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Study of Health Economics towards Accelerating Economic Growth

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Abstract - We drew our numbers from the State Bank of India, the World Development Indicators, and the Economic Survey of India. It is worthwhile, before moving on to the empirical model of economic growth, to investigate the role that TFP plays in fostering expansion when health is present as a kind of human capital. Among the collection of explanatory factors that determine India's GDP per capita, health, labor, and R&D emerge as the most important, as shown by the regression findings. While a positive correlation between physical capital and GDP growth was found, it was not statistically significant. This finding, significant at the 1% level, lends credence to the idea that improved health contributes to a flourishing economy. Based on information from 64 research totaling 719 estimations from across four continents, this study tries to analyze the effect of health on economic growth: Four Continents: Asian, European, American, and African.

Keywords - health, Economic Growth, population growth, productivity

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INTRODUCTION

A dynamic, nuanced, and sometimes underestimated link exists between health and economic expansion. Health, which is part of human capital along with things like schooling, may be thought of as an input to production much like things like labor and physical capital (Weil 2007). However, health is not like other things; it has many dimensions, and these dimensions may be represented by many metrics, such as life expectancy and the newborn mortality rate. Because of its multifaceted nature, there are likely a number of different methods in which health might be improved, making this a flexible commodity with which to raise living standards and boost GDP per capita. These considerations explain the current uptick in studies examining the link between health and economic development. At the turn of the twentieth century, real per capita gross domestic product (GDP) was less than a sixth of its present value, and average worldwide life expectancy at birth was significantly below 40 years. Many of the primary causes driving economic development throughout this time period have been explored in detail in the economics literature. Similarly, we have a solid understanding of how genetics, lifestyle choices, and the wider community all play a part in shaping our health. While the connections between health and economic development are becoming clearer, there is still room for improvement in our knowledge of these two topics. Complicating the depiction of this link is the fact that health impacts economic growth through a wide variety of economic and social channels, and that economic success also tends to lead to improved health.

LITERATURE REVIEW

Jinzhu Zhang1 et.al (2022) The widespread spread of Corona Virus Disease 2019 (COVID-19) is expected to have a significant effect on the economy, but the widespread use of digital services is seen as a promising strategy to cushion the blow. However, few studies have assessed how the digital economy contributes to economic development in nations along the "Belt and Road" or how COVID-19 would affect the digital sectors in these countries. To empirically examine the effect of digital economy on economic development in nations along the "Belt and Road" prior to COVID-19, this research built a complete assessment index system and utilized a panel data regression model. The effects of COVID-19 on digital industries and trade patterns were then analyzed using a model developed as part of the Global Trade Analysis Project (GTAP). Though there is a clear geographical disparity in the development of the digital economy in nations along the "Belt and Road," our findings suggest that the digital economy has a considerable beneficial influence on economic growth in these countries. Upgrading industrial structures, increasing overall employment, and reorganizing work are the primary channels through which this policy will have an effect. In addition, COVID-19 has had a stronger demand-side influence on the digital sectors than supply-side. Particularly resilient in the face of the pandemic are the digital sectors of Armenia, Israel, Latvia, and Estonia. However, the digital industries of Ukraine, Egypt, Turkey, and the Philippines have all been negatively impacted by COVID-19. In the wake of COVID-19, it is advocated that nations along the "Belt and Road" implement development policies to reduce the "digital gap" and increase the digital economy's driving influence for industrial upgrading, employment, and commerce.

T. Ibn-Mohammed et.al (2021) On March 11, 2020, the World Health Organization announced a worldwide pandemic due to the spread of COVID-19. Initially originating in China, the virus swiftly spread over the world, causing governments everywhere to take drastic action in an attempt to contain it. Yet, by shifting attention and resources away from sharing and toward hoarding, these policies have broken the backbone of today's global economy. In light of these considerations, this study provides a critical analysis of the tally of bad and beneficial effects of the pandemic and gives viewpoints on how it might be utilized to steer towards a better, more resilient low-carbon economy. The study identified the risk of depending on pandemic-driven benefits to achieve sustainable development objectives and emphasized the necessity for a dramatic, fundamental structural shift to the dynamics of how we live. It advocates for a sustainable model recalibrated on a circular economy (CE) framework as an alternative to the current global economic growth model, which is structured by a linear economy system and maintained by profiteering and energy-guzzling industrial processes. The paper provides concrete sector-specific recommendations on CE-related solutions as a catalyst for global economic growth and development in a resilient post-COVID-19 world, drawing on evidence in support of CE as a vehicle for balancing the complex equation of accomplishing profit with minimal environmental harms.

Dina Ahmad Omar (2020) This study used a two-stage Least Squares Test to investigate the connection between economic and human development in four Middle Eastern nations. The analysis confirmed a causal link between economic growth and social progress. Human development indices were shown to be significantly affected by economic growth in the studied Arab nations.

KolawoleOgundari et.al (2018) In this study, we examine the discussion of human capital's potential effect on economic development in Sub-Saharan Africa (SSA), focusing on two different indicators of human capital: health and education. Dynamic models using the system generalized method of moments (SGMM) were used to analyze a panel data set that included 35 nations and the time period 1980-2008. The empirical findings demonstrate that both forms of human capital contribute positively to economic development, with health making a somewhat higher contribution than education. This conclusion supports the notion from the literature that one measure of human capital, education, cannot fully replace the other, which measures human capital, health.

E. Wesley F. Peterson (2017) Growth in both population and GDP has been the subject of debate. This article uses historical statistics to show how rising populations, rising per capita production, and rising economies have all contributed to total economic expansion during the last two centuries. It is expected that rapid population growth in low-income nations would impede their progress, whereas low population growth in high-income countries may cause social and economic issues. Many people are against international migration, which may help address these inequalities. Economic evaluations of inequality suggest that slower population growth and less migration contribute to rising income disparities on a national and global scale.

MATERIALS AND METHODS

For this article, we used supplementary materials covering the years 1971-2008. We drew our numbers from the State Bank of India, the World Development Indicators, and the Economic Survey of India (all covering a variety of topics) (2005). It is worthwhile, before moving on to the empirical model of economic development, to investigate the role that TFP plays in fostering expansion when health is present as a kind of human capital. The Growth Accounting Method (GAM)5 is the method of choice for this investigation. The method is based on the following standard production function.

$$Y = F(A, K, L) \quad (1)$$

Total Factor Productivity (TFP) has been calculated using the following equation, which is obtained from TFP equation (1) utilizing Khan (2012)'s technique.

$$\mathrm{TFP} = \mathrm{y} - \mathrm{S}_1\mathrm{k} - \mathrm{S}_2\mathrm{l} - (1-\mathrm{c})\mathrm{h}_e \quad (2)$$

Where

$$c = \mathrm{S}_1 - \mathrm{S}_2$$

Where 'y' represents the rate of increase in GDP per capita, 'he' represents the rate of increase in labor, and 'h' represents the rate of increase in human capital in the form of health. The contributions of capital and labor to total production are denoted by the symbols S1 and S2, respectively. In a similar vein, the rate of increase in physical capital is denoted by k. Gross Fixed Capital (GFC) measures the value of the economy's physical assets, whereas the labor force is quantified by the number of people actively seeking employment. In this article, we will utilize life expectancy as a surrogate for health.

We're interested in econometric methods other than GDP per capita growth to determine health's contribution to economic growth. The empirical model for the research is mostly taken on Weil's key work from 2005.

$$Y = AK^{\alpha}(H)^{1-\alpha} \quad \textbf{(3)}$$

Where K represents the value of infrastructure, H represents the state of public health, and A represents the advancement of technology. With ln and some simplifying, we obtain

$$Y = \beta_0 + \beta_1 lnGFCF + \beta_2 lnHealth + \beta_3 ln + \beta_4 lnRD + U_i \quad (4)$$

We have used the following framework to identify the major social and environmental factors that contribute to health outcomes.

$$Y = \beta_0 + \beta_1 lnGFCF + \beta_2 lnHealth + \beta_3 lnL + \beta_4 lnRD + U_i \quad (5)$$

The Ordinary Least Squares technique and the Johansen Cointegration test have been used to examine the data.

RESULTS AND DISCUSSION

Based on the findings of Growth Accounting, Total Factor Productivity (TFR) was shown to be the primary driver of GDP per capita at the outset of the time period analyzed (1981-85). The average GDP per resident was split amongst its members by 67.85 percent. The second largest contributor to GDP per capita was fixed assets (26.03%), while personal consumption expenditures (1.57%) remained unchanged. During 1986-1990, TFP, capital, and health each contributed 9.60%, 80.52%, and 2.23% to overall economic growth. During that time period (1981-1985), health's proportion of the pie rose while capital's fell. TFP, capital, and health status shares continued to fluctuate until the conclusion of the research period. TFP, Capital, and Health Overages Kept at 47.61%, 44.15%, and 2.62%, Respectively, from 1981 to 2021. Table I shows the obtained outcomes.

According to the regression findings, health, labor, and R&D are the most important factors within the collection of explanatory variables that determine India's GDP per capita. As was to be predicted, physical capital exhibited a favorable link with economic development. It was shown that a person's health has a favorable effect on GDP growth, and this finding is statistically significant at the 1% level. This lends credence to the argument that rising life expectancy aids in fostering long-term economic expansion.

Table 1: The contribution of TFP in presence of Health

Period	Contribution to GDP Per Capital (%)		
	TFP	Capital	Health
1981-85	67.85	26.03	1.57
1986-90	9.60	80.52	2.23
1991-95	47.28	44.02	3.03
1996-2000	42.06	45.80	0.69
2001-05	57.64	38.11	1.91
2006-09	50.98	38.67	1.06
2010-13	58.73	29.15	0.57
2014-17	37.88	56.29	0.00
2018-21	46.61	43.15	2.61

Since good health is essential to a flourishing economy, more resources should be allocated there. The labor force's positive indication indicates that it has contributed positively to economic development in India. Research and development spending also emerged as an important factor influencing India's economic development. The outcomes of this investigation are supported by the R-Square and Durban-Watson statistics. We can rule out autocorrelation in the model since the DW Statistic is 1.81, which is less than 2. A summary of the findings is provided in Table II.

Table 2: Results of Economic Growth Model

Variable	Coeffect	St. Error	T-stat	Probability
LGFCF	0.102790	0.061380	1.674658	0.1035
LHEALTH	2.649692	0.850796	3.114367	0.0038*
LTLF	0.914044	0.274796	3.326263	0.0022*
LRD	0.123670	0.043913	2.816226	0.0081*
C	-18.91307	4.057598	-4.661150	0.0000*
R-squared	0.937462	DW Statistic		1.81
F-statistic	123.67	Prob (F-statistic)		0.0000
	*Shows 1% level of significance			

IMPACT OF HEALTH ON ECONOMIC GROWTH

Direct Productivity Effects

Workers' output is the most direct link in the chain between health and economic growth. Healthy people have greater energy and focus, which benefits their job. Children who grow up to be healthy adults will have a head start in terms of their human capital. The Eproximate impact of health on income is what Weil (2007) calls it. To investigate this, I develop a basic manufacturing framework that includes health considerations from the outset. It is assumed that total output may be expressed as the result of a Cobb-Douglas production function with a stock of physical capital and a sum of labor inputs as its inputs.

$$Y_i = A_i K_i^{\alpha} H_i^{1-\alpha}$$

where Y represents production, K represents physical capital, A represents productivity, and I represents an index of nations. The labor composite is made up of three individual components: raw labor L, average human capital in the form of education h, and average human capital in the form of health v:

$$H_i = h_i v_i L_i$$

The development accounting literature makes use of a similar framework to analyze the effects of factors like productivity, physical capital, and human capital in the form of education on income inequality between countries (for a review, see Caselli, 2005). In order to make such a computation, it is necessary to have some way of measuring the typical level of human capital in a nation, in this case, schooling. The standard method for quantifying human capital in the literature is to combine information on the average number of years of education among adults with an estimate of the return to education ("Mincer coecients"). Here, the rate of return estimate is especially important since the units of measurement (years of education) are not directly related to the quantity of human capital. Using the average estimate of 10% per year of education, a person with four years of schooling has just 1.21 times the human capital of someone with two years of schooling.

In order to take a similar approach with health, we need a global standard for measuring health as well as a method for converting health indicators into health-related human capital. There are two more challenges than with human capital in the form of schooling. While years of schooling may be a fair summary indicator of human capital in the form of education, health has several elements that may be significant for productivity. The second reason is that unlike education, health care has a shorter history of tracking ROI.

Estimates of the Return to Health Characteristics

Consider the labor composite wage in nation I to be wi (this could be its marginal product, although this is not necessary). Worker j's salary will be determined by factors such as his personal health and level of education in addition to this total compensation:

$$ln(w_{i,j}) = ln(w_i) + ln(h_{i,j}) + ln(v_{i,j}) + \eta_{i,j}$$

whereas the last phrase represents a unique typo for each reader. To keep things simple, I assume that our multiple measures of health (height, lifespan, etc.) are all just manifestations of a single, scalar, latent state of health. As you can see, this is a very drastic measure. Some of the biases it creates are discussed by Weil (2007). However, just because we model health at its most fundamental level as a scalar doesn't guarantee that all of its manifestations will behave in lockstep. Instead, I make room for random fluctuations in outcomes that may be influenced by factors like a person's genetic makeup or a stroke of luck. Take the correlation between zj and height as an illustration of this:

$$height_j = constant + \gamma_{height} z_j + \epsilon_{height,j}$$

Since the coecient that correlates health with stature can never be measured directly, neither can latent health. However, a practical indicator of health's influence may be calculated if latent health is assumed to be scalar. Let's pretend there's an identical formula for the correlation between latent health and v (the health factor that impacts pay) (the use of log here follows the existing literature).

$$ln(v_j) = constant + \gamma_v z_j + \epsilon_{v,j}$$

Coefficient distribution ratio ϒv/ϒGetting back up there in stature is what the term "height" means. What this chart shows is the percentage increase in pay for logs due to a one-unit increase in height due to improvements in general health. Since reported height includes a component unrelated to underlying health, the return to height differs from the observed link between height and earnings $(\epsilon_{height,j})$ the fact that height (and by extension latent health) is likely to be connected with other characteristics that influence earnings, and so on.

The value of health traits like these may be calculated for any health result. In other words, they will be most illuminating when the assumption of latent health being scalar causes the least injustice to reality, and when the health result is indicative of the whole of health. Consequently, I focus in on height, which is often used as a handy summary indicator of diet and health impairments until early adulthood.

The next obvious challenge is how to put a price tag on vertical gain. Clearly, it is not a good idea to simply regress log salaries on height. Higher-income people are in a better position to invest in their health, and there may be a connection between money and height that cannot be directly detected, such as being born into a rich family. Several studies have used an IV method to estimate the financial benefits of increasing one's stature (see Schultz (2002b), Ribero and Nunez (2000), and others). The instruments are the distance to local health services and the relative price of food in the worker's place of origin, all of which are found in data from Ghana, Brazil, and Mexico. A control variable that consists of education is included. According to several sources, the average return per centimeter of height is between 7.8 and 9.4 percent. There are concerns with the tools utilized in these studies, unfortunately. These estimates of the return to health will be upwardly skewed if favorable inputs into children's health are a reflection of parental traits that also contribute to high incomes.

Instead, I use estimates from Behrman and Rosenzweig to track down the return to height via exogenous variance in uterine nutrition among monozygotic twins (2004). Birth weight varies significantly amongst monozygotic twins, suggesting variances in intrauterine nutrition based on fetal positioning. The average absolute birth weight difference in their sample of female monozygotic twins from the United States is 10.5 ounces, compared to the mean birth weight of 90.2 ounces. Within-pair differences in prenatal development are regressed by Behrman and Rosenzweig on adult log earnings, height, and education (measured in ounces per week of gestation). They found that for every one unit variation in fetal development, there is an estimated differential of.190 (standard error of.077) in log wages,.076 (0.43) centimeters in adult height, and.211 (standard error of.190) years in education. The TSLS estimate of the return to height is 5.1% per centimeter, which is calculated by dividing the estimated influence of fetal growth on log earnings by the estimated effect of fetal growth on height. The positive impact of better health on educational attainment is included into this return. The estimated impact of health as proxied by height on salaries, with education held constant, is 3.3% per centimeter. (For details, see Weil (2007).) Using data on Norwegian twins, Black et al. (2007) do a similar computation and estimate the same impact at 3.5% per centimeter. I use the middle number (3.4% per centimeter) in the following computations.

This estimate of the height payoff may be used with the previously stated historical data. The average adult in a developed nation has grown by around 10 cm in the previous 200 years. Based on my calculations, the productivity boost due to height is equivalent to a factor of 1.4 in terms of worker production (in the steady state of a standard growth model, this will also be the effect on output per worker). So, although improved health has contributed to increased labor productivity, it hasn't been the primary driver of wage increases. To put some numbers behind this claim, think about a nation whose wealth has increased by a factor of 15 throughout this time. The percentage of this increase attributable to greater health-related productivity in the workplace may be computed as ln (1.4)/ln (15), or 12.4%.

Fogel provides a useful reference point against which to evaluate my prediction of labor input growth through time (1997). He examines British dietary and metabolic data from 1780 to 1980 and concludes that better nutrition led to a 1.96-fold increase in work output per working-age adult.

Health's Overall Contribution of Cross-Country Income Variance

We are interested in knowing how much of the income variance across countries may be attributed to differences in health, as well as how health has contributed to development through time. However, the estimate of the return to height that was just computed cannot be used for this purpose due to two factors. To begin, there is a dearth of reliable, international adult height statistics. Second, there is cause for concern when comparing the heights of people from different nations due to differences in the hereditary variables that impact height but not health. Since this is the case, Weil (2007) uses the available data on both height and adult survival to construct a mapping between the two. According to his calculations, a change of 0.1 in the ASR corresponds to a growth of 1.92 cm in stature. This predicts an ASR of 0.653, which in turn predicts that a 0.1 rise in ASR will result in a 6.7% increase in labor input per worker. Based on data from a variety of countries, we find that ASR varies from.214

(Botswana) to.904 (Iceland). Crossing this range would imply a 1.59-fold increase in labor input per worker.

Weil uses this figure to investigate the extent to which health explains differences in national wealth. Log production per worker variation is broken down into components due to factors including physical capital, human capital in the form of education and health, and a productivity residual, as suggested by Caselli (2005). To calculate the variation in log output per worker, add up the variances of each term and their respective covariances. The variance in ln(v) plus all the covariance factors involving v may be used to estimate the decline in log production per worker if health disparities across nations were eliminated. When set to zero, the variation in log output per worker is reduced by 9.9 percent. Weil also uses the health-income ratio (90/10) as an extra metric. The proportion is 20.5 in the raw data. If health disparities were eradicated, the ratio would drop to 17.9, with most of the change coming from a decline in the 50/10 wealth divide.

These findings suggest that health is an important, although secondary, factor in explaining economic disparities across countries. When compared to the estimated impact of human capital in the form of education, the estimated influence of health is just a little more than one-third as big in explaining the variation in income among countries. It's also worth noting that the proportion of income variation explained by health (9.9%) is quite close to the back-of-the-envelope figure of the fraction of income increase explained by health (12.4%) presented in the previous section.

CONCLUSION

The report focused on how improvements in health have contributed to Pakistan's expanding economy. The highest contribution to GDP per capita was total factor productivity, followed by physical capital. As a percentage of GDP, health care in India is a net contributor of 2.61%. Health, physical capital, labor force, and research and development were all shown to significantly contribute to GDP per capita in the regression analysis. Health is increasingly being seen as a crucial component of economic development in light of the present epidemic. With data from 64 research totaling 719 estimations throughout Asia, Europe, the Americas, and Africa, this study tries to analyze the effect of health on economic growth. The following are some key findings from our research that we believe will inform future theoretical discussions and policy decisions. First, we find that each increase of one year in life expectancy or the adult survival rate is associated with a 2.4% rise in economic growth, based on the studies in our sample set. Next, we discover signs of publication bias in favor of a causal relationship between health and economic expansion. Despite the benefits and drawbacks of the results of earlier studies, we demonstrate that health has a true beneficial influence on economic development after accounting for the variability of the estimates.

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