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Institutions in the development of Sub-Saharan African countries in 2004–2019

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Abstract

Motivation: Institutions play a significant role in development processes, contributing to understanding the economic backwardness of Sub-Saharan Africa. There is no consensus in the literature on the specific set of institutions that significantly influence developmental processes. Furthermore, there is no convincing evidence that institutions create the proper environment for long-term growth or result from increased development due to advances in human capital and investments. Therefore, the article examines overcoming the developmental backwardness of those countries following sustainable development.
Aim: The article aims to analyze whether institutions contribute to the development processes of Sub-Saharan African countries. The paper identifies the differences in channels

of institutions' impact on the two development measures, GDP per capita and the Human Development Index (HDI). Regarding the high diversity in the level of development of countries in the region and the differences in their institutional systems, thirty-two countries in Sub-Saharan Africa were grouped regarding HDI level.

Results: The heterogeneous panel Autoregressive Distributed Lags (ARDL) models revealed that in the lower developed countries, financial aid in the form of grants or very low-interest loans from the World Bank and OECD is of particular importance. They show that increased use of CO_2 is a proxy for driving forces of African economies (production, investments, etc.). Indicators referring to institutions' measurement like government effectiveness, political stability, economic freedom, or the number of days for establishing a business play important roles in continuing development.

Keywords: institutions; economic development; Sub-Saharan Africa; panel cointegration; panel ARDL
JEL: *B52; O11*

1. Introduction

Sub-Saharan African (S-SA) countries have the lowest level of development worldwide (UNDP, 2022). Most of them constitute the group of Least Developed Countries (LDC) (United Nations, 2022b). The backwardness of development raises the need to understand the specifics of the development processes and their determinants, contemporarily from the perspective of Sustainable Development Goals (SDGs), particularly SDG1, No poverty, SDG4 Quality education, SDG8 Decent work and economic growth, SGG16 Peace, justice, and strong institutions. Understanding Africa's economic backwardness requires not only an accounting of the relationship between slow growth and unfavourable economic determinants but also an understanding of weak institutional characteristics (Easterly & Levine, 1997).

In the literature, institutions play a significant role in growth and development processes (Acemoglu & Robinson, 2013; 2022; North, 1990), in particular contributing to understanding those processes in developing countries (Acemoglu & Robinson, 2013; Easterly et al., 2004; Osman et al., 2011; Świerczyńska & Kryszak, 2019). However, there is no consensus on a particular set of institutions that significantly influence development processes in the S-SA countries. Most often, studies emphasize the lack of conducive institutions resulting in low levels of corresponding measures, such as the poor quality of economic policy (Bates et al., 2012; Hopkins, 2009; Rodrik, 2006), the poor quality of effective governance (António, 2001; Fosu et al., 2006), the low level of private property protection (Deininger et al., 2014) or the presence of high transaction costs (Świerczyńska, 2019). Moreover, researchers disagree on the causal direction between institutions and economic growth (Voigt, 2013) and whether institutions are as much a result of economic development as its cause (Rodrik, 2007, p. 184).

The article assumes that institutions' effectiveness is related to their quality, which increases with economic growth. Therefore, we assume that in the very

fragile and volatile institutional framework of S-SA countries, economic factors act universally in the short and long term despite the institutional conditions.

The study aims to identify and assess the impact of institutions and channels of transmission on the economic development of S-SA countries in 2004–2019. Since the countries are not homogenous across the development level (Świerczyńska, 2019), they were grouped into two subgroups, counting for the lower and higher level of development. Based on the differences in their institutional systems (Legiędź, 2013), S-SA countries were characterized from the perspective of institutional quality.

The method applied in the study was the panel ARDL model. The panel ARDL allowed evaluation of the relations between economic development and institutional factors in the short and long perspective. Based on the critique of GDP per capita as the development measure (Fleurbaey & Blanchet, 2013; Stiglitz et al., 2009), the impact of the socioeconomic and institutional variables on two measures of development was evaluated and compared. These are GDP per capita and Human Development Index (HDI). The paper concentrates to answer the following research questions (RQ):

– RQ1: Do institutional factors affect the process of economic development in sub-Saharan African countries?
– RQ2: What channels appear to transmit the institutional mechanism?
– RQ3: What are the differences between the impact of institutions on development in the more and less developed groups of the S-SA countries in the long and short-term perspective?

The novelty of the study is twofold. Firstly, taking into account the developmental diversity of S-SA allowed the identification of the institutions that significantly affect the development of the two subgroups of the S-SA countries. The results of the panel ARDL models revealed that different institutions affect development in the group with a lower and a higher level of development. Secondly, considering HDI as a dependent variable, we applied the broad perspective of development and thereby identified the institutions that affect not only material dimensions but also the health and educational dimensions of development in the S-SA countries.

The structure of the article is as follows. Section two discusses the literature review describing selected approaches to define and measure institutions, emphasizing the role institutions play in the economic development of S-SA countries. The method is described in section three. The data and results of the empirical research are presented in section four. The last section offers a discussion and conclusions.

2. Literature review

2.1. Defining and measuring institutions

There are different approaches to defining and measuring institutions. On the one hand, institutions are understood as the rules of the game (formal and informal), which shape individuals' interactions and describe the incentives or constraints in the economic, social, and political spheres. Organizations are the players whose behaviour and interrelationships affect institutional change (North, 1997). Institutions establish important formal constraints, which are written down, introduced, and enforced by the state and can thus be seen as laws (North, 1990). However, institutions constrain individuals and allow behaviour as they enable choices and actions (Hodgson, 2006).

Secondly, contrary to defining institutions as "incentives in human exchange, whether political, social, or economic" (North, 1990, p. 3), other economists have proposed to think of institutions not as rules but as outcomes of a game (Schotter, 1981; Voigt, 2013) or outcomes of social interaction (players' of the game interaction) (Ambrosino, 2013;Schotter, 1981). Schotter (1981) applies formal game theory models to analyse the emergence of institutions corresponding to Hayek's (1967) theories. From this point of view, institutions are the framework in which individuals can coordinate their behaviour (Ambrosino, 2013). The institutional framework determines the economic system's efficiency, enabling the appropriate allocation of resources in the economy, stabilizing the markets, and coordinating economic development processes (Woźniak, 2005).

Greif (2006) proposed to define institutions as a system of rules, beliefs, norms, and organizations that together generate a regularity of (social) behaviour'. He has proposed an extensive definition, encompassing both the rules and outcomes of the game approaches, deliberately attempting to encompass many previous definitions (Voigt, 2013). Another approach is that institutions are forms of social capital, with the central ability to create incentives for parties of transactions to behave trustily, leading to decreased transaction costs (Ostrom & Ahn, 2009).

The critique of the relevance of institutions' measures was demonstrated in the literature due to the differences in their definitions. Glaeser et al. (2004) and Voigt (2013) suggested that the measures of institutions: (1) should refer to specific institutions, not to their aggregate measures; (2) should be rather objective, not subjective; (3) should aim at measuring institutions as formally specified in legislation (de jure) and as factually implemented (de facto). Another critique of flawed indicators as institutions was conducted by Dixit (2007) and Woodruff (2006), who underlined that institutions might also depend on historical and geographical conditions. Some commonly used aggregate measures of institutions, namely Governance Indicators of the World Bank

(Kaufmann et al., 2007) or the World Bank (2004–2020), do not fulfill some of the described characteristics of institutions in North's definition (i.e., do not constrain behaviour and are not permanent or stable). Still, they allow for significant progress in identifying institutional factors' role in development (Balcerowicz & Rzońca, 2010). Although aggregate measures of institutions have some weaknesses and represent simplifications, they provide an exemplary and universal picture of institutional arrangements (Bentkowska, 2020). Because it is challenging to find proxies that suitably represent the institutional environment, composite indicators that combine the several empirical measures of legal, economic, and political institutions seem to be an appropriate solution (Kuncic, 2014).

2.2. Institutions in the economic development of S-SA countries

Institutions have been frequently subjected to various analyses confirming their role in economic growth and development (Acemoglu & Robinson, 2013; Acemoglu et al., 2001; Kuncic, 2014; North, 1990; Rodrik et al., 2004). However, it is difficult to identify a complete list of necessary institutional arrangements that affect the region's developmental processes (Nelson, 2008). Regarding the whole group of S-SA countries, institutional quality is considered crucial for economic development (Tinta, 2022; Wandeda et al., 2021). Moreover, the ineffectiveness of institutions is often underlined concerning poor enforcement of the rule of law (Djankov et al., 2003), corruption, absence of strong civil society, and political interference (Kumssa & Mbeche, 2004) and interpreted as the obstacle to the economic development of S-SA countries.

Some examples of studies explore the links between institutions and economic growth in selected S-SA countries. The case study of Nigeria between 1980 and 2011 examines whether institutions' measures, such as more transparent government, the rule of law, sound civil liberty, and competitive political participation are preconditions for achieving economic growth by employing the ARDL approach to cointegration and causality. The findings indicated long-run relationships between institutions and economic growth and a two-way causal relationship, which implies that economic growth and institution causes each other (Yusuf, 2013). The study of the links between institutions and economic growth in the Democratic Republic of Congo concludes that poor economic policies and conflicts, through their effects on total factor productivity and the investment rate, significantly hampered the economic growth of this S-SA country from 1960 to 2000 (Akitoby & Cinyabuguma, 2004). Another interesting piece of evidence on the role of political institutions in Ethiopia was attained by Garedow (2022), who concluded that the deterioration of political institutions harmfully affected economic performance in Ethiopia between 1980 and 2019. However, based on panel Autoregressive Distributed Lags (ARDL) models, it was identified that level of democracy and democratic accountability had a long adverse effect on economic growth. In contrast, political violence

had a negative short-run causal effect on economic growth in Ethiopia (Garedow, 2022). As the current strategy of economic growth in Mozambique based on natural resources seemed to be failing, Cruz & Mafambissa (2020) suggested an alternative balanced growth strategy in the context of an effective democratic political system with the separation of powers principle and the degree of decentralization as crucial factors affecting the public financial management system.

However, there is no consensus among the researchers about the impact of institutions on economic development when the whole group of S-SA countries is evaluated. One reason is the identified developmental diversity in the majority of S-SA countries. Another reason is attributed to regional (geographical) factors.

Firstly, the differences in the role institutions play in economic development in the S-SA group relate to the diversity in the level of economic development. Tinta (2022) concluded that the quality of institutions (provided by the Worldwide Governance) significantly affected growth and development only in the upper-middle-income and high-income countries. The impact of the quality of institutions was not identified in low- and lower-middle-income countries (Tinta, 2022). On the contrary, Wandeda et al. (2021) identified that improvement in institutional quality is more likely to increase the economic performance of low-income S-SA economies than the middle-income S-SA countries. A possible explanation is that many S-SA countries adopt institutional solutions from developed countries. However, adapting such solutions during "catch-up" often brings unexpected results due to differences in economic and institutional conditions (Zielenkiewicz, 2015, pp. 88–89) and the political instability faced by most countries in the region (Świerczyńska, 2019, p. 324).

S-SA countries are characterized by exceptional political and economic instability, which is an important cause of the backwardness. Very often, countries in the S-SA region are referred to as fragile states (Fund for Peace, 2016), weak states (Rotberg, 2003), or even failed states (Helman & Ratner, 1992; Zajadło, 2005). Even if some institutional reforms are implemented, the results are often unexpected. An example of an optimistic development in the region was the adoption of the Banjul Charter on Human Rights in Africa in 1981 and democratization in the 1990s, which did not produce the expected result (António, 2001).

On the other hand, regional factors matter in the institutions' role in the economic development of S-SA countries. Higher effectiveness of institutions in the West African region than in Eastern and Central Africa affected the positive relationship between institutional quality and the development of S-SA countries (Wandeda et al., 2021). The historical background of S-SA countries is another important issue in this relationship. The quality of institutions in S-SA countries is highly determined by colonization and depends on whether the colonizers settled in the occupied land or only exploited the colonies, as they did in many African states (Acemoglu et al., 2001). The role of deeply-rooted pre-colonial ethnic institutions in shaping regional devel-

opmental diversity within S-SA countries was identified by Michalopoulos & Papaioannou (2013). Du Plessis (2006) showed a positive correlation between extractive colonization and low post-colonial economic growth in Zambia.

From the historical perspective, since the 1960s, the decolonization processes have resulted in armed conflicts, wars, separatist tendencies, civil unrest, religious extremism, or terrorism which requires reducing the polarization of ethnic privileges and resentments to provide social development (Fosu et al., 2006). During the watershed period of the 1960s, many S-SA countries adopted new constitutions. Still, they were amended in such a way that they provide a formal democracy but do not guarantee the real influence of citizens on how the state is governed.

After independence, the region's states were ruled by dictators often drawn from the most powerful tribes. They created economically inefficient regimes whose main goal was to maintain power rather than economic development. Bates et al. (2012; 2013), Foster-McGregor et al. (2016), Sachs and Werner (1997) pointed out the negative impact of the exercise of power by authoritarian, dictatorial regimes on the development of markets. In addition, S-SA countries suffer from limitations in the institutions that regulate economic relations, which have a historical basis (Adanu, 2017).

The lack of strong institutions of state power in African countries implies inefficiency in applying economic policy measures and a fundamental constraint on development.

3. Method

Panel Autoregressive Distributed Lags model is a useful construction for estimation relationships in panel time series data which are either nonstationary I(1) or a combination of nonstationary I(1) and stationary I(0) series (Baltagi, 2001). Therefore, the following steps are necessary to implement the model: (1) testing for panel unit roots, (2) testing for panel cointegration, and (3) model estimation.

Referring to the first step, there are several tests for panel unit roots (Strzała, 2009). For the heterogeneous panel, the right test for unit roots has been proposed by Im et al. (2003). The testing regression takes the form: $\Delta y_{i,t}=\rho y_{i,t-1}+\alpha_i+\varepsilon_{i,t}$, where T is the number of observations and $i=1,2,...,N$ is the number of units in the panel. The appropriate test statistics $t_{T,N}$ is standardized to converge to N(0,1).

$$\sqrt{N}\frac{\left(t_{N,T}-E\left(t_{i,T}\right)\right)}{Var\left(t_{i,T}\right)}, \tag{1}$$

where $t_{i,N}$ denote individual values of unit root statistics. It is important to notice, that rejecting the null hypothesis does not mean "no unit root in the panel". It stands that at least one unit root in the time series collected in the panel can-

not be accepted. In the case of autocorrelation of the error term $\varepsilon_{i,t}$, the test statistic is modified in two versions, similar to the ADF test (Im et al., 2003). The first consists of applying the same structure of augmentations for each unit in the panel; the second allows including different structures of augmentations between units.

The second step relies on testing for panel cointegration, which allows for establishing a long-run panel relation, and if the hypothesis of panel cointegration can be confirmed enables further model building. The most frequent test for panel cointegration is the Pedroni (2004) test. The idea of the test is based on the standard Engle and Granger (1987) approach and was adjusted for panel data. Pedroni's test for cointegration allows for individual constants and trend coefficients for each panel member. The following regression is estimated for testing purposes:

$$y_{it} = \alpha_i + \delta_i t + \beta_{1i} x_{1i,t} + \beta_{2i} x_{2i,t} + \ldots + \beta_{Mi} x_{Mi,t} + e_{i,t}, \quad (2)$$

for t=1,2,...,T; i=1,2,...,N; m=1,2,...,M; where y_{it} and x_{it} are assumed to be I(1). The parameters α_i and δ_i may vary individually for each panel member. The null hypothesis in the Pedroni test assumes no cointegration versus the alternative of cointegration. Pedroni (2004) provided several test statistics across both time and panel units and showed that the asymptotic properties of the above statistics after standardization allow them to converge to Gaussian N(0,1) distribution.

In the case of Sub-Saharan Africa, the countries are diversified, therefore the panel is heterogeneous. In such a case, while additionally, the time series observations are not too long the selection of models including dynamic properties is limited. It is known from the literature that a minimum number of time units should enable estimating a separate process for each unit in the panel (Blackburne & Frank, 2007). However, in the paper, we decided to apply the panel ARDL model proposed by Pesaran and Smith (1995) and Pesaran et al. (1999).

The panel ARDL model takes the following form:

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=1}^{q} \delta'_{ij} X_{i,t-j} + \mu_i + e_{i,t}, \quad (3)$$

where i=1,2,...,N; t=1,2,...,T; $X_{i,t}$ is a kx1 vector of explanatory variables; δ_{ij} is a coefficients vector; λ_{ij} are scalars and μ_i represents a group-specific effect. Additionally, time trends and other deterministic regressors are possible. If the variables are I(1) and cointegrated it is common to re-write (1) in the error correction form:

$$\Delta y_{it} = \varphi_i \left(y_{i,t-1} - \theta'_i X_{i,t} \right) + \sum_{j=1}^{p-1} \lambda^*_{ij} \Delta y_{i,t-j} + \sum_{j=1}^{q-1} \delta' \Delta X^*_{i,t-jij} + \mu_i + e_{i,t}, \quad (4)$$

where φ_i is the error correction speed of the adjustment coefficient; θ_i — represents a vector of the long-run coefficients. If φ_i=0, then a long-run relationship

is not supported. This parameter is expected to be significantly negative to ensure the adjustment in the long run.

Pesaran et al. (1999) have proposed a Pooled Mean Group (PMG) estimator for estimating (2). It combines both pooling and averaging. The PMG estimator allows the intercept, short-run coefficients, and error variances to differ across the groups while the long-run coefficients are set to be equal across groups. Since (2) is nonlinear in the parameters, Pesaran et al. (1999) develop a maximum likelihood method to estimate the parameters (Blackburne and Frank, 2007).

4. Results

4.1. Data characteristic

According to development metrics, the S-SA region ranks lowest in international rankings (Rynarzewski et al., 2017; United Nations, 2022a). Despite economic improvements in African countries in recent decades, a growing development and civilization gap can be observed between these countries and the global economy. Chart 1 illustrates the significant differences in global pc GDP compared to the region's pc GDP. In addition, a growing disparity was also observed among sub-Saharan African countries (Rynarzewski et al., 2017).

32 of the 43 S-SA countries qualified for the study, since not all institutional, economic, and social indicators for the period under study were available in the databases for all 43 countries. Due to the aforementioned developmental diversity among the region's countries, they were divided into two groups taking into account the size of the HDI index.

The countries of the region classified as Group 1 in this study always belonged to LHD and LDC countries. The countries in Group 2, like Botswana and South Africa, belonged to High Human Development and the rest to Medium Human Development. Even though the criteria for group membership changed, none of the 32 countries selected for the study during the 2004–2019 period changed their group (Chart 2). Thus, Group 1 consists of Benin, Burkina Faso, Burundi, Chad, Democratic Republic of Congo, Côte d'Ivoire, Ethiopia, Guinea, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Uganda, and Togo. Accordingly, Group 2 includes Angola, Botswana, Cameroon, the Republic of Congo, Ghana, Kenya, Namibia, South Africa, Zambia, and Zimbabwe.

The quality of institutions differed between the two groups. However, Group 2 was found to be better regarding institutional quality (Table 1). The most significant difference can be seen in the case of Government Effectiveness and Political Stability. Both higher government effectiveness and greater political stability result in stronger states. "Strong State" is one of the prerequisites for developing countries to enter the path of socioeconomic development, and in the case

of developed countries, a guarantee for maintaining stable growth (Piątek & Szarzec, 2008).

Data is taken from online databases of the Bertelsmann Stiftung (2004–2019), UNDP (2004–2022), World Bank (2004–2020; 2022), available on their websites. A brief description of the economic (i.e. TT, GDP_pc, INFL, LABOR, IBRD_IDA, ODA, ODA_pc, ACC_ELEC, FDI, UNEMPL. HDI, CO_2, CO_2_pc) and institutional variables (i.e., FSI, BTI, HFI, LP_SB, LD_SB, LD_WU, E_ FREE, GOV_ EFF, POL_ STA) selected for the study are presented in Table 2.

4.2 Empirical models

We use the panel ARDL models in two groups of countries. GDP p.c. and HDI were selected as the alternative endogenous variables. The motivation for using two of them comes from Stiglitz et al. (2009) report, providing an extended and multidimensional discussion on economic performance measurement.

The panel ARDL models were estimated in EViews v.11. The initial analysis of all considered panel series revealed that their dynamic structure is differentiated, but all of them are either I(1) or I(0), as concerns the unit root. The panel unit root tests such as Levin, Lin, and Chu test; Im, Pesaran, Shin, ADF — Fisher Chi-square, and PP — Fisher Chi-square were used to confirm the panel unit roots.

In the paper, it was assumed that economic variables considered the proxies for growth factors should be linked by the long-run relation. The rationale for such an assumption is that growth factors, such as labour force, human capital, investment, and technological progress, are acting universally despite institutional or political conditions. It is particularly important in a very fragile business environment in Sub-Saharan African countries. In literature, there are two competing views on causal relations between institutions and economic growth. First — institutional view — states that serve as mechanisms to secure property rights which spurs investment and eventually income and growth. According to the competing view — an increased level of human capital results in more political stability, more secure property rights, and finally better institutions (Rodrik, 2007, p. 184; Voigt, 2013). Here we check if the second approach is more appropriate for the developmental analysis of S-SA countries. The long-run variables were checked for panel cointegration using the Pedroni test. In all presented models describing the GDP p.c. and HDI, the null hypothesis of no cointegration was rejected. The results are presented in table 3. Table 4 presents the estimated panel ARDL(2) models for group 1 of countries. The modelling results for group 2 are presented in table 5.

The results can be compared between dependent variables and between the groups. The panel-ARDL model is the error-correction type model consisting of long-run and short-run equations. Considering the long-run relationship for group 1 presented in Table 4, it is clear that CO_2 emissions being the proxy

for production and economic intensity plays a crucial role in GDP p.c. increase in the long term. Therefore, energy use and greenhouse gas emissions show a positive impact on growth, while it is negative for the environment. Low-developed countries benefit much from the International Development Association (IDA) being part of the World Bank, particularly related to the International Bank for Reconstruction and Development (IBRD). The IBDR_IDA grants help to increase economic growth, however, its strength is much lower than the impact of production (measured by CO_2). The long-run relation for HDI relies much on international aid from the World Bank (IBDR_IDA) and official development assistance (ODA) granted by the OECD Development Assistance Committee as government aid that promotes and specifically targets the economic development and welfare of developing countries. The results confirm their positive impact direction on development in really poor countries. Therefore, financial channel plays the most important role in their development. The short-run equations in both models are valid due to the negativity of the adjustment coefficient in the long run. For D(GDP pc) the speed of adjustment is much faster (cointeq=–0.127) than for D(HDI) with cointeq=–0.027. Institutional impact on D(GDP pc) in the country is measured by LD_SB, i.e. number of days needed to establish a business with a negative sign; while for D(HDI) it is represented by the government effectiveness indicator, which positive impact. Therefore, encouraging business through the improvement of the state procedures and state effectiveness are crucial transmission mechanisms in the short run. They can play their role in the long run as well when they are finally established.

Looking at the results presented in table 5. one can see the following factors are significant in the long-run equation for GDP pc: terms of trade (TT) and foreign direct investment (FDI). The sign for FDI is not satisfactory in the long run, but due to countries' diversity and different motivations of investors, we treat this source of investment as unstable in S-SA. FDI and TT correlation coefficient is not very high (0.39), additionally the two variables are rather complementary which means that possible multicollinearity does not have place. On the other hand, in the long-run equation describing HDI: labour, TT, and CO_2 pc show. The negative sign with labour shows that the labour force is not too efficient yet or increasing fertility causes employees not efficiently used. Terms of trade and CO_2 per capita emissions increase the HDI in the long run. It appears that real processes transmit the incentives for development. In the short run, the adjustment to the long run is faster for GDP pc (cointeq=–0.3190) than for HDI (cointeq=–0.0874). Concerning institutional measures — Economic Freedom does not necessarily increase D(HDI) in the short run.

Comparing the results for both groups, they demonstrated that lower-developed countries depend much more on international financial aid than higher-developed ones. On the other hand, increasing CO_2 (or CO_2 pc) supports economic growth which confirms the very high energy need in the African region.

4.3. Robustness check

Referring to the literature, one can ask whether institutional factors could play a role in the long run in ensuring economic stability in the countries. We have checked such a hypothesis. The results of the panel ARDL model for HDI differ from the presented empirical results not only in model specification but also in model diagnostics. The results are presented in Tables 5 and 6.

Analysing the information criteria of the models for D(HDI) presented in table 6 compared to the corresponding models presented in tables 4 and 5 it is easily noticed that respective criteria are lower in the cases described in the previous section. The only exception is the Schwarz criterion for the group, which equals –6.814, and the respective value of Schwartz presented in table 5 is –6.662. Therefore, we can state that the results supported our research assumption, however, the findings should be treated with care, and need further monitoring.

5. Conclusions

To conclude, our results supported the viewpoint that S-SA countries should endeavour to establish conducive institutions that promote development. Contemporarily, fulfilling the SDGs, particularly SDG 16: Peace, justice, and strong institutions, is essential in overcoming the developmental backwardness of those countries following sustainable development. The study also revealed that various institutions act in different circumstances, both from the perspective of developmental diversity and the time horizon. Regarding the results, lower-developed S-SA countries with worse institutional quality depend much more on international financial aid than higher-developed with higher political stability and governance effectiveness. Therefore, comparative analyses of the determinants of economic development of the S-SA countries should concentrate on both economic and institutional diversity. It raises the practical implication that government interventions that are appropriate in more developed countries, with higher levels of institutional quality, may be inappropriate for the less developed economies (Djankov el al., 2003). From this perspective, the analysis regarding the S-SA countries should be conducted in groups distinguished not only by considering developmental diversity (Tinta, 2022; Wandeda, 2021) but also by institutional quality.

Moreover, the differences in the roles economic and institutional variables played in the two groups of S-SA countries were also observed in short and long perspectives. Based on the panel ARDL models results, we showed that economic factors acted universally both in the long and short term. The lack of statistically significant results on the institutional role in the economic development of S-SA countries, in the long run, shows that institutions are not a prerequisite to economic growth but its consequence (Rodrik, 2007, p. 184; Voigt, 2013), what is of particular importance in the fragile and volatile institutional environment of S-SA countries. If so, improved economic growth would

lead to good institutional governance, as in the Nigerian case (Yusuf, 2013). However, a deeper understanding of the causal relationship between institutions and economic development in S-SA countries is necessary to figure out a clear understanding of the direction of the relationship, which could be an area of further research.

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Appendix

Table 1.
Comparison of institutional conditions in the groups

Indicator	Group 1	Group 2
FSI	91.03	82.77
BTI	4.90	5.62
HFI	6.39	6.70
LP_SB	8.68	8.95
LD_SB	33.34	54.60
LD_WU	546.43	563.86
E _FREE	54.42	54.39
GOV_EFF	–0.83	–0.44
POL_STA	–0.78	–0.18

Note:

Average values are presented for groups 1 and 2.

Source: Own preparation.

Table 2.
The description and sources of variables

Variable	Description of the variable	Units	Source
	Economic		
TT	terms of trade	percentage	World Bank (2022)
GDP_pc	gross domestic product per capita	USD (current)	World Bank (2022)
INFL	inflation	percentage	World Bank (2022)
LABOR	labor force	individual	World Bank (2022)
IBRD_IDA	aid from the International Bank for Reconstruction and Development and the International Development Association	USD (current)	World Bank (2022)
ODA	official development assistance	USD (current)	World Bank (2022)
ODA_pc	official development assistance per capita	USD (current)	World Bank (2022)
ACC_ELEC	access to electricity	percentage	World Bank (2022)
FDI	foreign direct investments (% of GDP)	percentage	World Bank (2022)
UNEMPL	unemployment	percentage	World Bank (2022)
HDI	Human Development Index	points	UNDP (2004–2022)
CO_2	carbon dioxide emission	tons	World Bank (2022)
CO_2_pc	carbon dioxide emission per capita	tones	World Bank (2022)
	Institutional		
FSI	Fragile States Index	points	Fund for Peace (2016)
BTI	Political and Economic Transformation Index	points	Bertelsmann Stiftung (2004–2019)
LP_SB	number of procedures needed to establish a business	number	World Bank (2004–2020)
LD_SB	number of dates needed to establish a business	number	World Bank (2004–2020)
LD_WU	number of days of contracting out	number	World Bank (2004–2020)
E_FREE	economic freedom	points	Heritage Foundation (2022)
GOV_EFF	government effectiveness	points	World Bank (2022)
POL_STA	political stability	points	World Bank (2022)

Source: Own preparation.

Table 3.
Pedroni test results

Statistics	Group 1		Group 2	
	GDP pc	HDI	GDP pc	HDI
panel v-Statistic	0.9960	0.9998	0.7251	0.0000
panel rho-Statistic	0.0197	0.3650	0.0149	0.9613
panel PP-Statistic	0.0000	0.0292	0.0000	0.2223
panel ADF-Statistic	0.0000	0.0212	0.0000	0.0024
group rho-Statistic	0.9997	0.9997	0.6456	0.9998
group PP-Statistic	0.0972	0.0972	0.0000	0.0010
group ADF-Statistic	0.0016	0.0016	0.0000	0.0012

Note:

The null: no cointegration; p-values are presented. If four on seven tests allow rejecting the null we assume cointegration.

Source: Own preparation.

Table 4.
Estimated panel ARDL models for group 1

Variable	Dependent variable D(GDP pc)				Dependent variable D(HDI)			
	Coeff	Std. Err	t-Stat	Prob.	Coeff	Std. Err	t-Stat	Prob.
				Long Run Equation				
CO_2	0.876	0.100	8.749	0.000				
IBRD_IDA	0.000	0.000	3.919	0.000	0.000	0.000	4.132	0.000
ODA					0.000	0.000	6.089	0.000
				Short Run Equation				
COINTEQ	–0.127	0.045	–2.817	0.005	–0.027	0.012	–2.149	0.032
D(CO_2)	–0.123	0.074	–1.657	0.098				
D(IBRD_IDA)	0.000	0.000	–1.569	0.117	0.000	0.000	–1.497	0.135
D(ODA)					0.000	0.000	–1.698	0.090
LD_SB	–1.761	1.002	–1.757	0.080				
GOV_EFF					0.005	0.003	1.630	0.104
C	81.76	130.87	0.624	0.532	0.022	0.005	4.109	0.000
mean dependent var			75.417			0.006		
S.D. dependent var			126.492			0.004		
S.E. of regression			88.669			0.003		
RMSE			73.216			0.003		
log likelihood			–1739.92			1468.37		
Akaike			10.522			–7.706		
Schwarz			11.751			–6.477		
Hannan–Quinn			11.011			–7.217		

Note:

Significance level was assumed 0.1.

Source: Own preparation.

Table 5.
Estimated panel ARDL models for group 2

Variable	Dependent variable D(GDP pc)				Dependent variable D(HDI)			
	Coeff	Std. Err	t-Stat	Prob.	Coeff	Std. Err	t-Stat	Prob.
Long Run Equation								
Labor					0.000	0.000	–3.080	0.002
TT	14.380	2.720	5.286	0.000	0.001	0.000	5.565	0.000
CO_2_PC					0.237	0.051	4.633	0.000
FDI	–82.053	13.363	–6.139	0.000				
Short Run Equation								
COINTEQ	–0.319	0.066	–4.827	0.000	–0.087	0.038	–2.287	0.024
D(Labor)					0.000	0.000	0.403	0.687
D(TT)	–5.213	3.109	–1.676	0.096	0.000	0.000	–0.658	0.512
D(CO_2_PC)					–0.000	0.012	–0.023	0.981
D(FDI)	48.739	30.484	1.598	0.113				
GDP_PC					0.000	0.000	1.639	0.104
E_FREE					–0.000	0.000	–1.563	0.121
HDI	5845.19	2200.62	2.656	0.009				
C	–1752.49	1112.373	–1.575	0.118	0.046	0.023	1.993	0.049
mean dependent var			193.23			0.007		
S.D. dependent var			414.48			0.005		
S.E. of regression			300.86			0.003		
RMSE			247.18			0.002		
log likelihood			–957.70			718.27		
Akaike			12.623			–8.065		
Schwarz			13.620			–6.662		
Hannan–Quinn			13.027			–7.496		

Note:

Significance level was assumed 0.1.

Source: Own preparation.

Table 6.
Estimated panel ARDL models for D(HDI): groups 1 and 2

Variable	Group 1				Group 2			
	Coeff	Std. Err	t-Stat	Prob.	Coeff	Std. Err	t-Stat	Prob.
Long Run Equation								
E_FREE	–0.003	0.001	–5.551	0.000	0.005	0.001	3.492	0.001
FSI	0.001	0.001	2.041	0.042				
LD_WU	0.000	0.000	6.231	0.000				
POL_STA					0.102	0.026	3.856	0.000
Short Run Equation								
COINTEQ01	–0.115	0.023	–4.838	0.000	–0.042	0.023	–1.808	0.073
D(E_FREE)	0.0001	0.0001	0.924	0.356	0.000	0.000	0.403	0.687
D(FSI)	–0.0001	0.0002	–0.840	0.401				
D(LD_WU)	0.000	0.000	–1.034	0.302				
D(POL_STA)					–0.001	0.004	–0.233	0.816

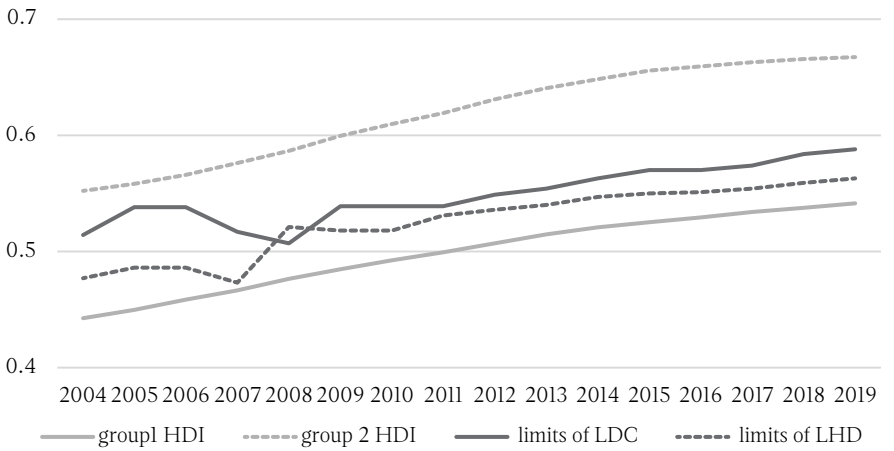
Variable	Group 1				Group 2			
	Coeff	Std. Err	t-Stat	Prob.	Coeff	Std. Err	t-Stat	Prob.
CO_2	0.000	0.000	2.163	0.031				
C	0.051	0.011	4.718	0.000	0.000	0.000	1.639	0.104
mean dependent var			0.006			0.007		
S.D. dependent var			0.004			0.005		
S.E. of regression			0.003			0.004		
RMSE			0.002			0.003		
log likelihood			1540.42			651.72		
Akaike			–7.985			–7.621		
Schwarz			–6.503			–6.814		
Hannan–Quinn			–7.395			–7.293		

Note:

Significance level was assumed 0.1.

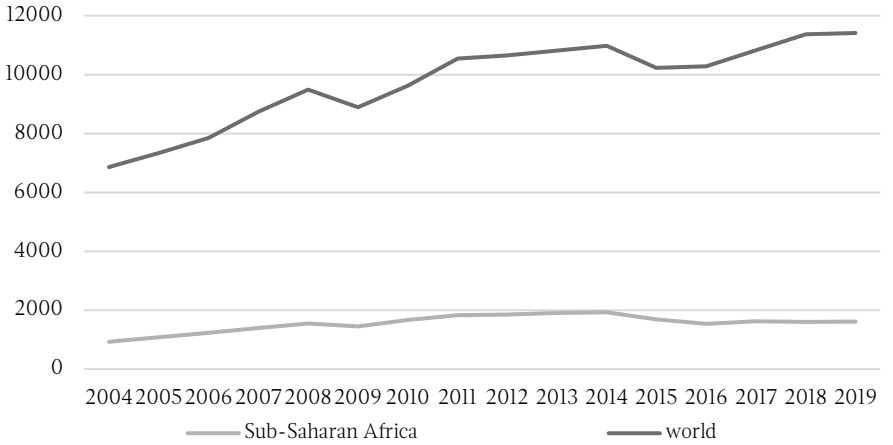
Source: Own preparation.

Chart 1.
GDP pc in World and Sub-Saharan Africa between 2004 and 2019 in USD (current)



Source: Own preparation.

Chart 2.
HDI in groups and entry limits



Notes:

Low Human Development (LHD) is the lowest level in the classification based on HDI index.

The country is identified as Least Development Countries (LDC) based on the following criteria: Gross National Income (GNI) per capita, Human Assets Index (HAI), and Economic and Environmental Vulnerability Index (EVI) (United Nations, 2022a).

Source: Own preparation.