

THE LINK BETWEEN GLOBALISATION, ECONOMIC GROWTH AND EDUCATION: AN ANALYSIS IN THE CASE OF ROMANIA

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Abstract

The paper tries to offer empirical evidence on the link between economic growth, globalisation phenomenon and education level of population in the Romanian economy. Using time series for 1990-2011 in a regression model, we found a positive validated correlation between globalisation and economic growth, globalisation and education and, economic growth and education. For globalisation measurement the KOF index of globalisation was used.

Key words: globalisation, economic growth, education

JEL Codes: F 60, F 63, F 62

Introduction

The term of globalisation began to be used more commonly in the 1980s, reflecting technological advances that made it easier and quicker to complete international transactions -both trade and financial flows. It refers to an extension beyond national borders of the same market forces that have operated for centuries at all levels of economic activity (IMF, 2008).

The globalisation definition is difficult due to its multidisciplinary nature, the complexity of its expression forms (economic, social, financial and political) and their combinations.

The most common definition of globalisation refers to the growth of economic activity across national and regional boundaries. It refers as well, to an increased movement of tangible and intangible factors: people via migration, goods and services, through trade and investments.

The globalisation phenomenon put in move people, capital flows, ideas, goods and services, tangible and intangible assets, raising social and environmental problems. All these changes are affecting the output level and the economic growth in both country categories (source or destination of capital flows). The investment in education is affected also.

The paper aims to examine the link between globalisation, economic growth and education level of population in the case of Romania.

The paper is organised as follows. After the introduction, globalisation's dimensions are depicted as they result from the relevant literature, then the impact of globalisation on economic growth is summarized and education and the possible measurement of globalisation are presented. The section 2 is dedicated to Methodological approach and data and section 3 presents the main findings, followed by conclusions.

1. Globalisation: definition, consequences and measurement

1.1. Globalisation's dimensions

Economic globalisation is a historical process, the result of human innovation and technological progress. It refers to the increasing integration of economies around the world, particularly through the movement of goods, services, and capital across borders. The term sometimes also refers to the movement of people (labour) and knowledge (technology) across international borders. There are also broader cultural, political and environmental dimension of globalisation (IMF, 2008).

Globalisation is defined as the process through which economies become increasingly interdependent, as reflected in their increased participation in world trade and by cross-country investments (Cernat & Vrânceanu, 2002). The trade ratio to world GDP was increasing rapidly before the Second World War and has risen sharply in last decades, following an increasing trend (Crafts, 2000). The latest level is unprecedentedly high and represents a massive increase from 12,40% in 1960, 19,60% in 1990 and 30,1% in 2012, according to World Bank Data. Thus, a core element of globalisation is the expansion of world trade through the elimination or reduction of trade barriers such as import tariffs. Greater imports offer consumers a wider variety of goods at lower prices, while providing strong incentives for domestic industries to remain competitive. Exports stimulate jobs creation and trade, promotes economic resilience and flexibility and competitive advantages for exporter countries. Greater openness can also stimulate foreign investments, which would be a source of employment for the local workforce and could bring along new technologies -thus promoting higher productivity (IMF, 2008).

Caselli (2006) mentions three „dimensions“ of globalisation mainly accepted in the contemporary theory, namely economic, political and cultural, which may be further divided into subdimensions. A definition of globalisation should reflect this multidimensionality. Also, the fact that globalisation really does enfold the whole globe needs to be stressed, as this is the distinguishing factor between globalisation and other forms of international openness of countries. In this view, *globalisation is a process of growing interaction and interdependence between economies, societies and nations across large distances* (Vujakovic, 2010).

According to IMF (2008), the world's financial markets have experienced a dramatic increase in globalisation in the recent years. Global capital flows have rise from 2% of GDP in 1980 to 15,5% in 2012. The most rapid increase has been experienced by advanced economies but emerging markets and developing countries have also become more financially integrated (IMF, 2008).

There is a debate among academics and policy experts on the impact of financial globalisation. Some of them are seen globalisation as a catalyst for economic growth and stability while for others globalisation is injecting dangerous and costly volatility into economies of growing middle income countries (IMF, 2008). The following effects of financial globalisation were identified by researchers of IMF:

(i) countries with well-developed financial sectors, strong institutions, sound macroeconomic policies, and substantial trade openness are more likely to gain from

financial liberalisation and less likely to risk increased macroeconomic volatility and to experience financial crises;

(ii) there are costs involved, related to a lower international trade, higher investments costs for firms, poorer economic incentives, and additional administrative/monitoring costs;

(iii) opening up to foreign investments may encourage changes in the domestic economy that eliminates these distortions and help foster growth.

As regards to the relationship between globalisation and inflation, the advancing globalisation process generated the idea that not domestic factors but international ones are primary determinants of inflation. As a result, monetary policy makers (representatives of central banks) have taken an active interest in the topic of globalisation and inflation. A part of them are sustaining the above view. There are, also other opinions stating that international forces are likely playing an increasingly important role in the inflation process, but domestic considerations remain with a predominant role. Ihrig, et al. (2010) provides empirical evidence, based on estimation of Philips curves inflation equation for 11 industrial countries on a weak link between globalisation and inflation. The link is obvious, but weak. Globalisation affects the ability of monetary policy makers to stabilize prices and output in two ways:

(i) through its effects on the behaviour of inflation and output;

(ii) through its effects on monetary transmission mechanism (Mishkin, 2009).

Within the efforts of maintaining the prices stability and reducing the globalisation impact, the independence of central banks affects the monetary policy measures on inflation stabilization. Several empirical studies (Dumiter, 2009, 2010 and 2012), have shown different findings in developed and developing countries, mainly related to the fact that an increasing central bank independence leads to an efficient inflation targeting regime.

1.2. Impact of globalisation on economic growth and education

A large number of papers revealed the effects of globalisation on the long-run growth of output. Globalisation was measured by economic variables, ignoring its social and political dimensions. Such variables referred generally, to as the openness of the economy (trade ratio, foreign direct investment, capital flows, tariff rates, trade restrictions, monopolization of exports, black-markets premiums etc). After introducing various globalisation indexes in their diverse forms (presented below), the number of papers, showing the growth effects of globalisation was multiplied.

The economic globalisation does affect growth and its beneficial impact depends on the level of country's income. High and middle income countries benefit from globalisation whereas low-income countries do not gain from it (Samimi and Jenatabadi, 2014).

Recently, researchers claimed that growth effects of globalisation depend on the economic structure of the countries during the process of globalisation and the

impact of globalisation could be changed by a set of complementary policies such as improvement in human capital and financial system.

It is obvious that a higher educated nation is more attractive for foreign investors and there is a relationship between the amount of skilled population of a country and its absorptive capacity of new technologies brought in the economy by foreign companies. As input (cause) and effect of economic growth, (Neagu, 2013) human capital plays a dual role in the process of globalisation, as a determinant of FDI flows (a factor of attractiveness) and effect of FDI flow, through the mechanism of economic growth.

Relatively little is known about the extent to which globalisation affects investments in human capital and studies on related topics are focused on globalisation impact on domestic labour markets, meaning wages and employment.

1.3. Globalisation measurement

In order to assess the causes and consequences of globalisation, researchers and economists were concerned to find measures for globalisation. A large number of studies used as proxies, capital flows and openness to these flows. For example, Beer and Boswell (2001) and Mah (2002) examined the consequences of globalisation on income inequality. Li and Reuveny (2003) analysed their effects on democracy, Heineman (2000) has shown that more globalised countries have lower increases in government outlays and taxes and Vaubel (1999) found them to have lower government consumption.

A major concern was to construct several indexes of globalisation. A first attempt was the A.T. Kearney/Foreign Policy Globalization Index, a comprehensive empirical measure of globalisation and its impact. It measured economic, person-to-person, political and technological integration in 62 countries, accounting for 96% of the world's GDP and 85% of the world's population.

A large criticised debate was generated by this index, as regards to its robustness (see: Lockwood, 2004). As a result, another globalisation index was proposed by the Center for the Study of Globalisation and Regionalism (CSGR), more suitable for academics and others who wish to use it in statistical or econometric analysis of the relationship between globalisation and other key economic variable. The CSGR index consists of three sub-indexes: economic, social and political (Lockwood and Redoano, 2005). Economic globalisation is composed of four variables: trade, foreign direct investment, portfolio investments and income. Social globalisation consists of eight variables grouped in 2 categories: *people* (foreign stock, foreign flow, workers remittances, and tourists) and *ideas* (phone calls, internet users, films, books and newspapers, mail). Political globalisation comprises: embassies, UN missions and international organisations.

One year later, Dreher (2006) demonstrated a positive effect of globalisation on emerging economies by using another globalisation index, known as KOF globalisation index. This index measures the three main dimension of globalisation: economic, social and political. The economic dimension of KOF index measures the effective trade and the volume of investments on one hand, as

well as the measure by which countries apply trade and circulation restriction on capital, in order to protect their own economies, on the other hand. The social dimension of globalisation reflects the level of data and ideas dissemination, while the political dimension shows the level of political cooperation between countries.

A second attempt was generated by the World Markets Research Centre, the G-index, introduced by Randolph (2001) to measure depth, breath and richness of the interdependence between national and global economy. The major weight of variables belongs to the economic dimension of globalisation.

Based on these prior findings, Marten and Zywietz (2007) propose a modified globalisation index and in 2008 they publish an improved version of it (updated Maastricht globalization index). The Maastricht index of globalisation uses seven group of variables including global politics, organised violence, global trade and finance, social and cultural, technology, and environment to cover all dimensions of globalisation. This index is the only one that captures environmental dimension of globalisation and includes also geographical characteristic of countries.

In 2010, Vujakovic has developed an index (the New Globalisation Index) with five new variables to measure globalisation. As compared to other globalisation indices, three major innovations are introduced: five new variables, geographical distances between countries are incorporated into the trade index and the principal component analysis method is used for constructing the globalisation dimensions.

The globalisation annual index launched by Ernst and Young in 2009 in cooperation with the Economist Intelligence Unit has five measurements to assess a country's global ranking including: openness to global trade, global capital movements, and global exchange of technology, global labour movements and cultural integration. It measures the performance of the highest 60 economies at international level, taking into account 20 indicators evaluating the key issues on the cross-border activities.

The European Union developed a list of globalisation indicators related to: persons, technology, goods and services, global responsibility, business and capital on Member States and candidate countries.

OECD (2010) provides a comprehensive selection of the main dimension of economic globalization measures, through a set of indicators referring to: international trade of goods and services, foreign direct investment, portofolio investment, globalisation of technology and knowledge, multinational enterprises, global value chains.

A comprehensive, critical and pertinent analysis of globalisation indices is provided by Dreher et al. (2010).

The present paper will use the KOF index of globalisation to illustrate the relationship between globalisation, economic growth and education.

Our investigation contributes to the literature that examines the impact of higher education graduates on globalisation advancement of Romania and the impact of this advance on the economic growth.

2. Methodological approach and data

The following aspects will be examined in the case of Romanian economy: impact of globalisation on growth, education and economic output and the link between education and globalisation.

We will use the following econometric models:

$$GDPR = C + \beta_1 \cdot GI + \varepsilon \quad (1)$$

$$GDPP = C + \beta_1 \cdot EDU + \varepsilon \quad (2)$$

$$GI = C + \beta_1 \cdot EDU + \varepsilon \quad (3)$$

where: *GDPR* is the growth rate of GDP, *GI* is the KOF globalisation index, for Romania, *GDPP* is GDP per capita, *EDU* is the number of higher education graduates, β_1 is regression parameter and ε is the standard error.

Data for Romania, for the period of 1990-2011, were extracted from World Development Indicators (from World Bank Data Basis) (GDP per capita, GDP growth rate), from KOF Swiss Economic Institute of Zurich data set (based on index introduced by Dreher, 2006) and from NIS Romania (higher education graduates).

3. Main findings

3.1. Economic growth and globalisation in Romania

As we can notice from the Table 1 which displays the estimation results of equation 1, a moderate correlation is identified between economic growth and globalisation (the value of correlation coefficient is 0,45) and in a proportion of 20% the variance of growth rate could be caused by the variation globalisation index, if other factors are remaining constant.

Our regression model is overall statistically validated for a threshold significance of 0,05, due to the fact that Sign F is 0,033, lower than 0,05. The intercept of the regression equation can not be validated due to its corresponding P-value of 0,069, higher than 0,05. But for the independent variable, globalisation index (*GI*), the regression is validated, the P-value is 0,033, under 0,05 (the significance threshold).

The equation 1 can be written as follows:

$$GDPR = -11,431767 + 0,2502309 \cdot GI \quad (4)$$

We can interpret the estimates of our regression model as follows: when the globalisation index increases with one single unit, the growth rate of GDP will increase with 0,25 units.

Table 1 Regression results (equation 1)

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R		0,453589				
R Square		0,205743				
Adjusted R Square		0,1660301				
Standard Error		5,8643055				
Observations		22				
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	178,16695	178,16695	5,180766	0,033984776	
Residual	20	687,80158	34,390079			
Total	21	865,96852				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-11,431767	5,9610981	-1,9177283	0,0695386	-23,86639935	1,002866
GI	0,2502309	0,109937	2,2761296	0,0339848	0,020906304	0,4795556

Source: report generated by Excel Data Analysis

3.2. Economic output and education in Romania

The estimations of regression equation 2 are displayed in the Table 2. As dependent variable, the economic output, expressed through GDP per capita, is strongly affected by the education level of population measured by the number of higher education graduates. In a proportion of 81,73%, the variance of GDP per capita could be determined by the variation in the educational level of population, if other factors are remaining constant.

The regression model is statistically validated overall and for all components due to the fact that the value of Sig F and P-values are under 0,05, the significance threshold.

The regression equation can be written as follows:

$$GDPP = 2877,9271 + 0,0162413 \cdot EDU \quad (5)$$

For an increase with one single unit of the EDU variable (educational attainment of population), GDP per capita will increase with 0,01 units.

Table 2 Regression results (equation 2)

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R		0,9040691				
R Square		0,8173409				
Adjusted R Square		0,8082079				
Standard Error		476,79956				
Observations		22				
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	20345274,35	20345274	89,493574	7,97803E-09	
Residual	20	4546756,475	227337,82			
Total	21	24892030,83				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	2877,9271	199,6145909	14,417418	4,985E-12	2461,53835	3294,3158
EDU	0,0162413	0,001716822	9,4601043	7,978E-09	0,012660084	0,0198225

Source: report generated by Excel Data Analysis

3.3. The link between education and globalisation in Romania

Using the equation 3 to estimate the regression parameters we found the results displayed in the Table 3.

The equation 2 can be written as follows:

$$GI = 35,13 + 0,0001787 \cdot EDU \quad (6)$$

The model is statistically validated due to the fact that Significance F is lower than 0,05, the chosen significance threshold. As components, the statistical validation is maintained, for Intercept and for variable 'education', because the P-value is under 0,05. The multiple correlation coefficient R (0,93) shows a strong positive correlation between education and globalisation index. The value of R-squared is 0,86, meaning that the variation of globalisation index of 86% could be granted to the variation of education level of population if other factors remain constant.

According to the regression results, when the level of education variable increases with one unit, the globalisation index will increase with 0,0001787.

Table 3 Regression estimation results

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R		0,9305684				
R Square		0,8659576				
Adjusted R Square		0,8592555				
Standard Error		4,3669542				
Observations		22				
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	2464,006175	2464,0062	129,20655	3,52097E-10	
Residual	20	381,4057715	19,070289			
Total	21	2845,411946				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	35,131837	1,828247829	19,216124	2,314E-14	31,3181793	38,945496
EDU	0,0001787	1,57242E-05	11,366906	3,521E-10	0,000145935	0,0002115

Source: report generated by Excel Data Analysis

4. Conclusions

Globalisation has a positive and moderate impact on economic growth: one single unit of globalisation index increase affects with 0,25 units the growth rate of GDP.

Education has a positive impact on globalisation index, through the growth mechanism. In more specific words, higher educated and skilled people can positively influence the globalisation process, making more attractive the country for foreign investors and globalisation stimulate a higher quality human capital. However, higher educated people affect economic growth in a determinant way.

These findings suggest important policy implications. If globalisation is beneficial for the economic growth and education is a determinant factor for both, growth and

globalisation, then Romanian policy makers could focus their attention to such priorities (a high qualitative education, investment attraction) and conceive public policies measures and programmes meant to stimulate these sectors.

References

1. Beer, L. and Boswell, T., 2001, "The effects of globalization on inequality: a cross-national analysis", *Halle Institute Occasional Paper*.
2. Caselli, M., 2006, "On the Nature of Globalization and its Measurement. Some Notes on the A.T. Kearney/Foreign Policy Magazine Globalization Index and the CSGR Globalization Index", *UNU-CRIS OCCASIONAL PAPERS*, Universita Cattolica del Sacro Cuore, Milano.
3. Cernat, L. Vrânceanu, R., 2002, "Globalisation and Development: New evidence from Eastern and Central Europe", *Comparative Economic Studies*, XLIV, No.4, pp.119-136.
4. Crafts, N. 2000, "Globalization and Growth in the Twentieth Century", *Working paper No.00/44*, International Monetary Fund.
5. Dreher, A., 2006, "Does Globalization Affect Growth?", *Applied Economics*, 38 (10), pp.1091-1110.
6. Dreher, A., Gaston, N., Martens, P., van Boxem, L., 2010, "Measuring Globalization-Opening the Black Box. A Critical Analysis of Globalization Indices", *Journal of Globalization Studies*, Vol.1, No.1, pp.166-1865.
7. Dumiter, F., 2009, "Measuring Central Bank Independence and Inflation Targeting in Developed and Developing Countries," *Timisoara Journal of Economics* 2(6), pp. 83-100.
8. Dumiter, F., 2010, "The Correlation Between Central Bank Independence and Inflation in Developed and Emerging Countries," *Selected Topics in Economy and Management Transformation* 5(1), pp.180-185.
9. Dumiter, F. 2012, "Empirical approach upon the relationship between independence of Central Bank independence and inflation in developed and developing countries", *The Annals of University of Oradea, Economic Sciences*, Tom XXI, first issue, December 2012, pp.803-808.
10. Heineman, F., 2000, "Does globalization restrict budgetary autonomy ? A multidimensional approach", *Intereconomics*, 35, pp.288-298.
11. Ihrig, J., Kamin, S.B., Lindner, D., Marquez, J., 2010, "Some Simple Tests of the Globalization and Inflation Hypothesis", *International Finance*, Vol 13 (3), pp.343-375.
12. Kearney, A.T., 2002, Globalization Index (<http://www.foreignpolicy.com>)
13. IMF, 2007, *Reaping the Benefits of Financial Globalization*, IMF Discussion Paper. (<http://www.imf.org/external/np/res/docs/2007/0607.htm>)
14. IMF, 2008, *Globalization: a Brief Overview*, IMF staff.
15. Li, Q. and Reuveny, R., 2003, "Economic globalization and democracy", *British Journal of Political Science*, 36, pp.575-601.
16. Lockwood, B., 2004, "How robust is the Foreign Policy-Kearney Globalisation Index?" *The World Economy*, 27(4), pp.507-523.

- 16.Lockwood, B., & Redoano, M., 2005. "The CSGR Globalisation Index: an Introductory Guide", *Centre for the Study of Globalisation and Regionalisation Working Paper*, 155 (4).
- 17.Mah, J.S., 2002, "The impact of globalization on income distribution: the Korean experience", *Applied Economics Letters*, 9, pp.1007-1009.
- 18.Martens, P., Zywiets, D., 2007, "Rethinking globalization: a modified globalization index", *Journal of International Development*, Vol.18 Issue3, pp.331-350
- 19.Martens, P. and Raza, M., 2008, "An Updated Maastricht Globalisation Index", *ICIS Working Paper 08020*, Maastricht.
- 20.Mishkin, F., 2009, "Globalization, Macroeconomic Performance and Monetary Policy", *Journal of Money, Credit and Banking*, Supplement of Vol.41, No.1, pp.188-196.
- 21.Neagu, O., 2013, "Human capital: cause and effect of the economic growth. An empirical analysis", *The Annals of University of Oradea, Economic Sciences*, Tom XXII first issue, July 2013, pp.726-735.
- 22.OECD, 2010, *Measuring globalization. OECD Economic Globalization Indicators*, OECD Publishing.
- 23.Randolph, J. 2001, "G-Index: globalisation measured", *World Markets Research Centre*.
- 24.Vaubel, R. 1999, "Internationales Politischer Wettbewerb: Eine europäische Wettbewerbsaufsicht für Regierungen und die empirische Evidenz", in *Jahrbuch für Neue Politische Ökonomie* (Eds) K.-E. Schenk, D.Schmidtchen, M.E. Streit and V.Vanberg, pp.280-309.
- 25.Samimi, P., Jenatabadi, H.D., 2014, Globalization and Economic Growth: Empirical Evidence on the Role of Complementarity, *PLoS ONE* 9(4)
- 26.Vujacovic, P.,2010, "How to measure globalisation? A New Globalisation Index (NGI)" *Atlantic Economic Journal*, Vol.38(2),pp.237-242.
- 27.<http://data.worldbank.org/indicator/NE.EXP.GNFS.ZS>
- 28.<http://www.ey.com/GL/en/Issues/Driving-growth/Globalization---Looking-beyond-the-obvious---2012-Index>
- 29.<http://globalization.kof.ethz.ch/>