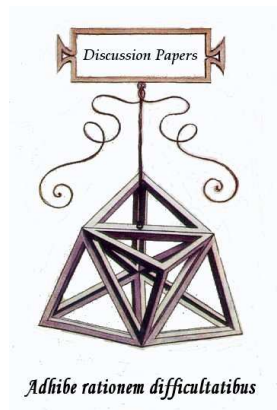




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On the Implications of Trade Openness, Foreign Aid and Democracy for Wagner's Law in Developing Countries: Panel Data Evidence from West African Monetary Zone (WAMZ)

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On the Implications of Trade Openness, Foreign Aid and Democracy for Wagner's Law in Developing Countries: Panel Data Evidence from West African Monetary Zone (WAMZ)

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Abstract

The impact of trade openness, foreign aid and democracy on government expenditure in developing countries has been emphasised in the literature in recent decades. Nonetheless, most recent studies of Wagner's law have often neglected the increasing role played by these policy variables. This paper provides an empirical analysis of the long run implications of trade openness, foreign aid and democracy for the fulfillment of Wagner's law in West African Monetary Zone (WAMZ) countries using panel data techniques for the period 1980-2008. The paper finds the existence of Wagner's law in WAMZ countries, but only when the role of these policy variables has been catered for. Therefore, if these countries are to meet the fiscal convergence criteria and ensure the sustainability of a single currency area, explicit sets of restraint on the national authorities and innovative and efficient ways of domestic revenue generation

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necessary to ensure that government revenue keep pace with its expenditure become crucial, because monetary union may not necessarily ensure fiscal discipline.

Keywords: Wagner's law, trade openness, foreign aid, democracy, WAMZ

JEL Classification: F35, H11, H50, O55

1. INTRODUCTION

The Economic Community of West African States (ECOWAS)² - aiming at fostering economic growth through harmonization of macroeconomic policies - has been working towards the adoption of a single currency by the year 2020 for decades. In 1994, for example, the West African Economic and Monetary Union (WAEMU)³ which currently share the same currency, CFA Franc, was created as the first Monetary Zone in the sub-region. On December 15, 2000, five non-CFA ECOWAS countries, including The Gambia, Ghana, Guinea, Nigeria and Sierra Leone, initiated a second Monetary Zone in Bamako, Mali. This led to the signing of the Accra Declaration on April 20, 2002, that launched the West African Monetary Zone (WAMZ)⁴ with the introduction of a common currency, the ECO, which was initially scheduled to commence in January 2003. However, due to

² ECOWAS consist of 15 West African countries including Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo

³ Eight ECOWAS member countries currently form WAEMU. The countries are Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo

⁴ The launch of WAMZ was to complement WAEMU so that the two Monetary Unions can be merged into a single Monetary Zone with a common currency for the sub-region by the year 2020. On February 16, 2010, Liberia become a member of WAMZ after signing the necessary membership agreement

member countries inability to meet all the necessary convergence criteria, the take-off has been postponed several times, and although it is currently aimed at 2015, a determinate commencement date for the ECO is yet to be decided⁵.

One of the *sine qua non* convergence criteria for WAMZ member countries is not only the achievement of, but also the sustainability of fiscal discipline. Nonetheless, although WAMZ countries committed themselves to reduce fiscal deficits to 4% of GDP by 2003, this criteria is one that was missed by most member countries in 2010⁶. Udoh (2011) note that fiscal deficits ? which is usually financed through domestic and foreign borrowing ? contribute immensely to the high inflation dynamics in WAMZ countries. Moreover, the lack of fiscal convergence and the fiscal behavior of governments of WAMZ countries remain the most critical constraint on the convergence programme of the proposed monetary zone (Ojo, 2005; Debrun et al., 2005). For this reason, it becomes imperative that what matters for government expenditure and revenue in WAMZ countries are well understood.

The present paper deals only with the first one and, in particular contributes to the existing literature on Wagner's law (Adolph Wagner, 1835-1917) and the

⁵ The commencement of the ECO was initially deferred to 2005, and then to 2009. Adam et al. (2010) provide further justification for the recent postponement of the ECO to 2015. They note that inflation rates shows high degree of divergence amongst WAMZ countries and that meeting the 2015 deadline would require interventional policy measures

⁶ The other primary convergence criteria for accession to WAMZ include the attainment of single digit inflation, central bank financing of fiscal deficits not exceeding 10% of the previous year's government tax revenue and external reserves to cover at least 3 months of imports. The single inflation criteria was also missed by most member countries in 2010

recent discussion on the need for fiscal discipline, fiscal policy coordination and innovative and efficient ways of revenue generation in WAMZ countries (see Guillaume and Stasavage, 2000; Debrun, 2000; Masson and Pattillo, 2003; Iyare et al., 2005, Debrun et al., 2005; Frimpong and Oteng-Abayie, 2009; Udoh, 2011) in several respects. Firstly, it extends this line of research by introducing the impact of trade openness, foreign aid and democracy on government expenditure to determine whether Wagner's law is fulfilled in these countries. This is reasonable considering the importance that these policy variables have for the overall size of government in developing countries in recent decades (See Rodrik, 1998; Sobhee and Joysuree, 2004; Remmer, 2004; Mosley, 2005; Stasavage, 2005; Vergne, 2009). If this happens and government revenue cannot follow the same path as its expenditure would imply large fiscal deficits and public debt accumulation. Moreover, because of moral hazard problems and the potential pressures that might persist for a bail-out for countries with large fiscal deficits⁷ (in excess of the stipulated 4% of GDP in the case of WAMZ), these countries inability to generate adequate domestic revenues and/or meet the fiscal convergence criteria would imply that they are unlikely to sustain a single currency. Secondly, many cross-country studies on the determinants of government expenditure include in their sample both developed and developing countries⁸. However, cross-country studies on Wagner's law that include both developed and developing countries are inappropriate and may yield misleading results as it is more likely that Wagner's law will operate in countries at low levels of income (see Abizadeh and Gray, 1985). This result is important as "the level and composition of government expenditures for developing economies differ substantially from those of industrialised economies" (Lindauer, 1988). In this paper, we focus only

⁷ See for example, Chari and Kehoe (1998) and Beetsma and Bovenberg (1998, 2001)

⁸ See for example, Ram, 1987; Rodrik, 1998; Benaroch and Pandey, 2008

on developing countries (in this case WAMZ countries) where the need for fiscal discipline has become crucial, not only for joining a monetary union, but most importantly to ensure the sustainability of a single currency. Thirdly, we investigate the issue using panel data techniques (including panel cointegration approaches) which allow us to address important econometric issues - parameter heterogeneity, non-stationarity and potential endogeneity of regressors, serial correlation problems and cross-sectional dependence - that have made most existing cross-country panel studies on Wagner's law unreliable. Last but not least, we highlight on the long run country-specific results for all six WAMZ countries in addition to the long run panel estimates.

The rest of the paper is organised as follows. The literature on Wagner's law and the relationship between trade openness, foreign aid, democracy and government expenditure are presented in Section 2. Section 3 discusses the empirical estimation methods. In section 4, we present and discuss the empirical results. Section 5 provides a summary of the main results of the paper and concludes with policy recommendations.

2. LITERATURE REVIEW

This section of the paper provides an overview of the theoretical and empirical literature on the determinants of government expenditure with special reference to Wagner's law and the impact of trade openness, foreign aid and democracy on government expenditure. The section is divided into three parts. In the first part we review the literature on Wagner's law. The second part considers the

literature on the impact of trade openness, foreign aid and democracy on government expenditure. The third and last part concludes the section.

2.1 Wagner's Law

Wagner's law ? basically understood as the increment of the public sector along with the economic development of a nation ? has received extensive theoretical and empirical investigation in developing countries⁹. The law offers valuable theoretical and empirical explanation for a positive relationship between government expenditure and per capita income¹⁰. For this reason, one would expect that "the greater the increment in economic affluence of a nation during a given period, the greater the expansion of the public economy" (Cameron, 1978). In other words, the common exogenous variable to explain the expansion of the size of government is the national product (Mourao, 2007).

Many empirical studies have provided support for Wagner's law in developing countries. For example, Abizadeh and Gray (1985) provide evidence for Wagner's law for a group of poor, developing and developed countries. They

⁹ In this way, we would expect for nations in the process of economic development (as in many developing countries) that the share of government expenditure in real GDP expands with per capita income. Nonetheless, this relationship could as well be negative as advocated by Wildavsky for low-growth countries (Wildavsky 1975, cited in Cameron, 1978)

¹⁰ Shelton (2007) has shown that the argument in favour of Wagner's law for developed countries (as opposed to developing countries) are mostly "driven by demographic factors that rich countries are older and spend more on social security". However, total spending less social security actually declines with income. In addition, there is the quest for politicians to satisfy the median voter and the need for redistribution which tend to spur growth in government expenditure

argued that the positive relationship between several measures of economic development and government expenditure only hold for the developing group of countries. Ram (1987) provides further support for Wagner's law for about 60% of 115 countries investigated in an individual-country time series study, but found no evidence for Wagner's law from several cross-section results from the 115 countries over the 1950-1980 period. Iyare and Lorde (2004) in a cointegration and causality study of selected Caribbean countries found support for Wagner's law for a significant number of these countries. Akitoby et. al. (2006) in a cointegration and error-correction model analysis using individual-country time series data from 1970-2002 for 51 developing countries found support for Wagner's Law for about 70% of these countries.

However, the recent empirical results for Wagner's law in WAMZ countries remain mixed and inconclusive. For example, Olomola (2004) adopted cointegration techniques to study Wagner's law in Nigeria for the period 1970-2001, and found evidence in support of Wager's law. Gharthey (2007), using Granger causality, autoregressive distributed lag and the error correction model for the period 1965-2004, finds strong support for Wagner's law in Ghana. On the other hand, Babatunde (2008), Frimpong and Oteng-Abayie (2009) and Oteng-Abayie (2011) find no support for Wagner's law for a number of WAMZ countries. For example, Babatunde (2008) employed the bounds testing approach to cointegration (Pesaran et al., 2001) and the Granger non-causality test (Toda and Yamamoto, 1995) to tests Wagner's law for four WAMZ countries: The Gambia, Ghana, Nigeria and Sierra Leone for the period 1970-2005, but find no evidence for Wagner's law for all four countries. Frimpong and Oteng-Abayie (2009) investigated Wagner's law for three WAMZ countries: The Gambia, Ghana and Nigeria. The time periods considered were 1966-2004 for The

Gambia, 1965-2003 for Ghana and 1965-2004 for Nigeria. Using cointegration and Granger causality tests they find no support for Wagner's law for all three countries. Finally, Oteng-Abayie (2011) employed panel cointegration estimation techniques to study Wagner's law in five WAMZ countries - The Gambia, Ghana, Guinea, Nigeria and Sierra Leone for the period 1965-2007 - but found no evidence of long run cointegration relationship for these countries (and hence no evidence for Wagner's law).

Notwithstanding this, it is important to note that empirical tests for Wagner's law for developing countries discussed above solely involves bivariate analysis of different measures of both government expenditure and national income¹¹. Nonetheless, as Sobhee and Joysuree (2004) note, testing for Wagner's law without controlling for trade openness, for example, may lead to specification bias. Moreover, Shonchoy (2010) in a multivariate panel data study of the determinants of government expenditure in 111 developing countries over the 1984-2004 period found strong evidence in support of Wagner's law. The results further revealed statistically significant positive impact of trade openness, foreign aid and political institutions on the relative size of government expenditure in these countries.

Based on the empirical results discussed so far, it is reasonable to think that some important determinants of government expenditure in WAMZ countries have not been considered for the study of Wagner's law. For this reason, we propose

¹¹ For a comprehensive review and various formulation of Wagner's law readers are referred to (Mann, 1980; Abizadeh and Gray, 1985; Henrekson, 1993; Peacock and Scott, 2000; Iyare and Lorde, 2004; Ghartey, 2007)

in this paper that, the study of Wagner's law in WAMZ countries should also take into consideration the implications that the recent patterns of trade openness, foreign aid inflows and democratisation have for government expenditure in these countries.

2.2 Trade Openness, Foreign Aid, Democracy and Government Expenditure

The relationship between trade openness and government expenditure has been discussed in line with two competing hypothesis: the efficiency hypothesis (or conventional wisdom) and the compensation hypothesis¹². The efficiency hypothesis argues that trade openness is undermining governments' sovereignty in the implementation and financing of domestic policies beyond the provision of fundamental public goods. This proposition is further elaborated by Wolf (2001) who argues that openness is limiting governments' capacity to function effectively, particularly in key areas of taxation, public expenditure for income distribution and macroeconomic policy. Moreover, the competition associated with the promotion of trade leads to a reduction in corporate and capital taxation that restrains government expenditure patterns. This is the case as the competition associated with trade openness "reduces governments' abilities to provide goods and services to their citizens" (Mosley, 2005) particularly in welfare state generosity programmes including social transfers. The reason for this observation is that, because government expenditures must be funded, his intervention in more open economies (through short-term borrowing and higher

¹² See Garrett (2001) for details on these two competing hypothesis

taxes on income and wealth) are deemed wasteful and less effective as they reduce a country's competitiveness in the international market (Garrett, 2001). For these reasons that trade openness could lead to a general decline in government expenditures in more open economies.

On the other hand, the idea of a positive relationship between trade openness and government expenditure, which is in line with the compensation hypothesis, was initially proposed by Cameron (1978)¹³. Cameron argued that, countries more open to trade are characterised by greater industrial concentration and strong unionised labour markets (through the formation of employees association), which through collective bargaining are able to demand more government expenditure in the form of social protection. However, Cameron's collective bargaining explanation for an expanding growth in government spending in OECD countries may not necessarily apply to many developing countries (particularly WAMZ countries) "due to the relative weakness of organised labour in developing countries" (Shelton, 2007).

In spite of this, Rodrik (1998), Alesina and Wacziarg (1998) and Alesina et al. (2005), provide further support for this observed positive relationship between trade openness and government expenditure. For example, in an influential paper, Rodrik (1998) documented a positive and robust relationship between trade openness and government expenditure for both low and high-income countries. Rodrik's explanation (as against Cameron's collective bargaining

¹³ Cameron (1978) in addition to this external explanation, also offers economic (as discussed under Wagner's law), fiscal, political and institutional structure explanations to government expenditure for these countries

explanation) was that “government spending plays a risk-reducing role in economies exposed to a significant amount of external risk”. For developed (developing) economies with (without) the necessary administrative capacity such external risk, which may include exchange rate, demand and supply fluctuations, is mitigated through the provision of social insurance (public work) programmes (Shonchoy, 2010). Benarroch and Pandey (2008) reconsidered the cross-sectional data of Rodrik (1998) using panel data estimation techniques, including country specific fixed-effects¹⁴. Their conclusion however, did not provide support for a positive link between trade openness and government expenditure as their Granger causality test show that higher lagged government expenditure rather reduces trade openness. Moreover, although the empirical evidence confirm that more open developing countries faces external risk, the possibility of government expenditure playing a risk-reducing role may not necessarily apply when most developing countries (particularly WAMZ countries) are considered. For this reasons, Rodrik’s hypothesis that the expansion of expenditure could be explained by increases in trade openness might not necessarily hold in WAMZ countries.

Along with trade openness is the impact of foreign aid on government expenditure¹⁵. As noted in Edwards (1993), World Bank (1998) and Remmer (2004) developing countries’ ability to receive financial assistance from bilateral and multilateral institutions routinely became conditional upon trade openness. The argument for foreign aid is that it would help developing countries augment

¹⁴ They considered 96 countries for the 1970-2000 period

¹⁵ See for example (Heller, 1975; Boone, 1996; Feyzioglu, 1998; Remmer, 2004; and Hudson and Mosley, 2008)

inadequate domestic revenue, saving and investment constraints, promote trade, and poverty reduction programmes, and improve the efficiency of domestic institutions and governance. Nonetheless, because most of foreign aid channelled to these countries goes through the public sector, its impact depends crucially on how it affects the behaviour of the receiving government (McGillivray and Morrissey, 2000). For this reason, it is expected that a relationship exists between foreign aid inflows and the expenditure patterns of aid receiving governments and critics, for example, argue that it may increase public consumption rather than its intended purpose. On the other hand, foreign aid inflows to developing countries is rather considered as too volatile and for that matter should exert negative impact on government expenditure. Due to the perceived volatility and/or fungibility of foreign aid (Feyzioglu, 1998; Remmer, 2004; Hudson and Mosley, 2008) the argument for its impact on government expenditure in developing countries is one that has not been straightforward. In particular, Hudson and Mosley (2008) note that, volatility of foreign aid reduces government expenditure, as it results in more volatile revenue inflows in developing countries. Moreover, overdependence on foreign aid has the potential to reduce domestic revenue generation (Remmer, 2004) and this effect combined with volatile foreign aid inflows should have negative impact on government expenditure.

In spite of the potential negative impact of foreign aid inflows, government expenditures in developing countries are often considered as driven by the availability of revenues, regardless of the source. For this reason, that availability of foreign aid is often considered an important determinant of government expenditure in many developing countries. Remmer (2004), for example, note that foreign aid has the potential of “systematically generating incentives and

opportunities for the expansion of government spending”. The argument here is that government expenditure, in many less developed countries, has been fuelled by foreign aid inflows from abroad (Heller, 1975) that increases the size of government by promoting rent-seeking behaviour of the political élites (Boone, 1996). Moreover, Ouattara (2006) argues that foreign aid although exert positive (negative) impact on developmental (non-developmental) government expenditure, does not in itself discourage domestic revenue generation effort of aid receiving governments. For this reason, and to the extent that WAMZ countries continue to depend on foreign aid we hypothesise that a positive relationship exist between foreign aid and government expenditure of these countries.

The extent to which democratic institutions impact on government expenditure is well emphasised in the literature (see Wildavsky, 1985; Boone, 1996; Adsera and Boix, 2002; Knack, 2004; Stasavage, 2005; Mosley, 2005). As Wildavsky (1985) and Mosley (2005) note, democratic institutions have the potential to influence government consumption, government transfer payments, public employment and taxation. Moreover, “domestic politics and institutions continue to be the most important determinants of the overall size of government”, with the effect been more pronounced in advanced democracies (Mosley, 2005).

It is important, however, to note that democracy may not only have a direct impact on government expenditure, but may also influence the extent to which both trade openness and foreign aid impact on government expenditure. As Adsera and Boix (2002) note, the working of the compensation and efficiency hypothesis, for example, are both conditional on the level of democracy, with the compensation hypothesis been more pronounced in both intermediate and

advanced democracies. This result is important as more democratic leaders may tend to spend more on public goods in order to attract political support (see Plumper and Martin, 2003). Moreover, it is more likely that the inflow of foreign aid may be more pronounced in developing countries more involved in the democratisation process. This is the case as foreign aid may serve to support the electoral process, in addition to strengthening the legislature and the judiciary (Knack, 2004). For this reason, it is hypothesised that a positive relationship exist between democracy and government expenditure.

2.3 Summary

The discussion above has provided an overview of the theoretical and empirical evidence on Wagner's law and the impact of trade openness, foreign aid and democracy on government expenditure in developing countries. The discussion clearly indicates that studies of Wagner's law that do not consider the recent patterns of trade openness, foreign aid inflows and democratisation in developing countries are likely to be biased. Moreover, although there has been some studies on Wagner's law in WAMZ countries there is virtually no evidence in the literature for all WAMZ countries that also considers the implications of these variables for Wagner's law. It is this empirical gap that this paper seeks to fill.

3. EMPIRICAL METHODOLOGY

3.1 Model specification and the data

The empirical analysis considers a model of the following specifications:

$$\log GOV_{it} = \alpha_i + \delta_i t + \beta_1 \log RGDPPC_{it} + \varepsilon_{it} \quad (1)$$

$$\log GOV_{it} = \alpha_i + \delta_i t + \beta_1 \log RGDPPC_{it} + \beta_2 \log OPEN_{it} + \beta_3 \log AID_{it} + \beta_4 DEM_{it} + \varepsilon_{it} \quad (2)$$

where $i=1,2,...N$ is the number of countries ($N=6$), $t=1,2,...T$ is the time series dimension of the data ($T=29$), GOV_{it} is the percentage share of government expenditures in real GDP, $RGDPPC_{it}$ is real per capita GDP (i.e. per capita income), $OPEN_{it}$ is real openness, AID_{it} is the percentage share of net Official Development Assistance (ODA) in real GDP, and DEM_{it} is democracy, α_i is the country-specific fixed effects, $\delta_i t$ is country-specific time trends¹⁶, ε_{it} is the error term, β_1 to β_4 are parameters to be estimated. Data on ODA is obtained from the African Development Indicators (2010). Data on DEM is obtained from Polity IV Project (Marshall and Jaggers, 2009)¹⁷. The rest of the data are obtained from the United Nations Statistics Database¹⁸. Additional information on the data are presented in Appendix A1.

3.2 Panel Cointegration Approach

3.2.1 Panel unit roots and panel cointegration tests

¹⁶ The inclusion of country-specific fixed-effects and time trends allow us to capture any country-specific omitted variables assumed to be stable in the long run

¹⁷ We have used Polity2 which ranges from -10 (strongly autocratic) to +10 (strongly democratic). We normalise the data such that it ranges from 0 (strongly autocratic) to 1 (strongly democratic)

¹⁸ All real data are measured in constant 2005 US dollars

The application of panel cointegration techniques means that the variables included in equations (1) and (2) must exhibit unit root properties and being cointegrated. For this reason, and taken cognisance of the fact that our models are plagued by cross-sectional dependence (see Appendix A2), we rely on several panel unit root and panel cointegration tests to treat this effect¹⁹. The panel unit tests due to Breitung (2000) and Breitung and Das (2005), Pesaran (2007) and Hadri (2000) are considered. The panel unit root test results reported in Appendix A3 show that all series can be treated as $I(1)$ stationary.

To establish panel cointegration we rely on two panel cointegration tests: the residual-based parametric panel t test statistic due to Pedroni(1999, 2004) and the standardised panel LR-bar test statistic due to Larsson et al. (2001). According to Orsal (2008) these two panel statistics have the best size and power properties (even in the presence of correlated errors) in heterogeneous panels if T increases faster than the N dimension of the panel. It is important to note that in implementing the two panel cointegration tests we have taken into consideration the existence of cross-sectional dependence in our models. The panel cointegration test results (see. Appendix A4) suggest no evidence of cointegration when we consider equation (1). In particular, there is not enough evidence to reject the null hypothesis of no cointegration for all tests statistics. This result is consistent with previous studies that does not support Wagner's law in WAMZ countries as discussed in section 2. However, both Pedroni (1999,

¹⁹ Readers are referred to (Breitung, 2005; Breitung and Das, 2005; Pesaran, 2007; Hadri, 2000; Pedroni, 1999, 2004; Larsson et al., 2001; Orsal, 2008) for additional details on these tests. To mitigate any impact of cross-sectional dependence the test is implemented on demeaned data as suggested in Levin et al. (2002) where appropriate

2004) and Larsson et. al (2001) panel cointegration test statistics provide evidence of cointegration when we control for the impact of trade openness, foreign aid and democracy. The panel cointegration test results suggest that a long run cointegration relationship exist between government expenditure, real income per capita, trade openness, foreign aid and democracy in WAMZ countries.

3.2.2 Estimation of panel cointegration regression

We estimate the long run coefficient of equation (2) using the group-mean panel dynamic OLS (DOLS) estimator proposed in Pedroni (2001). The panel group-mean DOLS estimator which is based on the between dimension of the panel has a number of advantages over other estimators (particularly those that are not based on the between-dimension of the panel). In particular, the estimator suffers less from small sample size distortions and appropriate in the presence of serial correlation and endogeneity of regressors. Moreover, the estimator is robust in the presence of either homogeneous or heterogeneous cointegration vectors and in the case of heterogeneous cointegration vectors, the point estimates can easily be interpreted as the mean values of the cointegration vectors (see Pedroni, 2001). In the presence of cross-sectional dependence, Pedroni (2001) suggest the inclusion of common time dummies to mitigate this effect.

Based on equation (2) the panel group-mean DOLS estimates

$$\begin{aligned} \log GOV_{it} = & \alpha_i + \delta_i t + \beta_1 \log RGDPPC_{it} + \beta_2 \log OPEN_{it} + \beta_3 \log AID_{it} + \beta_4 DEM_{it} \\ & + \sum_{j=-k_i}^{k_i} \gamma_{1ij} \Delta \log RGDPPC_{it-j} + \sum_{j=-k_i}^{k_i} \gamma_{2ij} \Delta \log OPEN_{it-j} + \sum_{j=-k_i}^{k_i} \gamma_{3ij} \Delta \log AID_{it-j} \\ & + \sum_{j=-k_i}^{k_i} \gamma_{4ij} \Delta DEM_{it-j} + \varepsilon_{it} \end{aligned}$$

(3)

where γ_{1ij} to γ_{4ij} are the parameters of the augmented lag and lead differences with

$\hat{\beta}_m = N^{-1} \sum_{i=1}^N \hat{\beta}_{mi}$, $t_{\hat{\beta}_m} = N^{-1/2} \sum_{i=1}^N t_{\hat{\beta}_{mi}}$ and $\hat{\beta}_{mi}$ the parameter estimate of the conventional time-series DOLS estimator for each member of the panel.

4. EMPIRICAL RESULTS AND DISCUSSION

Table 1 presents the panel group-mean DOLS results. As evident, the coefficient on per capita income is positive and statistically significant at the 1% level. The results clearly indicate that once trade openness, foreign aid and democracy have been catered for, Wagner's law becomes a reality for WAMZ countries. The coefficient on trade openness, though positive is statistically insignificant at any conventional level. This means that trade openness is not an important determinant of government expenditure in WAMZ countries (based on the panel estimates). For this reason, neither the compensation nor the efficiency hypothesis become important when these countries are considered.

However, not surprisingly, and considering the fact that foreign aid inflows to WAMZ countries average between 1-34% of real GDP, the coefficient on foreign aid is positive and statistically significant at the 1% level. The results, clearly indicate that, government expenditure in WAMZ countries strongly depends on

foreign aid inflows. The coefficient on democracy enters positive and statistically significant (i.e. at the 1% level). The result indicates that recent democratic advances in WAMZ countries have been crucial for (and also the most important determinant of) the overall size of the public sector in WAMZ countries.

Table 1. Panel group-mean DOLS estimates

Variables	$\log RGDP_{PPC}$	$\log OPEN$	$\log AID$	DEM
WAMZ	0.30 ^{zzz} (4.67)	0.01(0.09)	0.31 ^{zzz} (14.32)	0.36 ^{zzz} (3.88)

Note: Dependent variable $\log GOV$. In parenthesis are t-ratios. ^{zzz} denote rejection of the null hypothesis at the 1% level.

To check the robustness of the panel group-mean DOLS estimates in Table 1 we resort to an alternative estimation approach. We use 5-year averages for the 1980-2004 period (i.e. 1980-1984, 1985-1989, 1990-1994, 1995-1999, 2000-2004) and 4 year average for the 2005-2008 period of all variables . This transformation reduces potential business cycle and non-stationarity effects that may be present in the annual data (see Islam, 1995). Thus we split the data into six-time periods (i.e. $T=6$) for all six WAMZ countries. Using the transformed dataset we estimate equation (2) by dynamic OLS and IV(2SLS) that uses the Newey and West method to adjust the standard error as well as a correction for any potential serial correlation and heteroskedasticity problems. In estimating equation (2) by IV(2SLS) we use the transformed $\log RGDP_{PPC}$, $\log OPEN$, $\log AID$ and DEM lag one period ago.

This allow us to also control for any potential endogeneity problems as these may be expected. In column I and II (Table 2) we respectively report the dynamic

OLS and IV(2SLS) regression results with Newey-West adjusted standard errors. In all cases, the results clearly confirms the panel group-mean DOLS estimates with democracy remaining the most important determinant of the public sector in WAMZ countries over the study period.

Table 2. Dynamic OLS and IV(2SLS) estimates

Variables	I	II
$\log RGDP_{PC}$	0.451*** (0.106)	0.473z (0.245)
$\log OPEN$	0.218 (0.209)	0.202 (0.261)
$\log AID$	0.484zzz (0.045)	0.509zzz (0.077)
DEM	0.558zzz (0.191)	1.081z (0.585)
Wu-Hausman test	N/A	1.700 [0.1896]

Note: Dependent variable $\log GOV$. zzz and z denote rejection of the null hypothesis at the 1% and 10% level respectively. In parenthesis of regression coefficients are Newey-West heteroskedasticity and autocorrelation consistent standard errors. In parenthesis of Wu-Hausman test of exogeneity of instruments are robust p-values.

However, the results from the panel estimates does not necessarily mean that similar conclusions can be drawn for individual WAMZ countries. For this reason, we present in Table 3 the country-specific group-mean estimates. As expected, the impact of per capita income, trade openness, foreign aid and democracy varies across countries. With the exception of Liberia where government expenditure and per capita income are not significantly related, per capita income has statistically significant negative impact on government expenditure in Guinea (consistent with Wildavsky's hypothesis), but statistically

significant positive impact on government expenditure in all other countries. The results implies that Wagner's law has indeed happened in The Gambia, Ghana, Nigeria and Sierra Leone.

Table 3. Panel group-mean DOLS estimates (country-specific results)

Variables	logRGDPPC	logOPEN	logAID	DEM
The Gambia	2.96***(5.55)	-0.49z(-1.66)	0.35zz(2.40)	0.94***(4.46)
Ghana	3.30***(5.65)	-1.46***(-4.72)	1.09zzz(12.97)	-1.92zzz(-3.25)
Guinea	-1.55zzz(-8.06)	-0.14(-0.60)	-0.17zzz(-3.04)	0.76*** (3.19)
Liberia	0.03(0.53)	0.08(0.97)	0.26*** (14.72)	-0.86***(-4.43)
Nigeria	0.66*** (3.50)	0.76* (1.69)	0.53zzz(7.58)	0.38zzz(2.85)
Sierra Leone	1.06*** (4.29)	1.24zzz(4.54)	0.09(0.45)	2.17*** (6.67)

Note: Dependent variable logGOV. In parenthesis are *t*-ratios. zzz, zz and z denote rejection of the null hypothesis at the 1%, 5% and 10% level respectively.

The coefficient on trade openness enters negative for The Gambia, Ghana and Guinea, and positive for Liberia, Nigeria and Sierra Leone, but statistically insignificant for the case of Guinea and Liberia. The result implies that Rodrik's hypothesis is supported in Nigeria and Sierra Leone (but not all other WAMZ countries). We also find statistically significant positive impact of foreign aid on government expenditure in The Gambia, Ghana, Liberia and Nigeria, negative and statistically significant impact in Guinea, but no relationship in Sierra Leone. Democracy is the only variable that significantly explain government expenditure in all WAMZ countries. Democracy increases government expenditure in The Gambia, Guinea, Nigeria and Sierra Leone whilst it reduces

government expenditure in Ghana and Liberia. Overall, the country-level results reveals that per capita income, trade openness, foreign aid and democracy have important implications for government expenditure in WAMZ countries, although their magnitude and level of statistical significance varies across all six WAMZ countries.

5. SUMMARY, POLICY IMPLICATIONS AND CONCLUSIONS

This paper has analysed the implications of trade openness, foreign aid and democracy for Wagner's law in WAMZ countries. We have shown that no long run cointegration relationship exists between government expenditure and per capita income (and hence no support for Wagner's law). However, we have emphasised that the study of Wagner's law in developing countries (and in particular WAMZ countries) should incorporate into the analysis the potential impact of trade openness, foreign aid and democracy considering the implications that these variables have for government expenditure. Therefore, once we have controlled for the potential impact of these variables we find not only a long run cointegration relationship between government expenditure, per capita income, trade openness, foreign aid and democracy, but a relationship that also reveals that Wagner's law has indeed happened in WAMZ countries. Overall, our panel data results reveal that, per capita income, foreign aid and democracy have the potential to increase the size of the public sector in WAMZ countries in the long run.

Based on these results, we believe that the immediate take-off of the ECO could induce fiscal indiscipline as member countries' willingness to ensure fiscal discipline is not guaranteed. Although, monetary union has the potential to provide an agency of restraint over fiscal policies by preventing "public expenditure from outpacing public revenue" (Collier, 1991) - due in part because the influence of any single national authority is weakened in a monetary union (De Grauwe, 1996) - and/or pave way for credible commitment to sound macroeconomic policies (Guillaume and Stasavage, 2000; Beetsma and Bovenberg, 2001), it may not be enough to ensure fiscal discipline in WAMZ countries. This will arise due to the possibility for excessive public debt accumulation (Beetsma and Bovenberg, 1999; 2002) and the incentives available for governments to undertake suboptimal expansionary macroeconomic policies, particularly during election years. This is important because, as it currently stands, not enough institutional structures have been put in place to ensure innovative and efficient ways of domestic revenue generation to enable government revenue to keep pace with its expenditure. Udoh (2008), for example, note that government revenue generation still remain non-optimal in addressing fiscal deficit problems in WAMZ countries. However, as Iyare et al. (2005) note, if government expenditure expands but government revenue leads, then fiscal discipline will automatically follow. With WAMZ countries still characterised by weak monetary (coupled with their inability to satisfy the single digit inflation criteria) and fiscal institutions, it is recommended that institutional structures on innovative and efficient ways of domestic revenue generation are explicitly implemented in all WAMZ countries. These institutional structures if implemented would not only help reduce overdependence on foreign aid inflows, but should also ensure fiscal policy coordination that would be

necessary to complement what the monetary union could potentially provide so far as fiscal discipline is concerned.

Accordingly, we conclude the paper by reiterating that, if WAMZ countries are to meet the fiscal convergence criteria and ensure the sustainability of a single currency area (and to the extent that per capita income, foreign aid and democracy have the potential to increase the size of the public sector in the long run), explicit sets of fiscal restraint on the national authorities and innovative and efficient ways of domestic revenue generation necessary to ensure that government revenue keep pace with its expenditure should be what policy reforms should target.

Appendix A1. Averages of country-specific indicators

Table 4 present the list of WAMZ countries and their respective averages (1980-2008) of government expenditure share in real GDP, real per capita GDP, trade openness ratio, foreign aid share in real GDP and democracy index. As evident, the averages of these indicators varies across countries. For instance, the richest economy in WAMZ (also evident by its real per capita GDP)²⁰, Nigeria has the smallest public sector as well as the share of aid in real GDP. On the other hand, the public sector is biggest in Ghana, followed by the Gambia. Liberia has the highest trade openness ratio and aid share in real GDP while democracy index is highest in the Gambia with the poorest economy Guinea having the lowest

²⁰ Based on World Bank classification of economies (January, 2011), Nigeria is a lower-middle income economy. All WAMZ countries are low income economies

democracy index. Overall, the share of government expenditure in real GDP of WAMZ countries average between 3-17%.

Table 4. Country-specific indicators (Averages, 1980-2008)

Countries	Government share in real GDP	Real per capita GDP	Trade openness ratio	Aid share in real GDP	Democracy index
The Gambia	0.16	447.705	0.43	0.10	0.54
Ghana	0.17	405.950	0.80	0.09	0.49
Guinea	0.09	281.538	0.71	0.08	0.29
Liberia	0.14	350.627	0.83	0.34	0.44
Nigeria	0.03	620.111	0.60	0.01	0.46
Sierra Leone	0.09	341.403	0.47	0.14	0.39
WAMZ	0.11	407.889	0.63	0.13	0.44

Source: Polity IV Project (Marshall and Jaggers, 2009), African Development Indicators (2010) and United Nations Statistical Database (2011).

Appendix A2. Test for cross-sectional dependence

In estimating equation (1) and (2) particular attention regarding the presence of cross-sectional dependence, that results from unobserved common shocks, need to be taken into account as this provides some indication of model misspecification (see Phillips and Sul, 2003; De Hoyos and Sarafidis, 2006; Sarafidis and Robertson, 2006; Sarafidis and Wansbeek, 2010). This is important because as Driscoll and Kraay (1998) note, the standard errors associated with panel data models with cross-sectional dependence are inconsistent, although the estimated parameters may be consistent (Driscoll and Kraay, 1998). For this

reason, we first determine if equation (1) and (2) are plagued by cross-sectional dependence. The Breusch-Pagan Lagrange multiplier test statistic proposed by Breusch and Pagan (1980) appropriate for $T > N$ panels is employed. The test statistic follow a chi-squared(q), where q is computed as $Nz(N-1)/2$, under the null hypothesis of cross-sectional independence. The test results reported in Table 5 suggest that there is enough evidence to reject the null hypothesis of cross-sectional independence for both equations.

Table 5. Test for cross-sectional dependence

Equation	(1)	(2)
Test statistic	89.274 ^{zzz}	60.766 ^{***}

Note: zzz denote statistical significance at 1% level

Appendix A3. Panel unit root tests

All panel unit root test results reported in Table 6 include deterministic time trend and are robust in the presence of cross-sectional dependence. The null hypothesis of both Breitung and Pesaran tests is that the series have unit root against the alternative hypothesis that the series are stationary. Hadri test reverses the null and the alternative hypothesis where the null hypothesis assumes that all panels are stationary against the alternative hypothesis that some panels have unit roots. This allow us to further confirm the Breitung and Pesaran test that the series are nonstationary.

Table 6. Panel unit root test results

Variables	Levels			First difference	
	Breitung	Pesaran	Hadri	Breitung	Pesaran
logGOV	2.001	-1.754	4.865***	-3.359zzz	-4.202zzz
logRGDPPC	-0.373	-2.019	5.147zzz	-2.141zz	-3.790zzz
logOPEN	1.598	-2.552	5.781zzz	-4.302zzz	-3.272zzz
logAID	-0.277	-2.069	2.169**	-3.251zzz	-4.185zzz
DEM	-1.023	-1.213	5.436***	-5.709zzz	-3.200zz

Note: zzz, zz indicate statistical significance at the 1%, 5% level respectively.

Appendix A4.

Pedroni's parametric panel t -statistic is appropriate as it corrects for bias introduced by potentially endogenous regressors and robust in heterogeneous panel. Specifically, we compute the parametric panel t -statistic as:

$$Z_t^* \equiv \left(\hat{S}^{*2} \sum_{i=1}^N \sum_{t=1}^T \hat{L}_{11i}^{-2} \hat{\varepsilon}_{i,t-1}^{*2} \right)^{-1/2} \sum_{i=1}^N \sum_{t=1}^T \hat{L}_{11i}^{-2} \hat{\varepsilon}_{i,t-1}^* \Delta \hat{\varepsilon}_{it}^* \quad (4)$$

where \hat{L}_{11i} is the long run variance, $\hat{\varepsilon}_{it}$ is the estimated residuals from the equation

(1) and (2). The term \hat{S}^{*2} is computed as $\hat{S}^{*2} \equiv \frac{1}{N} \sum_{i=1}^N \hat{s}_i^{*2}$ where \hat{s}_i^{*2} is the simple

variance computed from the residuals $(\hat{\varphi}_{it}^*)$ of the expression

$\hat{\varepsilon}_{it} = \hat{\rho}_i \hat{\varepsilon}_{i,t-1} + \sum_{k=1}^{K_i} \hat{\rho}_{ik} \Delta \hat{\varepsilon}_{i,t-k} + \hat{\varphi}_{it}^*$ with K denoting the truncation lag permitted to vary by individual countries.

Larsson et al. (2001) uses the maximum likelihood procedure to implement a standardised LR-bar statistic to test the existence of common panel cointegrating rank for panels. Specifically, the test compute:

$$Y_{\overline{LR}} = \frac{\sqrt{N} (\overline{LR} - E(Z_k))}{\sqrt{Var(Z_k)}} \quad (5)$$

where $Y_{\overline{LR}}$ is the standardised LR-bar, \overline{LR} is the average of the individual cointegrating rank trace test statistics for each country of the panel, $E(Z_k)$ and $Var(Z_k)$ are the mean and variance of the asymptotic trace statistic respectively. For the model we use (i.e. the model with constant and trend) the asymptotic values of $E(Z_k)$ and $Var(Z_k)$ are based on Hlouskova and Wagner (2009a, 2009b). The null hypothesis is that all N countries in the panel have a common cointegrating rank, against the alternative that all N countries in the panel have a higher rank. The right tail of the standard normal distribution is used to reject the null hypothesis of no cointegration. However, because Johansen trace statistics often rejects the null hypothesis in small samples, we also report results based on adjusted country-specific trace statistics using small-sample correction factor suggested in Reinsel and Ahn (1992) and applied in Herzer (2010).

Table 7. Panel cointegration test results

Variables	I	II
Pedroni (1999, 2004) panel cointegration test statistic		
Panel t	1.059	2.535zz

Larsson et al. (2001) panel cointegration test statistic		
Standardised LR-bar (A)	0.388	10.245 ^{zzz}
Standardised LR-bar (B)	-0.352	5.941 ^{zzz}

Note: ^{zzz} and ^{zz} denote rejection of the null hypothesis of no cointegration at 1% and 5% level. Standardised LR-bar (B) are based on small-sample adjusted trace statistics. The optimal lags are based on Schwarz information criterion

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