

Michelle Otto

Knowledge as Currency: A Comparative Exploration of the Relationship between Education Expenditure and Gross Domestic Product in the European Union and BRICS Countries

Abstract

The purpose of this paper is to explore the relationship between the percentage of expenditure on public education of a country and the effect that each percentage mark has on the economic growth, and therefore Gross Domestic Product (GDP) of a country. The goal of this paper is to explore how investment in education impacts the economic growth of a country through the production of more skilled workers in the workforce. This paper aims to draw a comparison between the BRICS countries, and a representative number of the countries in the European Union to compare the investment, process and product delivered through these groupings. By looking at the production function from a Marxist perspective it is inevitable to notice that the error coefficient is significantly higher within the BRICS countries than in the European Union, which is reflected in the rate of economic growth. This paper would be of interest to economists, education policy makers, researchers, and scholars.

Keywords: BRICS, economic growth, education, European Union, expenditure, gross domestic product, human capital

Introduction

Education is defined as the process of changing the personality of an individual in a specific direction with the intent of adopting a variety of content subjected to the age and requirements of said individuals; it is the process through which accumulated knowledge, skills and values are transmitted to future generations (Tomić, 2015, p. 19). Tomić asserts that teaching and educational facilities are both fundamental elements of education – when the age and needs of individuals are considered (Tomić, 2015, p. 19). According to the goals of education set by the European Union, and the BRICS countries, education aims to: strengthen vocational education and training, promote quality in education, and the professional development of staff – by looking at these three goals it is evident that the goal of education is to produce skilled workers that would be able to join the workforce of a country and promote education further.

Human capital, economic growth and the production function

Swanson and Holton III (2001, p. 4) define human resource development as “a process of developing and unleashing human expertise through organization development and personnel training and development for the purpose of improving performance”.

Looking at the production function from a Marxist perspective (Schefold, 2016), the aim is to accumulate capital at a steady rate, which is not correspondent with an increase of workers income (Hanusek, 2020), in effect creating a steadily growing profit margin. Applying the Marxist philosophy to this study, with capital referring to skilled workers, it can be said that the aim is to accumulate skilled workers (human capital i.e. the workforce of a country), however, the skilled workers trained and accumulated do not correspond to the increase of benefits that these workers receive. The profit margin in this instance refers to the growing economy: The Gross Domestic Product (GDP) of a country.

Tomić (2015, p. 20) proposes a model derived from the previous model that focuses on components such as labour, material, capital and energy that has now shifted towards knowledge and by extent human capital is now regarded as primary component (Idrees & Siddiqi, 2013). This further reinforces the Marxist perspective, and states that:

investment in knowledge may increase the production capacity more than any other factor of production and to transform them into new products and processes. Because these investments in knowledge characterised by an increase in the rate of return on investment, they are the key to long-term economic growth.

Data selection

This paper explores the relationship between the expenditure on education in a country as opposed to the country's overall GDP. For the purpose of this paper, a representative number of the five BRICS countries (Brazil, Russia, India, China, and South Africa) was chosen, specifically Russia and South Africa as Brazil, China and India did not have complete statistics publicly available. The BRICS countries will be compared to a representative number of the countries in the European Union – it is important to note that the United Kingdom left the EU effectively from the 1st of February 2020, however, the available statistics include the United Kingdom as part of the European Union, and is thus used as such.

The countries from the European Union were chosen as follows: from the twenty eight EU countries, ranked from largest expenditure on public education to lowest expenditure on publication, the top two – the United Kingdom, and Sweden; the middle two – France and Ireland; and the lowest ranking two, Poland and Hungary were chosen according to the 2019 report by the National Centre for Education Statistics (NCES, 2019, p. 4). For this paper there will be a comparison made between these countries during the time period of 2012 to 2016 as the data from 2017 onwards is not available. It was determined that a prediction can be made for the years of 2017 to 2019, when the financial year comes to an end.

Drawing a comparison between public expenditure and the economic growth of a country, one has to determine the expenditure of public education over a specific time period, as well as the economic growth in the same time period, while taking into account the error coefficient (Tomić, 2015, p. 23).

Data analysis

Data from 2006 to 2016 was used to determine the relationship between the investment in education which produces more skilled workers, and their impact on

the overall economic growth, in essence, the GDP of a country (Idrees & Siddiqi, 2013; Schefold, 2016). By using a period of ten years, a trend should be evident if the error coefficient is minimal.

To determine the impact that the expenditure on education has on the GDP, one has to make use of a model; in the case of this exploration Lucas' model of economic growth was used. In this model, the factor of production is equivalent to human capital as the education system aims to produce skilled workers, according to the priorities of education set throughout the EU and BRICS countries, furthermore, the model suggests that knowledge is fundamental to accelerated economic growth. Therefore, according to Lucas' model of economic growth, if the investment in education increases, the human capital will increase and result in an accelerated economic growth to ultimately heighten the country's GDP, while taking the error coefficient into account and aiming to keep it as low as possible.

The analysis of the data will be done to determine the relationship between investment in education and the rate of return reflected in the GDP calculated with the current rate of economic growth per year.

Russia

Taking the information presented by the Organisation for Economic Co-operation and Development (OECD), Russia spent an average of 11.06% of the annual budget from 2012 to 2016 on education whereas the GDP average for the country is 76.57 Trillion USD, indicating that 8.47 Trillion USD is spent on education annually. Looking at the years individually: in 2012 Russia spent 8.36 Trillion USD on education; 8.36 Trillion USD in 2013; 9.11 Trillion USD in 2014; 8.15 Trillion USD in 2015; and 8.36 Trillion USD in 2016 – comparing this to the GDP of the country, it is clear that the expenditure on education is directly linked to the GDP of a country – Russia having a two year period of return on investment as is made clear over this period wherein 2013 Russia invested 8.36 Trillion USD in education, and the GDP was 75.05 USD in 2015, whereas in 2014 9.11 Trillion USD was invested in education and the GDP rose to 76.16 Trillion USD in 2016 – a difference of 1.11 Trillion USD. Taking the time period into consideration, for every 1% that Russia invests in education, the GDP will rise by 1.53 Trillion USD within two years.

South Africa

South Africa, on the other hand, has a decline of expenditure on education from 2012 to 2016, with an average of 2.6% decline from 81.8 million USD spent in 2012 to 53.46 million USD spent in 2016 on education, as opposed to the GDP declining from 396.33 Billion USD in 2012 to 296.36 Billion USD in 2016. Which, according to statistics, for every 1% invested in education, the GDP should rise by 10.94 Million USD per year, or for every 1% not spent, the GDP will fall with 10.94 million USD per year, with an investment return of three years.

United Kingdom

The UK spends an average of 56.32% of the annual budget on education, with their GDP being an average of 2.83 Trillion USD, the expenditure on education is

1.6 Trillion USD annually from 2012 to 2016. Given these statistics, for every 1% invested in education, the GDP should rise by 33.75 million USD annually.

Sweden

Sweden spends an average of 15.39% of the annual budget on education, with their GDP being an average of 54.7 Billion USD, the expenditure on education is 8.42 Billion USD annually from 2012 to 2016. Given these statistics, for every 1% invested in education, the GDP should rise by 40 million USD annually.

France

France spends an average of 57.32% of the annual budget on education, with their GDP being an average of 2.65 Trillion USD, the expenditure on education is 1.52 Trillion USD annually from 2012 to 2016. Given these statistics, for every 1% invested in education, the GDP should rise by 432 Billion USD annually.

Ireland

Ireland spends an average of 13.28% of the annual budget on education, with their GDP being an average of 26.28 Billion USD, the expenditure on education is 3.5 Billion USD annually from 2012 to 2016. Given these statistics, for every 1% invested in education, the GDP should rise by 8.5 million USD annually.

Poland

Poland spends an average of 58.32% of the annual budget on education, with their GDP being an average of 50.39 Billion USD, the expenditure on education is 29.39 Billion USD annually from 2012 to 2016. Given these statistics, for every 1% invested in education, the GDP should rise by 8.8 Million USD after three years, as the investment return takes three years.

Hungary

Hungary spends an average of 9.15% of the annual budget on education, with GDP being an average of 13.12 Billion USD, the expenditure on education is 1.2 Billion USD annually from 2012 to 2016. Given these statistics, for every 1% invested in education, the GDP should rise by 1.16 Billion USD after three years, as the investment return takes an average of three years.

Conclusion

It is clear that there is a definite relationship between the investment in education and the economic growth, which in the EU has an average growth rate of 19 Billion USD for every 1% invested into education with a return of the investment within three years. In contrast, the BRICS has an average economic growth rate of 77 Billion of the GDP for every 1% invested in education with a return of the investment within three years. The difference in the rate of return and increase of GDP between the EU and the BRICS is mainly, but not limited to, the attribution of the error coefficient as factors such as migration, administration and population has to be considered. The difference in the growth rates can be due to a variety of factors, such as investment from outside sources, and migration, especially within

the BRICS countries; on the other hand, the steady rate of economic growth within the EU countries is due to the EU being stable in terms of the grouping having had more time to stabilise, whereas the BRICS grouping is relatively new in comparison and have not had as much time to stabilise yet.

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Michelle Otto, United Kingdom