Financial Development and Economic Growth in the Southern African Development Community (SADC): The Role of Institutional Quality

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Abstract

The objective of this paper is to study the relationship between financial development and economic growth conditional on the institutional environment in the Southern African Development Community (SADC) countries over the period 2000-2020. To achieve this objective, we used the Aggregate Group Mean (AGM) estimator. Our results indicate that financial development is not homogeneous across the subregion, so it contributes significantly to economic growth in SADC countries when the institutional environment is of good quality. This empirical evidence explains the differences in economic growth across SADC countries and recommends good quality institutions for finance to positively impact growth in the subregion.

Keywords

Financial Development, Institutions, Economic Growth, SADC

1. Introduction

Over the past thirty years, the international economic context has been characterized by the phenomenon of financial liberalization, which has imposed more reforms on national financial systems. These reforms have led to structural transformations of economies promoting financial openness and economic growth (McKinnon, 1973; Shaw, 1973; Demirguc-Kunt & Detragiache, 1998; Chavula et al., 2017).

While financial liberalization positively impacts economic growth in devel-

oped economies (Levine, 2004); this reality has been questioned in developing countries with conflicting results due to their institutional environment (Rigobon & Rodrik, 2004; Easterly et al., 2004; Acemoglu & Johnson, 2005; Herwartz & Walle, 2014; Law & Singh, 2014; Ruiz-Vergara, 2018). Like sub-Saharan African countries, SADC member countries have experienced lagging financial development due to regulatory and institutional constraints. These constraints have not favoured the emergence of dynamic financial activity capable of stimulating the real sphere. A good institutional environment helps to boost the level of financial markets (Konadu-Agyemang, 2018). The role of states in the financial system differs according to confidence in the ability of the country's political system to foster the public good (World Bank, 2012). However, if the institutional framework is less effective, there will be less financial development (North, 1990b). Because of this complexity, financiers have divergent views regarding state interventions in the financial sphere as a channel through which financial development influences economic growth (Anwar & Cooray, 2012). This divergence of opinion can be attributed to the use of heterogeneous samples of developed and developing countries without taking into account their specificities.

Compared to other RECs that appear to be more efficient and relatively homogeneous such as the Economic Community of West African States (ECOWAS) or the Economic and Monetary Community of Central Africa (CEMAC), SADC involves heterogeneous economic structures (Economic Commission for Africa, 2016) justifying the differences in the economic growth of member countries. This situation reinforces the particular interest in considering the institutional variable in the finance-growth relationship to explain growth differences within SADC countries.

This paper examines the role of institutions in the relationship between financial development and economic growth in SADC countries. Specifically, it analyzes the effect of financial development on economic growth on the one hand and the combined effect of financial development and institutional quality on growth in SADC countries on the other. This study is organized as follows: Section 2 provides a brief review of the literature. Section 3 describes the methodology and data. The empirical results are presented and discussed in Section 4. Section 5 concludes the study.

2. Brief Review of the Literature

There are several theoretical and empirical works that have addressed the relationship between financial development and economic growth. The results of these studies are not unanimous (Herwartz & Walle, 2014; Beck et al., 2014; Ho et al., 2021). Many of these studies support the positive link between financial development and economic growth (Beck et al., 2014; Chavula et al., 2017). Most of these arguments implicitly start from the neoclassical perspective, which assumes that markets are the most efficient in allocating scarce resources.

However, the failure of financial liberalization experiments in many DCs has

led to the emergence of several analyses from new theoretical streams. Critics of financial liberalization policies have argued that the paradigm of efficient markets is fundamentally misleading when applied to capital flows. Stiglitz (1994) argues for some forms of financial repression. He argues that repression can have several positive effects such as: improving the average quality of the pool of loan applicants by reducing interest rates; increasing firm equity by lowering the price of capital; and accelerating the rate of growth if credit is directed to profitable sectors such as exporters or sectors with high technological spread.

Also, the effects of financial liberalization have been a source of macroeconomic instability (Mansour & Hassan, 2021). Demirguc-Kunt and Detragiache (1998) show that the probability of a crisis following financial liberalization decreases with the level of institutional development. In this sense, Stiglitz's (1994) arguments for government intervention in financial markets in the form of prudential regulation and supervision seem compelling. The main argument is that the government is the de facto insurer of financial systems. Therefore, a financial meltdown may have significant financial implications to the extent that regulation accompanies liberalization and negative impacts could be contained (Anarfo et al., 2020).

In analyzing the positive and negative arguments of the relationship between financial development and economic growth, contradictory results often emerge, which may be related to the existence of non-linearity between these two variables. This non-linearity can be explained by the phenomenon of multiple equilibria on the one hand, and through reciprocal causality on the other. Endogenous growth models that take into account the financial sector highlight multiple equilibria (Eggoh & Villieu 2010). Many works attempt to empirically illustrate the models providing multiple equilibria and to identify potential sources of non-linearity between financial development and growth (Khan & Senhadji, 2003; Huang & Lin, 2010).

Despite theories admitting the positive effect of financial development on economic growth, some authors have established a number of conditions that can ensure the success of financial development to avoid economic instability (Kim et al., 2018). Thus, it is currently established that financial development can indirectly influence economic growth through institutions as a conditioning variable. In other words, institutional quality is another channel through which financial development can influence a country's economic performance (Keho, 2012).

The literature on the joint effect that financial liberalization and institutions have on economic growth is nascent and still growing. Existing studies have reached conflicting conclusions. Benali (2020) concedes that financial development has a positive effect on economic growth. But, institutional quality seems to be a necessary complement to financial development. Kim et al. (2018) support the idea that a structured financial system is a key factor in a country's economic growth.

From an empirical point of view, the relationship between finance, growth, and institutions is not unanimous. Indeed, Levine (1997) uses a representative sample of 42 countries and shows that the enforceability of contracts and, to a

lesser extent, credit or protection, together account for a substantial fraction of the difference in cross-country variation in the private credit/GDP ratio. The institutional component of banking development related to creditor rights and the efficiency of contract enforcement is closely related to long-run growth rates of GDP per capita. Although the results are ambiguous about the relative importance of capital stock and productivity channels, Levine et al. (2000) show that Levine's (1997) main results hold for a larger number of countries (70) and use a broader set of financial development measures.

Demirguc-Kunt & Maksimovic (2002) use firm-level data from 30 countries to draw conclusions about the role of legal arrangements and financial frictions in preventing investment for growth. They find that high LOI values increase the proportion of firms with growth that require access to long-term external sources of capital. The proportion of equity-financed investments in the sample is positively correlated with the efficiency of the legal system, development in the form of enhanced investor protection improves capital allocation and growth.

Keho (2012) who looks at the role of institutional factors for six WAEMU countries argues that the quality of certain institutions conditions the level of financial system deepening and its ability to contribute significantly to growth. It also acknowledges that institutional uncertainty and the deficit situation of public finances force banks to adopt unproductive financial practices. To contribute to the emergence of more productive finance, the study supports the idea of "institutional convergence" as a prerequisite for financial and economic development in the Union.

Ni & Lin (2019) assessed the impact of financial liberalization on income inequality to identify sources of heterogeneity. Using 23 cross-country empirical studies on the relationship between financial liberalization and income inequality, they found a negative relationship existing between financial liberalization and income inequality. Their results also suggest that different impact channels, institutional quality, the measure used for financial liberalization and income inequality, and the use of different econometric methods are particularly useful in explaining differences in results across previous studies.

3. Data and Methodology

3.1. Data

This study uses panel data from a sample of eight SADC countries (Angola, South Africa, DRC, Zimbabwe, Zambia, Tanzania, Botswana, and Lesotho) for the period 2000-2020. This is due to the unavailability of data for the other SADC countries. The variable data from the study are reported in Table 1 below.

3.2. Methodology

3.2.1. Model Specification
We take as our starting point the direct effect of financial development on economic growth by specifying a simple growth regression model to explore the

Table 1. Survey variables.

Variables	Description of the variable	Characteristic	Data Sources
GDP/capita	It is the gross domestic product per capita that represents the economic growth, it represents our dependent variable	Continue	WDI, 2020
GFCF	The ratio of gross fixed capital formation to GDP measures physical investment in a given year.	Continue	WDI, 2020
Trade	This indicator is obtained by the rate of trade in relation to GDP to measure the degree of openness of the economy. It includes: exports and imports of goods and services relative to GDP.	Continue	WDI, 2020
Infl	This variable is taken into account to highlight the effect of inflation. High inflation is a structural factor that negatively affects economic growth by reducing investor incentives.	Continue	WDI, 2020
Sse	The theory of endogenous growth assumes a positive correlation between human capital and economic growth; a well-trained and educated population can positively influence technological innovation, thus promoting economic growth, and vice versa.	Continue	WDI, 2020
Pop	This variable captures the labor force and demonstrates that a young population positively contributes to economic growth.	Continue	WDI, 2020
Dep	The bank deposit to GDP ratio captures the ability of banks to mobilize deposits. It reflects the level of development and the size of the banking system.	Continue	WDI, 2020
Cred	It is a financial development indicator that measures the degree of intermediation in the economy.	Continue	WDI, 2020
Ms	This variable measures the degree of monetization of the economy or the depth of the financial system	Continue	WDI, 2020
Lspl	This indicator captures judicial independence; legislative and regulatory protection of property; protection of contracts; and the low incidence of crime in business.	1: Low, 10: High	WGI, 2020
Dpf	It measures the level of expropriation and corruption in an economy.	1: Low, 10: High	WGI, 2020
Del	It captures the economic freedom in a country	1: Low, 10: High	WGI, 2020
Dff	The degree of financial freedom measures government intervention in the financial sector. It captures the degree of independence of banks	1: Low, 10: High	WGI, 2020
Dc	This variable captures respect for plurality, the context for political debate. It does not measure procedures or rules of law, but focuses more on attitudes.	1: Low, 10: High	WGI, 2020

Note: Authors.

relationship between institutions, financial liberalization, and economic growth. The mathematical form of our model is as follows:

$$\text{GDP/capita}_{i,t} = \alpha X_{i,t} + \beta \text{Finance}_{i,t} + O_i + \mu_t + \varepsilon_{i,t} \tag{1}$$

where "$\text{GDP/capita}_{i,t}$" is the gross domestic product per capita that represents economic growth. The "Finance" variable captures indicators of financial development. "$X_{i,t}$" is a matrix of control variables, "i" represents the country and "t" represents a period of time. "μ_t" is a dummy variable to account for time-specific effects, "O_i" is a country-specific unobserved effect, and "$\varepsilon_{i,t}$" is an error term.

To test the main hypothesis of the effects of financial development on economic growth conditional on institutional quality, Equation (1) is augmented with a group of institutional variables. This approach ensures the interactions of both financial development and institutional quality indicators. As a precaution, a significance test of the interaction coefficient is performed to ensure that the interaction term does not represent either finance or institutions. The model augmented with these variables is as follows:

$$
\begin{aligned}
\text{LGDP/capita}_{i,t} = \theta_0 + \theta_1 X_{i,t} + \theta_2 \text{Finance}_{i,t} + \theta_3 \left(\text{Finance}_{i,t} * \text{Institutions}_{i,t} \right) \\
+ O_i + \mu_t + \varepsilon_{i,t}
\end{aligned}
\tag{2}
$$

From Equation (2), the focus is on the statistical significance of the interaction coefficient of θ_3. Depending on its sign, one can appreciate the complementarity or substitution characteristic of financial liberalization and institutions in the development process. Indeed, a negative interaction of (θ_3) is a result that corresponds to substitutability between the financial sphere and institutions. In the opposite case, the effects of financial changes on economic development are reinforced in a developed institutional framework, thus affirming a complementary relationship between these two variables. In terms of estimation, it should be noted that in the difference or system generalized methods of moments (GMM), the choice of the number and quality of instruments affects the results. Also, there is the difficulty in identification because of the race for instruments in the face of endogeneity concerns (Tauchen, 1986; Ziliak, 1997). In the case of our study, the use of the GMM method is not relevant because N < T. Thus, we used the Pool Mean Group (PMG) estimator which proceeds by maximum likelihood (Pesaran & Taylor, 1999).

3.2.2. Principal Component Analysis (PCA) Method

The heterogeneous nature of the institutional and financial variables makes it somewhat difficult to construct two synthetic indices (institutions and financial development), hence the use of PCA. Indeed, the advantage of the PCA method lies in the fact that it makes it possible to indicate the variables that are best able to explain the greater part of the variability of the institutional variables on the one hand, and the financial variables on the other. Given the number of institutional and financial variables selected, and especially the suspicion of multicollinearity between relatively close indicators, it is, therefore, more appropriate to aggregate the information held by each institutional and financial component, so that the information is not repetitive. Before proceeding with the PCA, we need to prove its feasibility. To do this, we have two criteria. The first is the determinant of the correlation matrix and the second is the Bartlett (1950) test.

The institutional variables selected were deemed relevant for SADC countries. However, using all of these variables at once can cause problems of multicollinearity as demonstrated by the correlation matrix in the following Table 2.

The financial variables chosen are explained by the fact that the banking system covers almost all the financing in SADC countries. The use of these variables in the

analysis can lead to problems of multicollinearity as shown in Table 3.

Before proceeding with the PCA, we need to check two criteria. The first one that confirms us is the determinant of the above correlation matrix which is such that 10 - 5 < determinant = 0.14 < 1 according to Field (2000) (Table 2). The second criterion is the Bartlett (1950) test which allows us to reject the null hypothesis of the singularity of the correlation matrix at the very threshold of 1%.

After performing the first criterion of the determinant of the correlation matrix (Table 2 and Table 3), the second criterion is the Bartlett (1950) test presented below in Table 4 and Table 5.

Table 2. Correlation matrix institutional variables.

		Lspl	Dpf	Del	Dff	Dc
Corrélation	Lspl	1.000	0.796	0.836	0.685	0.712
	Dpf	0.796	1.000	0.806	0.749	0.726
	Dle	0.836	0.806	1.000	0.714	0.556
	Dff	0.685	0.749	0.714	1.000	0.539
	Dc	0.712	0.726	0.556	0.539	1.000
		Determinant = 0.014				

Note: Author's calculation. Method of construction of the composite index of institutional development.

Table 3. Correlation matrix financial variables.

		Dep	Ms	Cred
Corrélation	Dep	1.000	−0.602	−0.085
	Ms	−0.602	1.000	0.287
	Cred	−0.085	0.287	1.000
		Determinant = 0.577		

Note: Author's calculation. Method of construction of the composite index of financial development.

Table 4. Bartlett's test of institutional variables.

Bartlett's sphericity test	Approx. Chi-square	565.989
	Ddl	10
	Signification	0.000

Note: Author's calculations.

Table 5. Bartlett's test of financial variables.

Bartlett's sphericity test	Approx. Chi-square	73.171
	Ddl	3
	Signification	0.000

Note: Author's calculations.

3.2.3. Results of the PCA

The correlation matrix and Bartlett's (1950) test of sphericity show that the indicators are highly correlated in our sample. These results allow us to extract the composite indicator of financial development (FD) and the composite indicator of institutional development through a PCA. Table 6 shows that the first principal component extracts 76% of the initial total variance; the second principal component returns about 11% of the variance. Under these conditions, we retain the first two components because they together account for 87% of the total variance.

Table 6. Results of the institutional PCA.

	Components				
	PCA1	PCA2	PCA3	PCA4	PCA5
Eigen values	3.79879	0.535086	0.353066	0.208154	0.104903
Percentage	76%	11%	7%	4%	2%
Cumulative	76%	87%	94%	98%	100%
	Eigen vectors				
	EV1	EV2	EV3	EV4	EV5
Lspl	0.4684	0.0273	−0.4852	0.5002	−0.5424
Dpf	0.474	−0.019	0.0936	−0.7809	−0.3956
Del	0.4585	−0.4174	−0.4154	−0.0951	0.6588
Dff	0.4323	−0.3417	0.7545	0.3562	0.0097
Dc	0.3985	0.8413	0.1182	0.0636	0.3395

Note: Author's calculations.

Table 7 below shows that the first principal component extracts 46% of the initial total variance; the second principal component restores about 33% of the variance. Under these conditions, we retain the first two components because together they restore 79% of the total variance.

Table 7. PCA finance results.

	Components		
	PCA 1	PCA 2	PCA 3
Eigen values	1.37228	0.98355	0.644165
% de variance	46%	33%	21%
Cumulative	46%	79%	100%
	Eigen vectors		
	EV 1	EV 2	-
Dep	0.4465	0.7879	-
Ms	0.5586	−0.6157	-
Cred	0.699	−0.0113	-

Note: Author's calculations.

Furthermore, the descriptive statistics in **Table 8** and **Table 9** below reassure us of the quality of the composite indicators constructed.

Table 8. Comparative statistics for the institutional composite index and component variables.

Variable	Obs	Mean	Standard error	Min	Max
Lspl	136	4.87	1.93	1	8
Dpf	136	34.74	19.92	5	75
Del	136	51.11	13.34	21	72
Dff	136	38.24	21.80	10	70
Dc	136	5.65	1.27	0	8
ins	136	42.98	16.95	15	74

Note: Author's calculations. ins: composite index of institutional development.

Table 9. Descriptive statistics of financial variables with the composite index.

Variable	Obs	Mean	Standard error	Min	Max
df	136	0.313	0.147	0.007	0.541
dep	136	0.153	0.217	−0.381	0.573
mm	136	0.342	0.214	0.029	1.515
cred	136	0.295	0.260	0.004	1.036

Note: Author's calculations. df: composite financial development index.

4. Results

4.1. Presentation and Interpretation of Econometric Results

This section presents the different results of the econometric tests as well as the discussion of these results. But, before the estimates themselves, the methodology first requires that stationarity tests be carried out in order to see the behavior of the series analyzed.

4.1.1. Stationarity Test

There is a plethora of stationarity tests of generations (1) and (2). In this study, we performed the generation (1) tests of Levin, Lin, & Chu (2002) (LLC) and Im, Pesaran, & Shin (2003) (IPS). As for the generation tests (2), we opt for the CIPS test of Pesaran (2004).

4.1.2. Estimation Results and Discussion

Panel data estimation methods (fixed/random effects estimators or GMM) impose homogeneity of the coefficients with the exception of the constant which is supposed to capture specific effects. GMM is sometimes criticized in that if a variable is positive in one sample and negative in another, a unique coefficient would have to be found for the whole panel which could result in a non-significant coef-

ficient (Keho, 2012). Also, in the difference or system GMM method, the choice of the number and quality of instruments can affect the results. The results of the long-run relationship are shown in Table 10 below.

The coefficient on df*ins is positive and that on df is negative, so the quality of institutions mitigates the negative marginal effect of financial development on economic growth. This marginal effect can be captured as follows:

$$\theta_2 + \theta_3 \text{ins} = -0.006421 + 0.003656 * \text{ins} \tag{3}$$

We can then determine a threshold level of the institutional variable at which financial development improves growth:

$$\text{ins*} = \frac{0.006421}{0.003656} = 1.756 \tag{4}$$

The results of the estimates of the interaction of institutions and financial development on economic growth in SADC countries presented in Table 9 allow us to highlight the combined effect of the institutional index and the financial development index. Recall that the results of the econometric tests of the estimates reported in this table indicate that financial development negatively affects economic growth. The implementation of financial liberalization policies in some countries has been done without taking into account internal reforms of the financial system and especially weakness in institutional quality.

In contrast, when we cross or interact with institutions and financial development, the results presented in Table 10 indicate that the effect of this interaction of institutions and financial development on growth is positive and significant. This means that the quality of institutions mitigates the negative marginal effect of financial development on economic growth. In other words, the effect of financial development on growth is conditioned by the quality of political and economic institutions in SADC countries. Our results corroborate those of Benali (2020) and Kourtelos et al. (2016).

The respect of rules and laws, a calm business climate, and the establishment of an efficient judiciary are all channels for influencing financial development

Table 10. Estimation results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Logdp/capita	3.25E−05	9.73E−05	0.333381	0.7403
Trade	0.000295	4.96E−05	5.943882	0
Gfcf	−0.000203	0.000348	−0.585235	0.5611
Pop	0.022543	0.011172	2.01781	0.0491
df	−0.006421	0.002635	−2.436719	0.0185
Infl	9.97E−05	2.54E−05	3.931391	0.0003
df*ins	0.003656	0.001672	2.186203	0.0336

Source: the author. Note: The p-values reported in the table above, ***, ** and * mean that the coefficients are statistically significant at the 1%, 5% and 10% thresholds respectively.

and reassurance in terms of investment (capital inflow) for sustainable growth.

The establishment of independent political and democratic institutions, the effective implementation of Central Bank independence, and economic institutions that are less controlled by the government would positively and significantly impact the marginal effect of financial development on growth (Muhammad et al., 2019).

From the above, we can say that financial development and institutional quality positively and jointly influence economic growth in SADC member countries. These results indicate that the importance of institutional variables should not be downplayed if SADC countries want to accelerate the convergence of their economies and reduce economic growth gaps within this Regional Community. In other words, without good quality institutions, SADC countries will not be able to meet their macroeconomic convergence criteria, which are still not homogeneous among member states, and they will not be able to meet the challenge of financial development and economic growth. Specifically, it should be said that "institutional convergence coupled with financial convergence" should normally precede the real convergence of the economies of this REC.

5. Conclusion

In several recent studies, financial development and institutional quality have evolved separately as determinants of economic growth. Few studies have attempted to link institutional development to both the real and financial spheres simultaneously. In this study, we attempted to detect the role played by institutional quality combined with financial development on economic growth in a sample of eight SADC countries.

Our econometric tests based on the PMG estimator show that the positive and significant effect of financial development on economic growth is conditional on institutional quality. In other words, the estimates show that financial sector development can only have positive effects on growth when there is a threshold effect of institutional development. The financial sector can only promote growth in the presence of an institutional environment based on more participatory democracy, political stability, an impartial judiciary, and low levels of corruption.

A number of policy implications emerge from this study. First, for financial development to positively influence economic growth, the financial systems of SADC countries should incorporate strong institutional frameworks. Also, SADC countries should adopt appropriate measures to improve the business environment and establish a transparent institutional and legal framework for the financial system. This means improving national policies and laws that promote private sector development, improve competition, and open up the domestic market. In practical terms, improving the business climate means improving the taxation framework, policies, and legislation on competition, taxation, trade, labor, etc. Building sound institutions is a key priority if the financial systems of SADC countries are to fully play the role of financial intermediaries in order for

production to reach its potential.

Nevertheless, this study has a number of shortcomings. One important limitation concerns the failure to take into account the financial market as a variable in financial development. Indeed, the study focused mainly on bank intermediation, thus minimizing the role that other components of the financial system (nonexistent or even embryonic in some countries) could play in the region's financial system. The inclusion of market-based proxies in the estimate could provide a more "complete" picture of financial development. In addition, the cultural, historical, and linguistic aspects of SADC member countries (French, Portuguese, and English-speaking countries) are not taken into account as determinants of institutional quality. Taking all these limitations into account may provide new avenues of research to better determine the effects of financial development on economic growth by taking into account institutional quality in SADC.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

Appendix 1: Results of the Stationarity and Cointegration Tests

The null hypothesis is that of the presence of a unit root which will be rejected if the test statistic is less than the critical value.

Table A1. Results of the stationarity tests (CIPS)_DF.

Variables	Level				Primary difference				Results
	$CIPS_1$	$CIPS_2$	$CIPS_3$	Valeur critique	$CIPS_1$	$CIPS_2$	$CIPS_3$	Valeur critique	
GDP/capita	−3.014	−3.014	−3.169	−2.6	–	–	–	–	Stationary in level
Log (GDP/cap (-1))	−1.158	−1.658	−1.852	−2.34	−3.082	−3.082	−3.082	−2.6	Stationary in first diff
Ms	−1.801	−2.314	−1.830	−2.34	−3.536	−3.752	−3.921	−2.6	Stationary in first diff
Cred	−1.264	−1.264	−1.604	−2.34	−3.90	−3.90	−3.90	−2.6	Stationary in first diff
Trade	−2.624	−2.624	−2.624	−2.6	–	–	–	–	Stationary in level
Pop	−3.424	−4.656	−3.672	−2.6	–	–	–	–	Stationary in level
Sse	−1.365	−2.332	−1.365	−2.34	−3.655	−3.825	−3.655	−2.6	Stationary in first diff

Note: the author. Note: -2.6 and -2.34 are the critical values at the 1% and 5% thresholds respectively. The test statistic is calculated for 3 different orders of delay (CIPSp, with p=1,2, and 3).

These two tests both postulate the null hypothesis of the presence of a unit root, which can only be rejected if the p-value associated with the different statistics is less than 5%.

Table A2. Results of the stationarity tests (LLC and IPS)_DF.

Variable	Level				Results
	LLC	p-value	IPS	p-value	
Dep	−1.752	0.039	−1.771	0.038	Stationary in level
Gfcf	1.383	0.916	−2.598	0.005	Stationary in level
Infl	−3.598	0.000	−5.515	0.000	Stationary in level
df	−2.218	0.013	−2.4239	0.008	Stationary in level

Note: the author.

Having variables I(0) and I(1), we verify the existence of a long term relationship through the Pedroni (1999) cointegration test.

Table A3. Results of stationarity tests (CIPS)_ins.

Variable	Level				First difference				Results
	$CIPS_1$	$CIPS_2$	$CIPS_3$	Valeur critique	$CIPS_1$	$CIPS_2$	$CIPS_3$	critical value	
LOGINS	−2.101	−2.267	−1.409	−2.6	−4.331	−4.639	−4.859	−2.6	Stationary in first diff