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Can the Public Debt of African Countries be Mitigated by Migrant Remittances?

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Abstract

The aim of this article is to study the effect of migrant remittances (RFM) on the public debt of a sample of 48 African countries over the period 1990-2020. To achieve this, we specify a panel model that we estimate using the generalized method of moments. The results show that migrant remittances reduce public debt in Africa in such a way that a 1% increase in the level of RFM would allow a 0.015% reduction in the level of public debt of African countries. Indeed, RFM can reduce public debt levels by broadening the country's tax base, by increasing foreign exchange earnings and by misaligning the exchange rate, depending on whether or not the country's currency is pegged to a foreign currency. We recommend that decision-makers set up incentives for formal remittances via digital channels, in particular by simplifying costs and procedures, and pursue policies aimed at better inclusion of the diaspora in the realization of major development projects in Africa, with a focus of RFM on productive investments which, combined with local development policies, will in the long term make it possible to have an independent national currency.

Keywords: Migrant Remittances, Public Debt Africa

Introduction

In the age of globalization, human emigration has increased worldwide, and particularly in Africa. In 2017, some 36 million Africans, or 3.6% of the continent's total population, were living outside their countries of origin. Some 19 million people migrated within the continent, and 17 million left the continent¹. Reasons for emigration from Africa include poor socioeconomic conditions, such as low wages, high unemployment, underemployment, poverty and lack of means and opportunities. (IMP², 2017).

Despite its negative effects, notably the brain drain and the proliferation of the clandestine emigration process, emigration offers significant opportunities for developing countries. Properly managed, it can have a substantial positive impact on the development of these countries, as well as significant benefits, since it is accompanied by substantial transfers, most often financial, which feed into the resources of the recipient countries. Commonly known as migrant remittances (MTRs), they refer to "household income derived from foreign economies, mainly from the temporary or permanent movement of people to these economies [...]. [They consist mainly of financial and non-financial flows sent or given by individuals who have migrated to a new economy and become resident there" (IMF, 2009).

Over the past decade, the importance of these funds has attracted considerable attention from the media, governments, development organizations, the private sector and researchers. Outstripping foreign direct investment (FDI) and official development assistance (ODA) in recent years, remittances are the largest, most stable and predictable external financial flows in many sub-Saharan African countries. (ASS)³.



Source : The authors use World Bank data.

Graph 1: RFM, ODA and FDI Trends in Africa

The World Bank ⁴ indicates that officially recorded RFM in 2018 to developing countries (PED) amounted to USD 52.8 billion or 30,263.91 billion FCFA. According to the World Bank [10], Africa is the third-largest recipient of remittances (representing 15% of global RFM in 2019), behind Asia-Pacific and Latin America and the Caribbean. However, these transfers are not evenly distributed across the different regions of Africa. The West followed by the North of the continent are the biggest beneficiaries, while the rest of the regions only account for around 11%. This overall volume of remittances to sub-Saharan African countries far exceeds official development assistance (ODA), hence the interest in studying their impact on the economies of these countries. According to World Bank estimates, remittances are set to continue growing, reaching around \$51 billion in 2020. In spite of the COVID-19 crisis, the World Bank forecasts that remittances to SSA will reach \$45 billion in 2021, confirming their stability.

The literature on RFM shows that these funds have both positive and negative effects on the economies of recipient countries. Regarding positive effects, RFM can stimulate inclusive economic growth through increased national disposable income and consumption, aggregate demand, reduced income volatility, poverty reduction, development of labor productivity, the financial sector and financial investment, and financial inclusion [1-4].

RFM also increase the level of household income and hence consumption [5]. By contributing directly to household budgets, they smooth consumption and reduce financial constraints on access to human and physical capital formation [6]. What's more, they improve education because, by easing the financial constraints weighing on low-income families, the sums received increase investment in this sector and reduce child labor. They also have a positive effect on school enrolment [7]. Beyond final consumption, RFM can finance private productive investment by recipient families, diaspora associations and the migrants themselves on their return [8]. Under certain conditions, they can indirectly influence foreign direct investment [9].

As for the negative effects of RFM, recent research shows that RFM also have adverse effects on the institutional quality of country reception, as they can weaken governance by increasing levels of corruption and crowd out public spending on education and health [10-12]. While RFM have been seen as a means of facilitating external financing constraints and thus a source of investment for developing countries, they could also trigger Dutch disease phenomena such as real exchange rate appreciation and a possible weakening of international relations and competitiveness [13]. RFM also increase Africa's overall fragility, as well as economic, political and environmental fragilities. However, they have no effect on social and security fragilities [14].

However, despite this literature on the effects of RFM, to our knowledge there are very few studies that have looked at the effects of RFM on the public debt of African countries. In some countries, RFM have become larger than export earnings (e.g., Haiti and Tonga), often exceeding 10% of GDP. Moreover, RFM tend to be counter-cyclical [15,16]. They can therefore play a useful role in absorbing shocks, and reducing countries' debt vulnerabilities.

Dalia Hakura⁵ defines a country's public debt as sustainable if the government is able to meet all current and future payment obligations without recourse to exceptional financial assistance or default. From the point of view of debt sustainability, migrant remittances (MRTs) are equivalent to other measures of repayment capacity (exports and GDP), as they can improve a country's foreign exchange reserves [17]. Although in some countries, RFM can be used extensively to finance imports, the same can be true of export earnings, and they alleviate domestic resource constraints in the same way as changes in domestically generated income [17]. Debt sustainability analysis enables countries to increase their borrowing, helping them to achieve high levels of inclusive growth. However, analysis of the evolution of public debt in Africa shows an increase in debt reaching up to 46.4% of the continent's GDP in 2020.



Source : The authors use data from the World Bank.

Graph 2: Public Debt as a Percentage (%) of GDP in Africa

In fact, the aim of this article is to show that increasing RFM has a negative impact on public debt in African countries. Indeed, intuitively, the surplus revenue created by RFM could enable states to reduce their financing needs and therefore their debt [17]. Moreover, it is well known that RFM influence exchange rates, which in turn have a direct effect on government debt [18].

Following this introduction, the rest of the article is structured as follows. Section 2 presents the state of the art concerning the effect of RFM on public debt. Section 3 presents the methodology used. Section 4 presents the results and discussions, and finally, section 5 presents the conclusion.

Lessons from the Literature

This section presents the state of the literature on the effects of RFM on public debt, as well as the channels through which these effects are transmitted.

The current literature discusses the benefits of RFM improvements for recipients. For example, RFM are credited to reduce poverty, and their compensatory nature is responsible for minimizing the consumption volatility of transfer recipients. Researchers have also recognized, however, that these flows involve development in a number of ways, notably with regard to their effect on growth . Unlike the well-documented impact of RFM on beneficiary households, the impact on public debt of these flows has received little attention until recently.

In particular, Ebeke (2012) finds that RFM, by increasing consumption, can broaden the revenue base, enabling the government to spend more [12]. The result is that RFM have a significant impact on fiscal policy and debt sustainability, and this result may initially be surprising since governments do not directly claim these person-to-person transfers.

Nevertheless, since RFM enter the recipient economy through family transfers, they affect fiscal policy and debt indirectly through the activities of RFM recipient households, primarily through their consumption decisions and savings patterns [19]. In this respect, MFTs affect debt in several ways, including initiating a higher tax base, enabling increased private savings and influencing the exchange rate [18,20].

Effects of RFM on Public Debt via a Higher Tax Base

Although not always taxed directly, RFM can indirectly increase government revenues from consumption and trade, as they contribute to increased consumption of domestic and imported products [21]. However, the strength of this channel depends on the tax structure of the receiving country. To the extent that MFTs are transmitted through formal channels and are therefore measurable, they can be taxed through financial transaction taxes, but governments generally avoid this type of taxation for several reasons [19].

With around half of revenues coming from consumption and production taxes, it may be that this channel can be particularly robust. In this case, higher MRTs lead to an increase in the tax base and may also reduce country risk and lower the marginal cost of borrowing [22,23]. If RFM increase the domestic demand of the passive banking sector, the demand for money will increase [24]. Analyzing the above, it could be that for a given inflation rate, government seigniorage revenues will tend to increase, reducing the need for recourse to debt or providing greater leeway for eventual repayment.

Effects of RFM on Public Debt via Increased Private Savings

RFM can lead to an increase in deposits in the banking sector, because to the extent that the marginal propensity to consume is less than unity, RFM can increase private savings [4]. This higher level of private savings could be channeled by banks through purchases of government bonds to support the increase in public debt. These channels suggest that

RFM can be considered as part of the potential tax base for additions to production revenues. They also suggest that, by increasing the potential revenue base, MFTs increase the resources available to a country to repay its debt.

Effects of RFM on Public Debt via Exchange Rate Misalignment and Whether or not the Country is Pegged to a Foreign Currency

In contrast to the situation in Latin America, the inflow of MFTs leads not to an appreciation but to a very slight depreciation of the real exchange rate over the long term. In periods of overvaluation, MFTs tend to reduce this misalignment, since currencies are less overvalued when MFTs are taken into account. In periods of undervaluation, MFTs tend to accentuate this effect slightly, particularly in the case of Tunisia and, to a lesser extent, Algeria. In short, the use of remittances by recipient families, the counter-cyclical characteristics of remittances, the role of the financial sector and the exchange rate policy implemented reduce the risk of exchange rate overvaluation, and the Dutch disease that would ensue [18]. Migrant remittances not only boost household income, but also restore balance-ofpayments equilibrium by alleviating currency shortages.

However, for Nersisyan and Wray (2011), a sovereign government spends by issuing its own currency and therefore has no constraints on its ability to spend. On the other hand, a nonsovereign country that pegs its currency to another currency can only issue currency up to the level where its foreign currency reserves allow it to maintain the peg. Adopting a peg forces a government to give up at least part of its monetary and fiscal policy autonomy. These constraints are obviously less restrictive if the country is running a current account surplus and accumulating foreign currency reserves.

Nersisyan and Wray (2011) also argue that a government operating with a non-sovereign currency, issuing debt either in a foreign currency or in a domestic currency pegged to a foreign currency (or precious metal) faces real operational risks and presents a solvency risk. However, the issuer of a sovereign currency (a government using its own floating, non-convertible currency) is not constrained in its operations and cannot be forced to default. This fact is recognized, at least in part, by the markets and even by the rating agencies. In short, countries operating at parity with foreign currencies are more exposed to shocks when it comes to debt repayment.

Literature on the Effects of Migrant Remittances on Public Debt

While RFM have been seen as a means of facilitating external financing constraints and therefore a source of investment for developing countries, Singer (2010) finds that the inflow of funds has an effect on exchange rate regimes and therefore proves that countries' receipt policy is sensitive to incoming RFM [25]. If RFM increase, and therefore public resources, then the need for financing and therefore borrowing must be reduced. Finally, based on the case of Egypt, Ncube and Zuzana Brixiova (2013) show the positive impact of increasing RFM on public debt sustainability [26]. Mijiyawa and Oloufade (2022) analyze the effect of remittances on external debt in developing countries, identifying international reserves as a potential transmission channel [27]. Using panel data over the period 1970-2017 and covering 50 low- and middle-income countries worldwide, they find a positive and significant effect of remittances on external debt.

Nersisyan and Wray (2011) argue that a government operating with a non-sovereign currency, issuing debt either in a foreign currency or in a domestic currency pegged to a foreign currency (or precious metal) faces real operational risks and presents a solvency risk. However, the issuer of a sovereign currency (a government using its own floating, non-convertible currency) is not constrained in its operations and cannot be forced to default. This fact is recognized, at least in part, by the markets and even by the rating agencies.

As an illustration, Japan has managed to increase its public debt to percentages of GDP more than twice the Reinhart and Rogoff thresholds, with extremely low interest rates on its yen-denominated sovereign debt. By contrast, the 50 states of the United States, currency board nations such as Argentina (in the late 1990s), or even the countries of the Eurozone (whose institutional structure makes them function in a similar way to the states of the United States) are exposed to downgrades of their debt by the rating agencies or increases in interest rates for deficits that are often much smaller than those of Japan or even the US government.

Indeed, according to him, a nation operating with its own currency can always continue to spend by simply crediting bank accounts, including interest payments. So, there is no risk of default in terms of ability to pay. On the contrary, a nation that pegs its currency or chooses a currency board may find itself in default due to a self-imposed limitation on its ability to pay; this is why the US government abolished the gold peg in 1933. Most SSA countries peg their domestic currency to a foreign one, and are therefore potentially subject to these mechanisms.

Assuming that increased tax revenues have an effect on public debt either by increasing repayment capacity or by reducing the need for debt, examines on a sample of 98 countries around the world whether repatriated international MFT widens fiscal room for maneuver due to the margin caused by their positive effects on the level and stability of government tax revenues [28]. It examines whether these effects are conditional on the presence of a value-added tax (VAT). After using a large sample of countries, and even after taking into account the endogeneity of MFTs and the adoption of VAT, he points out that MFTs increase the level and stability of the government's tax revenue ratio in the presence of VAT.

Ebeke and Le Goff (2010), starting from the hypothesis that MFTs can contribute to increasing tax revenues with a sample of seventy developing countries (DCs), finds a positive and significant impact of MFTs in DCs that have a well-adapted reliable tax policy. Moreover, using dynamic discrete choice modeling, he estimates a positive and significant impact of MFTs on the decision to adopt and maintain VAT in these developing countries. The following year, Ebeke (2011) shows that RFM contribute to increasing both the volume and stability of the tax revenue rate in countries that have adopted a VAT in developing countries, confirming that these countries widen their fiscal room for manoeuvre due to the margin caused by the positive effects of RFM on the level and stability of government tax revenues. According to the IMF and World Bank (2009), in Haiti, RFM play a positive role in reducing debt vulnerabilities, but have no impact on the country's risk rating (high) [17].

Despite this abundant literature, very few studies determine the impact of RFM on public debt specifically for the African continent. The remainder of this article sets out to analyze empirically the effect of RFM on public debt on this continent.

Data and Methodology

Data

To analyze the effects of RFM on public debt in Africa, we surveyed a panel of 48 African countries over the period 1990-2020, using data from a variety of sources. The choice of countries selected and the periodicity of this test are mainly dictated by the availability of reliable data. The description of the data in accordance with the studies by Ojo (1989) and Mijiyawa and Oloufade, (2022) is as follows[27,29]:

The Endogenous Variable: Public Debt

Estimated as the total stock of public debt in relation to gross national income. Total public debt is debt owed to nonresidents, repayable in foreign currency, goods or services. Total public debt is the sum of long-term non-guaranteed, public, publicly and privately guaranteed debt, IMF credit utilization and short-term debt. Short-term debt includes all debts with an original maturity of one year or less and interest on arrears on long-term debts. GNI (formerly GNP) is the sum of value added by all resident producers plus taxes on products (less subsidies) not included in the valuation of production plus nandreceipts of primary income (compensation of employees and property income) from abroad. Data for this variable come from the World Bank, in the international debt statistics section.

The Exogenous Variable: Migrant Remittances

Migrant remittances include personal transfers and compensation of employees. Personal transfers include all current transfers in cash or in kind made or received by resident households to or from non-resident households. Personal transfers therefore include all current transfers between residents and non-residents. Compensation of employees refers to the income of frontier, seasonal and other short-term workers employed in an economy where they are not resident, and of residents employed by non-resident entities. The data are the sum of two elements defined in the sixth edition of the IMF Balance of Payments Manual: personal transfers and compensation of employees. Data for this variable come from World Bank staff estimates based on IMF balance of payments data and World Bank/OECD GDP.

The links between the degree of indebtedness and certain macroeconomic variables have been the subject of econometric research. concluded that the ratio of outstanding debt to GDP for some thirty African countries between 1976 and 1984 was linked to changes in exports, the ratio of imports to GDP, population and the rate of GDP growth. Mijiyawa and Oloufade (2022) believe that trade openness, political stability and the exchange rate are variables that influence a country's public debt [29]. On the basis of this study, we were able to select control variables for our analysis, with a hypothesis as to the effects of these variables on public debt. The control variables are [27].

Export

Exports of goods and services represent the value of all goods and markandservices supplied to the rest of the world. They include the value of goods, freight, insurance, transportation, travel, royalties, license fees and other services such as communication, construction, finance, information, professional, personal and government services. They exclude compensation of employees and investment income (formerly known as factorial services) and transfer payments. This variable is taken from World Bank national accounts data and OECD national accounts data files.

Import

Imports of goods and services represent the value of all goods and markandservices received from the rest of the world. They include the value of goods, freight, insurance, transportation, travel, royalties, license fees and other services such as communication, construction, finance, information, professional services, personal services and government services. They exclude employee compensation, investment income (formerly known as factorial services) and transfer payments. This variable is taken from World Bank national accounts data and OECD national accounts data files.

Trade Opening

Calculated as the ratio of the sum of imports and exports to twice GDP, it will replace imports and exports in our model in accordance with the work of and we expect, like this author, a negative sign for its coefficient [27].

Population density

Population density is the mid-year population divided by the land area in square kilometers. Population is based on the de facto definition of population, which counts all residents regardless of legal status or nationality - with the exception of refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. Land area is the total surface area of a country, excluding groundwater, national claims to the continental shelf and exclusive economic zones. In most cases, the definition of inland water bodies includes the main rivers and lakes. This variable is derived from population estimates by the Food and Agriculture Organization and the World Bank. According to, the larger the population, the more resources public authorities need and the greater the incentive to go into debt. We therefore expect a positive sign for this variable [29].

GDP

GDP at purchasers' prices is the sum of gross value added by all resident producers in the economy, plus taxes on products and minus subsidies not included in the value of products. It is calculated without deducting depreciation of manufactured assets or depletion and degradation of natural resources. Data are in current US dollars. GDP figures in dollars are converted from national currencies using one year's official exchange rates. For some countries where the official exchange rate does not reflect the rate actually applied to actual exchange transactions, another conversion factor is used. GDP data come from World Bank National Accounts and OECD National Accounts data files. According to Mijiyawa and Oloufade, (2022) the GDP growth rate has a negative effect on public debt [27].

Political Consistency

This variable examines the effect of political factors or regime type on debt. have highlighted the importance of political factors or regime type in understanding the debt levels of developing countries [30]. Specifically, it has been argued that autocratic regimes will tend to borrow more abroad and invest less in the domestic economy due to a lack of accountability, generating more rent-seeking behavior in autocratic regimes. However, due to greater accountability, democratic regimes may also tend to borrow more to meandvoters' or citizens' needs for public goods and services. The effect of Political Stability on external debt is ambiguous. However, as most African countries have democratic regimes, political stability is likely to have a positive influence on debt.

Exchange Rates

This is a key variable for developing countries that borrow abroad. Because they are unable to borrow abroad in their own currency. In particular, for developing countries borrowing abroad, a depreciating currency means a rising debt burden [27]. The exchange rate is measured by the amount of local currency needed to buy one unit of dollar. Thus, a higher value of the exchange rate variable corresponds to a depreciation of the local currency against the dollar, which should have a positive impact on public debt.

Descriptive Statistics of Variables

Tables 1 and 2 show the descriptive statistics and correlation matrix of the variables used in the analysis, respectively. (Obs.) represents the number of observations of the variables

Variable	Mean	Standard deviation	Min	Max	
DETP	57.395	58.492	-1.171	289.84	
RFM	3.918	11.552	0	167.43	
Ouv	32.096	21.267	0	141.27	
LPOP	15.663	1.575	11.14 9	19.14	
LPIB	1.421	.856	-4.307	5.01	
STAB	3.254	1.19	-11.5	4.5	
TxEch	658.424	2221.242	0	31558.9	
Source : The author, u	using World Bank data				

Table 1: Summary Statistics

The table shows that external debt as a percentage of national income in Africa averages 57.39%. As for RFM, it averages 3.9% of GDP. The African population is therefore on average quite dense over time.

Study of the Correlation Between Different Variables

To gain a predictive understanding of the relationship between the variables, we constructed a correlation table. In order to verify the hypotheses made above regarding the relationships between the variables. The correlation matrix thus gives an overview of the signs between the different variables, even if it's true that correlation is not synonymous with causality. Table 2 shows the correlation matrix between the variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) DETP	1.000						
(2) RFM	-0.151 (0.075)	1.000					
(3) Ouv	-0.257 (0.001)	0.327 (0.000)	1.000				
(4) LPOP	0.265 (0.001)	-0.152 (0.000)	-0.518 (0.000)	1.000			
(5) LPIB	0.004 (0.964)	0.001 (0.973)	0.003 (0.915)	0.030 (0.299)	1.000		
(6) STAB	-0.330 (0.002)	0.086 (0.008)	0.189 (0.000)	0.022 (0.455)	-0.020 (0.529)	1.000	
Source : The author, WB data							

Table 2: Correlation Matrix

The correlation matrix shows very weak linear links between the variables: in absolute terms, the correlation coefficients are not close to unity. Nevertheless, according to this matrix, RFM reduce debt.

Methodology

To assess the impact of migrant remittances on the level of public debt in Africa, we have used a usual linear econometric function, and the model equation thus takes the following form;

$$DETP_{it} = \alpha + TFM\beta_1 + \beta_2 X_i + \varepsilon_i$$

(1)

With α a constant and ϵi the standard error term; βi (i=1...k) represents the various parameters of the model and k the number of these parameters; Xi represents the vector of the model's explanatory control variables. Clearly, the level of debt in one year will have an impact on the level of debt in the following year.

We therefore opt for a dynamic panel equation and the model takes the following form. We include temporal and individual measurement errors and variables in accordance with the work of and [27,29].

$$DETP_{it} = \alpha + \beta_{1(t-1)} + \beta_2 TFM_{it} + \beta_3 Ouvit + \beta_4 STAB_{it} + \beta_5 POP_{it} + \beta_6 PIB_{it} + \beta_7 TxEch_{it} + u_i + v_t + \varepsilon_i$$
(2)

However, it should be stressed that the logarithmic transformation of certain variables serves a dual purpose. Firstly, to avoid problems associated with magnitude effects, and secondly, to facilitate interpretation with elasticities between explanatory variables and indebtedness. As a result, the model can be rewritten as follows;

$$Log(DETP_{it}) = \alpha + \beta_1 Log(DETP_{i(t-1)}) + \beta_2 Log(TFM_{it}) + \beta_3 Log(Ouv_{it}) + \beta_3 Log(STAB_{it}) + \beta_6 Log(POP_{it}) + \beta_6 Log(PIB)_{it} + \beta_6 Log(TxEch)_{\ell+} u_i + v_t + \varepsilon_i$$
(3)

Estimation Technique

This article is based on a panel data analysis that takes into account both individual and temporal dimensions, enabling us to better understand the effects of RFM instability and international trade, as well as other factors affecting the level of public debt on the African continent. We will use a dynamic panel on which we will employ the method of generalized moments (MMG) as an estimation technique.

The motivation for using MMGs comes from the literature's demonstrations of the effectiveness of this estimation technique, notably and , which provided the rationale for using MMGs to study the relationship between variables [31-34]. Hence, MMG adjusts for endogeneity not only at the level of the explanatory variables, but also of the dependent variable through the use of a series of instrumental variables generated by the lag of the endogenous variables. More specifically, it is assumed that the explanatory variables are weakly exogenous, i.e. they can be affected by current and past realizations and must be decorrelated from future realizations and error terms.

Dynamic models are characterized by the presence of one or more lag values of the dependent variable among the explanatory variables. In this model, the presence of the public debt lag variable precludes the use of econometric techniques such as ordinary least squares. Results estimated with static panel models such as the combined OLS, fixed-effect and randomeffect estimators may therefore lead to biased results in the presence of country-specific effects and lagged dependent variables or potential endogeneity of explanatory variables. These results are presented in the appendix. In the light of these econometric axioms, we adopt the MMG estimation method in the analysis. The

MMG estimator has a number of advantages: it is robust for modeling misspecification, since its derivation requires no particular distributional assumptions on the residuals. It is closer to the theoretical relationship, as this estimator is chosen to minimize the weighted distance between theoretical and observed values.

There are two types of MMG: the first difference MMG estimator and the system MMG estimator. According to , the first difference MMG consists in taking for each period the first difference of the equation to be estimated to eliminate individualspecific effects, and subsequently instrumenting the explanatory variables of the first difference equation with their level values shifted by one or more periods [31-33]. The MMG system estimator of combines the first difference equations with the level equations [34]. The system MMG found more refutation than the difference MMG, which is why we'll base our analyses on the results of this method. However, we will apply both MMGs in order to better understand the results of our test, as the results of an estimation can change depending on the estimation method used.

According to ,if the dependent variable in an equation is persistent and close to a random walk (the parameter of the dependent variable approaching 1), application of the difference MMG estimator produces a biased and inconsistent estimate of the lag of the dependent variable [34]. They therefore attributed the poor performance of difference MMG to the use of poor-quality instruments, and to remedy this problem, they proposed system MMG estimation. Bond, for his part, believes that the self-integration model should initially be estimated using a fixed-effect, pooled MLS approach. The pooled MLS estimate of the lag of the dependent variable should be taken into account, and the upper-bound estimate and the fixed-effect approach estimate considered as the lower-bound estimate. If the various MMG estimates obtained are close to or below the lower bound, this suggests that the first estimates are biased downwards due to the weakness of the instruments, and that a systemic MMG estimate should be preferred. On this basis, we have based our interpretation of the results on system-based MMG estimation. We now present the results of the impact of RFM on public debt in Africa.

	MCO Estimator		Fixed effect	Fixed effect		GMM-System	
	(1)	(2)	(3)	(4)	(5)	(6)	
VARIABLES	Public debt	Public debt	Public debt	Public debt	Public debt	Public debt	
Public debt (delayed)	0.662***	0.682**	0.795*	0.781	0.217	0.123	
	(0.078)	(0.078)	(0.100)	(0.109)	(0.164)	(0.235)	
Remittences	0.003***	0.004	0.172**	0.158*	-0.012***	-0.015***	
	(0.013)	(0.013)	(0.078)	(0.090)	(0.006)	(0.008)	
Trade opening	-0.006***	-0.007***	0.003***	0.004***	-0.003***	-0.002***	
	(0.003)	(0.003)	(0.007)	(0.008)	(0.002)	(0.002)	
Population	0.089	0.043	-0.390	-0.413	0.166**	0.215*	
	(0.053)	(0.063)	(0.255)	(0.268)	(0.030)	(0.061)	
GDP	-0.278**	-0.275**	-0.000***	-0.001***	-0.318**	-0.318**	
	(0.080)	(0.079)	(0.009)	(0.009)	(0.016)	(0.026)	
Political stability	0.104	0.491	0.069	0.096	0.641	0.058	
	(0.470)	(0.548)	(0.360)	(0.374)	(0.244)	(0.106)	
Real exchange rate		-0.034**		0.000***		0.028**	
		(0.026)		(0.000)		(0.024)	
Constant	0.300	0.655	6.967	7.276	0.000	0.000	
	(1.068)	(1.089)	(4.010)	(4.166)	(0.000)	(0.000)	
Observations	42	42	51	51	42	42	
R-squared	0.803	0.813	0.713	0.714			
Number of countries			9	9	9	9	
AR(1) test (p-value)					0.118	0.174	
AR(2) test (p-value)					0.231	0.323	
Sargan test (p-value)					0.132	0.144	
Hansen test (p-value)					1.000	1.000	
Source : The author from stata, WB data Standard deviation in brackets $*** = p < 0.01$, $** = p < 0.05$, $* = p < 0.1$							

Results and Discussion

Table 5: Results of the Impact of RFM on Public Debt in Africa

Discussion of Results

Table 3 shows the impact of RFM on public debt in African countries. Let's analyse and interprandthis impact variable by variable.

Main Explanatory Variable

RFM

Column (5) of Table 5 shows that the regression coefficient of RFM on public debt is significant at 1%. The elasticity between these two variables is -0.015, so a 1% increase in RFM leads to a 0.015% reduction in public debt. RFM are therefore beneficial for the budgandrevenues of recipient African countries. The expected sign hypothesis and the thesis hypothesis are therefore verified in Africa. Finally, using the case of Egypt, Ncube and Zuzana Brixiova (2013) show the positive impact of increased remittances on public debt sustainability[26]. Mijiyawa and Oloufade (2022) analyze the effect of remittances on external debt in developing countries, identifying international reserves as a potential transmission channel[27]. Using panel data over the period 1970-2017 and covering 50 low- and middle-income countries worldwide, they find a positive and significant effect of remittances on the external debt/GDP ratio and also a negative and significant effect of international reserves on external debt. Migrants' remittances to Africa significantly improve household consumption and tax revenues, so it's understandable that they have a negative effect on public debt. However, the robustness of this result is checked below by the exchange rate variable, as many African countries have a fixed parity with certain currencies.

Controls Variables

Trade Opening

Obviously, a country that exports tends to reduce its debt level. In line with the work of, imports significantly increase debt. Column (5) of the table shows that trade openness significantly reduces the debt level of African countries. Hence, a 1% increase in imports will lead to a 0.003% decrease in public debt. Given the magnitude of this impact, we can affirm that trade openness is an extremely important variable for a country seeking to make its public debt sustainable. The hypothesis concerning the expected sign is therefore verified.

Political Stability

Column (5) of table II.5 shows that, as expected, the effect of political stability on public debt is ambiguous. Its coefficient is insignificant, and this is justified by the difficulty of measuring the level of democracy applied in democratic countries in order to observe the effect of political factors or regime type on debt. As mentioned above, have highlighted the importance of political factors or the type of political regime in understanding the level of indebtedness of developing countries [30]. Specifically, it has been argued that autocratic regimes will tend to borrow more abroad and invest less in the domestic economy due to a lack of accountability, generating more rent-seeking behavior in autocratic regimes. However, due to greater accountability, democratic regimes may also tend to borrow more to meandvoters' or citizens' needs for public goods and services.

GDP

It is clear that economic growth in a country reduces its level of dependence on borrowing. Column (5) of Table II.5 shows that in African economies, if GDP grows by 1%, then public debt decreases by 0.32%. These results are in line with our expectations and the work of [27].

Population

The larger the population, the more resources are required to manage it. Column (1) of the table confirms this assertion, as the regression coefficient is positive and significant at 1%, so that a 1% increase in the population rate will lead to a 0.17% increase in debt.

Analysis of the Robustness of Results

The exchange rate was used in this test to assess the robustness of our results. Indeed, this is a key variable for developing countries that borrow abroad. Because they are not in a position to borrow abroad in their own currency. In particular, for developing countries borrowing abroad, a depreciating currency means a higher debt burden [27]. Thus, a higher value of the exchange rate variable corresponds to a depreciation of the local currency against the dollar, which should have a positive impact on public debt.

In contrast to the situation in Latin America, the inflow of MFTs leads not to an appreciation but to a very slight depreciation of the real exchange rate over the long term. In periods of overvaluation, MFTs tend to reduce this misalignment, since currencies are less overvalued when MFTs are taken into account. In periods of undervaluation, MFTs tend to accentuate this effect slightly, particularly in the case of Tunisia and, to a lesser extent, Algeria. In short, the use of RFM by recipient families, the countercyclical characteristics of RFM, the role of the financial sector and the exchange rate policy pursued reduce the risk of exchange rate overvaluation, and the Dutch disease that would ensue [18]. Column (6) in Table II.5 shows that our results are robust to exchange rate control, as many African countries have a fixed parity with certain foreign currencies.

Conclusion

At the end of our discussions, we examined the effect of RFM on public debt in Africa, and it emerged that RFM reduce public debt in Africa in such a way that a 1% increase in the level of RFM leads to a 0.015% reduction in the debt level of African countries. The expected signs were effective in terms of the determinants of public debt. Indeed, trade openness and economic growth are major determinants of public debt on the continent, and African states must therefore play on these levers to manage their debt levels. RFM can reduce public debt levels by broadening the tax base, by increasing foreign exchange and by pegging or unpegging the country's currency to a foreign currency. African countries must therefore optimize this gain by encouraging RFM through formal channels and by involving the diaspora more closely in development policies [35-137].

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Footnotes

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⁹Press release n° 2019/148, World Bank.

¹⁰Press release n_{\circ} 2019/148, World Bank.

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