International Journal of Business and Management Invention (IJBMI)
ISSN (Online): 2319-8028, ISSN (Print):2319-801X
www.ijbmi.org || Volume 11 Issue 8 || August 2022 || PP 37-44

Which of Financial Development and Financial Inclusion More Effectively Drives Economic Development of Underdeveloped Countries?

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A Paper presented as part of the requirements for the Degree of
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Abstract
Background:*Many low-income and lower-middle-income countries have remained in their current development category despite the desire and effort to develop their economies to bring their citizens a better standard of living. Meanwhile, an overwhelming number of studies have recommended financial development as a tool for economic development,considering that it promotes capital aggregation, an essential factor of production. More recently, some studies have argued that financial inclusion is a more suitable tool for the economic development of underdeveloped countries.However, some researchers have explained that financial development andinclusive finance do not drive economic growth and development. This paper tests the correlation between financial development and economic development as its first hypothesis and financial inclusion and economic development as the second. The purpose is to ascertain the more robust correlation with economic development between financial development and financial inclusion to provide low-income and lower-middle-income countries with a more effective tool to aid their development.*
Materials and Methods:*The paper examines the relationship between financial development and economic development and financial inclusion and economic development. It employs the Pearson correlation coefficient (r)and the R-squared interpretation to find which one of financial development and financial inclusion is more correlated with economic advancement.*
Results:*It found that financial inclusion has a stronger positive correlation with economic development than financial development and recommends that countries implement financial inclusion strategies to develop their economies.*
Keywords*:Economic Development; Economic Growth;Financial Development;Financial Inclusion;Gross Domestic Product;Gross National Income; Pearson Correlation Coefficient;R-Squared.*

Date of Submission: 04-08-2022 Date of Acceptance: 17-08-2022

I. Introduction and Objective

Many low-income and lower-middle-income countries strive for economic development to improve their people's quality of life without noticeable results. This poor outcome is due to the employment of tools and strategies that have not produced the desired results. Consequently, many of these countries in Africa and Asia have remained underdeveloped despite the effort and investment toward development.

The United Nations describes underdeveloped countries as those with low income and structural impediments coupled with vulnerabilities to economic and environmental shocks. These features result inapoor Human Development Index evidenced by poverty level and illiteracy ratio. ("Welcome to the United Nations," 2021 as cited by Bello, 2022). On the other hand, a developed country, also known as an economically advanced country, offers economic security, high per capita income, quality education, access to good health care, and a high standard of living. The barometer for measuring economic development is usually Gross Domestic Product (GDP) per capita and Gross National Income (GNI) per capita. While economic growth measures increment in output, economic development measures improvement of productivity per person. It is deductible that economic growth may not always lead to economic development and improved living standard. This study focuses on economic development and not economic growth.

The World Bank describes financial development as overcoming "costs" incurred in the financial system. The definition implies that lowering the costs of acquiring information, enforcing contracts, and making transactions results in the emergence of financial contracts, markets, and intermediaries (The World Bank as cited by Bello, 2022). The level of maturity of the financial structure determines the ease of performing financial

transactions.The World Bank also describes financial inclusion as a process whereby individuals and businesses have almost equitable access to financial services regardless of their position in the economic pyramid.

For more than a century, a vast majority of studies in the field have confirmed that financial development causes economic development and recommend it as an effective tool for economic development. More recently, researchers have found a strong association between financial inclusion and economic developmentand suggested that countries pursue financial inclusion as a tool for economic development. Despite the result of the majority of research on the topic, some studies disagree that financial development and financial inclusion have a bearing on the economic development of countries.

It is worthy of note that while financial development measures aggregate ratios such as credit and deposit, it does not consider how those at the bottom of the economic pyramid are affected. On the other hand, financial inclusion measures access to financial services by those excluded from traditional financial services provided by mainstream commercial banks. While financial inclusion will constantly improve the financial development level, it becomes a crucialscholarly endeavor to determine which of the two concepts is more associated with economic development.

Statement of Problem

Many underdeveloped countries have unsuccessfully tried to develop their economies. This situation is evident in the few countries that migrated from the Least Developed Countries (LDC) development status since the turn of the current millennium. Many of these countries subscribed to the Millennium Development Goals (MDG) but failed to improve substantially. This paper provides a tool for solving the economic development challenges of the Least Development Countries by scientifically showing which one of financial development and financial inclusion has more association with economic development.

Hypotheses: This paper tests the following hypotheses:

1. H0: There is no positive association between financial development and economic development.
H1: There is a positive association between financial development and economic development.
2. H0: There is no positive association between financial inclusion and economic development.
H1: There is a positive association between financial inclusion and economic development.
3. H0: Financial inclusion does not have a stronger positive correlation with economic development than financial development.
H1: Financial inclusion has a stronger positive correlation with economic development than financial development.

Scope of the Study

Thestudy draws its sample from countries in all four World Bankclassifications of economies, i.e.,low-income, lower-middle-income, upper-middle-income, and high-income countries across diverse regions. It achieved adequate population representation by deploying the stratified random sampling technique. The paper draws its samples from various geographical locations. The study covers 2010 and 2019 to ensure recency without the debilitating effects of the Coronavirus pandemic on economies.

II. Literature Review

As noted earlier, a wide array of research has examined the relationship between financial development and economic growth since Bagehot (1873) and Schumpeter (1912). Most of these studies found a positive correlation between the variables and observed that financial development leads to economic growth and development. However, some studies found no correlation and causal relationship between the variables. Similarly, many studies agree that financial inclusion drives economic growth, while a few papers observe otherwise. The following session discusses some of these works.

Financial Development and Economic Growth

Many scholars have concluded that finance has promoted economic growth and development since the mid-twentieth century. Greenwood & Jovanovic (1989) and Bencivenga& Smith (1991) observed that the development of the financial service sector promotes economic growth. Similarly, Ejaz Ghani (1992) and King & Levine (1993) examined the impact of monetary policies on economic growth and found that positive developments in the financial service sector influence economic growth. Also,Elmawazini et al. (2015) confirmedthat Islamic and non-specialized commercial banks drive economic growth.In the same vein, Saint-Paul (1992) and De Gregorio et al. (1992) concluded that a sound and functional financial sector would yield more economic productivity that an economy with an underdeveloped financial system.

King & Levine (1993) investigated the Finance-Growth nexus and concluded that Schumpeter was right in his earlier work that finance is essential for economic growth. Darrat (1999) also investigated the role of

financial development on economic growth and concluded that financial deepening induces economic growth. More recently, Bucci et al. (2018) studied the relationship between the variables and found a positive correlation between finance and economic development.

As noted earlier,most studies on the finance-growth nexus submit that financial development drives growth, butsome papers deny that such a relationship exists. Lucas (1988) observed that there is no consistent pattern of growth that all economies mirror. Also, Stern (1989) and Stiglitz (1989) observed that financial sector development proxies do not cause or respond to growth. Similarly, Fattouh (2001) found no significant association between financial sector development and economic growth in poorly developed countries where low income is prevalent but observed a positive association in high-income economies. Like Fattouh (2001), Demetriades& James (2011) found that developed countries have more developed banking systems than less developed countries and economic development leads to economic growth. Becks (2013) found a non-linear and negative relationship between financial development and the advancement of high-income economies. Also, Deltuvaitė &Sinevičienė (2014) found no clear relationship between growth and financial development in EU countries.Likewise, Sekreter (2017) found an equilibrium relationship between financial and economic development. Guptha& Rao (2018) observed no uniformity in the causal effect of financial development and growth and vice versa. Pinshi (2020) found that economic growth drives financial development and not the other way (Bello, 2022).

Financial Inclusion and Economic Growth

Andranaivo&Kpodar (2011) observed that financial inclusion driven by mobile telephone penetration induces economic growth. Malhotra (2020) explained that financial technology is vital in improving financial inclusion and causing economic growth. Similarly, Yorulmaz (2012), Inoue &Hamori (2016), Rasheed et al. (2016),Kim et al. (2017), Lenka& Sharma (2017), Ganti& Acharya (2017), and Hariharan &Marktanner (2012) found a strong positive correlation between financial inclusion and economic development. In the same vein, Migap et al. (2015) and Onaolapo (2015) concluded that financial inclusion has a significant positive association and impact on the economic development of Nigeria. Park & Mercado (2015) and Kim (2015) discovered that financial inclusion lowers income inequality and promotes economic growth.Sethi& Acharya (2018) also found a positive and long-run relationship between financial inclusion and the economic development. More recently, Barik &Lenka (2021) analyzed the effect of financial inclusion on poverty reduction and observed that financial inclusion has a negative correlation with poverty reduction.

However, there is no consensus on the findings of studies on the impact of financial inclusion on growth and development. Sharma (2016) discovered mixed causality between financial inclusion and economic growth. Similarly, Gouréne& Mendy (2019) found no cause and effect between economic growth and financial inclusion in the short to medium term and bi-directional causality in the long run. Like Gouréne& Mendy (2019), Adedokun& Aga (2020), and Thathsarani et al. (2021) observed that the causal relationship between the variables depends on time without a unified pattern both in the long and short runs.In the same vein, Anane (2019) found a mixed relationship and no evidence of causality between financial inclusion and economic growth (Bello, 2022).

The absence of consensus on the finance-growth nexus motivates this paper to examine the subject.

III. Data Presentation and Analysis

Sample: The study employs the stratified sampling technique to select countries across the four income-based development categories of the World Bank to ensure that the test includes low-income, lower-middle-income, upper-middle-income, and upper-income countries. It draws an equal number of representatives from the four categories of countries (fifteen from each) to test the first hypothesis. In contrast, it attracts more samples from the low-income and lower-middle-income countries (twenty from each) to test the second hypothesis to accommodate the impact of lower financial inclusion ratios in less developed countries.Each sample size of 60 is about 25% of the estimated 240 countries worldwide("2021 Service Year Report of Jehovah's Witnesses Worldwide", 2022 as cited by Bello, 2022). The 25% sample size is sufficient considering the minimum recommended statistical research power of 80%, which requires at least a 20% (1- β) sample of the population.

Data and Data Presentation: This study employs proxies of the variables between 2010 and 2019 to test the hypotheses with recent data while avoiding the distortions of the Coronavirus pandemic on economies. The indicators of financial development used to construct thefinancial development index are Domestic Credit to Private Sector as a ratio of GDP, Private Credit by Deposit Money Banks as a ratio of GDP, and Bank Deposits as a ratio of GDP; while the proxies of economic development used to construct an index of the variable are Gross National Income per Capita and Gross Domestic Product per Capita. While retaining the same indicators of economic advancement, the ratio of people 15 years and above that saved money in the past year, bank branches per 100,000 adults, and Automated Teller Machines per 100,000 adults are proxies of financial

inclusion used to build an index for the variable. The paper developed the indexes in a similar approach as the United Nations Development Program Human Development and other indexes, which employs weighted averages to arrive at a number from an array of indicators. However, this paper assigns equal weight to each proxy.

Table no 1 shows the Financial Development Index (FDI) and the Economic Development Index (EDI)

Country	**FDI (x)**	**EDI (y)**
Yemen	32.93	1,372.20
Liberia	-	639.31
Syria	37.58	-
Sudan	11.46	2,075.43
Sierra Leone	9.53	548.38
Chad	7.52	854.12
Madagascar	12.96	425.95
Somalia	-	486.81
Afghanistan	9.23	593.23
Ethiopia	-	543.92
Burundi	19.31	270.49
Uganda	12.94	653.87
Guinea	11.02	729.97
Mozambique	30.19	525.36
Mali	12.73	778.81
Guatemala	35.23	3,556.42
Ukraine	46.25	2,952.18
El Salvador	49.22	2,757.17
Mongolia	49.42	3,626.73
Ivory Coast	17.92	1,357.27
Indonesia	33.74	3,473.31
Ghana	15.36	1,798.90
Philippines	45.64	2,943.03
Venezuela	30.71	13,177.67
Kenya	35.22	1,231.15
Nigeria	13.98	2,516.74
Cambodia	64.91	2,068.82
Benin	17.99	832.54
Pakistan	22.34	1,277.25
Cameroon	14.04	1,387.31
Colombia	36.41	-
Brazil	60.35	10,947.92
Romania	32.08	9,218.75
Argentina	16.04	12,702.45
Bosnia and Herzegovina	55.54	5,002.92
Thailand	119.53	5,729.97
Libya	50.52	7,730.46
Kazakhstan	30.33	10,172.59
Peru	36.38	6,075.45
Mexico	27.70	9,891.10
Jordan	79.58	3,942.74
Turkey	55.43	11,264.85
Botswana	34.49	7,275.16
Serbia	-	6,065.96
Australia	119.96	58,158.23
Namibia	58.75	5,420.18
Spain	119.57	28,677.15
Canada	-	47,781.40
United States of America	105.04	54,859.90
France	92.11	40,762.69
Germany	81.07	45,099.84
Poland	52.53	13,092.11
Czech Republic	55.50	18,715.91
Saudi Arabia	41.17	22,681.73
United Kingdom	-	41,859.10
Netherlands	106.83	49,669.12
New Zealand	94.95	39,204.53
Italy	83.48	34,158.10
Sweden	107.28	56,120.57
Belgium	75.75	45,454.55

Source - Adapted from the World Development Indicators.

Graph 1 shows the Scattered Diagram and Line of Best Fit of Financial Development and Economic Development Indexes

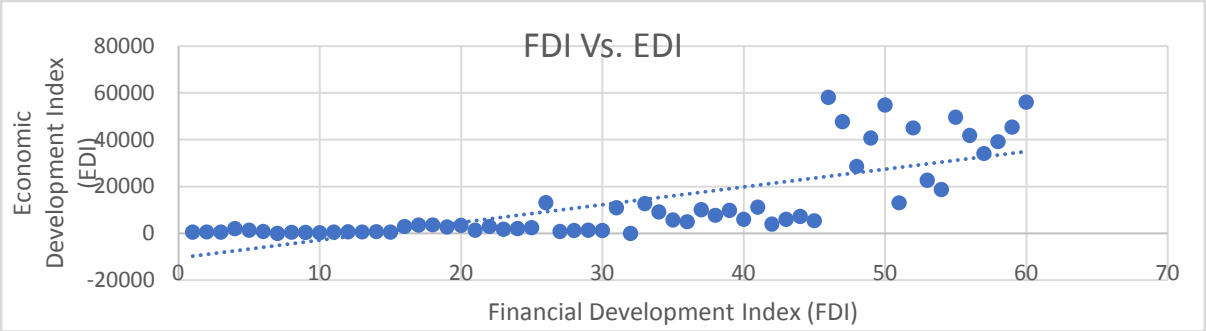


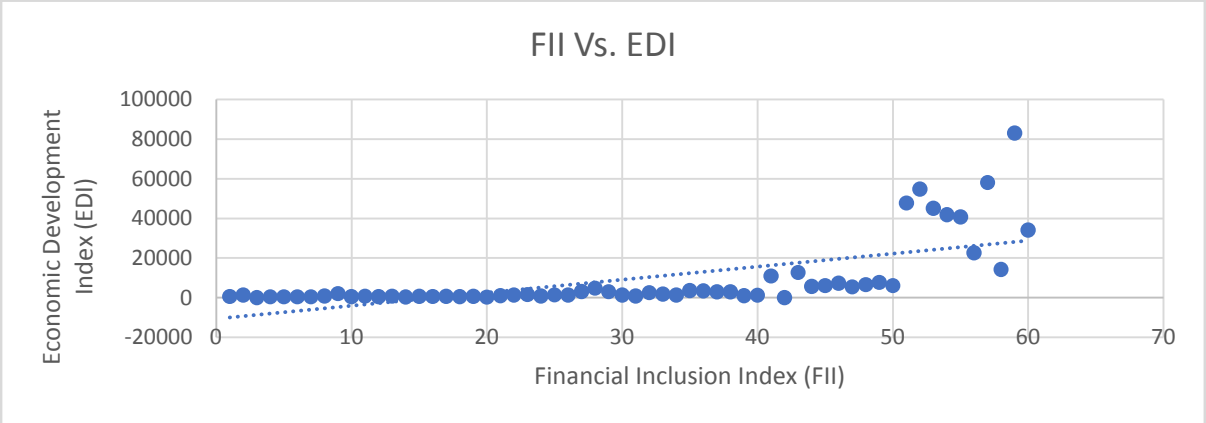
Table no 2 shows the Financial Inclusion Index (FDI) and the Economic Development Index (EDI)

Country	FII (x)	EDI (y)
Syria	-	-
Yemen	2.25	1,372.19
Mozambique	4.49	425.36
Madagascar	1.48	425.94
Afghanistan	1.10	593.23
The Central African Republic	0.75	458.36
DR Congo	-	429.94
Sudan	2.73	2,075.43
Chad	0.66	854.12
Guinea	1.53	729.96
Ethiopia	1.00	543.92
Mali	3.24	778.81
Sierra Leone	1.20	548.38
Liberia	2.07	639.30
Niger	1.09	377.27
Uganda	2.58	653.87
Burkina Faso	2.08	621.09
Rwanda	3.70	686.14
Somalia	-	486.81
Mauritania	5.35	1,026.29
Burundi	1.48	270.49
Zambia	4.93	1,568.56
Senegal	3.60	1,318.75
India	9.80	1,413.22
Tanzania	2.73	880.57
Egypt	6.29	3,090.72
Pakistan	5.83	1,277.25
Morocco	16.30	3,010.81
Algeria	4.46	4,811.04
Benin	2.73	832.54
Cameroon	1.99	1,277.25
Ghana	5.05	1,798.89
Nigeria	6.86	2,516.74
Mongolia	46.30	3,626.73
Ivory Coast	3.71	1,357.26
Ukraine	31.11	2,952.17
Indonesia	19.73	3,473.31
Cambodia	6.38	1,034.41
Philippines	10.84	2,943.03
Brazil	44.30	10,947.92
Kenya	5.01	1,231.15
Argentina	19.21	12,702.45
Colombia	-	-
Peru	28.57	6,075.45
Thailand	39.71	5,729.97
Namibia	24.51	5,420.18
Botswana	14.46	7,275.16
Libya	5.26	7,730.46
South Africa	24.63	6,608.29
Canada	80.42	47,781.40
Serbia	26.58	6,065.96
Germany	46.01	45,099.84

United States of America	-	54,859.90
France	47.87	40,762.69
United Kingdom	49.70	41,859.10
Australia	64.50	58,158.23
Saudi Arabia	25.45	22,681.73
Switzerland	48.00	83,154.08
Chile	24.60	14,215.69
Italy	48.49	34,158.10

Source – Adapted from World Development Indicators

Graph 2 shows the Scattered Diagram and Line of Best Fit of Financial Inclusion and Economic Development Indexes



The linear lines of best fit give an initial impression that there is a non-perfect positive correlation between financial development and economic development and between financial inclusion and economic development. However, the study now employs Pearson Correlation Coefficient (r) to confirm or disprove these initial views.

Data Analysis

$$\mathbf{r} = \frac{\mathbf{n}(\sum \mathbf{xy}) - (\sum \mathbf{x})(\sum \mathbf{y})}{\sqrt{[\mathbf{n}\sum \mathbf{x^2} - (\sum \mathbf{x})^2][\mathbf{n}\sum \mathbf{y^2} - (\sum \mathbf{y})^2]}}$$

n = number of data sets
$\sum xy$ = addition of the products of each data pair
$\sum x$ = addition of the independent variables (x)
$\sum y$ = addition of the dependent variables (y)
$\sum x^2$ = addition of squared independent variables (x)
$\sum y^2$ = addition of squared dependent variables (y)

From table 1, the following are the parameters of the first hypothesis.

n = 52
$\sum xy$ = 54,040,463.70
$\sum x$ = 2,527.74
$\sum y$ = 762,155.36
$\sum x^2$ = 171,853.57
$\sum y^2$ = 23,543,739,447.84

The number of data set (n) was arrived at after removing the eight countries without complete data pair from the sample of 60 countries, which is about 22% of the estimated population. The sample size remains higher than required at 80% statistical power.

r = 0.690235

The 0.690235 correlation coefficient indicates a strong positive relationship between financial development and economic development. However, the study calculates the *p-value* to determine whether or not the association is statistically significant. The formula for the*t*-ratio is

$$t = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

$t = 6.70$

We also require the degree of freedom (*df*), which is the data set minus 2:

$df = 52 - 2 = 50$

The critical *t*-value for a 99.99% confidence level is 3.496, which is lower than the calculated *t*-value of 6.70. It follows that the probability that the correlation between financial development and economic development is due to error or chance is less than 0.01%.

The paper furtheruses the R-Squared to explain the variability in economic development that financial development accounts for.

$R^2 = r^2 = 0.690235^2 = 0.4764$

The R-Squared result means that the difference in countries' financial development explains the difference in their economic advancement level.

From Table 2, the following are the parameters for the Pearson Correlation Coefficient of the second hypothesis.

$n = 55$

$\sum xy = 22{,}574{,}190.36$

$\sum x = 894.70$

$\sum y = 509{,}921.25$

$\sum x^2 = 34{,}684.64$

$\sum y^2 = 20{,}606{,}451{,}626.39$

The data set (n) was arrived at after removing the five countries without complete data pair from the sample of 60 countries, which leaves the sample size at about 23% of the population.The sample size is still adequate, considering the statistical power of 80%.

$r = 0.798672$

The Pearson coefficient of correlation at 0.798672 shows that financial inclusion has a stronger positive correlation with economic development than financial development. The paper further calculates the *p*-value to determine the statistical significance of the correlation.

$$t = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

$t = 7.72$

The degree of freedom (*df*) = 55 – 2 = 53.

At 53 degree of freedom, the critical *t*-value for a 99.99% confidence level is 3.484, which is lower than the calculated *t*-value, indicating that the probability that the correlation between financial inclusion and economic development is due to error or chance is less than 0.01%.

The study uses the R-squared technique to explain the variability in nations' economic development levels due to differences in financial inclusion rates.

$R^2 = r^2 = 0.798672^2 = 0.6379$

The result indicates that the difference in the financial inclusion ratio of nations explains 63.79% of the difference in their economic development.

IV. Findings and Discussion

The study examined the relationship between financial development and economic development as the first hypothesis and the relationship between financial inclusion and economic development as the second hypothesis. It used the Pearson correlation coefficient and the R-squared technique to determine whether financial development and financial inclusion positively correlate with economic advancement and which of the two has more impact. The study found that financial development and financial inclusion are both positively and significantly associated with economic progress, thereby agreeing with King & Levine (1993), Kashyap et al. (1998), Inoue &Hamori (2016), Onaolapo (2015),and Rasheed et al. (2016). It also observed that financial inclusion has a more positive correlation with economic development at a 0.80 correlation than financial development, which showed a 0.69 correlation.

The 47.64% R-Squared result shows that financial development accounts for 47.64% of the difference in the economic development level of countries. This causal relationship is in harmony with King & Levine (1993) and Darrat (1999). Similarly, the 63.79% R-Squared result indicates that the difference in financial inclusion rates explains 63.79% of the reason countries are at different levels of economic development. The causal relationship aligns with the findings of Ganti& Acharya (2017), Lenka& Sharma (2017), Kim et al. (2017), and Sethi & Acharya (2018).

The findings led the paper to acceptthe three alternative hypotheses and reject their null forms.

V. Conclusion and Policy Implication

This paper shows that there is a positive correlation between financial development and economic development. It also found that financial inclusion is more positively correlated with economic advancement and explains more of the reasons for the difference in the economic development of countries. It offers a solution to the economic development challenge of Least Developed Countries that often have the lowest financial inclusion ratios. It reveals that carefully implemented financial inclusion strategies will produce economic developmentoutcomes, rather than merely focusing on financial sector development. This position is more apparent considering that financial development can occur without financial inclusion's effectonpromoting inclusive aggregate output.

It is deductible from the preceding that the Least Developed Countries should pursue financial development and ensure that financial services are appropriately available to those at the bottom of the economic pyramid. Making financial products and services available to those excluded from the mainstream financial service sector will ensure that more individuals contribute meaningfully to the national aggregate output. This recommendation is in tandem with Onwumereet al. (2012) that underdeveloped nations should carefully implement financial development and inclusive finance plan as a strategy to achieve economic advancement.

Microfinance (credit and savings) and microinsurance are some of the tool nations can employ to promote inclusive finance by providing enabling environments and incentives to market participants. However, they should take adequate care to avoid direct intervention due to the studies that confirm that state-owned banks and credit programs do not result in economic development for many reasons (Yeyati, Micco& Panizza, 2004 as cited by Bello, 2022).

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