THE INTERCONNECTEDNESS BETWEEN HEALTH AND FINANCIAL DEVELOPMENT: EVIDENCE FROM LOW-INCOME AFRICAN COUNTRIES

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Abstract: Human capital, particularly health and education, is crucial for the development of countries. This study investigates the causality relationship between financial development and health variables in lowincome African countries. Using data from 11 African countries between 2001 and 2017, the study found a bidirectional causal relationship between financial development and health variables. Financial development leads to expanded employment opportunities and decreased wage gaps, as well as the possibility for the government to invest more in health expenditures for the poor. The study argues that investments in healthcare are not expenses but are, in fact, investments that contribute to long-term economic growth by increasing the health of the population. The study concludes that investments in human capital, including health, are crucial for economic development of low-income African countries.

Keywords: Health, Financial Development, Low-Income African Countries, Human Capital, Bidirectional Causality

1. Introduction

One of the important indicators that determine the quality of life of individuals and societies is health. In this context, health expenditures are one of the concepts that are frequently used in determining the welfare levels of countries. Economic development is expressed as continuous growth in production and per capita income in comparison to the previous year (Todaro and Smith, 2003).

The development of economic process, that is accepted jointly of the foremost vital indicators of financial aid and development, is among the most economic science goals that area unit tried to be achieved in terms of developed and developing countries. The qualitative and quantitative development of labor, which is the basic production factor needed in the first stage, is of great importance for feasible economic development, which is the ultimate aim of every economy. Today, the main target on economic process is on however long-run growth are often achieved, however it is often sustained, and growth policies that increase the quality of living (Silver, 2007).

The qualitative development of the workforce primarily depends on its being healthy and educated. There is a close and mutual causality relationship between a society's health level and economic development. The resources allocated for health are increasing in societies that have brought their economic development to a certain level. Thus, health awareness is formed in individuals. The development of services offered to

individuals in the health sector provides economic development (Mazgit, 2002). Many studies have also found a two-way relationship between health

services and economic development (Ye and Zhan, 2**018; Erdil and Yetkiner, 2009). The two-way relationship is explained as the economy will increase** welfare after health services provide people with a higher standard of living; healthy people increase both their productivity and information exchange with the people around them and contribute to the productivity of other production factors.

In recent years, there has been a lot of study and debate over the link between health spending and economic growth. Economists and policymakers agree that there is a favorable relationship between the two. In other words, investing in health can lead to greater long-term economic consequences. One rationale for this association is that health expenditures might act as a buffer between macroeconomic measures such as labor productivity, workforce participation rates, and human capital accumulation. A healthy workforce, for example, is more likely to be productive and less prone to absenteeism, which may contribute to better productivity and economic growth (Aghion et al., 2010). Furthermore, investment in health may lead to advances in education and training, which can further strengthen human capital (Mushkin, 1962). The "healthbased growth hypothesis" is one theoretical paradigm that attempts to explain the positive benefits of healthcare investment on economic growth (Admane and Slimani, 2021). According to this idea, health expenditures, like investments in physical infrastructure or research and development, constitute a type of productive capital. Health expenditures may boost a society's total productivity and contribute to long-term economic growth by increasing the health of its people. Health expenditures should not be considered as an expense in the budget but as an investment expenditure. Although health expenditures are considered an expense in the short term, they should be considered as an investment expenditure in the long term (Raghupathi and Raghupathi, 2020). The return of education and similar services are given to healthy individuals will be higher, and it is expected that people will benefit more effectively with increasing life expectancy. Theoretical discussions within the literature on specialize in the role of human capital within the process of economic development. Considering that the 2 foundations of human capital measure education and health, investments in these 2 fields measure expected to extend the human capital levels of people.

It is possible to define the concept of human capital as a qualified workforce (Mincer, 1984). Especially today, the theory of human capital has become very important both in terms of the development of nations and regional development and has attracted the attention of economists. Many studies and analyses have shown that investments in people accelerate the development process. As investments in human capital increase, so does individual income and the number of goods and services produced. Socio-economic development takes place depending on human capital investments as well as physical capital investments. Because it is the human capital that will provide technical development and marginal benefit by using resources effectively. In order to accelerate the economic development process, it is necessary to increase human capital investments that increase the quality of labor. In this context, it is thought that all kinds of investments made for people will contribute to economic development. Thus, the health capital stock of developing humans will constitute an important part of human capital. As a result, health facilities and medical investments that expand the health capital stock will play a significant role in the country's economic success by assuring the continuous improvement of human capital (Cooray, 2013).

In order to catch up with each other in terms of welfare levels, countries need to be similar in terms of human and physical capital. The relationship is expected to be more effective in lowincome countries than in others (Souzakis and Cravo, 2008).

It is argued that money mediation through the banking industry plays a very important role in allocating savings, up productivity, technical amendment, and therefore the rate of economic development (Schumpeter, 1911). The event of monetary markets and establishments may be an essential and integral a part of the

expansion method, and therefore the level of monetary development of nations may be a sensible predictor of future rates of economic development, capital accumulation, and technological amendment (Levine, 1997). The connection among monetary improvement and financial growth can be defined through 4 one-of-a-kind perspectives. The primary view argues that monetary boom leads to economic development (Kar and Pentecost, 2000). It is believed that as a result of the new demand, countries will also develop financially. First, economic growth emerges, and the funding requirements of economic growth lead to the development of the financial system and financial markets. According to the second approach, financial development supports economic growth (Ahmed and Ansari, 1998). This relationship is described as a "supply leading" relationship. The fact that financial institutions are developed ensures that savings are gained as an input to the economy. Thus, economic growth occurs with the support of the financial system. Third approach clarifies; there is a bidirectional causality relationship between financial progress and economic growth (Calderon and Liu, 2003). The remaining view, not like previous perspectives, argues that there is a negative between economic development and financial progress (Ahmed, 2013).

According to the findings of studies in the fields of economics and finance, the economic development of countries is strongly dependent on their financial development. However, a financial structure with a high level of development reduces transaction and monitoring costs and increases the efficiency of intermediary activities. This has a positive effect on economic performance. Economic growth, on the other hand, will bring improvements in meeting basic human needs such as income growth, education, and health.

The financing of health services is carried out in two different ways, the direct financing method and the indirect financing method (Uga and Santos, 2007). The direct financing method means that those who request health services pay the price of the service they receive directly. The service produced by the public and private sectors is purchased by the consumer, provided that the price is paid. In the indirect financing method, there is a third-party payer between the service provider and the requestor. In this financing method, the health system is financed by general taxes, special taxes, and consumer contributions. One of the most important problems experienced in health services is the problem of financing. This problem arises in both developed and developing countries, but its economic reflections are different in each country. Especially in low-income countries, there are deficiencies in the financing of health services (Coovodia et al., 2009). In this context, the relationship between financial development and health will be investigated in low-income African countries.

2. Materials and Methods

The study used data from 11 African countries that can be accessed to investigate the relationship between health and financial development. The available data of the countries used in the study is shown in Table 1. Data acquired from 11 African countries between 2001 and 2017 were utilized to carry out the study. As for the health variable, the life expectancy index was taken from the World Bank data pool. For financial development, the average of financial development indicators was taken from the financial structure data pool made by the World Bank.

Table 1. Countries

Burundi	Guinea
Burkina Faso	Mali
Congo, Dem. Rep.	Uganda
Chad	Togo
Ethiopia	Sudan
Gambia	

In the research part of the study, the cross-section dependency test, unit root tests, and causality tests were applied, respectively.

Considering the cross section dependency between the series has a considerable impact on the outcomes (Breusch and Pagan, 1980; Pesaran, 2004). Before commencing the analysis, it is required to verify for the presence of cross section dependency within the variables. When deciding which unit root and relationship tests to run, cross section dependence should be considered. Otherwise, the analysis may produce skewed findings. When the time dimension of the panel is bigger than the cross section dimension, the existence of

cross-sectional dependency is determined using the Breusch-Pagan (1980) Lagrange Multiplier (LM) test; when both are of comparable size, they can be explored with the Pesaran test (2004). The mentioned tests are given below.

$$LM = {}^{T}X_N N^2 {}_{(-1)/2} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{p}_{ij}^2 \quad (1)$$

$$CDlm = \sqrt{\frac{1}{N(N-1)} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} (T\hat{p}_{ij}^2 - 1)} \quad N(0,1) \quad (2)$$

First found unit root tests are supported the notion that the move phase elements that body the panel are freelance which all crosswise gadgets are equally suffering from a surprise to 1 of the gadgets that body the panel. But, it is a further sensible technique if a surprise to one of the pass segment units that frame the panel impacts the other elements at definitely different degrees. With a purpose to remove this deficiency, the contemporary unit root tests are evolved that examine the stationarity by using thinking about the dependence between go phase elements. The second era unit root test Pesaran CADF that cares concerning the move section dependency is given below.

$$t N T_{1}(, \quad \bar{\Delta}_i \quad) = (Y M Y - Y M Y_{1i} \quad w \, iw \, i - 11 \, 1/2$$

$$\hat{\Delta} \quad) \quad (3)$$

The mean t statistical value found per cross-section is called CIPS. The mathematical model of CIPS is given below.

$$\bar{t} = N^{-1} \sum_{i=1}^{N} t N T_i(,) \quad (4)$$

The Dumitrescu and Hurlin test can take into account both the cross-sectional dependence and heterogeneity between the countries that make up the panel. Another feature of the Dumitrescu and Hurlin test is that it can be used both in the presence and absence of a cointegrated relationship (Dumitrescu and Hurlin, 2012).

$$W N T^{Hnc}, = \frac{1}{N} \sum_{i=1}^{N} W_{i T,} \quad (5)$$

3. Results

To identify which unit root test will be used, the cross-section dependency of priorities must be examined. As a result, the Breusch Pagan and Pesaran Cross-Section De-pendence tests were carried out. It can be seen in Table 2.

Table 2. Breusch Pagan and Pesaran Cross Section Dependency

Variables	Breusch Pagan Statistics	Breusch Pagan Probability	Pesaran Statistics	Pesaran Probability
FD	594.0611	0.000*	16.5392	0.000*
Health	923.4887	0.000*	30.3882	0.000*

Note: *,**,*** show significance at the level of 1%, 5%, 10%, respectively.

According to the results of Breusch Pagan and Pesaran Cross-sectional dependency tests, it is seen that all variables have cross-section dependence. Because of this situation, the unit root test to be applied to these variables should also take into account the cross-sectional dependence. The results of the Pesaran CADF Unit Root Test, which takes into account the cross-sectional dependence, can be seen in Table 3. **Table 3.** Pesaran CADF Unit Root Test

Variables	Model Statistics (CIPS)
FD	-2.027
Health	-0.261
D(FD)	-3.332*
D(Health)	--2.224***

Note: *,**,*** show significance at the level of 1%, 5%, 10%, respectively.

The first difference between the series is represented by D(FD), which represents the first difference between the series' In the unit root test results, it is seen that the variables are not stationary at the first level, but become stationary together at the first differences level. **Tablo 4.** Var Lag Selection

	FPE	AIC	SC	HQ
0	0.200271	4.067668	4.120094	4.088880
1	1.36e-05	-5.528.285	-5.371.005	-5.464.650
2	8.85e-07*	-8.262190*	-8.000056*	-8.156130*
3	9.48e-07	-8.194.123	-7.827.136	-8.045.640
4	9.05e-07	-8.241.127	-7.769.287	-8.050.220
5	9.23e-07	-8.221.979	-7.645.286	-7.988.648
6	9.67e-07	-8.176.160	-7.494.613	-7.900.405
7	9.29e-07	-8.218.117	-7.431.717	-7.899.938
8	9.60e-07	-8.187.716	-7.296.463	-7.827.113

Note: *,**,*** show significance at the level of 1%, 5%, 10%, respectively

As a result of the var model lag length estimation analysis, it was determined that the appropriate lag length should be 2

Table 5. Pedroni Cointegration

	Statistic	Probability
Panel PP	-1.578006	0.0573**
Panel ADF	-2.181715	0.0146**
Group PP	-1.402001	0.0805***
Group ADF	-2.265914	0.0117**

Note: *,**,*** show significance at the level of 1%, 5%, 10%, respectively

Consistent with the Pedroni cointegration take a look at, the H0 hypothesis (there's no cointegration) is rejected. In step with the results of the assessments that make up both panel and organization information inside the Pedroni cointegration check, a cointegration relationship is observed between the variables.

Table 6: Dumitrescu and Hurlin Causality Test

Causality Direction	W-Stat	Z-Bar Stat	Probability
FD->Health	12.7977	10.5822	0.0000*
Health->FD	6.88073	4.50172	0.0000*

Note: *,**,*** show significance at the level of 1%, 5%, 10%, respectively.

The Dumitrescu and Hurlin causality test shows that a bidirectional relationship was found between financial development and health variables. In other words, the change in financial development causes the change in the health variable, and the change in the health variable causes the change in the financial development.

4. Discussion

Financing health services has been a very difficult and important issue in every country. Healthcare financing has three important and interrelated pillars. The first of these is raising sufficient funds to finance health services. The second is the pooling of funds based on risk-sharing between payers and the third is the appropriate use of funds to purchase or provide necessary health care. Especially in low-income countries, health services cannot be provided by the public due to priorities. Individuals have to meet their health needs themselves. Individuals in low-income countries also have limited resources to spend on their health needs. The link between impoverishment and health issues and shorter lifetime is understood. Impoverishment adversely affects health in several aspects, particularly deficiency disease and unsuitable housing conditions. For example, a study was conducted on the affordability of public hospitals' emergency delivery and newborn care costs between October 2007 and January 2008 in Mahojango province of the Boeny region in the northwest of Madagascar. While newborns cost an average of 59 dollars, drugs and medical devices accounted for 40% of that cost. The results show that the amounts paid for the health services received far exceed the paying capacity of middle and low-income households (Honda et al., 2011). A similar study was conducted on health expenditures in Burkina Faso. Families in Burkina Faso consist of an average of 8 people. The average monthly expenditure of a family is 23 dollars, and 43% of this expenditure is food. At the end of the study, the ratio of families that allocated 40% of non-food expenditures to health expenditures was found to be 8.66% (Su et al., 2006).

The health impact of poverty becomes more evident in economic crises. The economic crisis and the recession negatively affect public health not only due to health-specific conditions such as reductions in health expenditures but also for reasons related to social determinants of health, such as increased unemployment. Nowhere in the world is there a society in which income and wealth are perfectly evenly distributed among individuals. However, the existence of people who are too poor to meet their needs, even at the lowest level, draws attention as a source of unrest in society. The financial development of countries both provides economic growth and increases the health quality of individuals. In this study, as a supporting finding, a bidirectional relationship was found between health and financial development.

5. Conclusions

Technological developments that accelerated in today and the increases in per capita income deeply affected the financial services sector as well as many economic sectors and paved the way for modern changes in both

private sector organizations and the regulatory institutions of the state. With the effect of globalization, national financial systems are connected with developed transaction networks and integrated around the world. The link between financial development and health development is a hot issue among politicians, scholars, and practitioners worldwide. Financial development is a measure of financial systems' success in providing access to financial services and goods, whereas health development is the process of increasing health outcomes and healthcare services. In many aspects, financial development is projected to boost the development of the health sector. The purpose of this research is to look at the link between financial development and health development.

The development and effective use of human capital are very important, especially for underdeveloped and developing countries. For this, an educated and healthy society is needed. On the other hand, the degree of satisfaction of individuals in terms of financial opportunities and social relations is also an indispensable condition. The success of societies in their economic development processes depends on the development of their human capital as well as their physical capital. In this sense, it is not possible for countries that do not invest in human and social capital to show a high performance in the economic field.

Especially in developing low-income countries, the necessary investment in human capital cannot be made. Failure to make the necessary investments is a problem that affects the welfare of the country and individuals. Many studies in the literature have examined the relationship between financial development and human capital (Outreville, 1999; Monaceli et al., 2011). In these studies, it is seen that human capital is strongly related to financial development. Similar findings were obtained in this study on low-income countries. Several studies in the literature have found a link between economic growth and health (Mehrara and Musai, 2011; Nasiru and Usman, 2012). Unfortunately, financial development has not been included as a variable in this context. Financial development affects the health level of individuals living in low-income countries. At the same time, the financial development rate of economically growing countries is also affected by the health quality of individuals. To summarize, there is a bidirectional relationship between financial development and the health level of individuals. The study's findings are consistent with those found in earlier investigations (Mehrara and Musai, 2011; Nasiru and Usman, 2012). In the future, studies in this topic will be able to draw various conclusions by investigating countries of varying economic sizes. **References**

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