports to economic growth and from exports to economic growth.

Contrary to what was said above, there is a number of studies that definedthat imports growth causes GDP growth (Shahbaz & Rahman, 2012,Pistoresi & Rinaldi, 2012). More precisely, Fan and Nie(2013)have deduced that the growth rate of exports is led by the growth of imports by ensuring higher quality of the intermediate goods. However, Ajmi et al(2015)in their study investigated the dynamic causal link between exports and economic growth using both linear and nonlinear Granger causality tests. They used annual South African data on real exports and real gross domestic product form 1911-2011. As a result, the linear Granger causality test showed no evidence of significant causality between exports and GDP. The relevant VAR is unstable, which undermines their confidence in the causality result identified by linear Granger causality tests. Accordingly, they turned to the nonlinear methods to evaluate Granger causality between exports and GDP. The used both Himestra and Jones test, and found a unidirectional causality from GDP to exports. However, using Diks and Panchenko test, found evidence of significant bi-directional causality.

3. Background of exports and imports in Kosovo

Kosovo is a recent established country. Since its declarationof the independence on February 2008, Kosovo focused more on its political image than onits economic development. This might be a provocative statement since anyonefrom relevant institutions of Kosovo responsible for economic development areas is continuously proclaiming economic growth and development. After the 1999 war, Kosovo economy was destroyed, because of the conflict Kosovo has lost all local and international export markets and economic development still remains a challenge. According to Kosovo Customs, Kosovo exports covers only around 10% of the total imports.

Kosovo is an open economy with a fully liberalized trade regime, providing good conditions stimulatesthe private sector, attracts FDIs and enhances exports. Despite the fact of having a liberalized trade market, Kosovo never met its expectations regardingan adequate level of competitiveness of our products/services, thus resulting in a huge trade deficit. In macroeconomic terms the continuation of current situation will hinder Kosovo in improving economic indicators. Kosovo legal framework is well harmonized with the "acquiscommunautaire" of the European Union. However, rule of law enforcement is still a challenge. Around 40% of Kosovo enterprises ranked the non-implementation of lawsamong the biggest barriers of doing business. Kosovo enterprises are still trying to accommodate themselves into the local market, as well asregional and international markets are still a long-term goal due to the lack of economic potential and the quality of the goods and certificates. In 2007 Kosovo has joint the CEFTA market. Due to the signing of this agreement, Kosovo was fully liberalized, not even a sector was protected. UNMIK Administration has signed on behalf of Kosovo the agreement and yet even after a decade of its implementation Kosovo exporters are being discriminated and not equally treated. Kosovo exporters during these years have been facing different non-tariff barriers such as non-recognition of the stamps, additional laboratory tests, sanitary and phito-sanitary certificates, non-recognition of the plates, etc, by the regional countries, respectively by CEFTA member states.

Kosovo's economy, according to preliminary estimates of Kosovo Agency of Statistics,has grown by 3.4 percent in 2016. This growth of economic activity was generated mainly by investment growth of 9.1 percent and the increase of consumption by 3.0 percent, while net exports are characterized by a significant deepening of the deficit of 7.2 percent in real terms. The real growth of Kosovo's economy during 2016 is estimated to have been mainly driven by the growth of activity in the agriculture sector (7.6 percent), trade (4.8 percent) and financial activities (12.4 percent).

Meanwhile real decline is estimated to have been marked in real estate business (1.5 percent), processing industry (1.1 percent) and public administration (0.4 percent) (Central Bank of the Republic of Kosova, 2017).

Moreover, during 2016, the deficit of current and capital account amounted to 534.6 million euros, compared to the deficit of 471.4 million euro in the previous year(Central Bank of the Republic of Kosova, 2017). The decrease of exports of goods are mainly the result of the decrease of base metals exports, which at the same time have the highest share in the structure of total exports of the country (around 35.9 percent).As reported by the Kosovo Agency of Statistics(2016), the value of total imported goods amounted to 2.8 billioneuros, representing an annual increase of 5.9 percent. Within imports of goods, the imports of means of transport, machineries and mechanical equipment, plastic and rubber products, cooked foods, etc., was characterized with an increase. On the other hand, the import of mineral products suffered a significant decrease. Actually, the decrease in the value of exports and increase in the value of importedgoods resulted in the decrease of the coverage ratio of imports by exports to 11.1 percent (12.3 percent in 2015).

There are a lot of determinant factors and reasons for the poor performance of the export sector in Kosovo, including political, historic,and economic related reasons. According to World Bank(2017) the reasons for this situation are as stated below:

> *"The unresolved political status of Kosovo has been a hindrance to Kosovo economic development.*
>
> *The post-war Kosovo has inherited industries and companies in almost a total collapse as a result of destruction and theft; delays and many complications in the privatization process have made even more difficult for them to recover.*
>
> *For many years Kosovo was not part of regional initiatives aiming liberalization of trade, mainly due to unresolved political status.*
>
> *The level of Foreign Direct Investments (FDI) has not been satisfactorily (insignificant early after the 1999, however, relatively high since 2005), a factor very important in many transition countries in boosting their economies and particularly their export sector.*
>
> *Informal economy is also a dimension that should be mentioned which is estimated to comprise about 30-40% of Gross Domestic Product.*
>
> *Irregular power supply and limited road infrastructure as part of Kosovo reality"*

4. Data and method

This study aims to analyze trends of exports and imports and the impact they have on Kosovo nominal GDP in comparison with Western Balkan Countries and European Union countries. For the purpose of this study, we have used three main indicators such as GDP, exports and imports for the last decade, respectively from 2006-2016. This study, specifically the comparison data selected, may offer a better understanding of Kosovo's trade situationand economic potential, compared to regional countries that according to the existing economic development indicators are developing faster than Kosovo. Therefore, in this study,a descriptive quantitative analysis is used to inform on the current and the past situation of exports and imports. The data for exports, imports, and GDP were obtained from different sources, but mostly from the World Bank Development Indicators database for the period from 2006 to 2016. In addition the Kosovo Agency of Statistics was used to retrieveexternal trade data for Kosovo and for the same period above.Regarding economic development projections; data from the Central Bank of Kosovo (CBK) was also used. Aiming to support the objectives of this study, some of the data are also authors' calculations due to the fact that Kosovo lacks statistical data at the national level. Mostly authors'calculations areabout goods exported and imported.

5. Results: Exports and imports trends and impact in Kosovo'sGDP

In this section, it will discussedabout the exports and imports trends in Kosovo and an overview of their performance and the relation they have with nominalGDP will be given. Trading partners of Kosovo, mainly CEFTA and EU countries will be covered and analyzedbased on the value of exports and imports and also main traded products/services. Kosovo nominal GDP trend will be analyzed also in comparison with the CEFTA and EU member states.

5.1 GDP trends for the years 2006-2016

Kosovo nominal GDP growth kept a stable trend in the last years. Among years Kosovo economy was sometimes performing even better compared to the regional countries; in 2007 Kosovo (7.3) was the second fastest growing economy in terms of GDP, after Montenegro (10.7). Along with Albania, forecasts rank Kosovo with the highest GDP growth rate for 2017 with capital investments playing an important role in this regard.

Table 1.Annual GDP growth rate (2006-2016)

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Kosovo	4.5	7.3	2.6	3.3	3.3	4.6	2.8	3.4	1.2	4.1	3.4
Albania	5.4	5.9	7.5	3.4	3.7	2.6	1.4	1.1	1.8	2.6	3.5
Bosnia and Herzegovina	5.4	5.7	5.5	-2.9	0.8	0.9	-0.9	2.4	1.1	3.0	2.0
FYR Macedonia	5.1	6.5	5.5	-0.4	3.4	2.3	-0.5	2.9	3.6	3.8	2.4
Montenegro	8.6	10.7	6.9	-5.7	2.5	3.2	-2.7	3.5	1.8	3.4	2.5
Serbia	4.9	5.9	5.4	-3.1	0.6	1.4	-1.0	2.6	-1.8	0.8	2.8

Source: World Bank (2017)

The graph below shows a rather stable trend of the Kosovo's nominal GDP growth during 2006-2016. Interestingly, Kosovo GDP growth rate experienced its most fruitful time in 2007. The rapid fall of GDP between 2007 and 2008 is closely related to the political processes in the country which had an extraordinary impact on the economy as well. As it can also be seen from the table above, Kosovo GDP cannotyet approach the growth rate it had in 2007. A numerous reasons need to be considered here becausedespite the difficulties and tough processes in which Kosovo as a new country has been going through, the trends are about similar with the regional countries; meaning global trends, such as financial crisis could also been a factor.

Figure 1: Kosovo nominal GDP Growth (annual %)

Source: Kosovo Agency of Statistics, 2017 and author's calculations

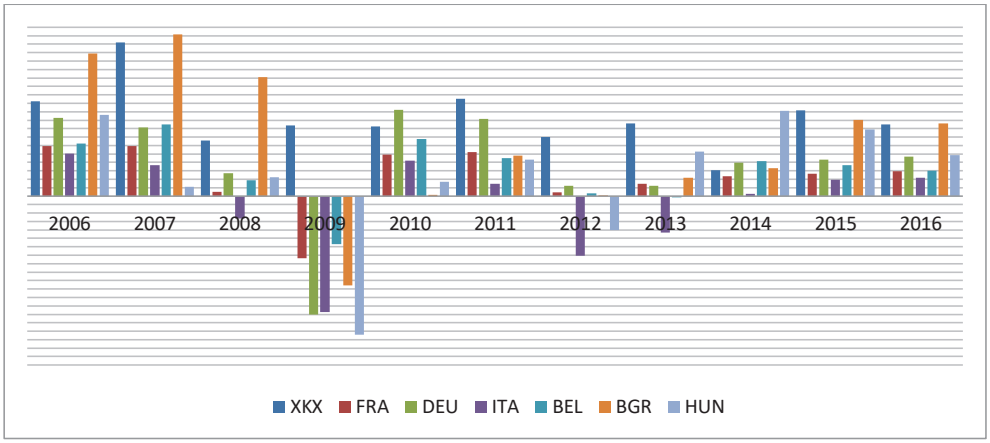
Kosovo economy in 2007 has shown a potential growth according to the GDP indicator. Mainly this growth was driven by the increased participation in the national economy of the agriculture, forestry and fishing, followed by Mining and quarrynig with a considerable increase taking into account that this sector represents one of the Kosovo biggest export potential. Construction sector in 2007 was an influencial sector onthe overall Kosovo economy along the wholesale and retail sectors.

In the following year (2008) after Kosovo declared its independence, domestic products suffered from an unequal treatment in the regional level and beyond. Due to its political uncertantiesKosovo could not compete (meaning wasnot being able to trade)with the regional countries, eventhough Kosovo was (and still is) a CEFTA member. The situation countinued to be about the same in the next three years, due to the political implications and animosities. Kosovo exports were negatively influenced until 2011 when it slightly started to promote the export sector and as such begun to overcome the above mentioned barriers. Still Kosovo exports are daily facing different tariff and non-tariff barriers, moslty while competing with the regional economies.

Due to political instability, in 2014 Kosovo economy was once again subject of a low economic activity performance, mainly due to the decline of agriculture, forestry, and fishing sector and transportation. Kosovo enterprises are still facing trade barriers in regards to doing business in the regional level, due to political influence manily driven by Serbia and Bosnia and Herzegovina. Reciprocity measures with Serbia took place in 2015 and the situation considerably improved for economic potential sectors of Kosovo.

Kosovo GDP growth followed the EU trends. Moreover, in specific years such as in 2009, 2015, and 2016 Kosovo's GDP growth ratewas even bettercompared to the EU member states. However, this is not the interpretation we will consider to use due to the fact that Kosovo economy is less than 2 million, while EU member states all together compose a much higher participation and have irreplaceable influence in European economy. Mainly this could be considered among the reasons why Kosovo managed to follow the EU trend, at least in economic indicators such as the GDP. While in 2009 European countries were trying to make positive moves and help their economies to overcome the effects of the global financial crisis, Kosovo achieved a high level of GDP. Kosovo GDP during the years, as it can be seen from the figure below performed even better than France (in percentage).

Figure 2: GDP growth EU countries and Kosovo (annual %)



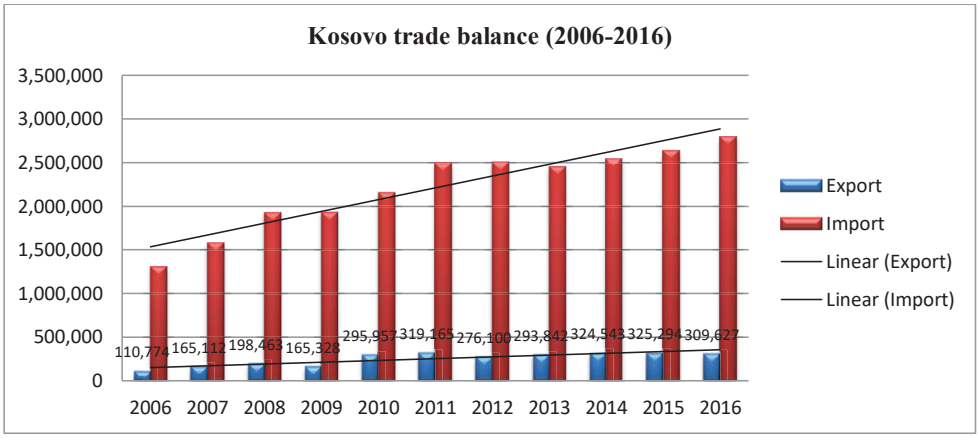
Source: World Bank and author calculation

5.2 Export and import projections for 2017 and exports/importstrends during the years

Kosovo net exports of goods and services in 2017 are expected to have a lower negative contribution to GDP compared to the previous year. This expectation is attributed to the forecasts for rising metal prices that may affect the growth of the total value of exports. Regarding goods, exports are foreseen to increase by 8.3 percent in real terms, while imports are expected to determine an increase of around 2.5 percent. Consequently, the trade deficit of goods is expected to indicate a slight increase of 1.7 percent in real terms. Kosovo export potentials are very limited. Since after the war, the key export products are about the same. During the second quarter of the year 2017 Kosovo is expected to increase the volume of exports of mineral products, base metals, prepared foodstuff, beverages, vegetables, etc. Basically, these products represent the highest exports potentials in national level.However, Kosovo economy, in terms of exports potentials will not be able to cover basically more than 10% of the total imports.

On the other side, Kosovo trade deficit is huge. While imports keep their positive trend, exports remain about the same, or even deteriorate. Compared to 2006, in the year 2016 the trade balance has changed considerably for both components (exports and imports). Both have manifested a significant increase. While imports have significantly increased in 2011, the exports showed a positive increase in 2010. According to ASK(2011), in 2010 the annual increase of the exports was about 79% higher. The main contributors on the export for 2010 were: manufactured goods classified which increased by 97%,crude materials 93%, miscellaneous 54%, mineral fuels 50%, animal and vegetable oils 32%, machinery and transportation equipment 24%, beverages and (6%), food and live animals (29%).

Figure 3: Kosovo trade balance (2006-2016)

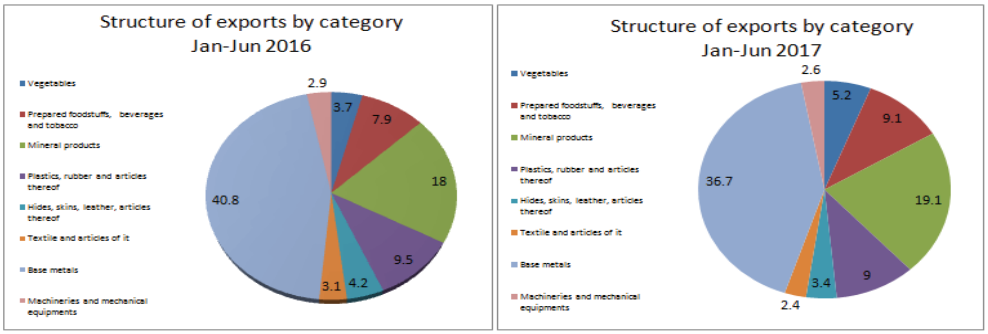


Source: Kosovo Agency of Statistics (2017)

5.3 The structure of exports/imports by categories

As mentioned above imports in 2011 have increased significantly. According to ASK(2011)annual increase of imports in 2011 has been 16%. Main components of theimports were: mineral fuels (33%), crude materials(31%), commodities and transactions not classifiedelse (31%), chemical products (25%), food and live animals (17%), manufactured goods classified (16%), beverages and tobaccos (12%),miscellaneous manufactured (12%),animal andvegetable oils (11%), and there is a decrease inthe group of: machinery and transportation equipment (-4%). The structure of exports for the first half of 2017 is about exactly the same as in the same period of 2016. Categories exported the most are: base metals, mineral products, prepared food and beverages, plastic, rubber and articles thereof, vegetables, etc.

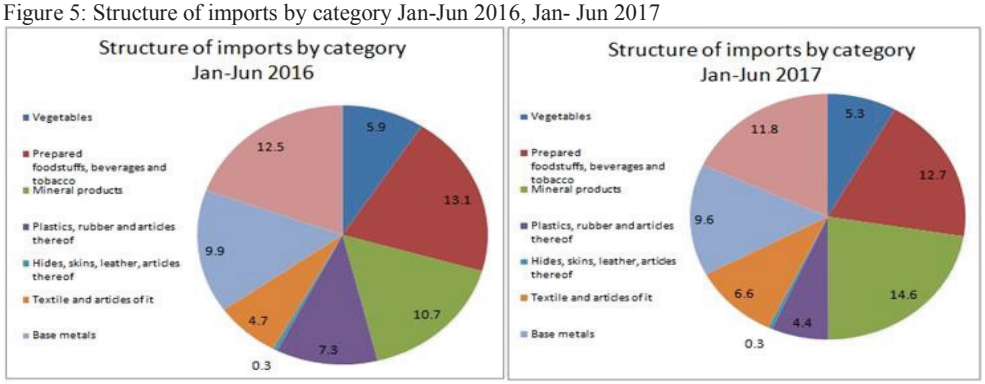
Figure 4: Structure of exports by category Jan-Jun 2016, Jan- Jun 2017



Source: Kosovo Agency of Statistics (2017)

On the other hand, growth of import was mainly a result of the increase of mineral products imports, mostly attributed to imports of oil and its derivatives, whose prices had marked an increase in international markets and that has directly reflected intoKosovo economy as well. An increase is also indicated in the imports of the transport means, machinery, prepared foodstuffs, beverages, etc. Conversely, the imports of plastics, articles of stone, ceramic products, glass, etc. marked a decline. In June 2017, the coverage rate of imports with exports stood at 12.8 percent (compared to 11.7 percent in June 2016).

Figure 5: Structure of imports by category Jan-Jun 2016, Jan- Jun 2017



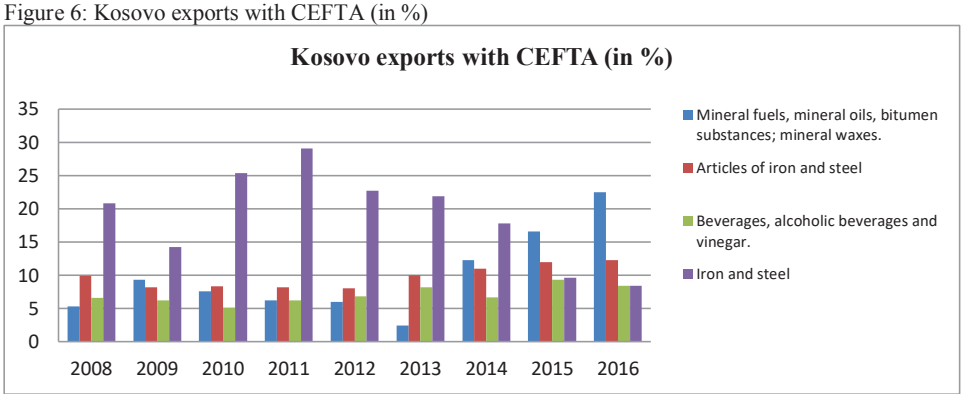
Source: Kosovo Agency of Statistics (2017)

5.4 Kosovo trade balance with CEFTA countries

CEFTA region is the main economic partner for Kosovo. As it can be figured out by the data provided below, iron and steel represent the highest percentage of the exported products to CEFTA, followed by

mineral fuels, mineral oils, etc. Compared to 2015, exports of minerals in CEFTA region have increased significantly, while steel and iron exports have marked a continuous decline.

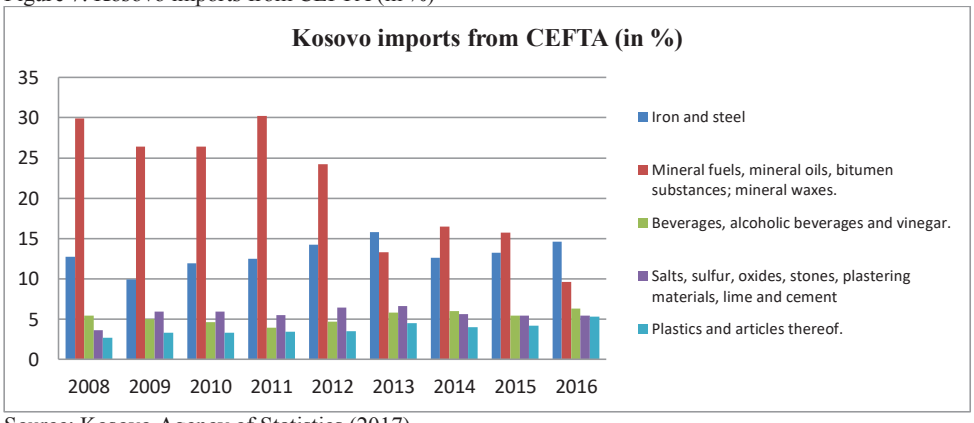
Figure 6: Kosovo exports with CEFTA (in %)



Source: Kosovo Agency of Statistics (2017)

On the other side, mineral fuels andmineral oils are mostly imported as well. While exports of minerals have increased in 2016, imports of minerals went down. Imports of beverages, alcoholic beverages, and vinegar have also indicated a slight increase in 2016.

Figure 7: Kosovo imports from CEFTA (in %)

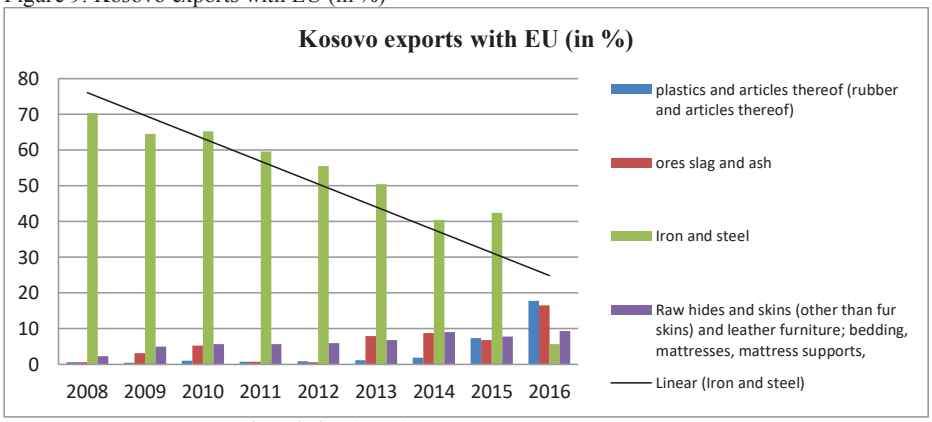


Source: Kosovo Agency of Statistics (2017)

5.5 Kosovo trade balance with EU countries

EU is the second biggest trade partner of Kosovo. While in 2008iron and steel were the main products exported to EU market, in 2016 plastics and articles thereof marked a significant increase. Gradually, iron and steel exports went down during the period considered in this study.

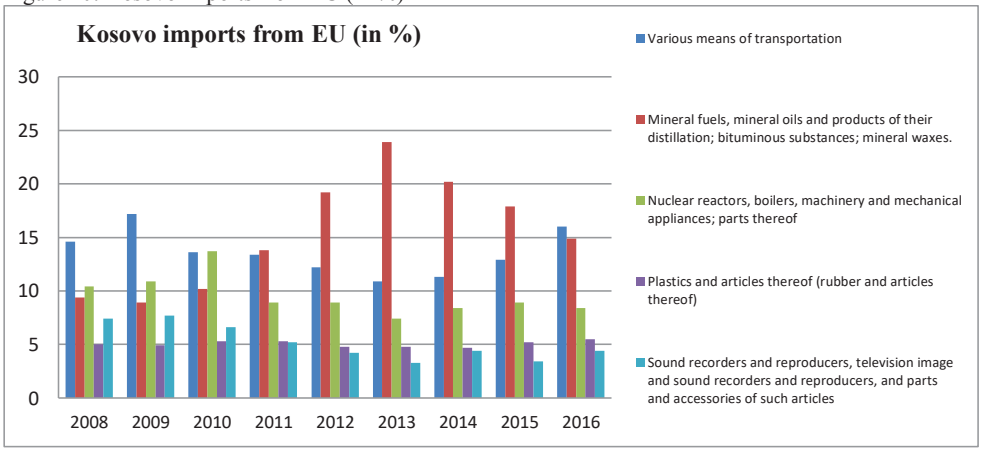
Figure 9: Kosovo exports with EU (in %)



Source: Kosovo Agency of Statistics (2017)

While during the years 2008 to 2011 various means of transportation represented the highest percentage of the goods imported from EU, in 2012 and 2013 mineral fuels, mineral oils and their products became top imported goods.

Figure 10: Kosovo imports from EU (in %)

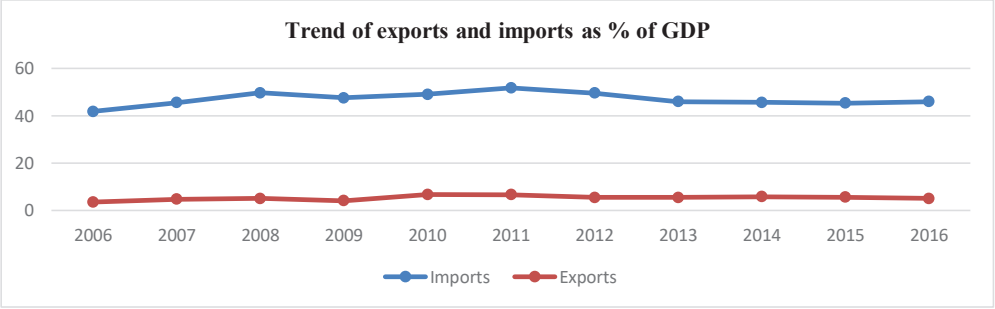


Source: Kosovo Agency of Statistics (2017)

5.6 Exports and imports as a percentage of GDP

As it can be seen from the graph below, exports show a stable trends during the years. Exports have a lower influence in Kosovo GDP compared to imports. However, while exports share to GDP remains stable, imports show a decline! The decline is especially marked in 2013. The gap between exports and imports was higher since 2006. During the year 2010 and 2011 this gap was somehow smaller due to the increased exports trends. However, Kosovo exports competitiveness is still an open issue and possibly has room for further research studies. While export share in Kosovo GDP in 2010 was 6.72% the share in 2016 was 5.10%. Due to the low volume of exports the share in the GDP is also very low compared to imports.

Figure 11 Trend of exports and imports as % of GDP

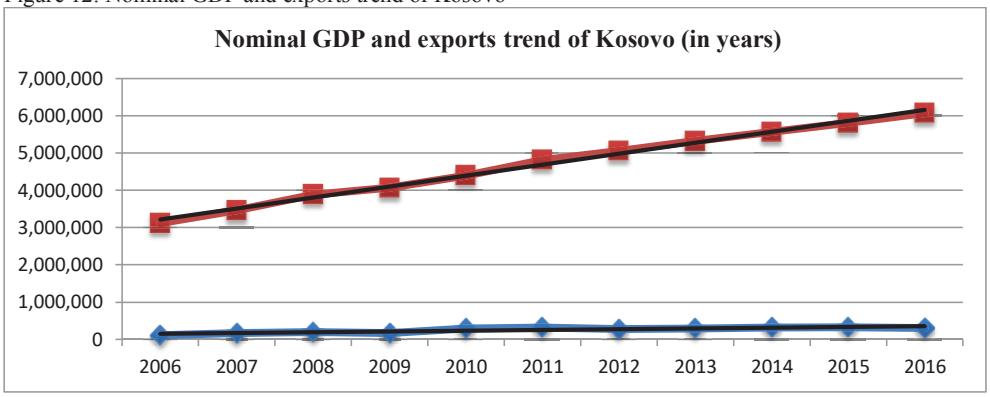


Source: Kosovo Agency of Statistics and author calculations

5.6 Nominal GDP and exports/imports trend (2006-2016)

The chart below shows the trend of Kosovo exports and the nominal GDP. While the nominal GDP in the last year's showscontinues positive trend, the performance of exports seems not to be stable and is not keeping its positive trend. While the GDP is increasing the export trend stared to decline considerably in the year 2016.Therefore, based on the figure below and the trends of the two variables we can assumethat there is no direct correlation between exports and nominal GDP. However, this interpretation should be considered with caution, since due to the limited source of information, we were not able to consider other relevant factors that contribute to the overall GDP and exports growth, eventhough exports are a determinant factor of the GDP growth.

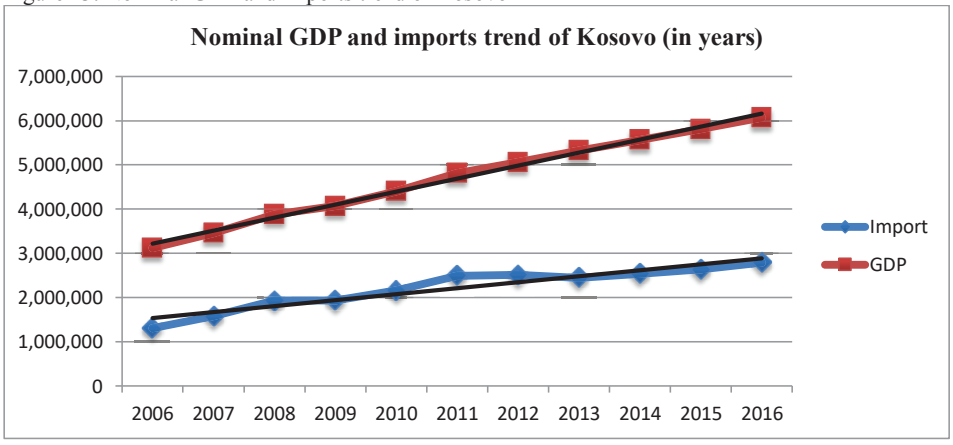
Figure 12: Nominal GDP and exports trend of Kosovo



Source: Kosovo Agency of Statistics (2017)

On the other side, imports and nominal GDP seems to have a direct correlation between them. While the imports trend increases the GDP trend keeps going up as well. However, the positive trend is more visible for GDP than for imports. As stated above under thissituation, the interpretation of these results should be taken into account with caution; due to the fact that other relevant factors that influence the relation between imports and GDP were not considered. Despite the fact that this paper emphasizes adifferent relation of exports and imports to the GDP there is room for further discussions and other approaches to this context.

Figure 13: Nominal GDP and imports trend of Kosovo



Source: Kosovo Agency of Statistics (2017)

6. Conclusion

This paper discusses Kosovo's exports and imports trends vis-à-vis the CEFTA countries and the EU, and their correlation with GDP.Kosovo is a new and fragile economy. It has an enormous number of difficulties in state level that have influenced the export and import trend. As mentioned in this paper export and import are two processes that directly influence national economic growth. The relationship between export and growth, or import and growth and also the fellowship between export, import and economic growth is the issue that theoretical as well as empirical studies mostly focus on. Exports of goods/services for many reasons have always been considered as key economic and social development generators.

In general, within this paper it is seen that there are a lot of determinant factors and reasons for the poor performance of the export sector in Kosovo, including political, historic, and economic related reasons. Kosovo's economy is lacking behind the regional countries mostly due to its political status and position. Kosovo has a lot of potential, some of which discussed in this paper that in some cases due to the status could not be used properly. Also, those potent sectors that could be determinants for future development, which Kosovo has targeted as national economic development potentials, are subject of different trade barriers actually present. In this paper we have shown that the relationship between export, import, and economic growth is an important topic and as such it is frequently discussed among policy makers, economists, and researchers, in different studies, in which they aimed to explain different levels of economic growth between countries. Kosovo is an open economy with a fully liberalized trade regime. As we have seen in this paper, this is stimulating the private sector, attracting FDIs, and stimulating exports. Despite the fact of having a liberalized trade market, Kosovo never met its expectations in regard to a proper competitiveness of its products/services, resulting to a huge trade deficit. In macroeconomic terms the continuation of current situation will hinder Kosovo in improving economic indicators. Kosovo legal framework is well harmonized with the "acquiscommunautaire" of the European Union. In recent years, the Kosovo's economy has grown - mainly through investment and consumption growth; but it also experienced a deepening of the deficit in net exports. In Kosovo, the real growth has been mainly driven by the growth of activity in the agricultural and financial sectors, but also in trade.

While Kosovo agenda since 2008 has been more focused on political level, economic development was limited. Despite the fact that exports have increased slightly the coverage of imports is only between 10-13%, depending on the years reported.

6.1 Further research

Kosovo has a lot of potentials which could be added among economic development potentials. However, due to the lack of relevant national strategies and structural studies and reports conducted by relevant institutions, Kosovo economic potentials have been overshadowed. When analyzed and elaborated the influence of exports and imports in Kosovo GDP, it can be seen that the influence is different for each category. While exports increased in certain years, GDP in national level decreased, whereas with increased imports, the GDP also increased. In this context, there is still room for further analysis and discussions since this interpretation should be considered with caution, due to the fact that we did not consider other relevant and influencing factors for the purposes of this paper. Therefore, this paper recommendsthat a national strategy is compiled to promote economic potentials and to enable the development of businesses that coulddirectly influence exports.

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Appendix

Exports according to countries (in values)

(000€)

Countries	Exports (FOB)										
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total	**110,774**	**165,112**	**198,463**	**165,328**	**295,957**	**319,165**	**276,100**	**293,842**	**324,543**	**325,294**	**309,627**
28 EU member states	**43,455**	**71,208**	**94,767**	**73,425**	**134,555**	**139,440**	**109,782**	**118,422**	**98,086**	**106,052**	**69,998**
Austria	1,211	2,005	2,072	1,978	5,670	5,711	4,425	6,327	6,416	12,316	6,667
Belgium	17	5,587	28,113	5,176	11,455	5,085	473	807	716	24,303	2,261
UK	62	154	173	249	681	1,343	2,194	2,131	1,314	810	779
Denmark	44	94	53	75	44	52	161	74	320	119	155
France	232	145	247	639	1,084	1,305	1,852	1,455	1,194	5,569	3,238
Germany	3,952	16,190	7,205	7,563	15,587	24,144	14,995	10,985	11,340	11,693	13,830
Greece	3,914	8,400	10,851	240	222	194	331	791	930	1,022	943
Netherlands	1,128	2,413	1,888	1,506	1,017	2,923	1,424	2,382	2,138	8,420	11,881
Hungary	18	112	105	396	29	89	118	233	118	238	278
Ireland	20	48	10	3	6	7	0	5	36	53	119
Italia	12,654	9,672	25,485	46,218	80,193	83,924	71,351	74,363	49,660	19,568	5,727
Luxemburg	:	:	:	:	:	8	:	35	102	103	453
Poland	281	121	102	53	150	650	737	3,870	5,782	3,221	3,365
Czech Republic	356	159	1,127	463	297	168	422	492	2,524	398	530
Slovakia	36	395	241	391	920	2,405	3,175	2,037	1,766	933	822
Slovenia	4,515	4,290	6,304	2,882	6,203	6,001	1,417	1,434	620	1,997	1,190
Spain	49	114	196	51	49	57	631	342	824	2,653	923
Sweden	43	8,155	4,389	322	1,116	365	264	615	992	1,517	1,031
Rumania	224	1,142	42	232	272	987	1,265	442	685	1,052	1,310
Bulgaria	13,506	10,005	2,632	2,709	6,765	936	1,829	1,026	3,820	6,700	11,283
Croatia	1,123	1,837	793	2,151	2,744	2,794	2,359	2,594	2,365	2,935	3,150
Other EU countries	69	169	2,741	129	50	294	360	5,982	4,428	432	62
CEFTA	**50,622**	**65,663**	**60,743**	**51,340**	**66,868**	**80,323**	**100,268**	**104,503**	**127,146**	**123,747**	**144,267**
Albania	12,645	20,799	21,113	26,182	30,841	34,566	40,180	43,774	44,011	40,254	42,053
Macedonia	9,734	17,385	20,046	17,355	26,308	30,949	26,376	26,139	35,960	33,355	38,578
Montenegro	2,207	2,913	3,770	3,084	3,920	6,988	16,759	17,310	16,069	12,140	13,890
Serbia	20,910	19,280	9,893	3,504	3,941	7,198	14,968	14,463	27,292	32,262	41,331
Bosnia and Herzegovina	5,126	5,287	5,919	1,206	1,847	612	1,974	2,812	3,807	5,655	8,405
Moldova	:	:	1	9	12	10	11	4	7	80	12
EFTA	**7,110**	**13,004**	**7,382**	**10,517**	**17,844**	**17,692**	**15,149**	**7,159**	**10,082**	**11,749**	**16,881**

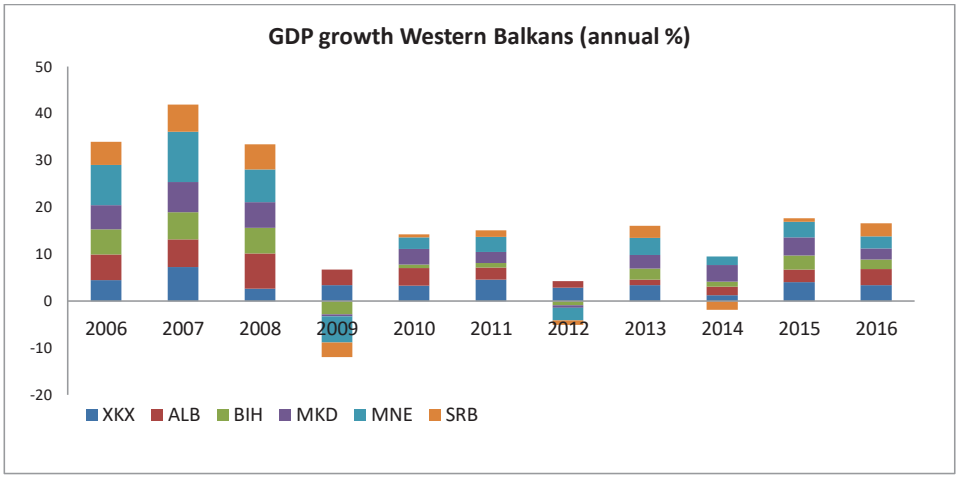
Switzerland	7,047	12,937	7,380	10,510	17,786	17,611	15,133	7,155	10,038	11,721	16,762
Iceland	:	:	:	5	:	77	:	:	:	:	:
Norway	62	67	1	2	22	3	16	4	44	28	119
Liechtenstein	:	:	:	:	36	:	:	:	:	:	:
Other European countries	**1,668**	**2,710**	**3,044**	**6,512**	**9,357**	**7,831**	**11,380**	**7,507**	**10,441**	**9,240**	**7,801**
Turkey	1,668	2,660	3,044	6,512	9,357	7,831	11,380	7,393	10,365	9,212	7,630
Ukraine	:	50	:	:	:	:	:	114	76	28	171
Other non-European countries	**3**	**25**	**286**	**297**	**123**	**230**	**264**	**339**	**504**	**474**	**1,810**
USA	3	17	286	290	116	182	254	314	500	458	1,799
Canada	:	:	:	3	:	1	:	25	3	16	10
Brazil	:	:	:	:	:	43	:	:	:	:	
Mexico	:	8	0	4	7	3	9	:	:	:	
Asian countries	**6**	**3,159**	**24,120**	**17,127**	**59,686**	**43,754**	**26,157**	**30,243**	**70,084**	**49,297**	**21,204**
Japan	:	:	:	3	12	5	2	:	507	2,062	84
China	6	18	31	1,596	14,779	28,268	3,266	1,290	42,152	206	11,694
India	:	3,141	24,089	15,528	44,895	15,482	22,889	28,953	27,425	47,029	9,425
Other	**7,910**	**9,344**	**8,122**	**6,109**	**7,524**	**29,895**	**13,100**	**25,669**	**8,201**	**24,735**	**47,667**

Imports according to countries (in values)

(000 €)

Countries	Imports										
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total	**1,305,879**	**1,576,186**	**1,928,236**	**1,935,541**	**2,157,725**	**2,492,348**	**2,507,609**	**2,449,064**	**2,538,337**	**2,634,693**	**2,789,491**
28 EU member states	**482,351**	**611,886**	**751,967**	**814,413**	**884,318**	**1,010,619**	**1,050,151**	**1,083,163**	**1,080,968**	**1,112,892**	**1,202,110**
Austria	23,539	26,842	30,953	38,915	33,126	38,669	34,073	36,858	36,742	43,705	46,368
Belgium	4,733	6,012	7,223	6,106	6,394	8,656	8,869	9,290	6,677	9,383	9,353
UK	6,378	9,502	12,580	14,153	13,457	17,084	13,630	13,209	13,581	16,019	18,939
Denmark	1,806	3,751	6,194	3,418	2,624	3,545	3,016	3,068	3,029	3,869	4,990
France	15,834	25,007	37,505	27,167	33,635	34,755	24,077	26,846	29,210	22,593	32,338
Germany	122,652	155,031	196,627	246,170	280,617	293,441	304,195	252,594	272,973	290,948	342,890
Greece	37,614	63,737	81,403	79,108	96,267	103,179	109,188	145,546	137,544	110,260	118,517
Netherlands	6,986	9,711	20,112	30,927	14,876	18,195	21,261	38,831	27,245	20,259	23,235
Hungary	20,011	25,537	37,694	27,046	28,950	35,020	27,665	28,236	24,915	24,397	26,552
Ireland	1,661	2,231	2,157	3,254	3,097	2,010	1,979	2,103	2,003	2,579	1,938
Italia	52,461	57,678	74,385	87,972	100,603	159,444	213,469	228,519	203,068	226,476	202,819
Luxemburg	127	94	91	202	114	51	89	134	118	410	982

Poland	13,796	14,067	22,223	24,215	39,876	32,963	30,970	36,595	55,785	71,174	75,405
Czech Republic	11,491	11,390	15,365	17,054	20,707	19,323	19,134	16,574	17,902	18,777	24,954
Slovakia	2,434	3,658	7,159	5,185	5,693	5,676	6,149	7,513	7,839	6,696	9,855
Slovenia	56,001	62,420	66,762	66,378	65,738	71,614	68,385	61,314	66,708	58,556	61,099
Spain	9,391	9,604	9,351	11,780	15,504	17,914	18,438	21,267	21,837	24,500	37,946
Sweden	2,353	12,387	11,089	9,252	8,286	9,049	8,444	7,734	9,650	6,269	8,335
Rumania	4,443	30,261	6,788	9,494	17,347	19,936	18,717	24,692	27,977	30,933	31,824
Bulgaria	58,498	42,008	53,824	44,500	35,211	50,541	39,125	44,515	47,242	47,721	56,895
Croatia	28,074	38,982	49,985	58,584	58,542	64,063	72,012	73,331	62,945	70,130	59,119
Other EU countries	2,066	1,976	2,497	3,532	3,656	5,491	7,268	4,391	5,981	7,237	7,759
CEFTA	**508,257**	**540,622**	**667,774**	**634,354**	**743,989**	**809,904**	**772,657**	**676,320**	**720,382**	**769,366**	**753,183**
Albania	23,108	35,262	59,632	58,385	69,714	96,400	110,528	110,597	133,702	151,897	115,791
Macedonia	257,754	237,895	346,536	292,012	319,313	365,961	287,739	185,020	139,668	143,846	156,727
Montenegro	17,800	15,063	13,789	13,059	11,454	12,232	10,510	11,387	13,848	15,676	13,692
Serbia	191,053	222,534	208,951	211,133	260,471	254,917	278,388	285,356	368,234	382,129	387,647
Bosnia and Herzegovina	18,465	29,838	38,747	59,742	82,986	79,835	85,309	83,531	64,793	75,689	79,112
Moldova	77	30	118	24	50	559	183	430	138	129	214
EFTA	**24,057**	**32,634**	**35,291**	**24,096**	**23,352**	**24,568**	**26,482**	**22,048**	**32,448**	**25,976**	**23,224**
Switzerland	22,800	28,222	32,441	21,983	20,981	22,194	22,664	21,020	30,185	23,674	21,796
Iceland	1	38	20	67	121	8	15	66	80	40	4
Norway	1,212	4,363	2,790	2,001	2,112	2,306	3,698	795	1,896	2,082	1,193
Liechtenstein	44	10	40	44	138	59	104	167	287	179	230
Other European countries	**109,053**	**118,094**	**139,979**	**148,179**	**155,206**	**190,887**	**209,292**	**212,894**	**248,513**	**259,671**	**294,878**
Turkey	97,075	101,827	128,249	141,825	150,360	184,452	199,881	204,922	238,268	252,285	288,488
Ukraine	11,978	16,267	11,730	6,355	4,846	6,434	9,411	7,972	10,245	7,386	6,389
Other non-European countries	**32,186**	**48,605**	**71,316**	**68,270**	**65,417**	**88,630**	**93,309**	**102,268**	**111,675**	**80,053**	**96,767**
USA	11,555	14,698	23,610	26,758	35,311	42,847	46,916	52,152	62,700	37,506	55,551
Canada	1,615	2,987	3,366	2,706	1,949	3,362	3,339	2,850	7,287	1,985	1,591
Brazil	18,578	30,282	43,499	38,006	27,188	40,925	41,791	45,756	39,551	37,908	37,212
Mexico	438	637	841	800	968	1,496	1,262	1,509	2,137	2,655	2,413
Asian countries	**85,496**	**118,974**	**135,287**	**147,504**	**154,502**	**190,611**	**186,268**	**204,363**	**225,647**	**258,389**	**288,524**
Japan	8,666	10,120	10,759	15,796	12,915	12,022	16,909	10,380	11,396	11,862	11,091
China	74,655	104,951	121,059	128,324	135,406	170,285	159,651	179,554	204,789	232,925	258,473
India	2,175	3,904	3,469	3,384	6,182	8,304	9,709	14,429	9,462	13,602	18,960
Other	**64,480**	**105,371**	**126,624**	**98,725**	**130,941**	**177,130**	**169,450**	**148,009**	**118,703**	**128,345**	**130,806**



Source: World Bank, 2017

A PROPOSED FRAMEWORK OF UNIVERSITY – INDUSTRY INTERACTION: THE CASE OF SOUTH-EAST EUROPEAN COUNTRIES

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Abstract

The aim of this research is to propose a University - Industry Collaboration (UIC) framework for South East European Countries (SEEC). To facilitate the UIC the paper identifies the drivers, benefits and obstacles but also some of the organizations forms and types of interactions as initials to a proper UIC framework for SEEC.
The main purpose of the paper is to address conceptual frameworks to micro level (cross employment, research projects and internships), meso level (Entrepreneurial university model, Triple Helix model) and macro level (Regional innovation system, Engaged university model and Open innovation)of stakeholders to a proper organizational form and type of an interaction at SEEC. All these conceptual frameworks facilitate the intensification and generation of UIC activities.

Keywords: University – Industry Collaboration, Innovation, UIC Framework, Entrepreneurship.

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1. Introduction

Nowadays, South East European Countries are embracing the need to create a more connected and functioning relationship between government, business and universities to increase the level employment, productivity and for economic development in general. Based on the importance of the interaction between government, industry and universities, a model, called Triple Helix model, was developed by Henry Etzkowitz and Loet Leydesdorff in the 1990s. The Triple Helix model of innovation means an extensive and active collaboration between actors and argues that the creation of the knowledge base depends on the synergies created between the main actors of the economy, university, industry and government. The Triple Helix of university, industry and government relations has been described as a 'highly charged intellectual enterprise (Todeva and Etzkowitz, 2013).

This research study is focused on the collaboration between universities – industry that is possible by many factors, such as publications, workshops or conferences, staff recruitment and the most significant factors are personal exchange of information, knowledge and experiences advantage (Ankrah and Al-Tabbaa, 2015). ***Universities*** educate people for the region and train talented problem solvers, provide cultural amenities to a local area (Goddard and Chetterton, 1999), and provide direct assistance to industrial firms in their innovative activities (Chesbrough et al., 2006; Mowery et al., 2001). ***Firms*** that can build links with university research may be more productive and may be able to gain higher status and value in the commercial exploitation of their knowledge (Zucker et al., 1998). They may even be more likely to innovate if they interact together (Feldman, 1994). A framework of university – industry collaboration is proposed for the South – East European Countries as a tool which facilitates the collaboration between universities – industry actors.

There has been a substantial increase in these collaborations and interactions in several developed and transitional nations, which is attributed to a combination of pressures on both industry and universities (Giuliani and Azra, 2009; Meyer-Krahmer and Schmoch, 1998). For industry, pressures have included rapid technological change, shorter product life cycle and intense global competition that have radically transformed the current competitive environment for most firms (Bettis and Hitt, 1995; Weight et al., 2008). With regards to universities, pressures have included the growth in new knowledge and the challenge of rising costs and funding problems, which have exerted enormous resource burdens on universities to seek relationships with firms to enable them to remain at the leading edge in all subject areas (Hagen, 2002). These pressures on both parties have led to an increasing stimulus for developing University – Industry collaborations that aim to enhance innovation and economic competitiveness at institutional levels, through knowledge exchange between academic and commercial domains (R et al., 2013).

2. Literature Review

A systematic review of the literature was performed to assess the current knowledge and collate scattered findings to present them in a way that is more relevant, reliable and provides collective insights and guidance to meet the needs of academics, practitioners and decision-makers.

2.1. Systematic Literature review method

The main objective of this study was to establish what is known about the key aspects of University – Industry collaboration, and find out how these aspects may be related. Guided by this objective, the methodology is based on the work performed by Tranfield et al. (2003) towards carrying out the review. The systematic review covered relevant articles to answer the following research questions related to UIC:

- What are the relations between geographical proximity with organizational forms and types of knowledge interaction between universities – industry?
- What are the drivers, benefits and barriers for university-industry co-creation in different tiers of geographical proximities?

To exclude some of the studies, in this article is used Farrington's methodological quality scale by implementing five criteria to assess the methodological quality of evaluation studies, including: internal validity, descriptive validity, statistical conclusion validity, constructs validity and external validity.
The first issue relates to the study's boundaries. The current research reports and discusses articles that have been included in academic journals during the period 2000 and 2016. This indicates the potential of some relevant studies to be excluded from the review. Nonetheless, this is an acceptable practice in systematic review (Pittaway and Cope, 2007), as all important contributions in each research field would usually appear continuously in subsequent journal papers. The second limitation concerns the selection of keywords applied to control in the inclusion criteria of the papers. However, to mitigate the consequences of this issue, a careful approach has been followed in the inspection process that incorporates three steps: title, abstract, and full text. Importantly, this would ensure that all relevant studies have been consulted.

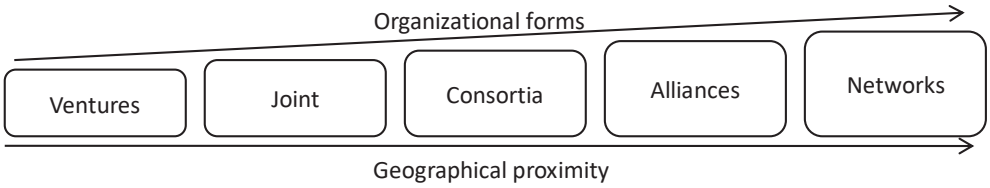
2.2. Organizational forms and types of interaction between universities – industry in different geographical proximities

Geography is an important determinant of firms' collaborative behaviour regarding innovation, and this article argues that geographical proximity to universities and industries' propensity to collaborate with local universities in the innovation process is winding, as the relationship depends on the characteristics of firms and universities, and on the related choices made by managers in firms and academics working in universities (Laursen, Reichstein and Salter, 2015). Geographical proximity is important for knowledge exchange especially when knowledge is "person-embodied, concept-dependent, spatially sticky and socially accessible only through direct physical interaction" (Laursen and Reichstein, 2015).
The most famous forms pursued in practice and discussed in the literature are: Joint ventures, Networks, Consortia and Alliances (Barringer and Harrison, 2000), which varies depends on the degree to which participants are linked. Different researchers present different typologies on University – Industry relationships. For instance, Chen (1994) classified the forms of University – Industry collaboration for technology exchange according to the duration of the relationship and the technology flow. Santoro and Gopalakrishnan (2000), on the other side suggest four classifications for University – Industry collaborations, including: research support (i.e. endowment/Trust fund), cooperative research (i.e institutional agreements, group arrangements, institutional facilities, and informal intentions), knowledge transfer (i.e. hiring of recent graduates, personal interactions, institutional programs, cooperative

education), and technology transfer (i.e. product development and commercialization activities through university research centers).

However, another framework proposed by Bonarccorsi and Piccaluga (1994) consisted on six main categories, namely: Personal Informal Relationships, Personal Relationships, Third Party, Formal Targeted Agreements, Formal Non-Targeted Agreements and Creation of Focused Structures. This framework has been extended by Bonarccorsi and Piccaluga (1994) to reflect additional information in terms of three dimensions: a) Organizational resources involvement from the university, b) Length of agreement, and c) degree of formalization. So, if the firm's contact with the university is with an academic without any agreement signed with the university there is no organizational resources involvement. The length of the agreement between universities and firms could vary from short in the case of Personal Formal Relationships, too long in the case of specific or Focused Structures. The issue of formalization is very important because of the argument that increasing formalization and monitoring of the relationship in a University – Industry collaboration could lead to conflict and distrust among the parties in their attempt to maintain the autonomy of their organizations in the face of increasing interdependence (Santoro and Gopalakrishnan, 2000, Ring and Van De Ven, 1994).

Figure 1: Geographical proximity and organizational forms



Adapted from Ankrah and Al-Tabbaa, 2015

The relationship between geographical proximity to universities and firms' propensity to collaborate with local universities in the innovation process is winding, as the relationship depends on the *characteristics of firms and universities*, and on the *related choices* made by managers in firms and academics working in universities. So, based on the most famous pursued in practice and discussed organizational forms, the literature show that the most famous organizational forms if Universities and Industries are far away from each other are Networks and the most famous organizational forms if Universities and Industries are nearby each other are Joint Ventures as an organizational form advantage (Ankrah and Al-Tabbaa, 2015)

The term knowledge interaction is used to describe all types of interactions between organizations and/or individuals from the firm side and the university side, directed at the exchange of knowledge within innovation processes.

Table 1: Types of knowledge interactions between university and firms

Types of knowledge interaction	Formalization of interaction	Transfer of tacit knowledge	Personal (face to face) contact
Employment of graduates by firms	+/-	+	-
Conferences or other events with firm and university participation	-	+/-	+
New firm formation by university members	+	+	+/-
Joint Publications	-	+	+
Informal meetings, talks, communications	-	+	+
Joint supervision of PhD and Masters theses	+/-	+/-	+/-
Training of firm members	+/-	+/-	+
Mobility of researchers between universities and firms	+	+	+
Sabbatical periods for university members	+	+	+
Collaborative research, joint research programmes	+	+	+
Lectures at universities, held by firm members	+	+/-	+
Contract research and consulting	+	+/-	+
Use of university facilities by firms	+	-	-
Licensing of university patents by firms	+	-	-
Purchase of prototypes, developed at universities	+	-	-
Reading of publications, patents etc.	-	-	-

+: interaction typically involves formal agreements, transfer of tacit knowledge; +/-: varying degree of formal agreements, transfer tacit knowledge, personal contacts; -: interaction typically involves no formal agreements, no transfer of tacit knowledge, no personal contacts.

Source: (Schartinger et al., 2002)

Mohnen & Hoareau (2002) find that size, government support, patenting and scientific industry status contributes positively towards explaining R&D collaborations with universities relative to other types of cooperation. Capron & Cincera (2002) also confirm the importance of firm size and government support as significant drivers for R&D cooperation with universities (Veugelers and Cassiman, 2003). Based on the table above, collaborative research (joint research programs) between universities and firms involves formal agreements and requires personal (face to face) contact. On the other hand, reading of publications and patents typically involves no formal agreements and no personal contacts between people from two different institutions (Schartinger, Rammer, Fischer and Frohlich, 2002).

To exchange knowledge, direct *face-to-face* contact is often required to help individuals explain to one another knowledge emerging from research activities that are still fluid and only partial formed (Storper and Venables, 2014). However Gertler posits that firms have to find ways of establishing common interests and aligned incentives with their academic partners and this can only be done by *"being there"* in order to establish a common background and shared set of expectations and understandings about the nature of the collaboration (Gertler, 2015).

Finally, geographical proximity can play an important role in shaping university-industry collaboration, but that the type of university in the local area shapes the likelihood that a firm will collaborate with a university.

2.3. **Drivers, benefits and barriers for university-industry co-creation**

A large variety of potential drivers exists for university and industry to collaborate, which drivers for both actors are discussed separately. Governments are actively encouraging collaborations between universities and industry as a means of improving innovation efficiency and thereby enhance wealth creation (Barnes et el., 2002). Universities are increasingly turning their attention to encouraging University – Industry collaboration in response to government policy and as an institutional strategic policy (Howells et al., 1998; Perkmann et al., 2011). Universities offer extensive access to a wide variety of research expertise and research infrastructure, whiles industry offers extensive access to a wide range of expertise in product development/commercialization, market knowledge (Sherhood et al., 2004) and employment opportunities for universities graduates (Lee and Win, 2004; Santoro and Betts, 2002). So, one of the most significant reasons why universities can be motivated to build relationships with industry is to take advantage of these strengths for mutual advantages (Ankrah and Al-Tabbaa, 2015). Universities are motivated to collaborate with industry because they reduce their dependence on public pursue (Logar et al., 2001), but also Industry funding usually involves less bureaucratic red tape than public funding. Faculty members may be motivated by personal financial gain to enter into relationships with industry (Siegel et al. 2004). Furthermore, Harman and Sherwell (2002) suggest that an important incentive for universities to partner with industry is publication in journals, as producing accessed-publicly information would emphasize the original mission of universities in disseminating the knowledge (Newberg and Dunn, 2002).

On the other side, Industry has a large variety of potential benefits to collaborate with universities and constantly is trying to get benefits from governmental programs by collaborating with the universities. A very significant driver for industry to enter into University – Industry collaboration is to seek to commercialize universities – based technologies for financial gain (Siegel et al. 2003). Another driver for industry to enter into University – Industry collaborations is to gain access to students for summer internships or hiring (Ankrah et al., 2013; Siegel et al., 2003), but also faculty member or senior researchers can also be hired to consult during the time they are allowed to work outside of the universities (Perkmann et al., 2011). Firms also partner with universities because of the possibility of benefiting financially from serendipitous results of research activity, innovative outputs, cost savings especially those relating to knowledge creation and exploitation (George et al., 2002).

The level of incentives does not correspond with the level interaction between actors, because the level of interaction depends significantly on the possibilities to communicate. So, if motives are higher to interact internationally because of the benefits, the possibilities are higher in a regional orientation perspective to interact.

A report of the Joint Project of the U.S. National Council of University Research Administration and the Industrial Research Institute recommends the following principles for university – industry endeavors in regional and international orientations:

- Successful UIC should support the mission of each partner;
- Institutional policies should focus on fostering appropriate long-term partnerships between actors;

- Universities and Industry should focus on the benefits of each actor to ensure timely conduct of the research and the development of the research findings.

Below, is a summary of the motives for interaction between university and industry:

Table 2: Drivers of University – Industry Collaboration

University	**Industry**
Enhancement of teaching	Sourcing latest technological advances
Funding/financial resources	Laboratory usage
Source of knowledge and empirical data	Personnel resources/cost savings
Political pressure	Risk sharing for basic research
Enhancement of reputation	Stabilising long term research projects
Job offers for graduates	Recruiting channel

Source: Rohrbeck and Arnold, (2006)

There is high degree of interactions between academics and external organizations, but there are also a range of factors that constrain such interactions. Lambert has considered companies and universities as two different entities which are natural partners even though their cultural and mission's differences are significant and sometimes tend to constrain their interactions (Lambert, 2003). The most important constraints considered by the scientists are lack of time, bureaucracy, and insufficient rewards and these constraints vary by the disciplines. At the core constraints to University – Industry collaborations are the different institutional norms governing public and private knowledge (Dasgupta and David, 1994). Based on Brunnel, D'Este and Salter perspective, they focus on three potential mechanisms to reduce the obstacles to University - Industry collaboration: experience of collaboration, breadth of interaction and inter-organizational trust.

Research on inter - organizational alliances shows that collaboration experience is a critical determinant of the success or failure of subsequent alliances (Hagedoorn and Schakenraad, 1994). Involvement in a variety of channels of collaboration may contribute to better equip the firm to manage conflicts over the orientation of research for engaging in a broad range of interaction channels which creates substantial synergies between channels, and this broad engagement contributes to strengthening the firm's capacity (Brunnel, D'Este and Salter, 2010). High level of trust helps to reduce the dears that one of the partners will act opportunistically, expresses the capacity of firm and university to work together to resolve problems, and demonstrates a willingness to understand and adjust behavior to align with the needs and expectations of partners (Zaheer et al., 1998).

3. Research methodology

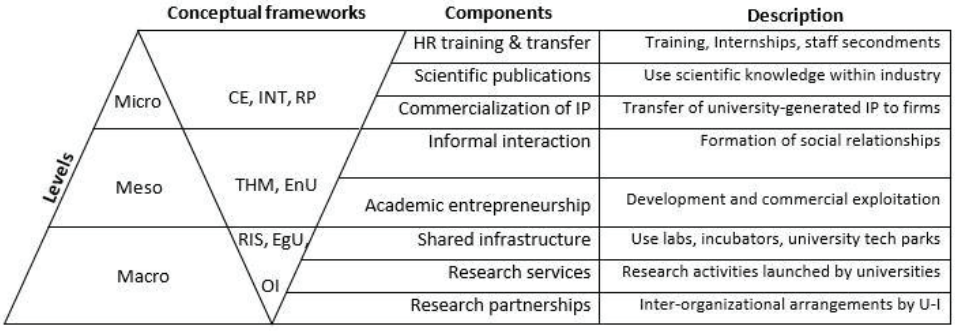
To propose a framework on UIC, the use of qualitative research method for the whole research is necessary.

Focus groups will further support the research proposed model. Thus, through a systematic literature review, besides identifying different types of interactions, organizational forms, barriers and drivers of interaction, on the second stage through the focus groups the research was oriented to the actor's and stakeholder's behavior according to the levels and conceptual frameworks considering the components of each level.
Essentially, qualitative analyses are based on hypotheses raised before starting the focus group discussions. To test the following hypotheses, focus groups were organized in three different countries from SEE (Greece, Albania and Kosovo):
H1: There is a positive correlation between geographical proximity and the level of knowledge and innovation capacity;
H2: Industry has a positive tendency for collaboration with university, more than university with industry;
H3: The level of education at industry is positively related with the level of collaboration with university;
H4: Micro level of the stakeholders is the base of a proper UIC?

3.1. Research outcomes

Recently, there has been an increasing role of the Universities that can play in contributing to economic growth. Results show that there is a negative correlation between geographical proximity and the level of knowledge and innovation capacity. *This means that as lower as the distance between University and Industry is, the higher is the level of knowledge exchange and innovation capacity, but results even show that industry is more interested in collaboration with universities rather than university with industry* (Laursen K., 2015).
Above there is a broad scale of conceptual frameworks and components which are going to be researched and analyzed on the next stages. Because the study is an inductive study, it will start from the micro level with individual stakeholders to the macro level with community stakeholders, which will result with a framework for this community (SEEC).
The paper after identifying drivers and barriers, organizational forms and types of interactions, identified some conceptual frameworks considering the level of the stakeholder. The application of these conceptual frameworks at SEEC facilitates UIC, which enables the generation of the innovations and makes more efficient the utilizations of resources. So, SEEC need more entrepreneurial and engaged universities who are willing to interact with government and industry through cross-emplyoments, internships, research projects etc.

Figure 7: Conceptual frameworks in different levels and components



As the final common proposal from the focus groups was a *proper framework to organize the exchange between actors.*

4. Conclusion

The initial stage of thesis was identifying organizational forms and types of university – industry co-creation, drivers and barriers for university – industry co-creation, the relation between University and Industry in different tiers of geographical proximities, and getting deeper understanding on entrepreneurial and engaged universities and their changing role in different periods and modes.
Based on these theoretical foundations, we show that the lower as the distance between University and Industry is, the higher is the level of knowledge exchange and innovation capacity, but even the higher is the level of education the higher are chance to collaborate with universities. Results even show that industry is more interested in collaboration with universities rather than university with industry, and the possibility of collaboration between university and industry depends on the functionalization of the conceptual frameworks, which means that conceptual frameworks are considered as significant factors *which impact on the performance and development of all actors and stakeholders.*
As the final common proposal from the focus groups was a *proper framework for SEEC to organize the exchange between actors which is shown above.*

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