

The Impact of Financial Development on Human Well-Being in Sub-Saharan Africa: Does Institutional Quality Matter?

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Abstract

This paper investigates the role of institutional quality in the effects of financial development on people's well-being in Sub-Saharan Africa. We use data from 35 countries from 2007 to 2021. The study tests for non-linearity between financial development and well-being by identifying threshold effects of financial development, using the panel smooth transition regression (PSTR) model of Gonzalez et al. (2005) and a quadratic model using the system GMM of Blundell and Bond (1998). The estimation results show that there is a non-linear relationship between financial development and well-being, conditioned by institutional quality and expressed as an inverted U-shape. There are financial development thresholds (40.217% for CRED and 49.038% for M2GDP) beyond which any improvement in the financial system leads to a loss of well-being in Sub-Saharan Africa. We show that low institutional quality reduces the positive effect of financial development on well-being. However, there are thresholds of institutional quality beyond which economic and political institutions reinforce the positive effect of financial development on well-being.

Keywords: financial development, institutional quality, well-being, Sub-Saharan Africa, PSTR, GMM

JEL Classification : E02; E44; N20; O32

1. Introduction

The pursuit of well-being is the essence of all human action (Ranis and Stewart, 2005). The CERDI report (2003) defines well-being as the state in which all members of a society are able to determine and satisfy their needs, with a wide range of choices available to them to realize their full potential. More than that, it is understood as the state in which all individuals have the opportunity to flourish, underpinned by an inclusive society and an open economy built by empowered people concerned with the stewardship of the natural environment (Legatum Institute Report, 2021). Well-being is multidimensional, and a distinction is made between objective and subjective well-being. Objective well-being refers to the quality of material and immaterial living conditions, while subjective well-being indicates people's perception of their living conditions (Sen et al., 2009).

Numerous studies have examined ways of improving the well-being of populations. Financial development, through the mobilization of savings, the efficient allocation of resources, managerial control, risk management and the provision of services that facilitate exchange, is said to be conducive to economic growth and well-being. For Levine (2005), financial development is the process by which the financial system gains in depth, accessibility and efficiency.

Since the pioneering work of McKinnon (1973) and Shaw (1973) stipulating that financial liberalization is an important lever for economic growth, numerous studies have been conducted in this direction. Bencivenga and Smith (1991) show that financial intermediaries enhance the efficiency of capital allocation by altering the composition of savings in favor of productive investment, and consequently improve liquidity risk management. For Boukhathen and Mokrani (2013), the case for a positive effect of financial development on growth rests on the idea that financial development makes resource allocation more efficient, improves risk management and thereby increases capital productivity.

For Kpodar (2004), financial development contributes to well-being by reducing poverty, because as the financial system develops, it extends its services to the poor. In his view, the financial system needs to reach a threshold of development enabling it to be more efficient and competitive in offering its services to the poor.

However, the positive effect of financial development on well-being is not universally recognized. Greenwood and Jovanovic (1990) argue that financial development exerts an inverse U effect on well-being through income inequality. For them, financial development increases income inequality in the early stages of development. This is because, in these phases, financial development improves the quality of services enjoyed by those who already purchase financial services. Financial improvement accumulates mainly for the wealthy. As access is not extended to the poor, financial development becomes an impediment to people's well-being due to income inequalities. Putnam (2000) follows this line of thought, arguing that inequality diminishes well-being by undermining social cohesion. On the other hand, financial development reduces income inequality when a country is in the mature phase of its development (Greenwood and Jovanovic, 1990). In this phase, poor households can make increasing use of financial products and become increasingly wealthy.

Some authors argue that institutions play a decisive role in the impact of financial development. For Demetriades and Law (2006), financial development is more powerful when the quality of institutions is high. They also argue that financial development without sound institutions may fail to deliver long-term economic development. In addition to this, numerous studies show the importance of institutional quality in the pursuit of well-being through wealth redistribution (Law et al., 2013), reducing waste and detour of funds earmarked for public spending (Mtiraoui, 2015). It curbs the waste and misappropriation of funds earmarked for public spending (Mtiraoui, 2015). It broadly distributes power in society and sets limits (Acemoglu and Robinson, 2012).

Well-being is frequently measured by indicators that do not reflect all its dimensions, notably the Human Development Index (HDI), the Multidimensional Poverty Index (MPI) and household consumption expenditure. The present study uses the Legatum Institute's Prosperity Index (2022), constructed from 300 indicators, thus making it possible to incorporate many aspects of well-being. Our study addresses this limitation of empirical studies on the link between finance and economic development in Sub-Saharan Africa. From the foregoing, it is clear that it is essential to study the relationship between financial development, institutional quality and the well-being of African populations.

The main question we are trying to answer for sub-Saharan Africa is the following. Are the effects of financial development on people's well-being in sub-Saharan Africa influenced by institutional quality? Thus, the main questions of this study are as follows:

- Does financial development improve the well-being of populations in Sub-Saharan Africa?
- Is there a transition threshold for the effect of financial development on the well-being of populations in Sub-Saharan Africa?
- Does institutional quality improve the effect of financial development on well-being?

In addressing these questions, our overall objective is to analyze the role of institutional quality in the relationship between financial development and population well-being in sub-Saharan Africa. This objective is broken down into three specific objectives, namely: (i) to determine the effect of financial development on the well-being of African populations (ii) to identify whether there is a transition threshold in the relationship between financial development and well-being in Africa (iii) to examine the effect of the interaction between institutional quality and financial development on well-being.

In this study, we start from the general hypothesis that the quality of institutions could improve the effect of financial development on the well-being of populations in sub-Saharan Africa. As secondary hypotheses, we postulate that: (i) financial development improves the well-being of African populations (ii) there is a transition threshold beyond which financial development reduces the well-being of populations (iii) the quality of institutions improves the effect of financial development on well-being.

This study contributes to the literature on the link between finance and development. Indeed, although numerous works have addressed the question of the relationship between financial development and certain aspects of well-being, to our knowledge, few have analyzed the role of institutional quality in the relationship between financial development and well-being in any depth. As mentioned above, in almost all studies, well-being is frequently measured by indicators that do not capture it in all its dimensions. These include the Human Development Index (HDI), the Multidimensional Poverty Index (MPI) and household consumption expenditure. To compensate for these shortcomings, this study uses the Legatum Institute Prosperity Index (2022), constructed from 300 indicators,

enabling it to incorporate many aspects of well-being. The index covers monetary wealth, human capital, the natural environment, social capital, physical capital, security and even governance.

Methodologically, this study first tests the non-linearity between financial development and well-being using a PSTR model, highlighting threshold effects in financial development. Secondly, the smooth panel transition regression (PSTR) model of Gonzalez et al. (2005) and a quadratic model estimated using the GMM system of Blundell and Bond (1998) are used.

The rest of the article is structured as follows. Section 2 reviews the literature on the relationship between financial development, institutional quality and well-being. Section 3 presents the study methodology. Section 4 presents the data source and variable descriptions. Section 5 deals with the empirical results. Section 6 concludes the study.

2. Literature Review

2.1 Theoretical Contributions

Economists such as Goldsmith (1969), McKinnon (1973) and Shaw (1973) have argued that the development of financial markets stimulates economic growth through the efficient allocation of capital and the mobilization of savings. Financial development would affect economic growth via risk diversification, the efficiency of financial intermediation (transformation of savings into investment) and the reduction of informational problems.

For developing countries, and those in sub-Saharan Africa in particular, although numerous empirical studies have examined the causal link between financial development and economic growth, the results remain ambiguous (Agbetsiafa, 2003; Adu et al., 2013). Some analyses suggest that causality depends on countries' level of economic and financial development: financial development would lead to economic growth in the early stages of development (Spears, 1992; Odedokun, 1996). On the other hand, other authors believe that a financial system can only foster economic growth if it reaches a certain level of structuring (Odhiambo, 2004; Ang and Mckibbin, 2007). They argue that it is economic growth that leads to financial development.

This lack of consensus on the link, and even the direction of causality, between financial development and growth has led monetary theorists to focus on the role of institutions in this relationship (Beji and Youssef, 2010; Kim et al., 2010). Empirical studies tend to show that institutions influence the link between finance and growth in different ways. In particular, Demetriades and Law (2006) find that financial development has greater effects on economic growth when the financial system is embedded in a strong institutional framework. The authors also found that the effect of financial development is stronger in middle-income economies if institutional quality is high. In low-income economies, weak institutions do not allow finance to sustain a growth dynamic. Although Keho (2012) shows that in UEMOA countries, in general, financial development is conditioned by the quality of its institutions, the bottom line is that financial development has, on the whole, a favorable impact on growth (Imam & Kpodar, 2015).

2.2 Empirical Contributions on the Link Between Financial Development, Institutional Quality and Well-Being

The mesh between financial development, institutional quality and well-being is fleshed out by several studies. Firstly, Boukhatem and Mokrani (2012) estimate the direct effect of financial development on poverty in 67 countries, including 37 low-income and 30 low- and middle-income countries, from 1986 to 2009. The financial development indicators used are M3/GDP and domestic credit to the private sector/GDP. Using fixed-effect and panel instrumental variable models, the results show that for all financial development indicators, financial development has a negative effect on poverty.

Bouhezam and al. (2021) confirm his results for Algeria, using an ARDL model on data from 1970 to 2019. The financial development indicators used by the author are credit to the private sector/GDP and gross domestic savings/GDP.

Even more, Zhang and Ben Naceur (2019) study the effect of financial development on income inequality and poverty in 143 countries around the world. Using instrumental variable regressions on data from 1961 to 2011, the results revealed that financial development indicators do not have the same effect on inequality and poverty. The authors show that over this period, increasing financial sector depth, widening access and improving efficiency and stability contribute to reducing inequality and poverty. However, domestic liberalization of the financial system and external financial openness have a positive effect on income inequality.

Furthermore, Cepparulo et al. (2017) examine the role of institutions in the relationship between financial development and poverty. Based on data from 1984 to 2012, in 58 developing countries, OLS and system-based GMM results revealed that the impact of financial development on poverty decreases as the quality of institutions

increases. These results are at odds with those of Rashid and Intartaglia (2017). Indeed, on data from 60 countries from 1985 to 2008, and using the GMM in a two-stage system, these authors reveal that institutional quality improves the effect of financial development on poverty.

In Sub-Saharan Africa, the study by Huang and Sing (2015), with data from 37 countries over the interval 1992-2006 analyzed the relationship between financial development, property rights and poverty. The results show that financial deepening could increase income inequality and poverty, if not accompanied by a strengthening of property rights. The liberalization of interest rates and lending, on the other hand, increases poverty when not accompanied by stronger property rights and greater access to credit information.

Previous empirical studies have used the Human Development Index (HDI), the Multidimensional Poverty Index (MPI), and household consumption expenditure as indicators of well-being. In addition, institutional quality is assessed through control of corruption and political stability. Our contribution to the empirical literature lies in the fact that we use the Legatum Institute's Prosperity Index (2022), constructed from 300 indicators, as an indicator of well-being. With regard to institutional quality, we use four indicators: control of corruption, investment freedom, political stability, and government efficiency.

3. Methodology

The methodology used in this study will be described here. First, we present the specification of the model and second, the estimation procedure.

3.1 The Model Specification

To examine the nonlinear effect of financial development on well-being, in sub-Saharan Africa, we use a threshold-effect Panel modeling. Threshold effect models are an instrument for the analysis of non-linear economic phenomena. They allow economic series to have different dynamics depending on the regimes in which they evolve. The transition mechanism for the transition from one regime to another is carried out using an observable transition variable, a threshold and a transition function. There are two main types of panel threshold modeling: the modeling proposed by Hansen (1999) and that of Gonzalez et al. (2005; 2017). In that of Hansen [1999], nonlinearity is reflected in the fact that the dependent variable is generated by two distinct processes. We are located in one process or another according to the value taken by a variable called transition variable. The modeling assumes that the transition between the two regimes is abrupt. Indeed, we are located in the dynamics of one process or the other. However, it could very well be that, instead of being abrupt, this transition is rather smooth. The PSTR modeling proposed by Gonzales et al. (2005 ; 2017) thus makes it possible to model situations where the transition from one regime to another takes place gradually. Thus, the transition function will be, not an indicator, but rather a continuous function. The PSTR can also be seen as models in which, there are two extreme regimes between which, there would be a continuum of regimes. In the context of this study, the gradual transition models (PSTR) are more appropriate to describe the change in economic behaviors induced by quantitative regime variables. To illustrate the relationship between financial development and well-being, we assume the simple case of the PSTR with two extreme regimes and a single transition function. In the case of two extreme regimes and a single transition function, the PSTR model can be written as follows:

$$y_{it} = \mu_i + \lambda_t + \beta'_0 x_{it} + \beta'_1 x_{it} G(DF_{it}; \gamma, c) + \varepsilon_{it} \quad (1)$$

Where $i = 1, 2, \dots, N$ is the number of countries and $t = 1, 2, \dots, T$ is the number of periods. These are the individual dimensions and the temporary dimensions of the panel, respectively. The dependent variable y_{it} is a scalar and represents the well-being (BE), x_{it} is a K-dimensional vector of the explanatory variables. μ_i and λ_t represent fixed individual effects and time effects, respectively, and ε_{it} is the error term, and β the regression coefficients. Transition function $G(DF_{it}; \gamma, c)$ is a continuous function and depends on threshold variable (DF_{it}) and normalized to be bounded between 0 and 1, and these extreme values are associated with regression coefficients β_0 and $(\beta_0 + \beta_1)$, and on $c = \{c_1, \dots, c_m\}$ which is a vector of threshold parameters and the parameter γ determines the slope of the transition function and indicates the transition speed from one regime to another (transition parameter). Like Granger and Teräsvirta (1993), González et al. (2005), we consider the following logistic transition function:

$$G(DF_{it}; \gamma, c) = \left[1 + \exp\left(-\gamma \prod_{j=1}^m (DF_{it} - c_j)\right) \right]^{-1} \quad (2)$$

With $\gamma > 0$ and $c_1 \leq c_2 \leq \dots \leq c_m$.

Note that m is the number of location parameters and $C_1 \leq C_2 \leq \dots \leq C_m$. For $m = 1$, the model has the two extreme regimes separating low and high values of DF_{it} with a single monotonic transition of the coefficients from β_0 and $(\beta_0 + \beta_1)$, as DF_{it} increases. For a higher value, the transition becomes rougher and transition function $G(DF_{it}, \gamma, c)$ becomes the indicator function $G(DF_{it}, c)$. When tends towards infinite, indicator function $G(DF_{it}, c) = 1$ if event $DF_{it} > c$ occurs, and indicator function $G(DF_{it}, c) = 0$ otherwise. When is close to 0, the transition function $G(DF_{it}, \gamma, c)$ is constant. In that case, the PSTR converges towards the two-regime panel threshold regression (PTR) of Hansen (1999). In general, for any value of m , the transition function $G(DF_{it}, \gamma, c)$ is constant when is close to 0. In which case, the model in equation (1) becomes a linear panel regression model with fixed effects. The empirical model to be estimated is presented as follow:

$$\begin{aligned} BE_{it} = & \mu_i + \alpha BE_{it-1} + \theta_1 INFL_{it} + \theta_2 FBCF_{it} + \theta_3 TXPOP_{it} + \theta_4 CCOR_{it} + \theta_5 LIB_{it} + \theta_6 STAB_{it} + \theta_7 EG_{it} + \\ & \theta_8 DF_{it} + (\theta'_1 INFL_{it} + \theta'_2 FBCF_{it} + \theta'_3 FBCF_{it} + \theta'_4 CCOR_{it} + \theta'_5 LIB_{it} + \theta'_6 STAB_{it} + \theta'_7 EG_{it} + \theta'_8 DF_{it}) \\ & * G(DF_{it}; \gamma, c) + \varepsilon_{it} \end{aligned} \quad (3)$$

Where θ_i represents the regression coefficients. The selected dependent variable is well-being measured by the prosperity index (BE_{it}) for each country at time t . The explanatory variable of interest is the financial development index (DF_{it}). $INFL_{it}$ is measured by the growth rate of the consumer price index (CPI), at time t for each country. In addition, a set of variables was selected as a control variable. This is the investment rate ($FBCF_{it}$) of a country defined by gross fixed capital formation to real GDP, at time t . The population growth rate ($TXPOP_{it}$) at time t for each country. In our analysis, we will focus on the institutions responsible for controlling corruption ($CCOR_{it}$), for each country at time t . Government efficiency (EG_{it}) at time t for each country. Freedom of investment (LIB_{it}) for each country at time t . Political stability ($STAB_{it}$) at time t for each country.

3.2 The Estimation Procedure

The econometric approach is based on three steps. In the first one, the stationarity of each variable is examined by performing the unit roots tests of Pesaran (2007). In the second one, we test both the linearity against the PSTR model and the number of transition function. Finally, in the third one, we apply the non-linear least squares methods to estimate our PSTR model. It's the estimation procedure for obtaining the coefficients.

• The Pesaran test (2007)

Indeed, Pesaran's (2007) second generation test assumes possible correlations between individuals (inter-individual dependencies) of the panel. The CIPS (Cross-sectionally Augmented IPS) test takes into account the cross-sectional dependence (inter-individual dependence) of the observations. In general, the objective is to test the null hypothesis of the presence of unit root against the alternative hypothesis of the absence of unit root. The principle of the test is as follows:

$$H_0: \text{presence of unit root or } H_1: \text{absence of unit root}$$

The presence of a unit root means that the series are non-stationary. The absence of a unit root means that the series studied are stationary. If the p-value associated with the test statistic is less than 5%, then the null hypothesis is rejected and the hypothesis of no unit root is accepted.

• Linearity test

The estimation of the PSTR model begins with the elimination of the fixed individual effects μ_i by removing the mean of the specific individual effects and thus applying the nonlinear least squares on the transformed model. González et al. (2005) proposes a test procedure according to the following order :

- i) The linearity test against the PSTR model,
- ii) Determination of the number r of the transition functions

The linearity test in the PSTR model (equation 1) can be done by testing:

$$H_0: \gamma = 0 \text{ or } H_0: \beta_1 = \beta_0$$

However, under the null hypothesis, the test will not be the same in both cases, and the PSTR model contains unidentified nuisance parameters. One possible solution is to replace the transition function $G(z_{it}; \gamma, c)$ with the Taylor expression at order 1 around $\gamma = 0$ and test an equivalent hypothesis in an auxiliary regression. We then get the following:

$$\begin{aligned}
BE_{it} = & \mu_i + \alpha BE_{it-1} + \theta_1^* INFL_{it} + \theta_2^* FBCF_{it} + \theta_3^* TXPOP_{it} + \theta_4^* CCOR_{it} + \theta_5^* LIB_{it} + \theta_6^* STAB_{it} + \theta_7^* EG_{it} \\
& + \theta_8^* DF_{it} + (\theta_1^{*'} INFL_{it} + \theta_2^{*'} FBCF_{it} + \theta_3^{*'} TXPOP_{it} + \theta_4^{*'} CCOR_{it} + \theta_5^{*'} LIB_{it} + \theta_6^{*'} STAB_{it} + \theta_7^{*'} EG_{it} + \\
& \theta_8^{*'} DF_{it}) * G(DF_{it}; \gamma, c) + \varepsilon_{it}^*
\end{aligned} \quad (4)$$

Since the parameters $\theta^{*1} \dots \theta^{*m}$ are proportional to the slope parameters of the transition function, and ε_{it}^* is ε_{it} plus the residue of Taylors development. The null hypothesis of the linearity test becomes $H_0: \theta^{*1} = \dots = \theta^{*m} = 0$ and the linearity is tested with standard tests.

We use Wald test expressed as follows:

$$LM_w = \frac{NT(SCR_0 - SCR_1)}{SCR_0}$$

where SCR_0 is the sum of the squares of the panel residuals under the hypothesis H_0 and SCR_1 is the sum of the squares of the panel residuals in the PSTR model with m regimes. Then the corresponding statistic F is then defined as follows:

$$LM_F = \frac{(SCR_0 - SCR_1)/mK}{SCR_0/(TN - N - mK)} \sim F(mK, TN - N - mK) \quad (5)$$

Where T, N and K are the number of years, the number of countries and the number of exogenous variables respectively. After applying the linearity test, the problem is to identify the number of transition functions. LMF follows a Fisher distribution with mK and $(TN - N - mK)$ degrees of freedom ($F(mK, TN - N - mK)$). All these linearity tests are distributed $\chi^2(k)$ under the null hypothesis.

3.3 Robustness Test

To test the robustness of the PSTR model results, we estimate a growth equation that is expressed as follows:

$$y_{it} = \theta y_{it-1} + \mu_i + \beta_0' x_{it} + \beta_1' \pi_{it}^2 + \varepsilon_{it} \quad (6)$$

Thus to estimate equation 6, we use the dynamic panel generalized method of moments (GMM) (Arellano and Bond, 1991; Arellano and Bover, 1995 and Blundell et Bond, 2000). By specifying our GMM in quadratic form (the π_{it}^2 term in equation 6), we postulate the existence of a nonlinear relationship between financial development and well-being. One advantage of the GMM method is that it controls for endogeneity between variables. The instrumentation method differs according to the nature of the explanatory variables: (a) for purely exogenous variables, current variables are used as instruments; (b) for weakly exogenous variables, values lagged by at least one period are used as instruments; (c) for endogenous variables, values lagged by two or more periods can be used as valid instruments.

4. Data Sources and Descriptive Statistics

The data in this study covers 35 countries in Sub-Saharan Africa, over the period 2007-2021. They come from the Legatum Institute (2022), the World Development Indicators (2022), the Worldwide Governance Indicators (2022) and the Heritage Foundation (2022).

4.1 Summary of Study Variables and Descriptive Statistics

Table 1 summarizes information on the variables in this study.

Table 1. Summary of variables and data sources

Variables	Description	Sources
Dependent variable		
BE	Well-being measured by the prosperity index	Legatum Institute (2022)
Financial development measures		
DF	Financial Development Index	IMF (2022)
CRED	Credit granted to the private sector	WDI (2022)
M2PIB	M2 to GDP ratio	IMF (2022)
M2M1PIB	Ratio (M2-M1) to GDP	IMF (2022)
Institutional variables		
CCOR	Corruption control, ranging from -2.5 to 2.5	WGI(2022)
LIB	Investment freedom, ranging from 0 to 100	Heritage Foundation (2022)
STAB	Political stability, ranging from -2.5 to 2.5	WGI (2022)
EG	Government effectiveness, ranging from -2.5 to 2.5	WGI (2022)
Control variables		
INFL	Inflation	WDI (2022)
FBCF	Gross fixed capital formation	WDI (2022)
TXPOP	Population growth rate	WDI (2022)

Source: Authors, based on literature review.

The descriptive statistics for all variables are shown in Table 2. This table calls for a few comments. On a scale of 100, we can see that the level of well-being remains low in Sub-Saharan Africa, with a mean value of 45.299 and a high dispersion (7.165). This highlights the still insufficient level of development in Sub-Saharan African countries. In addition, the high dispersion reflects the heterogeneity of countries in terms of well-being. Total investment by African economies over the study period represents just 22.67% of GDP.

Table 2. Descriptive Statistics

Variables	Mean	SD	Min	Max	Observations
BE	45.299	7.165	30.030	66.629	525
DF	0.152	0.125	0.027	0.642	525
CRED	21.146	18.533	2.170	104.848	525
M2PIB	32.868	22.266	0.0156	159.329	525
M2M1PIB	27.008	21.550	3.329	148.885	525
CCOR	-0.602	0.629	-1.572	1.039	525
LIB	50.485	14.778	10	90	525
STAB	-0.514	0.853	-2.699	1.200	525
EG	-0.707	0.621	-1.849	1.056	525
INFL	5.975	8.091	-21.165	85.353	525
FBCF	22.671	8.682	5.885	81.021	525
TXPOP	2.507	0.794	0.002	3.907	525

Source: Authors, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022).

On a scale of 1, we can see that the level of financial development remains low in Sub-Saharan Africa, with an average value of 0.152. This reflects the overall lack of dynamism in the financial sector. Indeed, credit granted to the private sector averaging 21.148% of GDP reveals a low intensity of financial intermediation and the constraint of financing private sector companies. The average financial depth indicator of 27.008 indicates that there is a poorly diversified range of financial products in our study area. Institutional quality indicators are generally low (CCOR 0.629; LIB 50.485; STAB -0.514 and EG -0.707). The high dispersions (0.629; 14.778; 0.853; 0.621) show the heterogeneity of situations in the region's countries.

4.2 Summary of the Study of Correlations Between Independent Variables

The Pearson correlation coefficient matrix is summarized in Table 3. The advantage of the correlation matrix is that it highlights the correlation between the independent variables and the model's dependent variable, but also enables us to identify the correlation between the explanatory variables in order to avoid problems of multicollinearity. This table shows that the correlations between the explanatory variables are low and moderate. Of all these variables, the EG and BE pair has the highest correlation coefficient (0.903), with DF and CRED at 0.811. The EG and CCOR pair has a high correlation coefficient (0.862). According to Kennedy (2008), a multi-collinearity problem exists when the correlation coefficient between two explanatory variables is greater than 0.8.

Table 3. Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) <i>BE</i>	1											
(2) <i>DF</i>	0.710*	1										
(3) <i>CRED</i>	0.754*	0.811*	1									
(4) <i>M2PIB</i>	0.691*	0.701*	0.909*	1								
(5) <i>M2MIPIB</i>	0.742*	0.754*	0.921*	0.948*	1							
(6) <i>CCOR</i>	0.836*	0.599*	0.644*	0.5740*	0.640*	1						
(7) <i>LIB</i>	0.582*	0.328*	0.449*	0.424*	0.461*	0.600*	1					
(8) <i>STAB</i>	0.745*	0.462*	0.494*	0.485*	0.535*	0.718*	0.413*	1				
(9) <i>EG</i>	0.903*	0.725*	0.741*	0.649*	0.707*	0.862*	0.618*	0.670*	1			
(10) <i>INFL</i>	-0.083*	-0.0341	-0.152*	-0.165*	-0.109*	-0.093*	-0.121*	-0.065	-0.056	1		
(11) <i>FBCF</i>	0.142*	0.035	0.0606	0.109*	0.109*	0.187*	0.083*	0.220*	0.15*	-0.11*	1	
(12) <i>TXPOP</i>	-0.518*	-0.547*	-0.666*	-0.613*	-0.647*	-0.524*	-0.343*	-0.36*	-0.47*	0.090*	0.140*	1

Source: Authors, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022)

Note: (*) represents significance at the 5% level.

Consequently, there is a strong correlation between institutional variables and financial development indicators. There is therefore a presumption of multicollinearity. To verify this, we performed a multicollinearity test, namely the VIF test. The results of this test are shown in Table 4.

Some VIF values are greater than 5, notably those for M2M1PIB, M2PIB, CRED, EG and CCOR. There is thus multicollinearity between the financial development variables. To avoid the problem caused by multicollinearity, we will use sequential regression.

Table 4. VIF results

Variables	VIF	1/VIF
M2M1PIB	14.40	0.069
M2PIB	12.14	0.082
CRED	11.18	0.089
EG	6.86	0.145
CCOR	5.18	0.193
DF	3.68	0.271
STAB	2.27	0.441
TXPOP	2.21	0.451
LIB	1.84	0.542
FBCF	1.21	0.829
INFL	1.11	0.902
Mean VIF		5.64

Source: Authors, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022)

The following section looks at the results of the estimates and the economic interpretations derived from them.

5. Estimation Results

This study evaluates the non-linearity between financial development and well-being on the one hand, and the role of institutional quality in the relationship between financial development and well-being on the other.

5.1 Non-linear Relationship Between Financial Development and Well-Being

The first step in the estimation process is to examine the properties of the different series, in order to determine whether the variables are stationary and at what order they are integrated. To take account of the possible presence of inter-individual dependence, we use the second-generation unit root tests of Pesaran (2003) and Pesaran (2007). The results of these tests are shown in Table 5.

Table 5. Unit root test by Pesaran (2007) and Pesaran (2003)

Variables	Pesaran (2003)	Pesaran (2007)	Ordre d'intégration
BE	-9.253*** (0.000)	-9.253*** (0.000)	Stationnaire I (1)
DF	-3.959 *** (0.000)	-4.791 *** (0.000)	Stationnaire I (0)
CRED	-2.697 *** (0.003)	-3.411*** (0.000)	Stationnaire I (0)
M2PIB	-2.595 *** (0.005)	-3.570 *** (0.000)	Stationnaire I (0)
M2M1PIB	-4.408 *** (0.000)	-5.359*** (0.000)	Stationnaire I (0)
CCOR	-9.186 *** (0.000)	-9.186 *** (0.000)	Stationnaire I (1)
LIB	-3.222 *** (0.001)	- 3.622*** (0.000)	Stationnaire I (0)
STAB	-3.031 *** (0.001)	-2.571*** (0.005)	Stationnaire I (0)
EG	-10.966 *** (0.000)	-10.966 *** (0.000)	Stationnaire I (1)
TXPOP	-2.805 *** (0.003)	-2.805 *** (0.003)	Stationnaire I (1)
FBCF	-10.521 *** (0.000)	-10.521*** (0.000)	Stationnaire I (1)
INFL	-3.729 *** (0.000)	-9.179 *** (0.000)	Stationnaire I (0)

Note: (***), (**) and (*) indicate significance at the 1%, 5% and 10% thresholds respectively.

Source: Author, based on data from the World Bank (2023), BCEAO (2023) and WGI (2023).

The results of the unit root tests show that some variables are stationary in level and others in first difference. The level-stationary variables are DF, CRED, M2PIB; M2M1PIB, LIB; STAB, and INFL. On the other hand, BE; CCOR; EG; TXPOP and GFCF are stationary in first difference.

The LM_F test presented in Table 6 rejects the hypothesis of no non-linear effect for the four financial development variables. The effect of financial development on a country's well-being is therefore determined by its level of financial development.

For all financial development variables, the results show that the coefficients of the first regime are all positive, while those of the second regime are negative. Thus, financial development initially improves people's well-being, but can have a negative impact on well-being beyond a certain threshold of financial development. This is an inverted U-shaped relationship. On the one hand, the positive impact of financial development on well-being is due to the fact that financial development broadens access to financing. It remains an important determinant of economic growth and thus helps to combat unemployment (Eggoh et Villieu, 2013). Financial development indirectly improves household consumption and enables households to better cope with shocks, thus mitigating the risk of poverty re-emerging (Rewilak, 2017). On the other hand, the negative effect of financial development on well-being could be explained by the fact that, in the presence of low institutional quality, financial development could be a lever for

increasing income inequality (Jaumotte et al, 2008; Jauch and Watzka, 2016). Institutional weakness would therefore be the basis of a “financial curse” (Law et al, 2018). This would be explained by the fact that financial development would enable the better-off to earn more than others on investment opportunities (Cournède and Mann, 2017). Poor households are those who suffer the most from liquidity constraints, creating an unequal distribution of income, accentuating poverty.

Table 6. Non-linear relationship between financial development and well-being: PSTR model

Transition variable	DF		CRED		M2PIB		M2M1PIB	
Threshold	0.2720		40.217		49.038		39.797	
Slope	15.749		18.206		232.33		149.80	
Regimes	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
DF_{t-1}	0.465*** (10.99) [0.042]	-0.396*** (-8.97) [0.044]	-	-	-	-	-	-
CRED_{t-1}	-	-	0.176*** (9.910) [0.017]	-0.167*** (-7.55) [0.022]	-	-	-	-
M2PIB_{t-1}	-	-	-	-	0.126*** (10.019) [0.012]	-0.080*** (-6.034) [0.013]	-	-
M2M1PIB_{t-1}	-	-	-	-	-	-	0.151*** (9.171) [0.016]	-0.106*** (-6.55) [0.016]
IFNL	-0.016** (-2.349) [0.006]	-0.049** (-2.416) [0.020]	-0.024** (-4.575) [0.005]	-0.032 (-0.764) [0.041]	-0.03*** (-5.758) [0.005]	-0.015 (-0.383) [0.039]	-0.009 (-1.416) [0.006]	-0.027 (-1.450) [0.019]
FBCF	0.019** (2.215) [0.008]	-0.095*** (-5.230) [0.018]	-0.010*** (-4.575) [0.009]	-0.078 (-0.764) [0.021]	-0.004 (-0.652) [0.007]	0.125 (0.901) [0.138]	0.003 (0.436) [0.007]	0.010 (0.482) [0.022]
TXPOP	0.710** (2.671) [0.266]	-0.945** (-2.373) [0.398]	0.190 (0.253) [0.750]	-2.502 (0.979) [-0.25]	0.079 (0.298) [0.266]	1.154*** (5.298) [0.217]	0.273 (0.983) [0.278]	1.146*** (4.514) [0.253]
Linearity LMF	8.462	(0.000)	5.084	(0.001)	4.159	(0.003)	9.130	(0.000)
Régime LMF	1.637	(0.164)	0.329	(0.858)	0.792	(0.531)	1.635	(0.164)
AIC	0.030		0.068		0.091		0.060	
BIC	0.111		0.149		0.172		0.141	

Source: Authors, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022)

Note: (***) and (**) represent significance at the 1% and 5% thresholds respectively, () represents t-statistics and [] represents standard deviations.

In terms of control variables, we note that inflation has a negative and significant effect on well-being. Inflation erodes household purchasing power. As a result, consumption falls and well-being declines. Inflation also tends to increase inequality, as it affects the incomes of poor households more severely than those of well-off households (Meo et al., 2018). On the other hand, investment has an overall negative effect on well-being. This could be attributable to poor governance, which would neutralize the positive impact of investment, by widening inequalities. Finally, the demographic growth rate presents mixed results. High population growth, coupled with inequality and unemployment causes insecurity, poverty and reduces well-being (Adedodja and Sirpe, 2019). However, population growth could generate pressure to improve production techniques, provide sufficient manpower thus helping to satisfy consumption needs (Boserup, 1992).

To test the robustness of our results, we investigated the non-linearity between financial development and well-being using a quadratic model, thanks to the GMM system. The results are shown in Table 7.

Table 7. Non-linear relationship between financial development and well-being: GMM system model

Variables	DF	CRED	M2PIB	M2M1PIB
BE_{t-1}	0.914*** (0.000) [0.026]	0.943*** (0.000) [0.017]	0.919*** (0.000) [0.051]	0.921*** (0.000) [0.052]
DF	0.147** (0.010) [0.057]	-	-	-
DF²	-0.002** (0.037) [0.001]	-	-	-
CRED	-	0.037** (0.025) [0.016]	-	-
CRED²	-	-0.0004** (0.037) [0.0002]	-	-
M2PIB	-	-	0.124*** (0.000) [0.030]	-
M2PIB²	-	-	-0.001** (0.006) [0.0004]	-
M2M1PIB	-	-	-	0.097** (0.001) [0.029]
M2M1PIB²	-	-	-	-0.001** (0.007) [0.0004]
INFL	-0.009*** (0.000)	-0.005** (0.001)	0.002 (0.364)	0.0009 (0.751)

	[0.001]	[0.001]	[0.003]	[0.003]
FBCF	-0.005 (0.274) [0.004]	-0.0001 (0.959) [0.003]	0.009 (0.513) [0.014]	0.0001 (0.990) [0.012]
TXPOP	-0.353 (0.121) [0.227]	-0.013 (0.944) [0.189]	-0.998** (0.035) [0.474]	-1.260** (0.014) [0.514]
Cons	3.939** (0.009) [1.518]	2.327** (0.028) [1.058]	3.925 (0.180) [2.930]	5.562* (0.054) [2.890]
AR (1) p-value	0.000	0.000	0.000	0.000
AR (2) p-value	0.352	0.290	0.184	0.137
Hansen J-test	0.418	0.547	0.958	0.937
Threshold	0.275	41.88	48.47	40.32

Source: Authors, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022)

Note: (***), (**) and (*) represent significance at the 1%, 5% and 10% thresholds respectively, () represents p-values and [] represents standard deviations.

The results confirm the existence of non-linearity between financial development and well-being in Sub-Saharan Africa. Indeed, the coefficients of the financial development variables are all positive, while those of the square of these variables are negative. This confirms the results of the 1st and 2nd PSTR regimes. We deduce that financial development initially improves people's well-being, but has a negative impact on well-being beyond a certain financial development threshold. Table 8 summarizes the transition thresholds in the PSTR and GMM models.

Table 8. Summary of transition thresholds in the PSTR and GMM models

Variables	DF	CRED	M2PIB	M2M1PIB
Transition threshold (PSTR)	0.272	40.21	49.04	39.79
Transition threshold (GMM)	0.275	41.88	48.47	40.32

Source: Authors, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022).

We have determined the financial development thresholds in the GMM model on the basis of the marginal effect of financial development on well-being. These thresholds are generally consistent with those obtained in the PSTR model. However, the small discrepancies observed in the value of the thresholds are attributable to the fact that the marginal effect of financial development on well-being is linear in the quadratic model, whereas in the PSTR model, the elasticity is a non-linear function of financial development. Overall, the results show that there are thresholds of financial development beyond which any improvement in the financial system leads to a loss of well-being in Sub-Saharan Africa. Excessive financial development could lead to a financial crisis and a deterioration in people's well-being. The regulatory framework and institutional quality could influence the effect of financial development on well-being.

To verify whether the non-linearity between financial development and well-being could be the result of the low level of institutions in Sub-Saharan Africa, we introduced the role of institutional quality in the relationship between financial development and well-being.

5.2 The Role of Institutional Quality in the Relationship Between Financial Development and Well-Being

Here, we analyze the relationship between financial development and well-being through the role of institutions. We distinguish between economic institutions (control of corruption, freedom of investment) and political institutions (political stability and government effectiveness). The estimation results are reported in Tables 9 and 10.

Table 9. Financial development index and well-being: the role of economic institutions

Variables	CCOR					LIB		
BE_{t-1}	0.745** * (0.000) [0.050]	0.845*** (0.000) [0.024]	0.811*** (0.000) [0.022]	0.757*** (0.000) [0.022]	0.870*** (0.000) [0.023]	0.654*** (0.000) [0.164]	0.859*** (0.000) [0.042]	0.904*** (0.000) [0.058]
INST	2.132** * (0.000) [0.481]	2.279*** (0.000) [0.228]	2.115*** (0.000) [0.299]	2.774*** (0.000) [0.591]	0.019 *** (0.000) [0.005]	0.127** 0.004 (0.000) [0.044]	0.033*** (0.000) [0.006]	0.020** (0.006) [0.007]
DF	0.053* (0.075) [0.0300]				0.040** (0.011) [0.016]			
DF*INST	-0.056 ** (0.022) [0.0244]				-0.0006* ** (0.000) [0.0001]			
CRED		0.023*** (0.000) [0.005]				0.152** 0.047 (0.000) [0.076]		
CRED*INST		-0.038** * (0.000) [0.003]				-0.002 ** (0.014) [0.0009]		
M2PIB			0.007** (0.013) [0.002]				0.026 ** (0.003) [0.009]	
M2PIB*INST			-0.011 ** * (0.000) [0.002]				-0.0003* ** (0.000) [0.0001]	
M2M1PIB				0.026** (0.001) [0.007]				0.026** (0.021) [0.011]
M2M1PIB*I				-0.030**				-0.0004*

NST				*			*	
				(0.000)			(0.003)	
				[0.008]			[0.0001]	
INFL	-0.043*	-0.019**	-0.010**	-0.020**	-0.021**	-0.006	-0.015 **	-0.024**
	**	*	(0.015)	*	*	(0.677)	(0.002)	*
	(0.000)	(0.000)	[0.004]	(0.000)	(0.000)	[0.014]	[0.004]	(0.000)
	[0.004]	[0.004]		[0.003]	[0.004]			[0.006]
FBCF	-0.030*	-0.048**	-0.059**	-0.078**	-0.012**	-0.015	-0.017 **	-0.026
	**	*	*	*	(0.023)	(0.567)	(0.044)	(0.166)
	(0.000)	(0.000)	(0.000)	(0.000)	[0.005]	[0.026]	[0.008]	[0.018]
	[0.006]	[0.005]	[0.009]	[0.011]				
TXPOP	-1.107*	-0.010	-0.846**	-0.751**	-1.589**	-2.915**	-0.946**	-1.121*
	**	(0.972)	*	(0.041)	*	(0.035)	(0.008)	(0.091)
	(0.000)	[0.306]	(0.001)	[0.367]	(0.000)	[1.386]	[0.356]	[0.664]
	[0.263]		[0.243]		[0.383]			
Cons	15.617*	9.046	13.138	15.640**	9.430***	16.584 *	7.455 **	6.903
	**	***	***	*	(0.000)	(0.087)	(0.008)	(0.123)
	(0.000)	(0.000)	(0.000)	(0.000)	[1.851]	[9.689]	[2.811]	[4.470]
	[2.561]	[1.588]	[1.593]	[1.749]				
AR (1) p-value	0.000	0.000	0.000	0.000	0.000	0.047	0.000	0.000
AR (2) p-value	0.597	0.539	0.746	0.954	0.285	0.131	0.333	0.387
Hansen J-test	0.662	0.469	0.389	0.446	0.556	0.320	0.478	0.490
Institutional quality threshold	0.95	0.601	0.652	0.856	59.02	63.69	66.63	60.45

Source: Author, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022)

Note: (***), (**) and (*) represent significance at the 1%, 5% and 10% thresholds respectively, () represents p-values and [] represents standard deviations.

Table 9 shows the positive effect of financial development and economic institutions on well-being. These results indicate that financial development contributes to improved well-being in Sub-Saharan Africa. Also, any improvement in the control of corruption and freedom of investment helps to raise the level of well-being in Sub-Saharan Africa. The results show, however, that the interaction between financial development indices and each institutional variable has a negative effect on well-being. These results suggest that our economic institutions attenuate the positive effect of financial development on well-being. Such a counter-intuitive result could be attributable to the inadequacy of economic institutions, notably control of corruption and freedom of investment, in the zone. We then identified for each model a threshold level of institutional quality beyond which economic institutions improve the positive effect of financial development on well-being (Law et al, 2013). As shown in Table 10, we first observe the positive effect of financial development indicators and political institutions on well-being. Thus, political stability and government effectiveness prove to be levers in improving well-being in Sub-Saharan Africa. Subsequently, we note that interactions between financial development and political institutions have negative effects on well-being. These results show that political institutions in Sub-Saharan Africa reduce the positive effect of financial development on people's well-being. This is undoubtedly linked to the level of political stability and government effectiveness in Sub-Saharan Africa. On the other hand, there are thresholds of political

stability and government effectiveness beyond which these political institutions reinforce the positive effect of financial development on well-being.

Table 10. Financial development index and well-being: the role of political institutions

Variables	STAB				EG			
BE_{t-1}	0.785*** (0.000) [0.036]	0.842*** (0.000) [0.029]	0.862*** (0.000) [0.021]	0.837*** (0.000) [0.019]	0.836*** (0.000) [0.021]	0.732** (0.000) [0.046]	0.624*** (0.000) [0.036]	0.737*** (0.000) [0.027]
INST	2.203*** (0.000) [0.368]	1.543*** (0.000) [0.195]	1.415*** (0.000) [0.189]	1.475*** (0.000) [0.222]	2.805** * (0.000) [0.399]	4.980** * (0.000) [0.665]	6.034*** (0.000) [0.435]	4.220*** (0.000) [0.475]
DF	0.049*** (0.000) [0.009]				0.063** (0.002) [0.020]			
DF*Inst	-0.070** * (0.000) [0.019]				-0.084* * (0.001) [0.026]			
CRED		0.017*** (0.000) [0.003]				0.068** * (0.000) [0.015]		
CRED*Inst		-0.026** * (0.000) [0.002]				-0.095** * (0.000) [0.014]		
M2PIB			0.005** (0.001) [0.001]			0.050** * (0.000) [0.007]		
M2PIB*Inst			-0.007** * (0.000) [0.002]			-0.059** * (0.000) [0.008]		
M2M1PIB				0.012*** (0.000) [0.003]				0.039*** (0.000) [0.007]
M2M1PIB*Inst				-0.017** * (0.000) [0.003]				-0.043*** (0.000) [0.009]

INFL	-0.050** * (0.000) [0.009]	-0.014 ** (0.027) [0.006]	-0.014 ** (0.002) [0.004]	-0.013** (0.036) [0.006]	-0.028* ** (0.000) [0.006]	0.006 (0.448) [0.008]	0.003 (0.554) [0.005]	-0.012 (0.108) [0.007]
FBCF	-0.045** * (0.000) [0.005]	-0.059** * (0.000) [0.005]	-0.027** * (0.000) [0.006]	-0.060** * (0.000) [0.008]	-0.030* * (0.003) [0.010]	-0.050** (0.003) [0.017]	-0.062** * (0.000) [0.017]	-0.043*** (0.000) [0.012]
TXPOP	0.405 (0.271) [0.368]	-0.656** (0.002) [0.210]	-0.304 * (0.083) [0.175]	-1.218** * (0.000) [0.192]	-0.171 (0.585) [0.312]	0.901 (0.155) [0.634]	0.503 (0.209) [0.400]	0.787* (0.092) [0.467]
Cons	10.543** * (0.000) [2.575]	10.779** * (0.000) [1.750]	8.268 *** (0.000) [1.240]	12.427** * (0.000) [1.241]	9.327** * (0.000) [1.17]	12.597* ** (0.000) [3.072]	18.887* ** (0.000) [2.733]	12.563*** (0.000) [2.024]
AR p-value	(1) 0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR p-value	(2) 0.603	0.883	0.952	0.863	0.519	0.618	0.625	0.715
Hansen J-test	0.928	0.194	0.401	0.328	0.444	0.151	0.210	0.239
Institutional quality threshold	0.711	0.675	0.747	0.684	0.756	0.718	0.853	0.907

Source: Author, based on data from Legatum Institute (2022), IMF (2022), WDI (2022), WGI (2022) and Heritage Foundation (2022)

Note: (***), (**) and (*) represent significance at the 1%, 5% and 10% thresholds respectively, () represents p-value and [] represents standard deviations.

Overall, these results show that weak institutional quality reduces the welfare benefits of financial development in Sub-Saharan Africa. Indeed, in the presence of an inadequate institutional framework, the benefits of financial development cannot be allocated to the entire population. Financial services would benefit only one class of society. With the poorest left behind, the result is growing inequality and poverty (Jauch and Watzka, 2016).

At the level of economic institutions, for example, weak controls on corruption open the door to waste and embezzlement of funds acquired through financial services. Restrictions on investment, meanwhile, contribute to rising unemployment. At the political level, political instability promotes a framework of insecurity and slows down savings and investment (Wang and Swain, 1997). Moreover, when a government is less effective, it creates red tape and situations of injustice (Dixit, 2009).

To prevent financial development having a detrimental effect on well-being, Sub-Saharan African countries must commit to guaranteeing a satisfactory minimum threshold of institutional quality.

6. Conclusion

Global poverty has fallen drastically over the last 30 years, driven by strong catch-up growth in developing countries, particularly in Asia. In 1990, the number of people living below the extreme poverty line of \$2.15 a day exceeded 1.6 billion in Asia. According to World Bank estimates, the percentage of poor Africans fell from 56% in 1990 to 43% in 2012. By 2019, 35% of the population of sub-Saharan Africa was still living in extreme poverty, while rates had fallen to 9% in South Asia and 1% in East Asia and the Pacific. For every 1% of growth, Africa reduces its

poverty rate by 1%, compared with 2.5% in the rest of the world. Inequalities are structural, and individual efforts do not allow for mobility up the social ladder, notes the World Bank.

The issue of poverty reduction and well-being therefore remains a major challenge in Africa. Furthermore, an underdeveloped financial sector and limited access to finance are obstacles to growth in sub-Saharan Africa. Indeed, several countries still have only an inadequate financial sector and instruments, and financial inclusion, i.e. the level of access to financial products and services by the majority of the population, is still limited. In terms of institutional quality, the CPIA 2024 for Africa report provides an assessment of the quality of policies and institutions in all 39 countries eligible for IDA assistance in sub-Saharan Africa. For example, for calendar year 2023, the average CPIA score for sub-Saharan African countries eligible for IDA resources remained broadly similar to its 2022 level, at 3.1 on a scale of 6.

Thus, the main objective of this study was to analyze the role of institutional quality in the relationship between financial development and well-being in Sub-Saharan Africa. It covered a sample of 35 countries from 2007 to 2021, using the Legatum Institute Prosperity Index as a measure of well-being. Institutional quality was also approximated by economic institutions (control of corruption, freedom of investment) and political institutions (political stability, government effectiveness).

Using the PSTR model and the GMM system on a quadratic model, the estimation results showed that there is a non-linear relationship between financial development and well-being, in the shape of an inverted U. In addition, weak institutions reduce the positive effect of financial development on well-being. Furthermore, weak institutions reduce the positive effect of financial development on well-being. We then determined minimum thresholds of institutional quality above which economic and political institutions reinforce the positive effect of financial development on well-being.

If we consider these results, the major lesson to be drawn is that financial development is only beneficial to the well-being of populations if it is accompanied by quality institutions. Consequently, we can deduce several economic policy implications. Sub-Saharan African countries must work to further strengthen the institutional framework. More specifically, this means fighting corruption in all sectors of activity, and facilitating investment. At the political level, governments need to become more efficient, by combating red tape and poor governance. Political stability should also be guaranteed, by promoting democratic governments and combating coups d'état and terrorism in the region. In addition, the states of Sub-Saharan Africa would benefit from integrating African values into their institutions and giving more thought to their operationalization, in order to make them more effective.

Authors' contributions

Prof. Dr. PRAO Yao S éraphin and Taky Ange Carelle were responsible for the design and revision of the study. Taky Ange Carelle was responsible for data collection and estimates. Prof. Dr. PRAO Yao S éraphin drafted the manuscript and revised it. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

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The Publication Ethics Committee of the Sciedu Press.

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Data sharing statement

No additional data are available.

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