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Wages and human capital potential in the Albanian labour market: Comparing Albanian workforce productivity and labour market earnings to those in neighbouring countries

Abstract

One of the basic tenets of human capital theory, in the domain of labour economics, is that there are two main factors which sustain and enhance worker productivity in the labour market: the individual's investment in formal education; and the level of on-the-job training. Theoretical common ground among economists with regard to the inclusion of women in the labour force is also that, in developing economies, higher levels of female workforce participation are strongly correlated with higher levels of national welfare; hence, higher average wages. This article is an econometric enquiry intended to determine an average wage level for the countries of central, eastern and south-eastern Europe, controlling for the rate of the population which has secondary education, the percentage of private sector firms offering formal training and the workforce participation gender gap, from which to identify a comparison benchmark for the actual wages received by employees in the Albanian labour market. Such an average wage level may well then serve as a set target towards which local labour market policies might be established and driven.

Keywords: *labour market, wages, workforce, female participation, education, human capital, Albania*

Introduction

Following the 2007 financial crisis, labour under-utilisation has grown into the most scrutinized topic in regional economic research in Europe. What during the last decade has drawn economics researchers and scholars towards this field of inquiry may have to do with the sudden downwards shift in the momentum of worker efficiency that Europe had started to experience since the turn of the century but which uncovered itself in full as the financial crisis struck. The swift plummeting swing of labour demand generated by the crisis, coupled with a rising level of labour market entry barriers for young people, particularly in southern Europe, have revealed the two most essential criteria allowing job seekers successfully and lastingly to participate in productive activity. These are human capital and labour productivity.

This article attempts to investigate labour productivity in several countries of central, eastern and south-eastern Europe by observing labour market behaviour as regards worker compensation (i.e. wages) as the level of human capital and female

workforce participation shifts upwards or downwards across countries. The focus of research is the country of Albania. The author's aim is to set a theoretical benchmark for wages in the region and subsequently contrast this benchmark to the level of wages received in Albania and neighbouring countries. This will allow us to draw a set of conclusions about the productivity levels prevailing in Albania in comparison to those observed in neighbouring countries.

Theoretical framework

The most academically-acknowledged perspective regarding a worker's ability to perform adequately on the job is the theory of 'human capital'. Pioneered by Shultz and Becker (Spring, 2015: 2-4), human capital's central tenet is that formal education and workplace-based training, among various other variables reflecting factors outside education and the workplace, should be considered a direct investment in the worker's creative and productive capacities. Alternatively stated, by acquiring education and training workers enhance their respective levels of productivity, thereby jointly contributing to higher wage levels (Garo, 2016: 2-3).

It ought to be clear from the outset that a worker's echelon of human capital is not shaped by formal education and on-the-job training alone. It comprises several other determinants of creative and productive virtuosity, among them:

- job experience
- inherent intelligence
- the level of energy characterising the individual's approach to task implementation
- the individual's ability to adapt to and execute the plans, initiatives and decisions made in the workplace
- the individual's trustworthiness
- the individual's level of diligence in conducting job tasks (Ruder, 2014).

All these factors belong among the choices and attributes of the individual, but formal education and on-the-job training remain the two single most apt tools a country (or society) has at its disposal with which to raise the level of human capital of the participants in its workforce. Because of its innate relationship to labour productivity and output, the formal education system is a subject which has been extensively studied and used for quantification purposes by economists. In contrast, on-the-job training, while being considered just as important, is a subject far less touched upon as a result of difficulties in making suitable assessments. For instance, Gary Becker (1967) experienced difficulties assessing workers' level of on-the-job training when he modelled his version of the internal rate of return from which to estimate the earnings premium yield from specific levels of education. In his famous specification of the age-earnings profile, this impediment to obtain data for – or otherwise assess – the duration of workers' on-the-job training led Jacob Mincer (1958) to use a complicated 'experience on the job' proxy for this variable, expressing workers' experience as a function of age, minus years spent in formal education minus six (pre-school years).

This research article attempts to set out an alternative approach to deriving estimations of average periodic earnings from the perspective of making international

comparisons. The data used in this enquiry is nationally collected so, instead of appraising the level of on-the-job training from worker-reported surveys, the author uses World Bank survey data, gathered in the countries of central, east and south-east Europe, in which private sector entities report information about their own rate of investment in formal training. The reported data is, in turn, used for country comparisons.

The theoretical basis of labour economics, as well as most empirical studies, points to a U-shaped relationship between female workforce participation and both economic development (Goldin, 1995) and household income level (Mincer, 1962). Theory maintains that, in poverty-stricken countries and regions (mainly agricultural economies), high levels of female participation in the labour force are a necessity as a means of supporting the existence of the household. Further rises in household earnings, thereby alleviating poverty conditions, lead women to a clear inclination to disengage from the labour force in order to contribute to their families' welfare through child care and other unpaid – but essential – household activities. However, continued rises in a country's economic output beyond a certain threshold – which, according to several macroeconomic estimations, has remained, during the 1980s to 2000s, at a fairly constant, above average, GDP per capita figure (Goldin, 1995; Elborgh-Woytek *et al*, 2012) – lead labour markets gradually to increase female employment opportunities, with women tending to undertake higher levels of formal education and rejoin the labour force in higher numbers.

Albania, alongside all other developing nations in central, eastern and south-eastern Europe, is currently positioned alongside the rising section of the U-shaped curve, so it may be presumed that female workforce participation for all these countries is on a rising trend. Hence, countries with higher rates of female workforce participation ought to be among those that exhibit higher average wage figures.

Research objective

To estimate a representative level of the average wage in those central, east and south-east European countries selected for the purposes of this research,[1] controlling for, in each case:

a) the country's population rate with secondary education
b) the country's percentage of private sector firms offering formal training
c) the country's workforce participation gender gap;

and then to use this as a comparative benchmark for Albania's actual level of average wages.

Literature review

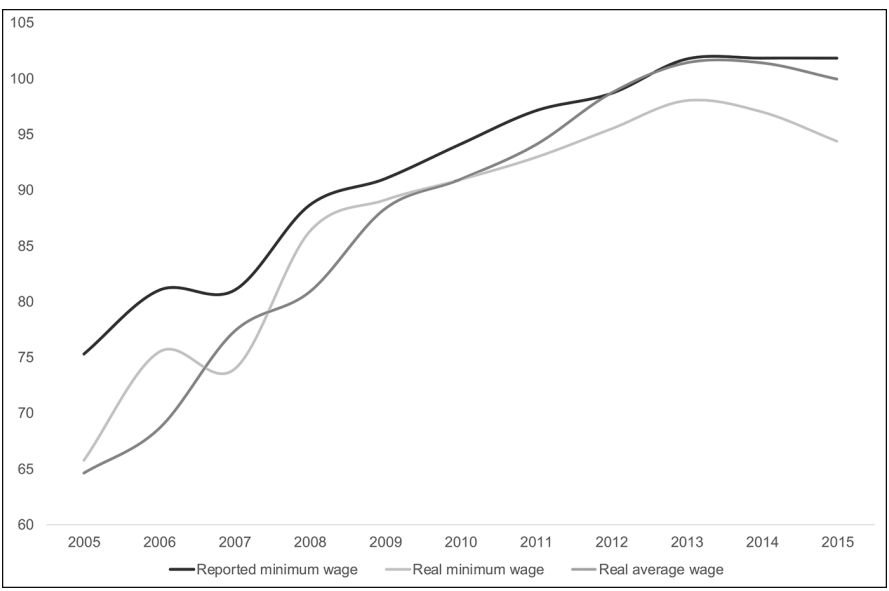
In a 2016 report giving a general economic overview of Albania, the International Monetary Fund calculated that the 2014 average wage in Albania was € 380 (public sector figures only), which amounted to around one-half of the median of the average wage figures for the countries of central, eastern and south-eastern Europe.

1 See Model validity and limitations sub-section of the Annex.

Likewise, the productivity of Albanian workers was estimated to stand at a level of about 63 per cent compared to average productivity figures for workers in the countries of the region (Cabezon *et al*, 2016).

One of the important factors in the suspended growth in the wage level since 2012 appears to be what has happened with the progression of the level of the minimum wage. Chart 1 reports figures over a ten-year timeframe. Disregarding the last three years (2013-2015), Albanians' minimum wages (as reported by state agencies) display a growth of about 40-50 per cent (indeed, one of the highest in Europe). The levels of real minimum and average wages display even steeper growth trends, at about 55 per cent and 60 per cent respectively, with the latter catching up with the state-reported nominal level of the minimum wage sometime around 2012. The following year (2013) saw progression in the real minimum wage showing a declining trend. The same declining trend, albeit a little more moderate, may also be observed in the real average wage. The difference between the real and the reported (nominal) minimum average wage is estimated over the whole investigated period at about 5.85 per cent.

Chart 1 – Wages trendlines – Albania

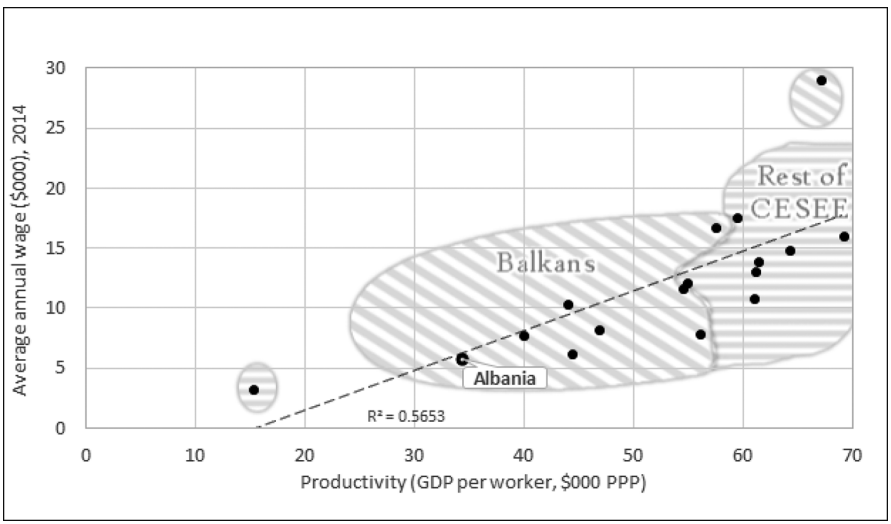


Source: Albanian Institute of Statistics, IMF Data and Statistics, author's own estimates

The progression in real average (net) wages, according to IMF estimates, reached its peak at about ALL 24 000 per month in 2013. In this particular year, the ALL 24 000/month real wage appears to be equal to that of the nominal minimum wage. For the years thereafter (2014-2015), the real average net wage level displays a slight decline, winding up at a figure of about ALL 22 500/month in 2015.

As clearly laid out in Chart 2, Albania ranks second-lowest among central, east and south-east European countries (ahead only of Moldova), both in terms of average gross wages (circa $483.30 per month, based on official figures drawn solely with respect to the country's public sector) and in terms of worker productivity. Moreover, a relevant positive correlation with selected countries from the region may be observed between the average gross wage and worker productivity trends for the decade in question (2005-2015).

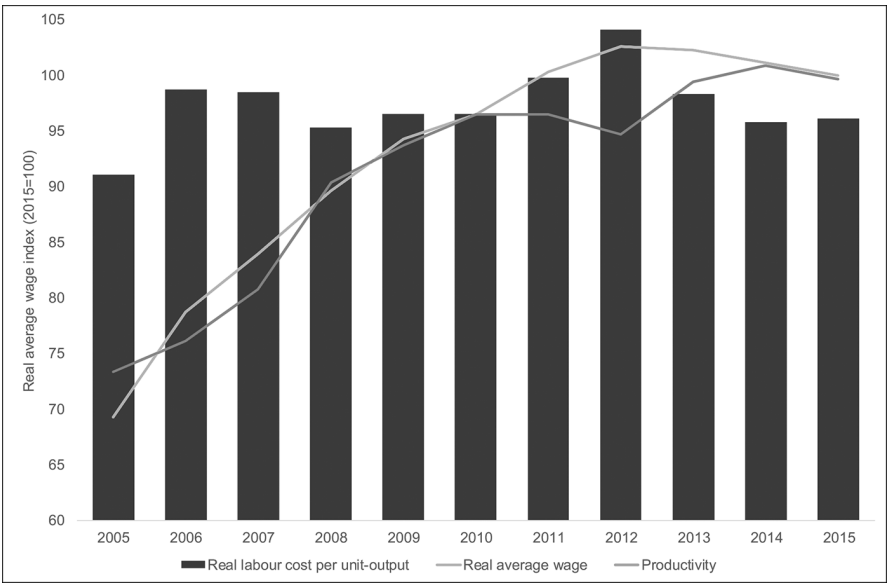
Chart 2 – Correlation between average wages and workforce productivity



Source: IMF Data and Statistics, OECD.stat, Albanian Institute of Statistics, author's own estimates

Meanwhile the level of wages in the Albanian labour market caught up with the level of the country's real labour cost per unit of output around 2012 (see Chart 3). At about this time, the effects of the Greek financial crisis began to be felt in the Albanian economy, with the result that both worker productivity and average wages experienced slight downwards trends.

Chart 3 – Wages and productivity related to labour costs per unit output – Albania



Source: Albanian Institute of Statistics, IMF Data and Statistics, author's own estimates

The downwards trend in wages is accounted for by the following factors:

- the growth in those making themselves available for work which is – in turn – due to a furtherance of domestic migration from rural areas of the country towards urban ones
- a steep decline in remittances,[2] a geo-financial phenomenon which compels the non-working population to join the workforce (Cabezon *et al*, 2016).

On the other hand, labour costs per unit of output may, for the first time, be spotted after 2012 at a level below those of average wages and worker productivity. This implies that, for the last three years, the country's economy appears sustainable and that, for the previous eight, and possibly even in prior ones since the beginning of the country's exposure to the free market economy, the country's economy has, from a macro perspective, been operating at a loss.

2 Over a long period of time since the beginning of the 90s, remittances have been the 'serum' of the Albanian economy which, at first glance, has been characterised by healthy and continuous growth. However, aside of remittances, it has, in reality, been left very sluggish and impaired in terms of its capacity to match the region's productive vitality.

Data sources

A review of the literature explicitly points to a positive relationship between worker productivity and periodic earnings. Data on the latter, because of their quantifiable nature, can be retrieved relatively easily but intrinsic data on worker productivity, because of its subjective nature and diverging interpretation, is harder to obtain. For instance, GDP – the *de facto* anchor instrument in the assessment of a country's (or region's) economic condition and performance – fails to capture the distinct traits of worker productivity. GDP is a major assessment tool on the macro scale; however, it is estimated by taking into account traditional methods either of expenditure or income. Both these economic engagements are mainly related to market transactions and are particularly disconnected from the most prominent pursuit of human expression, which is through work. It is therefore deemed more feasible to conduct research employing alternative indicators that may be more related to the creative/physical activities performed by the individual. Such indicators, according to human capital theory, can be sought out in the subject's level of education and level of training.

World Bank datasets, based on data collected since the second half of the 20th century in most countries of eastern Europe and central Asia, and compiled in preparation for its regular surveys of the business environment and enterprise performance, enable the economics researcher to identify an array of indicators related to certain features and characteristics of human capital located in the Albanian labour market that allow comparison with the countries of the region. Additionally, the database of the Albanian Institute of Statistics (INSTAT), the IMF's 'Data and Statistics' platform and the OECD's Stats platform provide a variety of statistical material that can be utilised in economic research. The data used in this enquiry have been collected over the 2010-2015 period; therefore, the conclusions drawn from this study apply to this particular timeframe.

Methodology and estimation instrument

Formal education attainment

To be able to assess the periodic differences in earnings between central, east and south-east European countries, workforce participants' completed education may be the most important indicator. On the subject of the private financial benefits of attaining formal education credentials, Psacharopoulos (1985) states, when comparing the different levels of education:

> Primary education is the most profitable educational investment opportunity, followed by secondary education.

In his article, he provides several tables and charts giving quantitative results for various world regions which, when roughly averaged, reveal that, worldwide, the completion of primary education accounts for about 31 per cent of private returns from schooling. In turn, secondary education for about 18 per cent and higher education for an additional 20 per cent (Psacharopoulos, 1985: 586-587). Taking into con-

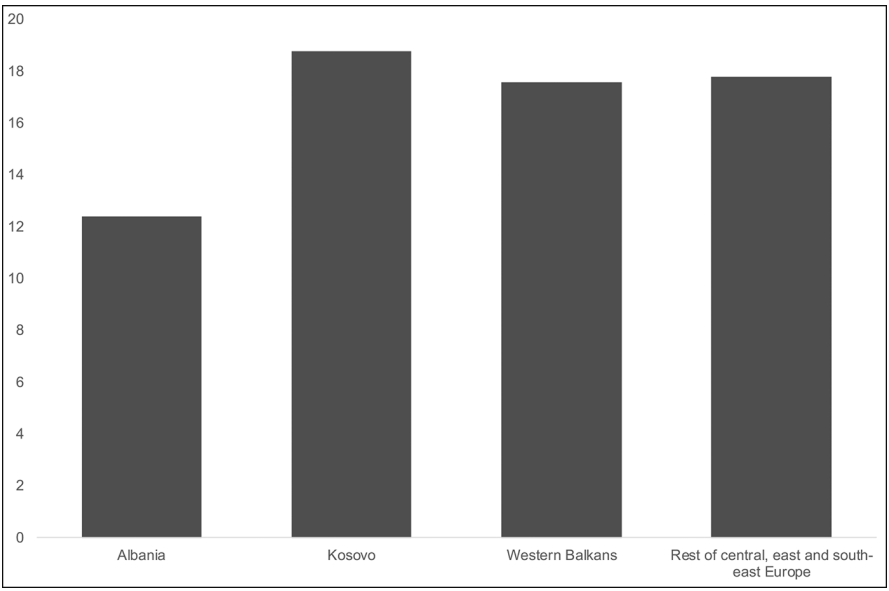
sideration that the majority of the workforce in central, east and south-eastern Europe is composed of employees whose highest formal education credential is a high school diploma (c. 52 per cent)[3] – while those whose highest formal education credential is a university degree make up only about 9 per cent – it is safe to assume that, in terms of currency amount, most of the private financial benefits within the region which have been obtained as a result of investment in formal education are collected by employees having a secondary education. This implies that, from a macroeconomic viewpoint, of all private investment in the three standard levels of formal education, the highest percentage gain included in an average wage within the region is derived from investment in secondary education. Therefore, the percentage of a country's population with an attained secondary education diploma could, presumably, correlate with that country's average wage.

Rate of investment in formal training

One of the greatest structural challenges in the Albanian labour market remains the private sector's minimal investment in formal employee training and the acquisition of experience. Data evidence pertaining to the latter shows that, for the 2007-2013 period, the typical chief executive of an Albanian business firm averages about five years of experience less – in the sector in which his or her business operates – than the average period of experience acquired by leading business managers in the wider region (encompassing the countries of central, east and south-eastern Europe and the western Balkans).

3 Author's own calculations on data extracted from the World Bank's education statistics databank, pruned for the 2010-2015 quinquennial.

Chart 4 – CEO's average years of experience in the sector in which firm operates

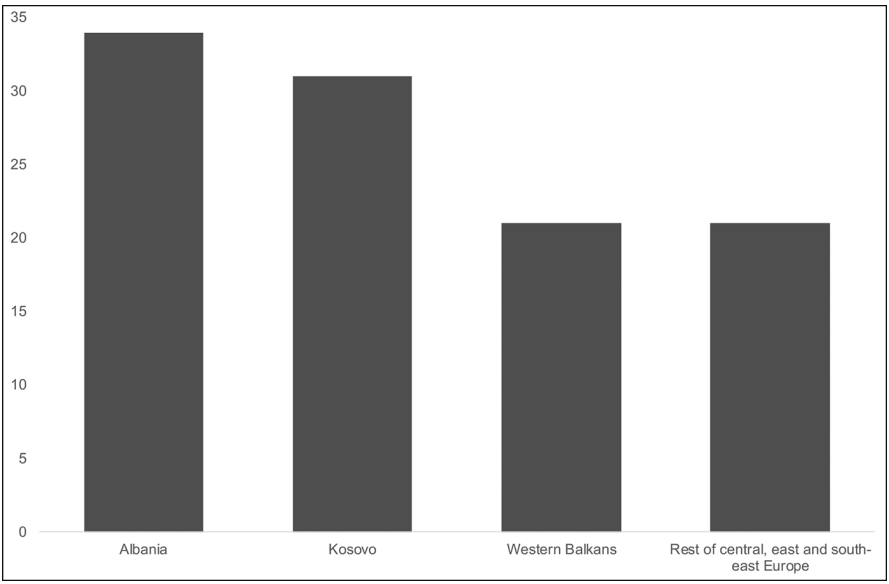


Source: World Bank data

For comparative purposes, Chart 4 (and also Charts 5 and 6) includes data gathered in Kosovo. Perhaps surprisingly, the Kosovar column shows that, on average, the level of seniority in terms of heading a private business is higher than elsewhere: so much so that Kosovo leaves behind not only Albania, but also appears conservative compared to the other countries of the region.

In regard to the presence of staff in private businesses who have no access to training, there is again a distinct difference between Albania and the countries of central, east and south-eastern Europe and the western Balkans. Compared to these countries, the percentage of staff in a firm who have no training in Albania stands, on average, at about 13 points higher. This indicator is very similar for Kosovo as well, with the difference between the two countries only being three percentage points (but with Albania holding the higher mark).

Chart 5 – Average percentage of staff in firm with no access to training

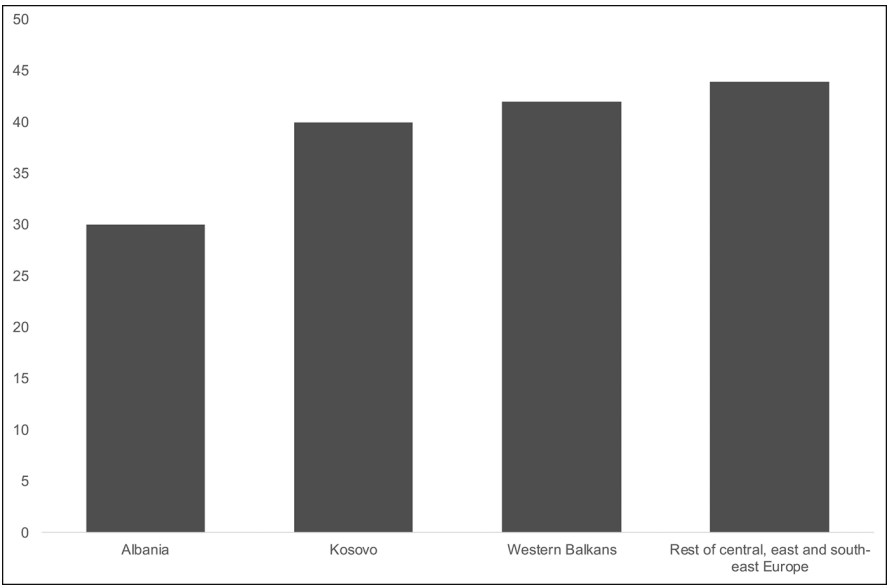


Source: World Bank data

The World Bank data reveal that Albanian businesses are simply not inclined to invest in formal training for new employees, or for those who need training. Data from the 2003-2013 period show that just about 30 per cent of Albanian private sector firms extend the facility and/or cover the formal training expenses of their employees. This figure is around 12 percentage points lower than the region's average.

This clear lack of disposition to invest in formal training is observed mainly among Albanian businesses, as distinct from Kosovar ones. Chart 6 shows that, with regard to this indicator, Kosovo again displays a level very similar to that of the wider region. Taking into account that the investigated region is, essentially, eastern Europe excluding the Slavic-inhabited territories of the former Soviet Union, and considering the rationale that private sector corporations in western Europe reach much higher levels in covering formal employee training expenditures, one is able to envision the real value of formal training in relation to occupational performance as well as the impact that both formal education and training may have on an employee's periodic earnings.

Chart 6 – Average percentage of firms offering formal training for staff



Source: World Bank data

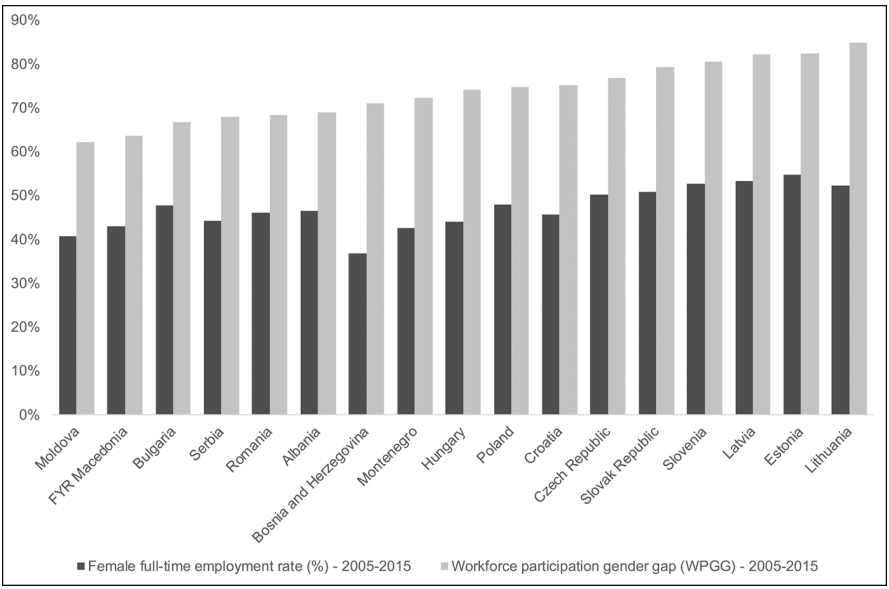
Workforce participation gender gap

Another key factor in a country's economic advancement is the rate of female participation in the workforce. The inclusion of women in a country's macroeconomic mechanism of community well-being and empowerment, national wealth creation and production is an essential requirement in a free market economy and in democratic systems of governance more broadly. World Bank data on the inclusion of women in the workforce points out that, in general terms, the more economically advanced the country, the higher is the rate of female inclusion in the workforce.

Chart 7 displays information about female participation in the workforce of countries of the region (as a percentage of that country's female population above the age of 15) and also the male-female employment ratio (WPGG).[4]

4 The Workforce Participation Gender Gap is a ratio developed by the author to show the gender gap in a given country's workforce. The closer to 1 this value, the more balanced is female participation compared to that of males. WPGG is a ratio (ranging from 0 to 1) that reveals information on the gap between male and female participation rates in a country's workforce. So, if Country X has a 60 per cent female and a 70 per cent male participation rate in its workforce, it follows that Country X's WPGG would be: 0.6 / 0.7 = 0.86.

Chart 7 – Workforce participation by gender



It can be noted from the chart that the WPGG does not necessarily coherently follow the female workforce participation rate. For instance, Lithuania has a female workforce participation rate that appears close to the average for the region. However, its WPGG is the highest among central, east and south-east European countries because, among them all, Lithuania's male workforce participation rate is the closest to that of its female participation rate.

With the research approach set out, the objective is to come up with an econometric specification able to estimate the average wage of a typical country in the central, east and south-east European region based on obtainable data on the following indicators in each country, which constitute the model's independent variables:

- the workforce's highest level of formal education attainment
- the rate of investment in formal training in the private sector
- the Workforce Participation Gender Gap.

We have included the econometric analysis and associated model in the Annex to this article.

Main results

The model developed in the Annex can be used to deliver several quantitative estimations regarding the hypothetical backdrop to the periodic earnings of the region's workforce participants. Table 1 provides an example of the model's estimation output. On the left-hand side, it lists the dollar estimations of 2014's average monthly wages for Albania, its immediate neighbouring countries and Serbia; the right-hand

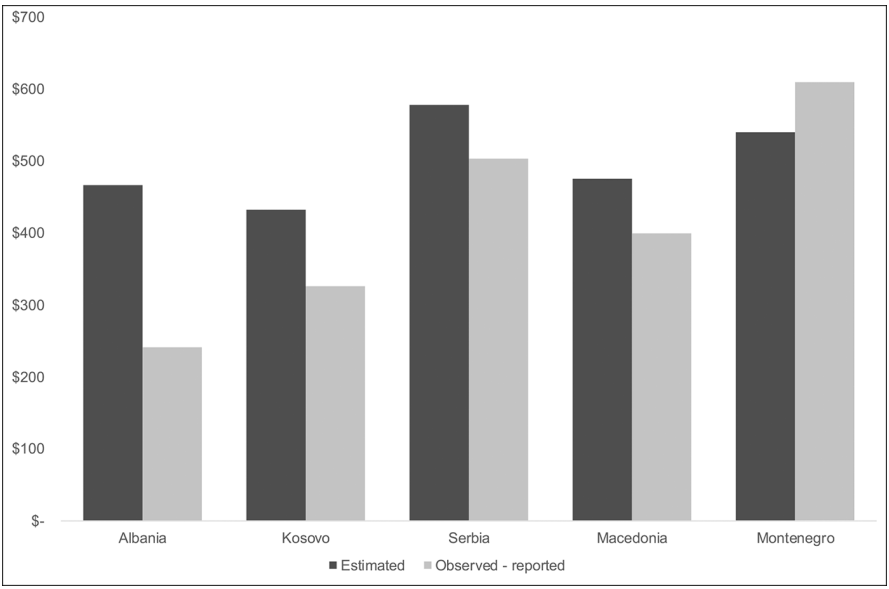
side lists the respective actual wage figures as observed and reported in official statistics platforms and research works. The estimations on the left are derived by controlling for each country's scores against the model's independent variables. Additionally, converting these values into purchasing power parity dollars can be very informative as it provides a common denominator for comparing several countries' living standards.

Table 1 – Estimation output

Country	Model estimations for 2014 average monthly net wage (in ($)	Converted to 2014 $PPP	Actual wages, as reported in official statistics platforms and research work	Converted to respective year's $PPP	Year of reporting (and $PPP conversion)
Albania	466.70	1,388.44	Employees with higher education:		
			334.96	960.62	2015
			Employees with high school education:		
			235.18	674.45	2015
Kosovo	432.45	1,138.23	Employees working in the public sector:		
			357.74	941.58	2014
			Employees working in the private sector:		
			325.20	855.93	2014
Macedonia	475.80	1,377.38	399.64	1,156.89	2015
Montenegro	541.50	1,169.33	610.56	1,318.46	2014
Serbia	578.61	1,285.16	503.70	1,118.79	2014

Furthermore, Chart 8 depicts these differences between the estimated and the actual (i.e. reported) wages, based on Table 1 data.

Chart 8 – Estimated and observed 2014-15 average monthly net wage for selected countries



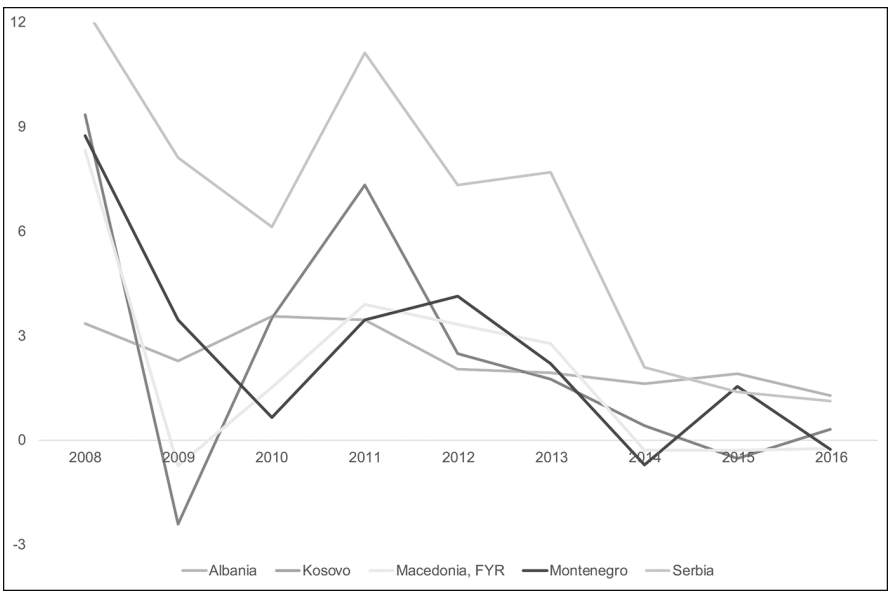
Source: Values from Table 1

We can see that there is a noticeable difference for Albania, which means that, based on our model's output, average wages in Albania are much lower than what they should hypothetically be. Just by comparing this difference to those belonging to our neighbours (which are not nearly so noticeable), it can be fairly concluded that wages in Albania show static tendencies and do not follow the regional pattern.

The reasons why wages in Albania are static may be attributed mainly to weak demand in the labour market, coupled with a level of supply that has little to offer in terms of trained workers. Such a market environment tends to rely on a high rate of unemployment as well as to inflate significantly the proportion of slack labour. It follows that the number of people competing for jobs remains high; hence producing little to no incentive for private sector wages to rise.

Inert wages lead to a low propensity to consume, so this phenomenon will also manifest itself in the country's consumer price inflation. Chart 9 shows that Albania is the only country among those selected for analysis to have – over the most recent eight-year period – inflation rates consistently below the a level of 4 per cent. This is a distinct indicator of a cautiously low propensity to consume which, in turn, points towards low levels of disposable income deriving from static wages.

Chart 9 – Consumer price inflation (annual per cent)

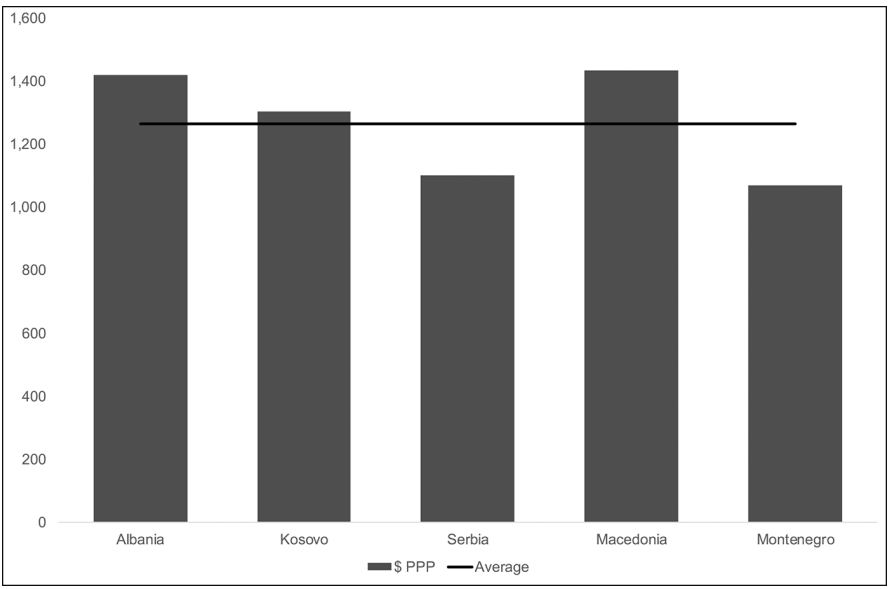


Source: World Bank data

In order better to assess the purchasing power of average net wages in Albania and neighbouring countries within their own markets, it would be informative to make a comparison based on the collective average wage received in each country. Chart 10 illustrates this comparison for a hypothetical average wage converted into international dollars[5] as estimated by our model based on the average scores against each of the independent variables in our selected countries, which sums to $496.22. As we can see, a $496.22 wage received in Macedonia provides the highest purchasing power among the selected countries, equivalent to $PPP 1 436.49. This is followed by Albania ($PPP 1 423.10), Kosovo ($PPP 1 306.08), Serbia ($PPP 1 102.18) and Montenegro ($PPP 1 071.56).

5 The international dollar ($PPP; int$) is a calculated measure used by economists denoting purchasing power parity. In essence, if a specific amount of given country's currency, if converted, amounts to precisely int$1, it would be able to buy the same amount of comparable goods and services in the market of that country that $1 would buy in the US market.

Chart 10 – Estimated average net wage in Albania and neighbouring countries ($PPP equivalent)



Conclusions

The objective of this research enquiry was to assess the prevalence of a worker productivity gap between Albania and its neighbouring countries. The author tried to attain this comparison by determining – by means of an econometric specification – a theoretical benchmark average monthly net wage that workers should receive across the countries of central, east and south-east Europe, controlling in accordance with the internal position in each country for the model's independent variables of the rate of the population with secondary education (SE), the percentage of private sector firms offering formal training (FT) and the workforce participation gender gap (WPGG).

The results for the selected countries were shown in Chart 8. Albania's individual SE, FT and WPGG scores put it slightly below the neighbouring region's average of $500. In terms of actual wages, however, it remains positioned in last place. Compared to the respective theoretical benchmark delivered by the model (which is what the country's average monthly net wage should be based on its own scores against the model's individual variables), Albania's actual average monthly net wage is set at 51 per cent: a considerable forty percentage points below the region's average monthly net wage (which in turn stands at 91 per cent). This means that average wages in Albania have quite a bit of catching up to do with the country's level of worker productivity and that the labour market has not fully tapped into the human capital potential available in the country.

Chart 10 represents visually the purchasing power of the hypothetical average wage derived by the model, which is estimated to be $496.22, in each of the selected countries. If workers in Albania and its neighbouring countries all received in principle an average wage of $496.22, their purchasing power in the markets of their respective countries would vary between Macedonia, at the top end (and marginally ahead of Albania), and Montenegro at the other end.

In conclusion, the above analysis attests that there is a productivity gap between Albania and its neighbouring countries, but it is not significant. The average wage gap, on the other hand, is quite substantial. Albanian labour demand seems to be unable to absorb the labour supply available in the country. Hence, wages in Albania tend to remain static and, in broad terms, do not give merit to its workforce productivity.

Much therefore remains to be done in terms of adjusting labour demand so as to meet the needs of the human capital available in the country, for it is not currently being utilised at its full potential. In addition, in order to prepare young workforce participants for the future challenges in the labour market, concrete steps should be taken by policy-makers to design and execute the policies that enable Albania's young people to have adequate access to qualitative formal education and, most importantly, on-the-job training.

References

Average monthly net wage paid per employee, November 2015 (2016) Retrieved from MAKSTAT (Republic of Macedonia State Statistical Office) and available at: http://www.stat.gov.mk/PrikaziSoopstenie_en.aspx?id=40&rbr=1897.

Becker, G (1967) *Human Capital and the Personal Distribution of Income: An Analytical Approach* pp. 94-144.

Cabezon, E, N. End, K. Ismail and M. Thackray (2016) *Albania: Selective Issues* Washington, DC: International Monetary Fund (European Department).

Elborgh-Woytek, K, M. Newiak, K. Kochhar, S. Fabrizio, K. Kpodar, and P. Wingender, B. Clements and G. Schwartz (2012) *Women, Work and the Economy: Macroeconomic Gains from Gender Equity* Washington DC: International Monetary Fund (Strategy, Policy and Review Department).

Garo, O (2016) 'Higher Education as a Direct Contributor to Lifetime Periodic Earnings: The Case of Albanian Workforce Participants' *International Journal of Economics, Commerce and Management* IV(2): 107-119.

Goldin, C (1995) 'The U-shaped Female Labor Force Function in Economic Development and Economic History' in T. P. Schultz (Ed.) *Investment in Women's Human Capital and Economic Development* University of Chicago Press, pp. 61-90.

Mincer, J (1958) 'Investment in Human Capital and Personal Income Distribution' *The Journal of Political Economy 66*(4): 281-302.

Mincer, J (1962) 'Labor Force Participation of Married Women: A Study of Labor Supply' in Universities-National Bureau Committee for Economic Research (Ed.) *Aspects of Labor Economics* Princeton University Press, pp. 63-105.

Nikolić, M, M. Filipović and S. Pokrajac (2016) Regional Competitiveness for Achieving Sustainable Development – The Case of Serbia' *Industrija* XLIV(3): 7-26.

Psacharopoulos, G (1985) 'Returns to Education: A Further International Update and Implications' *The Journal of Human Resources* XX(4): 584-604.

Ruder, P. J (2014) *Human Capital Theory*.

Shehaj, E, A. Loxha and E. Pula (2016) *The Race for Public Sector Employment in Kosovo and Albania: What lies behind it?* Prishtina: Group for Legal and Political Studies.

Spring, J (2015) *Economization and Corporatization of Education: Human Capital, Global Corporations, Skills-Based Schooling* New York: Routledge.

Wages data: Average wages without taxes and contributions (NET) by activity sector (2018) Retrieved from MONSTAT (Statistical Office of Montenegro) and available at: http://monstat.org/eng/page.php?id=1270&pageid=24.

Annex: econometric analysis

After some testing conducted with the World Bank databank, the IMF Data and Statistics platform and INSTAT data on the independent variables selected for the model – for each of the seventeen central, east and south-east European countries listed below in the Model validity and limitations sub-section – the algebraic form of the most statistically viable model for the objective of this research was developed as follows:

$$\ln Y = \ln Y_0 + \alpha SE + \beta FT + \gamma WPGG + \mathfrak{M} \quad (1)$$

The statistical software fits the model, and delivers its perditions for Y, using data on the average wage (in dollars) in each of the investigated countries in the region. The elements of the model are specified thus:

Variable of interest: Y	The average yearly wage in a country in central, east and south-east Europe (for which the values of *SE*, *FT* and *WPGG* may also be provided)
Intercept: Y_0 Predictor variables: *SE*	The hypothetical estimate of the average monthly wage of a typical employee in central, east and south-east Europe, working in a country with a 0 per cent score of the population with secondary education, a 0 per cent score for the rate of formal training in the private sector and a 0 per cent score for WPGG
FT	The percentage of the country's population having a high school diploma as their highest formal education credential
WPGG	The percentage of the country's private sector firms offering formal training to their employees
	The country's workforce participation gender gap

Parameters α, β and ɤ are the respective coefficients of *SE*, *FT* and *WPGG*. The statistical software aptly generates these when the provided population data is fitted into the model. For the data available on our seventeen countries in central, east and south-east Europe, our model's generated output is as follows:

$$\ln Y = 4.968 + 0.016SE + 0.017FT + 3.789WPGG \quad (2)$$

The output from the model may be interpreted as follows:

1. *ceteris paribus*, for every percentage point increase in the rate of a given country's population which is equipped with a high school diploma as their highest formal education credential, the natural logarithm of the country's yearly average wage goes up by 0.016 (meaning, the actual yearly wage goes up by approximately $162.85)
2. *ceteris paribus*, for every percentage point increase in the rate of a given country's score for formal training offered by its private sector firms, the natural logarithm of the country's yearly average wage goes up by 0.017 (meaning, the actual yearly wage goes up by approximately $164.87)
3. *ceteris paribus*, for the hypothetical swing of a given country's WPGG mark from 0 to 1, the natural logarithm of the country's yearly average wage would go up by 3.789 (meaning, the actual yearly wage goes up by approximately $26,178.51).
   - obviously case 3 cannot happen in practice, since this would imply that the country (or region) ought to have zero per cent participation of women in its workforce. If that were to be the case for our region, the model predicts that the yearly average wage in central, east and south-east Europe would be the inexplicable value of $606.05. Nevertheless, starting from this figure as a base, a swing of the WPGG score in central, east and south-east Europe from 0 to 1 (implying that the rates of the region's working males and females were equal), the region's average wage would rise to $26,784.56

– this result implies that, *ceteris paribus*, for every percentage point increase in the rate of a given country's WPGG score, the country's yearly average wage would go up by approximately $261.79).

Model validity and limitations

Numerous techniques may be used to assess the soundness of a regression model. Those which are most in deployment are the coefficient of determination R^2; the P-values of the parameter estimates; and the model's overall F-statistic.

- R^2 indicates the percentage of the variable of interest within the total variation that is accounted for by the interaction between the predictors in the model. Typically, the higher the R^2 value, the greater the predictive power of the model. The output value for our model's adjusted R^2 is 74.55 per cent, which means that about three quarters of the total variation of *Y* (the average wage) is explained by the model. In the areas of science involving human interactions, such as economics, an R^2 above the 50 per cent mark is considered very suitable. Therefore, judging from the R^2 value, our model appears solid
- the P-values of the model's independent variables – the percentage of the workforce attaining secondary education, the percentage of private sector firms offering formal training and the male / female employment ratio – are 0.097, 0.032 and 0.006 respectively. They fall, in that order, within the 10 per cent, 5 per cent and 1 per cent levels of significance, suggesting that each one adds value to the model and is necessary for its integrity
- the model's F-statistic is 0.0001 and is significant at the 1 per cent level. Theory avers that the F-statistic is an indicator of how substantial is the combined influence of all the independent variables on the model's variable of interest. Values within the customary levels of significance, as is the case is with our model's F-statistic, indicate in principal that the constructed model is valid and can be used to serve the purposes for which it was conceived. So, based on our F-statistic, we may conclude that this model contributes to the ensuing results of this research work.

Another necessary investigation regarding the model's validity is to test whether there are traces of heteroscedasticity in it. A formal method for assessing this statistically is the Breusch-Pagan test. In essence, the procedure calls for a multivariate fit of the model's squared residuals against its independent variables (in our case *SE*, *FT* and *WPGG*). If the F-statistic found in the fit's output is greater than its assigned level of significance (typically, 5 per cent) the null hypothesis – which maintains that the error terms are homoscedastic – holds. Conversely, if the produced F-statistic is smaller than its assigned level of significance, the null is rejected, concluding that heteroscedasticity is present and that the model should therefore be revised.

After following this procedure for our model, the output produced an F-statistic of 0.169. This value falls outside the 5 per cent level of significance and, consequently, we fail to reject the null hypothesis, thereby concluding that no traces of heteroscedasticity are observed in our model.

The limitations of this study are mainly related to its assessment methodology, i.e. the choice of the type of economic analysis. The data utilised belongs to the

2010-2015 quinquennial; therefore, being cross-sectional, the study is not able to capture the time dynamics of human capital and the productivity attributes of the Albanian workforce.

Moreover, the study uses data from a selection of countries constituting the central, east and south-east European region: namely, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovak Republic and Slovenia. These countries make up the majority of the region of central, east and south-east Europe, but they do not represent the entire population.

The decision to conduct the study with this selection of countries was made because there is insufficient data from the remaining countries. In addition, the political ideologies of some of them, namely Turkey and Belarus, apply significant restrictions to their economic systems and markets. Therefore, in the author's judgement, the inclusion of the data from such countries could have produced a bias in the results. In spite of these exclusions, the utilised data represents the great majority of countries in central, east and south-east Europe; therefore, the study's results may be considered representative of the entire population.