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Research Article

How do University Education, Health Expenditures and Gross Fixed Capital Formation Affect Economic Growth: An Evidence from SAARC Countries

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Abstract

Human capital plays a leading role in advancing social well-being by enhancing labor output and productivity to create long-term market success. Considering this, our research makes an effort to highlight the role of university education and health care expenditures along with other factors in SAARC countries. We have used data from 1972 to 2022 for the analysis. The ARDL result showed that trade openness, university education, labor force participation, and gross fixed capital formation have significant effects on the growth of SAARC countries in the short run. However, trade openness, university education, and gross fixed capital formation seemed to affect the growth of the concerned economies in the long run. On the basis of findings, it is recommended that Governments of these economies must focus more on the education and health care of their people for their better welfare. There is also a need to eliminate trade barriers for better regional market access for these countries. Countries must focus on more capital formation to achieve high growth.

Keywords: Human capital, Health care, Work force, SAARC countries.

Introduction

The study of economic growth has, in the recent past, shifted to become one of the most important areas of focus for nations in the present world. One of the key ideas in the growth theory is human capital. In the past, Harrod (1939) as well as Domar (1946) included factors of economic growth through an improved Keynesian model. Moreover, Rodrik (2005) noted that strong economic growth generates a cycle of opportunities and prosperity, where increased employment opportunities encourage families to invest in their children's education. Furthermore, it is identified that human capital is a key driver of economic growth. Moreover, it has been shown that technological advancements and an expanding labor force enhance the impact of savings and investments on economic expansion (Phelps, 1966). Economic development is gradually becoming the main concern of countries since it helps to fight poverty, improve the infrastructure, and increase the quality of life. However, there are always demerits associated with economic growth, especially when focusing on economic growth at the expense of environmental conservation, as noted by Yasmeen et al. (2020).

Human capital is defined as the sum total of skills, knowledge, and experience possessed by an individual, and these are valued in terms of their worth or cost to an organization or a country. In this case, student enrollment is used as a human capital measure by economists since it is widely considered a key factor in theories of economic growth. Stated more narrowly, human capital is the human assets that are internalized in the

workforce and that raise efficiency (Goldin & Katz, 2020). Investments in education are increasing in developing nations, enhancing the stock of human capital, which, in turn, boosts economic performance. Human capital also plays a crucial role in facilitating the transfer of technology from neighboring regions, through the assimilation of new knowledge and the importation of equipment (Nelson & Phelps, 1966; Benhabib & Spiegel, 1994; Teixeira & Tavares-Lehmann, 2014). Moreover, human capital influences the economy indirectly by interacting with the productive structure of a country. Specifically, the quality of vertical specialization, which involves focusing on technologically advanced industries, significantly enhances the impact of human capital on economic growth (Silva & Teixeira, 2011).

Various internal and external factors have crucial roles in the process of economic growth, and trade and human capital are closely connected. Human capital and foreign trade are closely related as both are crucial in improving the process and volume of growth. Exports and imports affect domestic markets, and human capital works to enhance trade. Education, as one of the key constituents of human capital, plays a vital role in trade development and is considered one of the pillars of factor productivity. More educated people are more flexible and creative, and these attributes are suitable for the conditions of foreign trade and contribute to the formation of the future economic growth. For instance, Asghar et al. (2012) examined the effect of human capital on economic growth in Pakistan during the period 1974–2009 using two indices of health and education as indicators of human capital. They established a direct link between human capital and economic growth; they encourage governments and organizations to invest more in human capital to enhance economic growth in the long run.

Gross fixed capital formation also helps in increasing economic growth. As Dutta and Ahmad (2004) pointed out that industrialization has been widely acknowledged to have positive impacts on other factors that include the stock of capital, secondary school enrollment, and foreign trade. Technological developments were also observed to amplify these beneficial effects on economic growth and, at the same time, reduce any external costs, especially those that are detrimental to the environment (Shao, 2020). Health, along with education, is a fundamental component of human capital that significantly contributes to economic development. As an integral part of human capital, healthcare has become a major focus within essential spending and policy domains. Individuals in good health are more likely to perform well at work, excel in their studies, maintain job stability, and have higher life expectancy and motivation to stay healthy. This paper indicates a positive correlation between income and health. According to Sachs and Warner (1997), there is an inverted U-shaped relationship between human capital, specifically health measured through life expectancy, and economic growth. This suggests that while health positively influences economic growth, the rate of impact decreases over time.

Above mention studies highlight the significance of macroeconomic factors on the growth of economies. Considering this, we have focused on the role of trade openness, university education, health expenditures, labor force participation, and gross fixed capital formation in influencing the economic growth of SAARC economies. In our study, we have examined the influence of trade openness, university education, health expenditures, labor force participation rate, and gross fixed capital formation on the economic growth of SAARC countries.

Hypotheses of the study

The study proposes the following hypotheses as:

1. There exists a relationship between trade openness and economic growth in SAARC countries.
2. The healthcare spending and economic growth are positively related in SAARC countries.
3. A positive association exists between university education and economic growth in SAARC countries.
4. The higher the labor force participation, the lower the economic growth of SAARC countries.
5. There is a positive relationship between gross fixed capital formation and economic growth of SAARC countries.

Literature Review

A lot of studies have highlighted the role of different major macroeconomic variables affecting growth in developing and rich nations of the world. However, we have focused on how education and health, along with trade openness, labour force participation, and gross fixed capital formation, affect the economic growth of South Asian countries.

Higher education affects the growth potential of the economy. Considering the education variable, Wolf and Gittleman and Wollf (1993) showed that higher university enrollment rates were linked to growth in the labor market, and an increased presence of scientists and engineers per capita was observed. Furthermore, by using panel data, Borensztein et al. (1995) further emphasized the pivotal role of technology transfer from developed to developing countries in catalyzing economic expansion. This transfer often dictated the pace at which these economies could grow and compete globally. Highlighting the significance of social capital, Whitely (2000) revealed that social capital was similar to physical and human capital by fostering cooperative relationships that facilitated the effective functioning of economic systems, thereby enhancing productivity and growth. Again, higher education tended to enhance the earnings of the workers. In a related study, Bloom et al. (2006) found that workers in U.S. states with higher rates of college graduates earned more than those in states with lower graduation rates.

Using panel data, Hartwig (2010) recognized the crucial role of health in boosting economic performance, especially in less developed countries. This body of research collectively affirmed the significant influence of human capital development on economic growth. Bloom et al. (2014) identified a significant correlation between higher education and entrepreneurship, noting that individuals with higher educational attainment tended to create more jobs. This finding supported the view that education increased job creation. In a specific case, Israel Akingba et al. (2018) used data from 1980 to 2013 in Singapore. The study result showed that health capital resulted in increased growth of the economy. Additionally, Khakan and Rabia (2016). The study investigated how foreign direct investment (FDI) influenced economic growth in Central Asia, with a focus on Pakistan and Afghanistan. Their findings illustrated FDI's role in sectors such as electricity, telecom, education, and information technology, emphasizing its potential to foster economic welfare and development. They recommended policy improvements in infrastructure and security to attract more FDI, underscoring the importance of political stability for economic growth.

Furthermore, Pashtoon (2017) conducted a time series analysis from 2005 to 2016 to assess FDI's impact on Afghanistan's economic growth. Their empirical findings supported a positive relationship between FDI inflows and economic expansion, highlighting FDI as a significant contributor to Afghanistan's economic development despite challenges posed by factors like inflation, interest rates, exchange rates, and unemployment. Azam et al. (2019) explored how energy consumption, CO_2 emissions, health expenditures, FDI inflows, and GDP per capita interrelate in China from 1995 to 2016. Their research indicated that energy consumption had a positive effect on FDI, health outcomes, environmental conditions, and overall economic growth. They advocated for the formulation of policies that optimize energy use to drive sustainable economic growth in China. Additionally, Rizvi (2019) examined the impact of health spending on economic growth, with a focus on the quality of health institutions by collecting data from 20 developing countries in South, East Asia, and the Pacific from 1995 to 2017. The author discovered that doubling the quality-adjusted health spending could lead to a 5% increase in economic growth. This study highlighted the critical role of quality in health expenditures to accelerate economic development.

Moreover, Hotak and Wani (2019) investigated the effects of trade liberalization on the environment using the Ordinary Least Squares (OLS) method from 2005 to 2017. They found a surprising positive correlation between pollution and the impacts of trade liberalization, alongside a negative correlation with trade intensity. This suggests that while freer trade has potential economic benefits, it also poses environmental challenges. Thus, the Afghan government must balance market openness with robust environmental safeguards to ensure sustainable development. Additionally, Duodu and Baidoo (2020) explored how trade openness and

institutional quality influenced economic growth in Ghana from 1984 to 2018. Their study, employing the Autoregressive Distributed Lag (ARDL) model, revealed a strong positive impact of both trade openness and institutional quality on economic growth over the long and short terms. However, the interaction between these factors showed minimal influence on economic growth dynamics. They further highlighted the significant role of exchange rate fluctuations in shaping economic outcomes, underscoring the need for coherent policies that promote sustained economic growth in Ghana.

Barlas (2020) examined how government spending compositions influence Afghanistan's economic expansion. Analyzing data from 2004 to 2019, the study used the ARDL model alongside unit root and Johansen cointegration tests to demonstrate the long-term relationship between public expenditures and GDP growth. The study highlighted a positive correlation between economic growth and investments in infrastructure and education. However, it also pointed out an inverse relationship between security spending and growth rates, underscoring the need for more efficient management of defense expenditures to mitigate corruption and enhance economic performance. Furthermore, a study by Ho et al. (2023) investigated the role of tax revenue in fostering economic growth amid increasing trade openness in developing countries. Analyzing data from 29 rapidly growing developing economies from 2000 to 2020, the research employed fixed effect model (FEM) and generalized least squares (GLS) methods to evaluate the impact of tax revenue and trade openness on economic growth. The findings indicated that tax revenue positively affected economic growth, and trade openness generally enhanced this positive relationship, although excessive openness can mitigate the benefits. These insights were particularly crucial for developing nations aiming to enhance tax collection and trade policies to bolster economic growth.

Methodology

For this study, we have used panel data from 1972 to 2022 of SAARC countries such as Bangladesh, India, Bhutan, Maldives, Nepal, Pakistan, Afghanistan, and Sri Lanka. Data on the following variables were acquired from the World Development Indicators (WDI), the World Bank Governance Database, the World Bank Education Index, and the UNDP HDR. These data sets were already made as comparable as possible for the variables. We have collected data on variables such as GDP per capita, trade openness, University enrolment ratio, health expenditures, labor force participation rate, and gross fixed capital formation.

The analysis employed the cross-sectionally augmented autoregressive distributed lag (CS-ARDL) model. The CS-ARDL approach is applied for the long-run and short-run analysis of the variables. Pesaran et al. (2001) have introduced a combination of autoregressive and distributed lag model as ARDL, which is referred to as the auto-regressive distributive lag model for cointegration. Pesaran and Shin (1999) initiated ARDL, which was expanded by Pesaran et al. (2001). Single cointegration is dealt with ARDL approach. This technique is only used for stationary variables. Furthermore, the ARDL bound testing approach is used for empirical analysis and examination among macroeconomic variables, having advantages over other Cointegration techniques.

The model takes the following form:

$$GDP = \beta_0 + \beta_1 TRADOit + \beta_2 UEDUit + \beta_3 HEXPit + \beta_4 LFPRT\ it + \beta_5 GRFPC\ it + uit \quad (1)$$

GDP= Growth rate per capita

TRADO= Trade openness (% of exports and imports GDP)

UEDU= University education (University enrollment ratio)

HEXP= health expenditures (% of GDP)

LFPRT= Labor force participation rate (total)

GRFCF= Gross fixed capital formation (USS)

Results and Discussion

Descriptive Statistics

Descriptive statistics are useful to check the early pattern and trends in the panel data. It can also detect outliers, extreme values, and a bird's eye view of abnormalities in the data. Mean, standard deviation, maximum, and minimum are reported in Table 1.

Table 1. Summary statistics.

Variables	N	Means	Std. Dev.	Min	Max
GRFPC	408	23.5830	11.3710	4.6977	69.4726
GDP	408	4.9156	5.0457	-33.4928	41.7451
UEDU	408	4.8446	7.0330	0.017	35.2981
LFPRT	408	5.84e+07	1.22e+08	20007	5.08e+08
TRADO	408	42.6008	22.0634	6.5362	121.0449
HEXP	408	3.7887	2.4129	1.0042	16.8261

In the same Table 1, it can be observed that the average of the EG – growth rate of Gross Domestic Product (annual %) – is 4.9156, which is even less than the 5% in the cross-section sample. Its standard deviation is 5.0457, with minimum and maximum values of EG are -33.4928 and 41.7451, respectively. It shows that EG shows wide variations among the sample countries.

The minimum and maximum values of UE are 0.017 and 35.2981, respectively. In the same line, these are 10 and 98.6101 for LR. On average, TRADO is 42.6008 percent in SAARC countries. Moreover, HEXP are observed as 3.7887 percent in the SAARC countries. Table 1 reveals that the mean of GFC – gross capital formation as a percentage of GDP - is 23.5830 percent. However, it varies across the cross-section units, which are shown by the standard deviation of 11.3710. The minimum and maximum values of GFC are 4.6977 and 69.4726, respectively.

ARDL Results

In Table 2, we have highlighted the ARDL results. The study result showed that all variables except health expenditures have a significant effect on the economic growth of SAARC countries. Trade affects the economic growth of the economies in the long run. The result showed that a one percent increase in trade openness resulted in decreased growth by 0.0433 percent in the long run in SAARC countries. The result is supported by. The result also showed that a one-unit increase in university education caused for decrease in growth by 1.2996 percent in the long run SAARC countries. The reason may be that highly educated persons perform in service sectors as compared to agriculture or industry. Our result is inconsistent with Bloom et al. (2014). The findings also showed that gross fixed capital formation resulted in more economic growth of SAARC countries in the analysis. It is found that a one percent increase in gross fixed capital formation resulted in increased growth by 0.0642 percent in SAARC countries. The study result is supported by.

Table 2. Results of CS-ARDL.

Variable	Coefficient	Std. Error	Z-score	P-value
Short Run				
ΔGDP	-0.6018 *	0.0178	-33.71	0.000
TRADO	-0.0686 *	0.0260	-2.64	0.008
UEDU	-2.0847* *	0.9699	-2.15	0.032

HEXP	-0.3219	0.6770	-0.48	0.634
LFPRT	0.00004	0.00003	1.21	0.227
GRFCP	0.1008 ***	0.0630	1.60	0.109
Long Run				
GRFCP	0.0642 ***	0.0389	1.65	0.098
HEXP	-0.2177	0.4220	-0.52	0.606
LFPRT	0.00002	0.00002	1.22	0.224
UEDU	-1.2997**	0.6120	-2.12	0.034
TRADO	-0.0433*	0.0167	-2.59	0.009
ECM	-0.6018	0.0178	-89.74	0.000

Note:*** indicates significance at 10 percent,** indicates 5 % level of significance and * indicates significance level at 1 percent.

Conclusions

This research examines how human capital development impacts economic growth throughout SAARC countries using indicators like education quality, healthcare, trade openness, university education, and active workforce participation. Human capital plays a leading role in advancing social well-being while boosting labor output and productivity to create long-term market success. The analysis shows that placing resources into higher education results in better worker capability and stronger economic activity, which matches endogenous growth principles. The study findings show that trade openness, university education, and gross fixed capital formation have significant effects on the economic growth of the economies. The study suggested that economies with open trade markets demonstrated a stronger potential to bounce back from this event. The research urges SAARC nations to eliminate trade barriers for better regional market access so their countries can share technology advancements and structural improvements with other nations. There is a dire need for more capital formation in these economies. Moreover, the research proves that investing in fixed capital helps nations develop their potential and stay on a steady growth path. Building transport, power, and communication systems as infrastructure leads to better economic performance and stronger market resistance over time. Finally, Governments need to continue spending money on both education and healthcare programs to reach their long-term goals.

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