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Fiscal Sustainability in the PALOP Economies

Sustentabilidade Fiscal nas Economias PALOP

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ABSTRACT

The Global Financial Crisis has typically led to a significant widening of fiscal positions (i.e. higher budget deficits and public debt), an issue that has been addressed by many researches on fiscal sustainability. Our aim in this study is to extend the extensive knowledge about fiscal policy sustainability in advanced economies by analysing the sustainability in the African continent. In particular, we examine the sustainability of public finance in Portuguese-speaking African countries (PALOP), using stationarity tests of external public debt-to-GDP ratios and cointegration tests between public revenue and public expenditure (as a percentage of GDP). Our findings for the period 1975-2019 suggest that some of the PALOP countries have endangered the sustainability of their corresponding fiscal positions. In fact, in our sample the solvency requirement seems to have been met only by Angola. In the context of a financial crisis, stemming from the COVID-19 pandemic, such sustainability issues are bound to be further challenged.

Keywords: Debt sustainability; global financial crisis; fiscal policy; PALOP; stationarity; cointegration; time series.

JEL Classification: C22; E62; H62

RESUMO

A Crise Financeira Global conduziu a um aumento significativo das posições fiscais (isto é, défices orçamentais e dívida pública mais elevados), dando origem a inúmeras pesquisas académicas relativas à sustentabilidade fiscal. Muito embora existam bastantes estudos sobre a sustentabilidade fiscal nas economias mais avançadas, a nossa contribuição académica amplia este esforço de investigação ao continente Africano. Mais especificamente, analisamos a sustentabilidade das finanças públicas nos Países Africanos de Língua Oficial Portuguesa (PALOP's), através da aplicação de testes de estacionaridade aos rácios de dívida externa em percentagem do PIB, bem como a aplicação de testes de cointegração às receitas e despesas públicas (em percentagem do PIB) destes Países. Os nossos resultados empíricos para o período 1975-2019 sugerem que alguns PALOP apresentam uma posição fiscal comprometida do ponto de vista da sustentabilidade fiscal. Com efeito, a condição de solvência apenas é observada para o caso Angolano. Tendo em consideração o impacto económico-financeiro da presente situação pandémica, a questão da sustentabilidade fiscal irá constituir um relevante desafio futuro.

Palavras Chave: Sustentabilidade da dívida; crise financeira global; política fiscal, PALOP; estacionaridade; cointegração; series temporais.

1. INTRODUCTION

We examine the sustainability of fiscal policies in Portuguese-speaking African countries (hereafter PALOP's). This important community is composed of the following African countries: Angola, Cape Verde, Guinea-Bissau, Mozambique, and Sao Tome and Principe. We conduct econometric sustainability testing on macroeconomic data associated with these PALOP economies.

There are several reasons that justify the importance of this research topic. First, this is a pressing macroeconomic problem for these economies, in view of the PALOP's wide sphere of influence¹ within the African continent. In fact, given that some PALOP economies yield a significant influence over the African continent's economy as a whole (e.g., Angola), addressing this specific set of economies becomes an important research issue. Second, taking into consideration the fallout related to previous macroeconomic shocks (namely the Global Financial Crisis and the more recent global oil price collapse), there is some clear indication that fiscal policies in PALOP economies might presently be on unsustainable trajectories. This potential lack of a fiscal sustainability dimension should be further aggravated by the present COVID-19 pandemic. As of September 2020, developing economies collectively require USD 2.5 trillion to counter the impact of the latest global health crisis and associated macroeconomic fallout (Stubbs et al., 2021). Third, fiscal unsustainability is presently a clear source of concern for policy makers globally, and for African policy makers in particular. However, there has been a significant knowledge gap in the academic literature between advanced economies and African economies regarding potential fiscal policy sustainability issues over the long-term. Since the Global Financial Crisis, the potential negative link between excessive public debt and lower economic growth has been extensively examined in most advanced economies, due to its implications to the design/implementation of fiscal policies. This highly relevant policy issue gains further relevance after we take into consideration the impact brought about by the present COVID-19 global pandemics on fiscal policies. The same reasoning is applicable to African economies, but a significant knowledge gap related to fiscal policy sustainability issues still prevails.

The research question associated with this article critically analyses whether fiscal policy trajectories might be unsustainable for these PALOP economies. We employ multiple advanced unit root testing procedures to assess fiscal sustainability and we use publicly available data to critically examine this policy issue for the 1975-2019 period. Therefore, this empirical article contributes to the literature by filling an important gap associated with fiscal sustainability issues in African economies, more specifically the PALOP economies. To the best of our knowledge, this is the first research to address this relevant policy issue in the PALOP economies.

Our key findings suggest that fiscal policies in these African economies are presently unsustainable, and that the capacity to fiscally accommodate future economic or financial shocks might be seriously compromised. We are in fact facing a sovereign shock of global magnitude due to the COVID-19 pandemics, as the fiscal impact of this shock might be quite

¹ For example, Angola has been a top supplier to international oil markets, and fiscal sustainability issues might have an indirect impact on the long-term performance of globally important energy markets.

difficult to deal with, given existing fiscal weaknesses. Ultimately, this fiscal unsustainability issue might have some spillover impact to some segments of the financial markets (e.g., this might be the case of Angola's influence on international oil markets).

The present article is structured as follows: section 2 addresses the main literature review; section 3 addresses the methodology and data used in this research; section 4 presents and discusses the main empirical findings, while section 5 concludes.

2. LITERATURE REVIEW

Historically, advanced European economies have been severely impacted by sovereign default episodes, as multiple European nations identifiable to present-day Euro Area Member States have been in sovereign distress (i.e., they either defaulted or heavily restructured their public debt profiles) (Reinhart and Rogoff, 2009). More recently, the Euro Area Sovereign Debt Crisis has led to extensive research trying to answer whether the Eurozone's fiscal policies are sustainable (or not). For example, (Panizza and Presbitero, 2013; Reinhart et al., 2012) survey the academic literature associated with this fundamental policy topic, most notably addressing the case of advanced economies. Some seminal contributions highlight the role of sovereign debt thresholds, which essentially reference a point beyond which fiscal policy instruments (such as public debt) become unsustainable and lead to slower economic growth. The emergence of a post-crisis literature addressing the sustainability of fiscal policies globally, as well as the need to strengthen fiscal discipline in fiscally overburdened economies has been the main concern of policy makers globally. Moreover, the Euro Area Sovereign Debt Crisis has revealed how important this global research topic has become following the Global Financial Crisis (GFC). For example, Afonso and Jalles (2012) observe that the sustainability of public finances might be threatened in a wide sample of 18 OECD countries, most especially after the GFC; while Afonso and Jalles (2013) suggest that the implementation of stricter fiscal policy rules should contribute to strengthen economic growth in economies where fiscal policies have been overused in order to counter the more recent financial shocks.

In the specific case of African countries, there are some previous researches connected with either the African continent as a whole or with specific parts of the continent (e.g., Sub-Saharan Africa). Elbadawi et al. (1997) examine the link between high debt and economic growth for multiple developing countries (including Sub-Saharan countries) between 1960 and 1994. The authors conclude that there is a negative nonlinear link between the variables, especially once the 97% threshold (of the debt-to GDP ratio) is surpassed. Moreover, Fosu (1999) further addresses the impact of high external debt on the economic growth trajectories of Sub-Saharan economies in the 1980's, a period marked by many sovereign debt defaults and depressed economic growth. The authors also find sufficient empirical evidence in favour of the 'direct effect of debt hypothesis' (DEDH), according to which external debt becomes a burden to economic growth.

More recent research, such as Ndoricimpa (2017), addresses the following important issues in relation to the specific link between public debt and economic growth in African economies: (i) the heterogeneity in the public debt – economic output nexus throughout the African continent; (ii) the presence of nonlinearities which are quite influential in the

determination of public debt thresholds; and (iii) the sensitivity of the estimation of thresholds to the choice of empirical method. In addition, Ncube and Brixiová (2015) observe that there are some upward risks associated with the recent increase in public debt levels, especially in the context of rising interest rates; prior to the pandemic, there was nevertheless a relative stability of the fiscal sustainability outlooks for some African economies. On the other hand, Lopes da Veiga, et al. (2016) observe that: (i) public debt and economic growth referring to Sub-Saharan economies in the 1950-2012 period are negatively related; and (ii) economic growth rates are optimal in these economies when the corresponding public debt-to-GDP ratios are in the 30%-60% interval, and this interval might also be a sound reference point for the PALOP sample, notwithstanding the 97% threshold earlier proposed by Elbadawi et al. (1997).²

However, and to the best of knowledge, the literature on African public debt sustainability issues is not as extensive as in the case of Eurozone countries³ (where researchers can benefit from the existence of historical datasets). Therefore, the main motivation associated with the present research is to fill this literature gap and contribute to the critical review of fiscal sustainability issues in these young PALOP democracies, namely where public debt management is concerned. Furthermore, fiscal sustainability discipline in African economies in a post-GFC environment is thus an important source of policy concern. The present COVID-19 pandemic should reinforce the need for further research on fiscal sustainability issues, especially considering the fiscal fallout of the global health crisis on the African continent, as public resources are directed towards reinforcing PALOP national health systems in the face of this global health threat. Nevertheless, this important research topic associated with post-GFC fiscal sustainability has been largely overlooked by the academic literature. To the best of our knowledge, this is the first such attempt to address this relevant issue using a sample of the PALOP sub-set of African economies.

Our paper thus addresses a relevant research issue, as (i) tighter global financial conditions and (ii) the sustained decrease in commodity prices have drawn significant attention to the need to correct recent fiscal policy trajectories in African economies. However, creating conditions for solid economic growth in these economies might be challenging in the near future, because of the pressure to rightfully capitalise African national health systems due to the global pandemic, and the need to adequately fund these systems, adding further pressure to overused fiscal policy instruments in African economies.

The present article focuses on fiscal sustainability issues in PALOP economies, which collectively have approximately 60 million citizens. It should be observed that data limitations impact our findings. This is because the sustainability of the intertemporal budget constraint is difficult to assess in stochastic environments where the level of economic uncertainty is

² On the potential downside effects of government debt, Afonso and Ibraimo (2020) report that debt service components in Mozambique, in the period 2000Q1-2016Q4, depressed real output, increased the general price level and accounted for the depreciation on the domestic currency.

³ A potential explanation for this might be related to the fact that multiple modern-day African nations have gained their sovereign independence in the second half of the 20th century, and previous historical data is not necessarily available in connection to these autonomous States. This lack of historical data naturally constrains the estimation of long-run sustainability researches. In effect, this is the case with the countries included in our sample, as the PALOP countries are effectively young democracies, having gained their corresponding independent Nation statuses mostly in the 1970's onwards. This means that these countries' autonomous fiscal policies and corresponding data did not exist before their independence date.

significant (Bohn, 1998); this is further aggravated because emerging market economies typically exhibit a more unstable access to capital markets during painful economic adjustments (i.e., during economic/financial crisis periods). This further incentivises the reversion of high public debt trajectories within sustainable limits (Mendoza and Ostry, 2008), a lesson that should also be applicable to PALOP economies.

Lastly, it should also be important to assess the specific type of fiscal sustainability issues faced by these economies. In order to provide a more accurate answer as to the specific source of fiscal stress, Afonso and Rault (2009) implement a panel data empirical approach for European Union countries, in order to assess the specific type of fiscal sustainability faced by the economies in their sample. Our research approach will also benefit from the research design implemented by these authors. That is, the empirical method used here closely follows the methodological design first proposed by Afonso and Rault (2009), which carefully addresses this important sustainability question.

3. METHODOLOGY AND DATA

The framework for critically analysing the sustainability of public finances in PALOP economies is based on the assessment addressing the state of each country's intertemporal budget constraints. Following Afonso (2005), complying with the intertemporal budget constraint requires that the present value of future government surpluses might be sufficient to pay the existing stock of public debt. This can be represented as follows:⁴

$$D_{t-1} = \sum_{s=0}^{\infty} \frac{1}{(1+i)^{s+1}} (R_{t+s} - E_{t+s}) + \lim_{s \rightarrow \infty} \frac{D_{t+s}}{(1+i)^{s+1}} \quad (1)$$

where D is public debt; R represents public revenues; E are public expenditures and i is the interest rate, and t and s are time parameters.

We implement our analysis via a two-step approach in order to assess fiscal policy sustainability in PALOP economies. The first step entails the application of stationarity tests to our sample set of PALOP economies. This is done for the variable representing external public debt as a percentage of GDP, a procedure suggested by Trehan and Walsh (1991). Specifically, the article uses both the Augmented Dick Fuller (ADF) and Phillips and Perron (1988) (PP) unit root testing procedures across the sample. In order to verify the potential existence of structural breaks in the time series, the Zivot & Andrews (1992) and Perron (1989) testing procedure are also applied.

The second step involves the application of cointegration tests (individual/country time-series and panel data) between public expenditures and public revenues (both variables are expressed as a percentage of GDP). These tests are implemented according to the Johansen and Engle-Granger (1991) procedures. Before applying the proposed tests, the integration orders of each series have to be determined, so that the second step is only applied when both series are non-stationary (e.g., integrated of order one $I(1)$, or higher). Accordingly, the following cointegration regression is estimated:

⁴ The use of the constant interest rate is an implicit assumption, which in itself is not crucial for the empirical analysis (this can be confirmed in the existing literature).

$$R_t = c + bE_t + u_t \tag{2}$$

where R and E represent public revenues and public expenditures respectively.

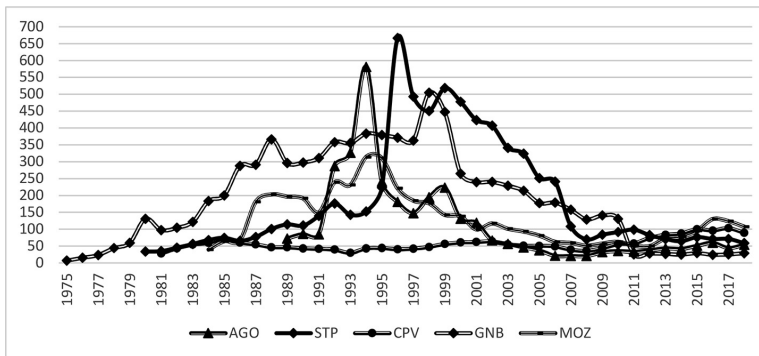
The data set that we use comes from three sources: i) the International Monetary Fund’s *World Economic Outlook*; ii) the World Bank’s *World Development Indicator*; and iii) Sao Tome and Príncipe’s Ministry of Finance. The time span of the data covers the 1975-2019 period, and country-specific testing depends on available data for each country comprised in our PALOP sample.

4. EMPIRICAL FINDINGS

As we take a first visual inspection of the debt-to-GDP ratio (Figure 1), it is easy to see that such series are hardly stationary.

Therefore, in the first step, we initially applied stationarity tests to external public debt as a percentage of GDP. We used the Augmented Dick Fuller to perform unit root testing and the Zivot and Andrews (1992) tests in order to apply unit root testing in the presence of structural breaks in the corresponding series.

Figure 1: Debt-to-GDP (GNI) ratios



Source: World Bank, IMF.

According to Table 1, our findings indicate that the series are nonstationary. This suggests that the solvency condition associated with the sustainability of public finances is not adequately met. Our sample’s time series related to external public debt-to-GDP ratios are $I(1)$. This means that we can safely reject the null hypothesis of a unit root present in the majority of the countries in our sample, with the exception of Angola (which is stationary). Similar results have been obtained using the stationarity testing procedures suggested by Zivot and Andrew (1992), and Perron’s testing procedures.⁵

⁵ With the exception of Guinea Bissau (Perron test).

Table 1: Unit root tests for external public debt as a percentage of GDP

Country	Period	Lag	t- statistic	ADF			PP		Zivot and Andrews			Perron						
				Test critical values; 1%	Test critical values; 5%	Test critical values; 10%	p-Value	stationarity	(Z) t-statistic	p-Value	stationarity	Break Date	ADF Break Point Test	Break Date	ADF Break Point Test	stationarity		
ANG	1989- 2018	7	-11.77	-2.6648	-1.9556	-1.6087	0	yes	-1.4	0.146	no	2000	-6.101	yes	2	1994	-5.22	yes
CV	1981- 2018	9	0.842	-2.6289	-1.9501	-1.6113	0.889	no	0.506	0.820	no	2007	-4.318	no	9	2010	-3.82	no
GB	1975- 2018	9	-0.674	-2.6198	-1.9486	-1.6120	0.621	no	-0.695	0.409	no	2000	-3.135	no	4	2010	-8.69	yes
MZ	1984- 2018	8	-0.56	-2.6347	-1.9510	-1.6109	0.652	no	-0.586	0.456	no	1996	-3.551	no	4	1998	-3.36	no
STP	1980- 2018	9	-1.051	-2.6272	-1.9498	-1.6114	0.260	no	-0.975	0.289	no	1995	-3.176	no	4	1994	-3.31	no

Notes: ANG=Angola; CV=Cape Verde; GB=Guinea Bissau; MZ=Mozambique; STP=Sao Tome and Principe. Following the procedure adopted by Afonso (2005) and Afonso and Jalles (2012) for the Zivot & Andrews and Perron tests, "no" denotes we do not reject the null hypothesis of a unit root using t-statistics and critical values.

Moreover, we follow the approach suggested by Hakkio and Rush (1991). These authors apply cointegration testing between public revenues and expenditures (as a percentage of GDP). Accordingly, the Engle Granger and Johansen tests are applied in order to determine whether there is a long-term relationship between the two variables. Prior to applying cointegration testing, we initially assess the stationarity of the time series, using the ADF and PP tests. Accordingly, in Table 2 most country series are nonstationary in levels.⁶ These findings are also confirmed by performing stationarity tests that test for the potential existence of structural breaks (Zivot and Andrews, 1992; Perron, 1989) in the time series.⁷

⁶ With the exception of public revenue in Guinea–Bissau, and Sao Tome and Principe for the ADF and PP test, and Public Expenditure for Guinea Bissau for the PP test.

⁷ With the exception of public revenue of Sao Tome and Principe (Perron test).

Table 2: Unit root tests for public revenue and public expenditures (as a percentage of GDP)

Country	Dep. variable	Lag	Period	ADF			PP			Zivot and Andrews			Perron		
				t-statistic	p-value	stationarity	($\hat{\alpha}$) t-statistic	p-Value	stationarity	Break date	Break point test	stationarity	Break date	Break point test	stationarity
ANG	R	5	1997-2019	-1.361	0.58	no	-1.361	0.58	no	2005	-4.032	no	2014	-4.22	no
	E	5	1997-2019	-1.472	0.53	no	-1.472	0.53	no	2008	-4.107	no	2007	-4.043	no
CV	R	4	1995-2019	(*)-3.67	0.012	(*)no	(*)-2.986	0.05	(*)no	2011	-4.361	no	2003	-4.68	no
	E	4	1995-2019	(**)-3.24	0.029	(***)no	(**)-3.36	0.02	(***)no	2001	-4.384	no	2003	-4.262	no
GB	R	6	1993-2019	-4.842	0	yes	-3.773	0.008	yes	1997	-6.286	no	1998	-4.227	no
	E	6	1993-2019	(**)-3.18	0.033	(***)no	-4.463	0.0015	yes	2011	(*)-4.65	(*)no	2004	-4.777	no
MZ	R	9	1981-2019	-1.612	0.467	no	-1.612	0.467	no	1995	-3.85	no	2005	-3.814	no
	E	9	1981-2019	-2.209	0.206	no	-2.277	0.184	no	2009	(*)-4.86	(*)no	2008	-3.078	no
STP	R	3	1990-2019	-4.934	0.005	yes	-4.934	0.005	yes	2009	-6.135	no	2008	-11.443	yes
	E	7	1990-2019	-1.417	0.56	no	-1.67	0.431	no	2001	-3.79	no	2000	-3.74	no

Notes: R and E represent public revenue and public expenditure respectively. * and ** denote that we do not reject the null hypothesis of a unit root, at the 5% and 1% level, respectively. Following the procedure adopted by Alfonso (2005) and Alfonso and Jalles (2012) for the Zivot and Andrews and Perron tests, "no" denotes we do not reject the null hypothesis of a unit root using t-statistics and critical values.

The existence of breaks might be explained by two types of determinants: i) external (e.g. debt reliefs, which occurred in Guinea-Bissau, Mozambique, and Sao Tome and Principe around certain corresponding break dates); and ii) internal (e.g., strong inflationary pressures that eroded the market value of sovereign debt and public debt-to-GDP ratios, as was the case with Sao Tome and Principe in 1995). These country-specific determinants justify further research on a country-by-country basis.

To confirm the order of integration of the public revenues- and expenditures-to-GDP ratios, we conduct stationarity testing in first differences. The test results presented in Table 3 suggest that the series associated with public revenues and expenditures are stationary in first differences. This further suggests that the original series are I(1) in levels, given that the differentiated series are I(0) in first differences.

Table 3: Unit root tests for public revenues and public expenditures as a percentage of GDP (first differences)

				ADF			PP		
Country	Dependent variable	Lag	Period	<i>t</i> -statistic	<i>p</i> -value	stationarity	\tilde{z} <i>t</i> -statistic	<i>p</i> -value	stationarity
ANG	R	5	1997-2019	-4.869	0	yes	-4.869	0	yes
	E	5	1997-2019	-5.673	0	yes	-5.673	0	yes
CV	R	5	1995-2019	-6.447	0	yes	-6.447	0	yes
	E	5	1995-2019	-7.237	0	yes	-7.237	0	yes
GB	R	6	1993-2019	-7.047	0	yes	-5.02	0	yes
	E	6	1993-2019	-7.314	0	yes	-6.27	0	yes
MZ	R	9	1981-2019	-6.36	0	yes	-6.36	0	yes
	E	9	1981-2019	-5.97	0	yes	-5.97	0	yes
STP	R	7	1990-2019	-9.557	0	yes	-10.545	0	yes
	E	7	1990-2019	-6.76	0	yes	-5.76	0	yes

Therefore, the Engle-Granger and the Johansen tests were only applied to Angola, Cape Verde, Mozambique and Sao Tome and Principe, indicating the same order of integration (1). Our findings in Table 4 thus suggest that in Cape Verde, Mozambique, and Sao Tome and Principe, the public revenues and public expenditures time series as a percentage of GDP are not cointegrated, as opposed to the case of Angola.

Table 4: Cointegration test of public revenue and public expenditure as a percentage of GDP

			Engle-Granger		Johansen	
Country	Dependent Variable	Period	<i>p-value</i>	<i>Cointegration</i>	<i>p-value</i>	<i>Cointegration</i>
ANG	R	1996-2019	0.0000	yes	0.0005	yes
	E	1996-2019	0.0000			
CV	R	1994-2019	0.1623	no	0.003	yes
	E	1994-2019	0.1718			
GB	R	1991-2019				
	E	1991-2019				
MZ	R	1980-2019	0.0760	no	0.0630	no
	E	1980-2019	0.0302			
STP	R	1989-2019	0.0006	no	0.5147	no
	E	1989-2019	0.8031			

The reduced number of observations associated with the revenues- and expenditures-to-GDP ratios for some of the countries included in our sample may limit the explanatory power of the individual cointegration tests (as per the empirical analysis presented). A more robust examination of the PALOP's fiscal sustainability assessment is conducted in this subsection. This is done through the implementation of cointegrating tests associated with a panel data framework.

In effect, Tables 5 and 6 present the findings associated with the panel cointegrating tests involving both the revenues- and expenditures-to-GDP panel data. In Table 5, the findings suggest the rejection of the null hypothesis of no cointegration for the whole of the PALOP dataset. In this case, the estimated coefficients associated with the panel dataset are statistically significant (at a 5% level).

Table 5: Pedroni Residual Cointegration Test (public expenditure and public revenue as a percentage of GDP 1980 -2019)

		Statistic	Prob.	Weighted Statistic	<u>Prob.</u>
Alternative hypothesis: common AR coefficients (within-dimension)	Panel v-Statistic	0.007020	0.4972	1.008817	0.1565
	Panel rho-Statistic	-9.939263	0.0000	-6.840556	0.0000
	Panel PP-Statistic	-6.286731	0.0000	-5.144135	0.0000
	Panel ADF-Statistic	-3.498435	0.0002	-4.171382	0.0000
		Statistic	Prob.		
Alternative hypothesis: individual AR coefficients. (between-dimension)	Group rho-Statistic	-3.850772	0.0001		
	Group PP-Statistic	-5.838433	0.0000		
	Group ADF-Statistic	-5.358273	0.0000		

However, when the analysis is conducted at a country-level, as in Table 6, these findings suggest that the solvency condition is met by 3 of the 5 countries of our sample (Angola, Cape Verde, and Guinea-Bissau). In this case, the p value (less than 0.05) clearly demonstrates that revenues and expenditures as a percent of GDP are clearly cointegrated. These findings confirm the previously-mentioned country-individual results (with the exception of Guinea-Bissau).

Although the PALOP economies are geographically dispersed and heterogeneous, our findings should support subsequent academic research addressing deeper economic and financial integration within the PALOP community. This relevance should be emphasized, as this community represents a set of countries that possess significant influence within the African continent, which is likely to grow in the forthcoming years.

Table 6: Johansen Fisher Panel Cointegration Test (Public Expenditure and Public Revenue as a percentage of GDP 1980 -2019)

	Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
	Hypothesized	Fisher statistic*		Fisher statistic**	
	No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
	None	63.89	0.0000	44.94	0.0000
	At most 1	42.05	0.0000	42.05	0.0000
	Individual cross section results				
		Trace Test		Max-Eign Test	
Cross Section	Statistics	Prob.**	Statistics	Prob.**	
Hypothesis of no cointegration	ang	23.1228	0.0029	22.3015	0.0022
	cv	33.3824	0.0000	26.1449	0.0004
	gb	44.1225	0.0000	24.5079	0.0009
	mz	10.1969	0.2659	6.7411	0.5202
	stp	8.2948	0.4344	7.8702	0.3920
Hypothesis of at most 1 cointegration relationship	ang	0.8213	0.3648	0.8213	0.3648
	cv	7.2376	0.0071	7.2376	0.0071
	gb	19.6146	0.0000	19.6146	0.0000
	mz	3.4558	0.0630	3.4558	0.0630
	stp	0.4245	0.5147	0.4245	0.5147

Notes: * Probabilities are computed using asymptotic Chi-square distribution; **MacKinnon-Haug-Michelis (1999) p-values.

5. CONCLUSION

The present article addresses the critical issue of the sustainability of public finances in PALOP economies. This is quite an important research question associated with the sustainability of the fiscal policies of this important set of African economies, given these countries influence in Africa. The article applies econometric testing procedures to the time series associated with the major public finance variables related to this specific sub-set of African economies (the PALOP's). The applied empirical methodologies range from individual country-by-country time series econometrics analysis, to more advanced panel data testing, ensuring the completeness and robustness of the analyses. Our research design provides a more holistic perspective on the issue of fiscal sustainability in the PALOP economies.

Despite the existence of some data limitations, the individual country findings (both stationarity testing and cointegration testing) suggest that the sustainability of public finances in PALOP economies might present some sustainability issues. That is, some PALOP countries public debt trajectories are relatively unsustainable. The solvency condition of the corresponding economies' intertemporal budget constraints are not adequately respected in most

of the PALOP countries. Angola is the only PALOP economy that passes both stationarity and cointegration testing procedures, most likely due to the Angolan economy's structural role as a major oil exporter to global energy markets.

Lastly, panel data for the PALOP set fully confirms the individual country results, although there is a small discrepancy associated with Guinea-Bissau.

Therefore, the present article's overall findings suggest that further research is needed on this fundamental research topic for the African continent, as some PALOP economies (e.g., Angola) play an important role in international oil markets. These markets might be impacted by any serious fiscal unsustainability issues. As the COVID-19 pandemic impacts the African continent, there is a greater likelihood of more significant and expressive fiscal and public debt unsustainability issues, as greater financial resources will be inevitably needed to counter the global pandemic health crisis, thus adding significant pressure on the sustainability of fiscal policies associated with these African economies.

Finally, given the impact of previous financial crises, the expressive downward dynamics in the price of oil, and the required capitalizations of these countries' national health systems in order to address the COVID-19 pandemics, one would need more sustainable fiscal policy management practices, as well as the design of future corrective fiscal policy measures in the PALOP countries, with the goal of ultimately ensuring the long-term sustainability of their public finances.

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