The evolution of state capacity in West Africa

- fiscal volatility and economic development in Benin, Côte d'Ivoire, Niger and Senegal 1850-2010

Paper presented at *AEHW2015 - The 10th New Frontiers in African Economic History Workshop, 30-31 October, 2015 - Wageningen University*

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Abstract

The once gloomy view of the African state is now at last changing for the better, why it seems opportune to reassess its performance from a long-term perspective. This paper focuses on fiscal capacity, which is one of the most widely used indicators of the overall strength of the state. We study the volatility of and the relationship between fiscal capacity and economic development in both the long- and the short-run in a set of francophone West African countries. We document a secular fall in volatility in tax revenue and economic output starting well into the colonial period for both France and its former colonies. Using cointegration modelling we find a long-term relationship between tax revenue and economic relationship for Côte d'Ivoire and Senegal and a short-term relationship for most of the countries. The paper also makes some initial attempts to discuss economic, political and fiscal factors that may influence the patterns observed.

Introduction

The image often conveyed of the African state since independence can be liked to a distorted expressionistic painting with neo-patrimonial characteristics rather than a classicist Weberian ideal. The title of Van de Walle's (2001) widely read book "*African Economies and the Politics of Permanent Crisis*" from 2001 is telling. Only recently has this gloomy view of Africa been changing for the better as the economic performance of the continent has improved. This creates a good opportunity to look back at the full history of African states and reassess their performance. This paper starts from the notion of fiscal capacity, which is one of the most widely used indicators of the overall strength of the state (Fukuyama 2013), and studies in detail how tax revenues in a set of francophone African countries have behaved and related to economic and political factors.

In spite of recent improvements, fiscal systems in many developing countries remain less developed compared to developed countries, both in terms the levels and stability of tax revenues. Given the fundamental role of taxation in the functioning of the state (North 1981), this is a sign of state weakness, which inhibits the ability of the state to finance core state functions, support development efforts and eventually reach sustainable development goals (United Nations 2015). The explanations for weak tax systems can be found in a confluence of economic, political and social factors with historical and, in the case of many developing countries, colonial roots (Mkandawire 2010; Besley and Persson 2013; Bird and Das-Gupta 2014). One effect of this weakness is that fiscal policy in developing countries is more pro-cyclical in relation to economic developments and shocks than in developed countries (Gavin and Perotti 1997; Kaminsky, Reinhart, and Végh 2004; Talvi and Végh 2005; Afonso, Agnello, and Furceri 2010). This volatility has considerable welfare costs and has a negative impact on long-term growth prospects (Carmignani 2010).

Understanding the roots and consequences of weak fiscal capacity in developing countries is thus a central element of development studies. It involves studying both the long-term and short-term relationship between fiscal systems and economic, political and social factors. This paper adds to the literature on fiscal capacity by studying the relationship between fiscal revenues and economic developments both in the long- and the short-term in four francophone West African countries and France until present day. The more specific research questions are:

- Is there a long-term relationship between fiscal revenues and economic development?
- How does the short-term volatility and responsiveness to economic and trade shocks compare between the countries and time periods? Does pro-cyclicality increase or decrease?
- Is there a difference in the development of fiscal capacity before and after independence?
- Which factors can possibly increase our understanding of differences between countries and changes over time in the volatility and relationship between fiscal capacity and economic development?

The analysis relies on econometric analysis of a unique set of recently assembled time-series of annual data on fiscal outcomes and economic variables covering a period of up to 150 years for modern-day Benin, Côte d'Ivoire, Niger and Senegal.[1] In addition, the same data has been collect for France as a comparator.

Most analyses of the relationship between taxation and economic output cover limited periods of time. By relying on long time-series we can get a better understanding of the long-term dynamics of fiscal capacity, instead of presuming a largely static situation with stable developed countries and volatile developing countries. In addition, although there has recently been increasing interest in the study of fiscal outcomes in Africa, we are not aware of previous attempts to combine analysis of fiscal

[1] See Andersson 2015 for a presentation of the data, methods and sources

volatility and the relationship between fiscal outcomes and economic development in both the long-term and short-term for the continent. The four countries we study are intricately linked by a common colonial past and post-colonial inter-relationship, why we are able for control for a range of institutional factors in particular pertaining to legal and fiscal systems, monetary policy and regional cooperation. At the same time the four countries are different in several fundamental respects in terms of geography, climate, population patterns, economic structures and political developments after independence. In addition, we are contrasting with a "developed" country, which allows us to study the divergence between outcomes in West Africa and Europe before and after independence.

The rest of the paper is organized as follows. We first provide a brief review of different strands of literature related to fiscal capacity, development and vulnerability with a particular focus on Africa. The following section explains our method and data followed by a presentation of the key results. The paper ends with some conclusions and discussion.

Fiscal capacity, development and volatility

This paper relates to several strands of literature. There is a well-established literature on the role of taxation in the historical development of the state and its capacity. Studies of state formation in the West show how fiscal capacity emerges in a long-term gradual process together with the expansion of the market economy (Webber and Wildavsky 1985; Tilly 1992; Hough and Grier 2015) and from the 19th century the modern welfare state (Lindert 2004; Piketty 2014: 756-765). This highlights the interplay between persistence and change that characterize the development of fiscal capacity (Bird and Zolt 2005).

The formation of the state and tax systems in Africa differed in many important respects from that of the West. The modern European state structure was transplanted by the colonisers in a very short period of time on local contexts that differed considerably from the European situation (Badie 1992). The outcome of this process of transplantation is hotly debated, but it is difficult to deny that there were transformational and lasting consequences in terms of the establishment of state borders, nation states and institutions in Africa (Young 1994; Herbst 2000). Financial constraints, extractive policies, resistance and low levels of economic diversification all contributed to keeping down the size of the state to the extent that African governments have been labelled 'gatekeeper states' focusing on controlling external flows (Cooper 2002). These weak structures were taken over by independent governments. There is a large literature that analyses how a confrontation between traditional clientelistic networks mixed with Weberian formal structures to create the neo-patrimonial African state after independence (van de Walle 2001; Bayart 1989). Within these overall patterns local contexts mattered. A rapidly growing literature on African colonial taxation shows that local economic conditions and settlement patterns were important determinants of the level and types of taxation that were established (Cogneau, Dupraz, and Mesplé-Somps 2015; Frankema and van Waijenburg 2014;

Gardner 2013; Frankema 2011). It is now strongly argued that pre-colonial and colonial structures have an impact on contemporary institutions and outcomes (Acemoglu, Johnson, and Robinson 2001; La Porta, Lopez-de-Silanes, and Shleifer 2008; Bolt and Bezemer 2009; Huillery 2009; Huillery 2011), including on fiscal outcomes (Mkandawire 2010; Feger and Asafu-Adjaye 2014), even though such studies relies on econometric correlations between points in times that are far apart (thus "compressing history") and the mechanisms of persistence are not always well explained (Austin 2008).

General models have been proposed to explain the evolution of fiscal capacity over time in relation to economic and political factors (Besley and Persson 2013). Both historical studies and cross-sectional comparisons indicate that the association between the three factors is in general positive - as countries grow richer and democratize they tend to increase the tax level and diversify the tax mix. Lack of economic development and political openness are thus likely to be important explanations to why developing countries generally have significantly lower fiscal capacity than developed economies. Today taxes make up around 17% of GDP in developing countries compared to 33% in industrialised countries and these levels have been largely unchanged since the 1970s. A general characteristic of developing countries is reliance on indirect taxes, such as trade taxes, while personal income and social security taxes are less developed. However, each country is unique and its level of tax revenue depends on both demand-side and supply-side determinants such as GDP per capita, the non-agricultural share of GDP, quality of governance and inequality (Bird and Das-Gupta 2014).

Fiscal capacity in Africa seems to be on par with other developing countries. Africa's non-resource tax intake represented 15% of GDP in 2010 and has been largely unchanged since the 1980's (Mansour 2014).[2] While African tax revenues are commonly said to be insufficient to provide necessary public services, the tax effort for many African countries actually exceeds what would be expected given structural characteristics (OECD and African Development Bank 2010: 95). African countries are thus faced with the considerable challenge of how to increase the fiscal capacity, given that the tax base may not be able to support this.

The fiscal revenues of developing countries are not only lower than in developed countries; they are also generally more volatile. This is shown in the literature that studies the impact of economic shocks and cycles on fiscal outcomes and public policy more generally and whether fiscal policy is pro-, counter- or acyclical. This kind of research focuses on the responsiveness and vulnerability of fiscal systems and has provided great inspiration to this paper. We argue that fiscal capacity is not only a matter of levels of tax revenue, but also the degree of volatility of these revenues.

It has been shown that fiscal systems are generally more pro-cyclical in developing countries than in developed countries (Gavin and Perotti 1997; Kaminsky, Reinhart, and Végh 2004). A central

[2] If resource taxes are included the African tax to GDP ratio increased from 17.5% in 1980 to 22% in 2010 (Mansour 2014).

explanation is the volatility of the tax base of developing countries together with political instability. It is argued that corrupt democratic regimes are subject to pro-cyclical fiscal policies because of widespread pressure group politics and weak institutions (Talvi and Végh 2005). Evidence to the contrary is the case of Spain for which it has been shown that the pro-cyclical fiscal bias of the autocratic regime shifted to a more countercyclical stance with democracy. It should also be noted that this was a process that started before democratization (Battilossi, Escario, and Foreman-Peck 2013). Diallo (2009) found a positive association between democratic institutions and countercyclical fiscal policies for a panel of African countries. Overall, however, Carmignani (2010) finds that African fiscal policy tends to be pro-cyclical, which he ascribes to the limited fiscal space of fiscal authorities:

> "*Low incomes (and hence a small tax base) coupled with a large informal sector and inefficient tax administrations imply a high dependence of African countries on external resources to finance expenditure. The pro-cyclical pattern of external resources then makes it very difficult for the average African country to run fiscal policy counter-cyclically*." (p. 262)

Fiscal space in Africa is further limited by the fiscal convergence criteria imposed by regional economic communities, e.g. in the case of the CFA Zone for the four countries studied in this paper (Adedeji and Williams 2007). The fiscal instability in Africa has been shown to have considerable welfare costs and a negative impact on long-term growth prospects (Carmignani 2010). It leads to instability of public investment and government consumption and reduced levels of public investment, with the establishment of domestic indirect taxation, such as VAT, having stabilizing effects (Ebeke and Ehrhart 2012). Pro-cyclical public investment, in particular, has also been found to be associated with higher income inequality in Africa (Ouedraogo 2015).

Instead of just focusing on responsiveness another approach is to decompose fiscal policy into fiscal persistence, responsiveness and discretion and study all these three dimensions simultaneously. This type of analysis shows that for most countries fiscal policy is more persistent than responsive and that a range of macroeconomic, institutional and geographic variables explain country variation in fiscal policy. Developing countries are more responsive, which can be explained by government size, government effectiveness and special interests (Afonso, Agnello, and Furceri 2010). In one of the rare studies focusing on a particular African country, Ghana, government revenue appears to be more responsive to output conditions than government spending, which is more persistent (Loloh 2011). Adeji and Williams (2007) report that the fiscal balance of the countries in the CFA Zone is characterized by both persistence and responsiveness to terms of trade shocks.

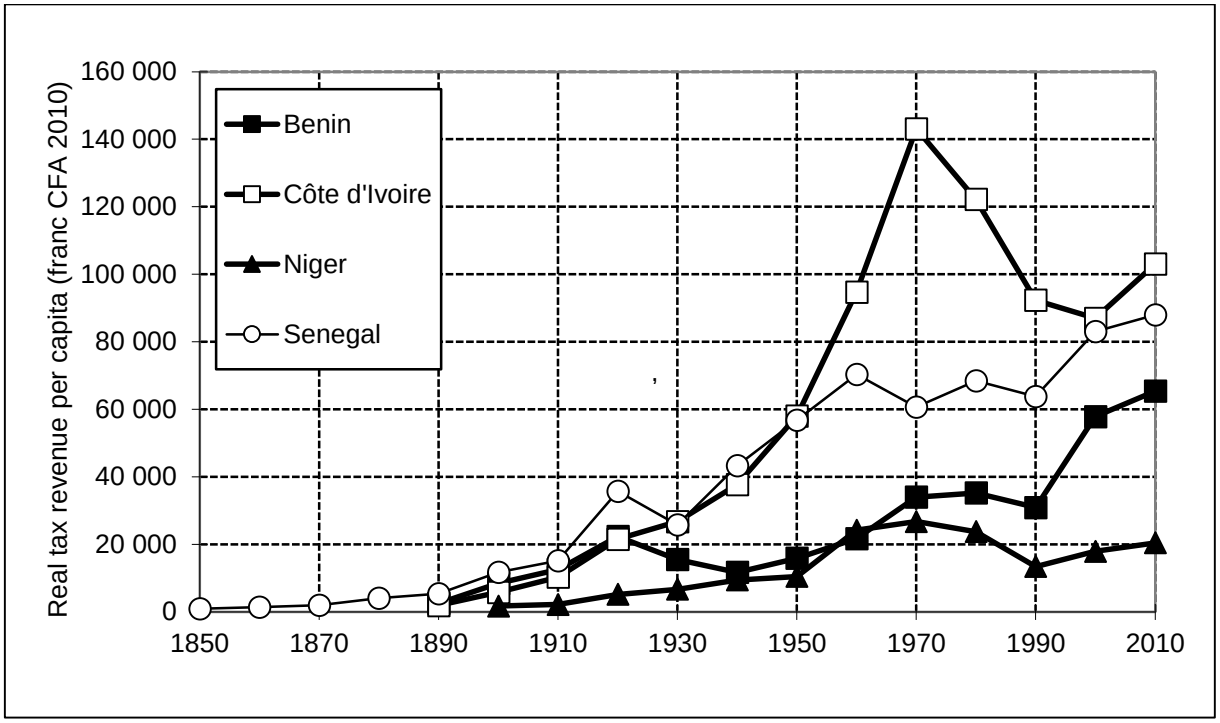
To sum up the discussion this far, studies of fiscal capacity need to take into account both the level and the volatility of tax revenues. African countries are considered to be in a worse position on both these accounts. In the long run there is a great deal of persistence in tax outcomes, but the general pattern is that economic development favours fiscal capacity and that the nature of the political regime is

influential, with a possibly favourable effect of more democratic regimes. In the short run the weakness and the volatility of the tax base (due to e.g. dependence on a few commodity exports) is an important factor in explaining fiscal volatility in developing and African countries alike.

Most of the literature addressing empirically the relationship between fiscal outcomes and economic and fiscal factors is concerned with explanations and consequences of short term fiscal volatility. The study period rarely extends further back in time than the 1980/1990s. This gives rise to two major limitations. First, it is not possible to study the historical evolution of fiscal capacity and how it relates to the process of state building and economic development. This long-term perspective is of key concern of this paper. Second, relying on short time-periods severely limits the possibility to compare fiscal capacity between major historical time-periods and political regimes, such as developments during the pre-World War II period or comparisons between the contemporary and colonial periods. In particular, in studies using contemporary data there is a risk of cementing a developing-developed country dichotomy that does not acknowledge that developed countries also went through an arduous process of state formation under which tax levels and volatility were considerably weaker than today (Hough and Grier 2015). A long-term perspective makes it possible to detect structural breaks in the nature of fiscal capacity and points of divergence between different countries.

The focus of this paper is on the long- and short-run relationship between fiscal revenues and economic output, keeping major regime shifts in mind. In a previous paper we have documented a long-term increase in tax levels and diversification of the tax mix in all the four countries (Andersson 2015). Figure 1 shows that these has been significant persistence in tax outcomes in that the relative position between the countries has rarely changed, but at the same time each country has followed its own unique pathway sometimes characterized by rapid change as in the case of Côte d'Ivoire. The relationship between tax outcomes and economic variables for each country and time period is an empirical question. For example, Carmignani (2010) classifies Côte d'Ivoire as pro-cyclical, and Benin and Senegal as weakly pro-cyclical (Niger is not included) based on an analysis of the cyclical behavior of government consumption from 1960 onwards, but this does not necessarily tell us anything about the behavior of tax revenue, which is generally less prone to discretion than government consumption. However, given that tax levels are increasing, we would also expect volatility of tax revenues to fall for all the four countries, more so for Côte d'Ivoire and Senegal than Benin and Niger, since the former pair of countries had more developed economies and institutions than the latter since well into the colonial period. We would in general expect a much higher degree of stability of fiscal revenue in that case of France under the assumption that the tax levels are significantly higher and that the tax base more stable compared to the African countries.

Figure 1 Real total tax revenue per capita 1850-2010



Source: Andersson (2015). Note: The amounts take into account price differences between the countries and are expressed in the price level of Senegal in 2010.

Method and data

Tax revenue is frequently used as an indicator of state capacity, which is the state's ability "… *make and enforce rules, and to deliver services*" (Fukuyama 2013: 350). It is thus considered a measure of the executive, or infrastructural, power of the state, as distinct from the political regime (Soifer 2008). In the state capacity literature the main measures used for fiscal capacity consider the relative level (e.g. compared to GDP) and composition (e.g. share of direct taxes) of tax revenue (see e.g. Besley and Persson 2014). We argue that fiscal volatility can provide a useful and complementary measure of fiscal capacity under the assumption that high (low) volatility can be associated with low (high) state power. This opens up for two types of analysis. The first focuses on the long-term association between tax outcomes and economic development. The second focuses on the short-term variation between tax outcomes and economic shocks.

A good starting point for thinking of these relationships is a simple model of tax outcomes proposed by Kaminsky, Reinhart, and Végh (2004), where,

*Tax outcome = Tax base * tax rate*

Tax outcomes are thus a function of the tax base, which is the economy's output, and the tax rate, which is the fiscal policy set by discretion of the government. This basic model provides the bases of

the literature on cyclicality of fiscal policy. That literature is primarily interested in assessing how governments use fiscal policy to respond to shocks in the short-term. A countercyclical fiscal policy tends to stabilise the business cycle and involves higher (lower) tax rates in good (bad) times. A pro-cyclical fiscal policy tends to reinforce the business cycle and involves lower (higher) tax rates in good (bad) times. An acyclical fiscal policy does not influence the business cycle and involves constant tax rates over the business cycle. The challenge of this type of analysis is that volatility of tax outcomes is the net effect of both variations in the tax base and the changes of the tax rates determined by governments. Separating these two effects are difficult since output and fiscal policies are determined simultaneously (Fatás and Mihov 2003).

There is no consensus in the literature on how to measure the discretionary component of fiscal policy. Separating discretionary and non-discretionary effects would require knowledge of a benchmark and the elasticities of tax outcomes to economic output, which are difficult to obtain, in particular for developing countries (Gavin and Perotti 1997: 24).[3] Blanchard (1990) proposes using the output of the previous year as a benchmark. Building on this idea and the work of Fatás and Mihov (2003), Afonso, Agnello, and Furceri (2010) suggest a simple econometric framework for simultaneously analyzing three aspects of fiscal policy: responsiveness, persistence and discretion. Responsiveness is measured by the elasticity of government revenue to output of the same year. Persistence is measured by the degree of dependence of current revenue on its own past developments. Discretion is the consequence of exogenous political processes or extraordinary non-economic circumstances and is measured by the standard deviation of the residuals in the regression. This approach has merits for short time periods (in this case 1980-2007).

However, since our aim is to explore both long-term and short-term relationships we use cointegration models to study the interaction between tax outcomes and economic output. In addition, the way cointegration model measures these relationships has pure economic implications. An econometric advantage of the use of cointegration models stems from the search for the most parsimonious model that fits the data. VAR modelling is also based on the former but produces biased estimates if there is cointegration between the variables. In addition to the cointegration models we calculate simple measures of volatility of tax outcomes and economic output. Volatility is calculated by taking the standard deviation of log changes of real quantities over a specific time period (see e.g. Gavin and Perotti 1997: 23).

The main data used comes from both colonial and contemporary sources. These are specified in Annex 1. The full database covers the following countries and periods: Benin (1890-2010), Côte d'Ivoire (1893-2010), Niger (1903-2010), Senegal (1856-2010), and France (1896-2010). Since GDP data is

[3] Kaminsky, Reinhart, and Végh (2004) suggest that government consumption or the tax base are better measures of the cyclical behaviour of fiscal policy than tax outcomes. See Albuquerque (2011) for an application

missing for the African countries before 1960 we rely on trade data as a proxy for economic output for that period.

Results

Volatility

Table 1 presents the volatility of tax revenues and economic output for the five countries for the full series of each country and split by 1960, which was the year of independence from France for all the African countries.

Table 1 Volatility of real tax revenue and economic output

		Full period	Before 1960	From 1960	Diff
Total tax revenue	Benin	20%	23%	14%	-9%
	Côte d'Ivoire	15%	18%	10%	-7%
	Niger	15%	16%	12%	-4%
	Senegal	17%	19%	9%	-10%
	France	11%	15%	3%	-12%
Direct taxes	Benin	43%	53%	24%	-29%
	Côte d'Ivoire	34%	42%	17%	-25%
	Niger	18%	15%	21%	5%
	Senegal	25%	29%	13%	-16%
	France	12%	16%	4%	-12%
Trade	Benin	25%	28%	20%	-8%
	Côte d'Ivoire	21%	27%	8%	-19%
	Niger	27%	42%	13%	-29%
	Senegal	21%	24%	14%	-10%
	France	23%	31%	7%	-24%
GDP	Benin	-	-	3%	-
	Côte d'Ivoire	-	-	5%	-
	Niger	-	-	6%	-
	Senegal	-	-	4%	-
	France	10%	13%	2%	-10%

Note: Measured by the standard deviation of the first differences of the log real values. Both total tax revenue and direct taxes for France include social contributions

Several observations can be made from these results:

- The volatility of both tax revenue and economic output was in almost all cases (except direct taxes in Niger) lower after 1960 than before 1960.
- As expected tax revenue was much more volatile in the African countries than in France in the period from 1960. The difference in volatility of economic output is much smaller. The most surprising finding is perhaps that the volatilities of both total tax revenue and trade in France

were at similar levels as in the African countries before 1960. French direct taxes, however, were more stable.

- There were also considerable differences between the African countries. The tax revenues of the more developed countries Côte d'Ivoire and Senegal were characterized by lower volatility at least from 1960. Given the boom and bust nature of Côte d'Ivoire's economy in the 1960s-1980s this may deserve an explanations. We will come back to this issue below.

The question then is if there was a break around independence? More detailed analysis of the temporal pattern reveals that if there was a break it came well into the colonial period. This is shown in the diagram in Annex 4 that shows the volatility per decade. A falling trend in tax revenue is clearly identified for Côte d'Ivoire and Senegal already in the 1950s, with Benin also moving to a lower level of volatility around this time. The main contrast to France is that the 1930s was a very stable period for France and after the war France regained stability in the 1950s.

Cointegration

We perform the tests for cointegration between fiscal capacity (share of direct taxes in total taxes) and measures of economic output (real exports and real GDP). The share of direct taxes in total taxes is often used as a central measure of fiscal capacity. The time-series on direct tax as share of total taxes and real trade are presented in Annex 2.

We proceed in the following way. First, we perform three unit root tests – the augmented Dickey and Fuller (ADF) test, the Phillips and Perron (PP) test, and the Kwiatkowski et al test (KPSS). Second, for all vector autoregressive (VAR) models, including those that underlie cointegration models, we select optimal lag length using the Akaike Information Criterion. Finally, we test for cointegration using the methodology of Johansen, Mosconi, and Nielsen (2000). Based on the results, we estimate cointegration models if cointegration exists between the variables and vector autoregressive models if it does not. We repeat these procedures for the share of direct taxes in total taxes and log of real export, and for the share of direct taxes in total taxes and log of real GDP.

From the unit root tests for the share of direct taxes in total taxes, we can conclude that the series contain unit root in level but not in first differences. For all countries and both sub-periods, both the ADF and PP tests and frequently the KPSS test show that the series are non-stationary and that first differencing eliminates this problem. Similar conclusions can be drawn for the logs and first differences of real exports, except for Senegal in 1856-1959 that is likely to be trend stationary. Log levels stationarity can be rejected for real GDP, but not first differences stationarity. We therefore conclude that all variables are I(1).

Assuming that all variables are I(1), we perform the tests for cointegration between the measures of fiscal capacity (share of direct taxes in total taxes) and economic performance (real exports and real GDP). The cointegration analysis is based on the simultaneous equations:

$$\Delta Output_t = \mu_1 \Delta Output_{t-1} + \mu_2 \Delta Tax_{t-1} + \alpha_1 (Output_{t-1} - \beta_1 Tax_{t-1} - \varphi_1) + \varepsilon_t, \quad (1)$$

$$\Delta Tax_t = \mu_3 \Delta Output_{t-1} + \mu_4 \Delta Tax_{t-1} + \alpha_2 (Output_{t-1} - \beta_2 Tax_{t-1} - \varphi_2) + \nu_t, \quad (2)$$

where $\Delta Output_t$ and $\Delta Output_{t-1}$ denote first differences of logged output (real exports or real GDP) in current year and lagged one year; ΔTax_t and ΔTax_{t-1} denote first differences of share of direct taxes in total taxes current and lagged one year; $Output_t$ and $Output_{t-1}$ are log-level of output current and lagged one year, Tax_t and Tax_{t-1} are share of direct in total taxes current and lagged one year, φ_1 and φ_2 are constants in cointegration (long-term) equations, ε_t and ν_t are errors. In the models, as we normalize on the output and therefore focus on the output from the model (1), β_1 refers to the long-run effect of output on fiscal capacity and α_1 is the adjustment effect, that measures how much of the disequilibrium is corrected within a year. Coefficients μ before first differences denote multiplier, or short-run, effects, which measure the immediate impact a change in one variable will have on the other. We specify the models as required by the estimation procedure; that is by adding more lags to the short term part of the equation and by adding trend into the long term part and/or a constant into short-term part of the equation.

The results of the Johansen test for cointegration are presented in Annex 3. The null hypothesis of no cointegration versus one cointegration relationship can be rejected for two out of five countries, Côte d'Ivoire and Senegal. For the other countries, including France, output and fiscal capacity should be modelled in short run specifications. There are cases, where trace statistics is larger than a critical value for the one cointegration relationship versus the two that we often find for sub-periods and that is likely to emerge due to the small samples. For the latter, we run only short-run models. We further follow the Pantula principle in choosing the specification of the cointegration relationship; that is, moving from the most to the least restrictive model and topping only when for the first time the null hypothesis is not rejected. In both VAR and cointegration models, we run Granger tests in order to establish the direction of causality. In cointegration models, we also report adjustment- and long-run coefficients to grasp the sign and the magnitude of the relationship between the variables.

Table 2 Parameter estimates for cointegration and VAR models, share of direct taxes in total taxes in relation to economic output

Variables	α	β	Granger causality test	Granger causality test
			Output -> share	Share -> output
Côte d'Ivoire				
1897-2010, exports	-0.052**	0.075***	at 1% level	at 1% level
	(-2.04)	(3.22)		
1897-1959, exports	-0.022	0.293***	at 1% level	at 1% level
	(-1.12)	(3.10)		
1960-2010, exports	-	-	does not	does not
	-	-		
1960-2010, gdp	-	-	at 5% level	does not
	-	-		
Senegal				
1858-2010, exports	-0.164***	-0.373***	does not	at 1% level
	(-4.36)	(-7.94)		
1858-1959, exports	-0.198***	-0.359***	does not	at 1% level
	(-4.02)	(-7.44)		
1960-2010, exports	-0.402*	0.155***	does not	at 1% level
	(-1.72)	(8.44)		
1960-2010, gdp	-0.427***	-0.073***	at 1% level	at 1% level
	(-3.30)	(-4.29)		
Benin				
1889-2010, exports	-	-	does not	does not
	-	-		
1889-1959, exports	-	-	does not	does not
	-	-		
1960-2010, exports	-	-	does not	does not
	-	-		
1960-2010, gdp	-0.007	-0.152	does not	does not
	(-0.43)	(-1.26)		
Niger				
1929-2010, exports	-	-	at 1% level	does not
	-	-		
1960-2010, exports	-	-	does not	at 5% level
	-	-		
1960-2010, gdp	-	-	does not	at 1% level
	-	-		
France				
1895-2008, exports	-	-	does not	does not
	-	-		
1895-1945, exports	-	-	at 10% level	at 1% level
	-	-		
1946-2008, exports	-	-	at 10% level	at 1% level
	-	-		
1895-2008, gdp	-	-	does not	does not
	-	-		
1895-1945, gdp	-	-	at 5% level	does not
	-	-		
1946-2008, gdp	-	-	at 1% level	does not
	-	-		

Note: t-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1

The results presented in Table 2 provide evidence in favour of the hypothesis that there is long-run relationship between output and fiscal capacity. The long-run coefficients (β) for Côte d'Ivoire show that on average across the whole period a doubling of real exports led to a 15 percentage point increase in share of direct taxes in total taxes. Such dependence occurs in the period prior to independence. The sign of the long-run coefficient is negative for Senegal for the whole period and a period before

independence but positive afterwards. The sizes of the coefficients are much stronger for this country, suggesting that increase in real exports accounts for more than a half of decrease in share of direct taxes in total taxes before 1960 but is associated with less than 0.01 percentage point increase after 1960. Adjustment coefficients (α) are of expected signs, and show that if the short-run shock occurs the variables mutually adjusts to it and stabilize quickly in the case of Senegal (in less than 3 years).

We find a short-run relationship between output and fiscal capacity in all countries, except for Benin, as reported by the two last columns of Table 2. There are significant effects from output (real exports or real GDP) to share of direct taxes in total taxes for Côte d'Ivoire (overall and in pre- and post-independence period), Senegal (post-independence period), Niger (overall), as well as France (pre- and post-WWII periods). The direction of the granger-causality goes also in the opposite direction, from fiscal capacity to economic performance, for the pre-independence period in Côte d'Ivoire and Senegal and for the two sub-periods in Niger. Both measures of output predict the share of direct in total taxes in France.

Conclusions and discussion

Getting back to our original research questions, we document the following:

- There is a fall in volatility of fiscal outcomes and the tax base between the period before and the period after independence for all countries. The fall seems to start well into the colonial period. It should be noted that France was relatively volatile before the 1930s.
- We find a long-run relationship between economic output and tax outcomes for Côte d'Ivoire and Senegal, but not for Benin, Niger and France. One interpretation is that Côte d'Ivoire and Senegal represent a middle-ground in which fiscal capacity grows with economic development. The fiscal systems of Benin and Niger are too poorly developed and that of France too sophisticated for this to be the case.
- There is a change in the long-term relationship between economic output and tax outcomes between the pre- and post-1960 periods for both Côte d'Ivoire and Senegal.
- We see short-run co-movement between economic output and tax outcomes for all countries except Benin. Causality frequently runs in both directions. The strength of these relationships need to be explored further.

Our overall interpretation is that that the reduction in volatility in combination with the increase in the level of tax revenue indicate a long-term strengthening of fiscal capacity for the West African countries, the start of which can be traced as far back as to the late colonial period. The explanations to this remain to be explored, but are likely to be due to a confluence of economic, political and fiscal factors. The economies have grown larger since the post-war period, among other things fueled by French investments at the end of the colonial period, increases in exports and a reduction in the share of agriculture in the economies. GDP/capita developments have been less dynamic or even stagnant

because of rapid population growth and the commodity dependence established during the colonial period remains (UNCTAD 2015). One can note that the first wave of strengthening of fiscal capacity coincides with a long-term period of stabilization of commodity prices, which was particularly strong between 1930s and the 1960s (Jacks 2013). This decline in price volatility may have contributed to stabilize both the tax base and the tax revenue of the four countries.

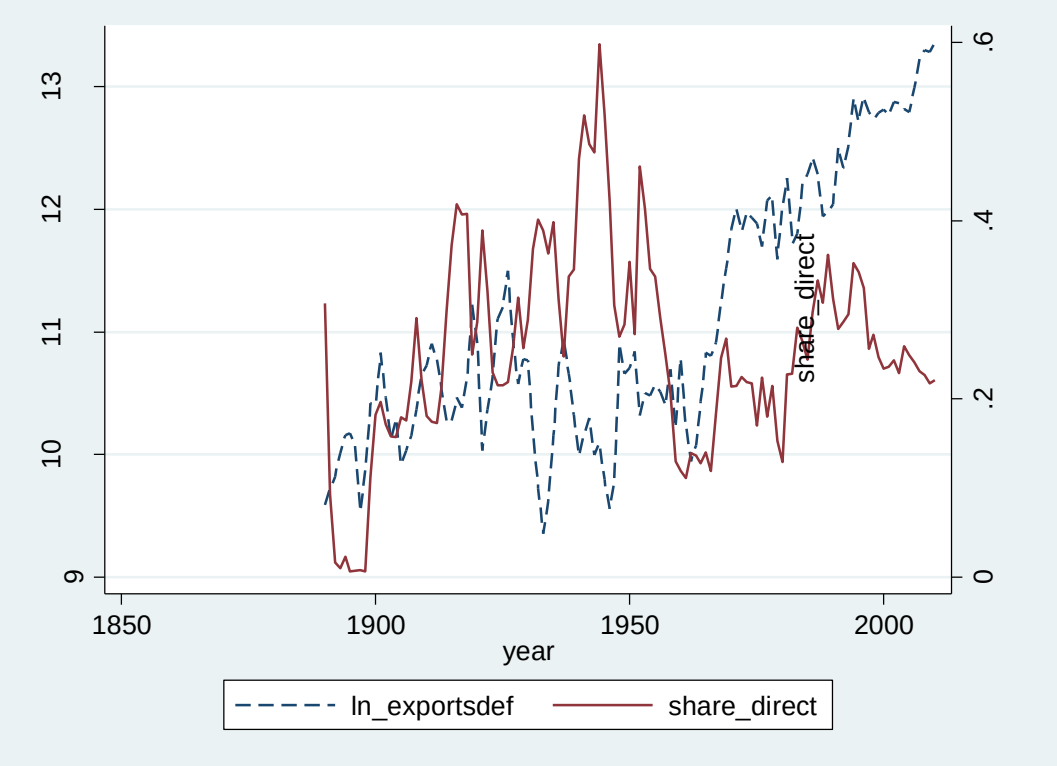
The results of this paper support the view that independence did not constitute a significant break for state capacity. Instead we need to look at the period immediately preceding or following World War II as is advocated by some prominent African economic historians (Cooper 2002; Coquery-Vidrovitch 1976). This period was characterized by political and institutional reforms. A second wave of political reform – in the form of democratisation of Benin and Niger in particular – occurred in the 1990s. The extent to which this may have contributed to improved fiscal capacity is worth further study. Lastly, it is worth highlighting the potential effect of reforms in the tax systems. The West African countries inherited French fiscal systems and that heritage has remained. Within this persistence we have seen that there may be considerable changes in the behavior of fiscal outcomes. There have been a number of reforms to the tax systems, which have for example led to the reduction of customs duties and the introduction of VAT. These reforms have followed international trends promoted by international organisations and development experts and been fueled by regional cooperation processes.

Annex 1 Main data sources

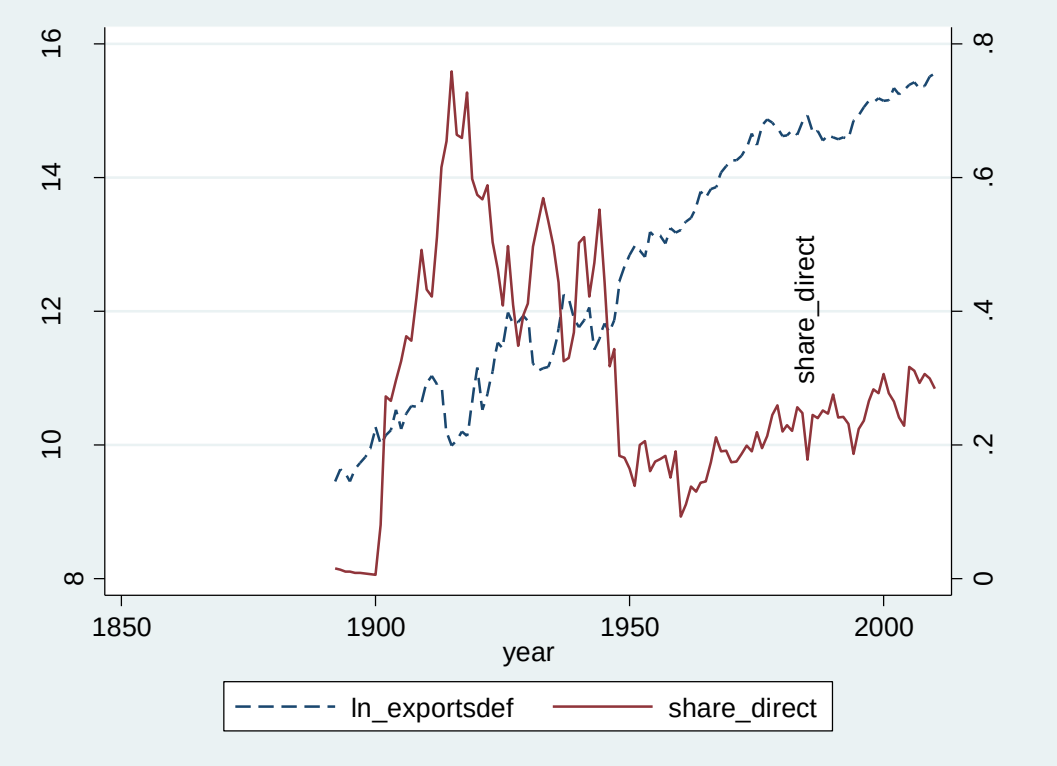
	Pre-1960	From 1960
Total tax revenue **Direct taxes**	African countries: Colonial sources. See Andersson (2015) France: Piketty (2010)	African countries: Banque Centrale des Etats de l'Afrique de l'Ouest and Manour (2014). See Andersson (2015) France: Piketty (2010)
Trade	African countries: Colonial sources. See Andersson (2015) France: Statistiques générales de la France 1951, p. 190* and INSEE	African countries: Banque Centrale des Etats de l'Afrique de l'Ouest. See Andersson (2015) France: INSEE
GDP (nominal)	France: Piketty (2010)	African countries: World Development Indicators France: Piketty (2010)
Deflator	French CPI (all countries): Piketty (2010)	GDP deflator (all countries): World Development Indicators

Annex 2 Shares of direct taxes in total taxes and real exports

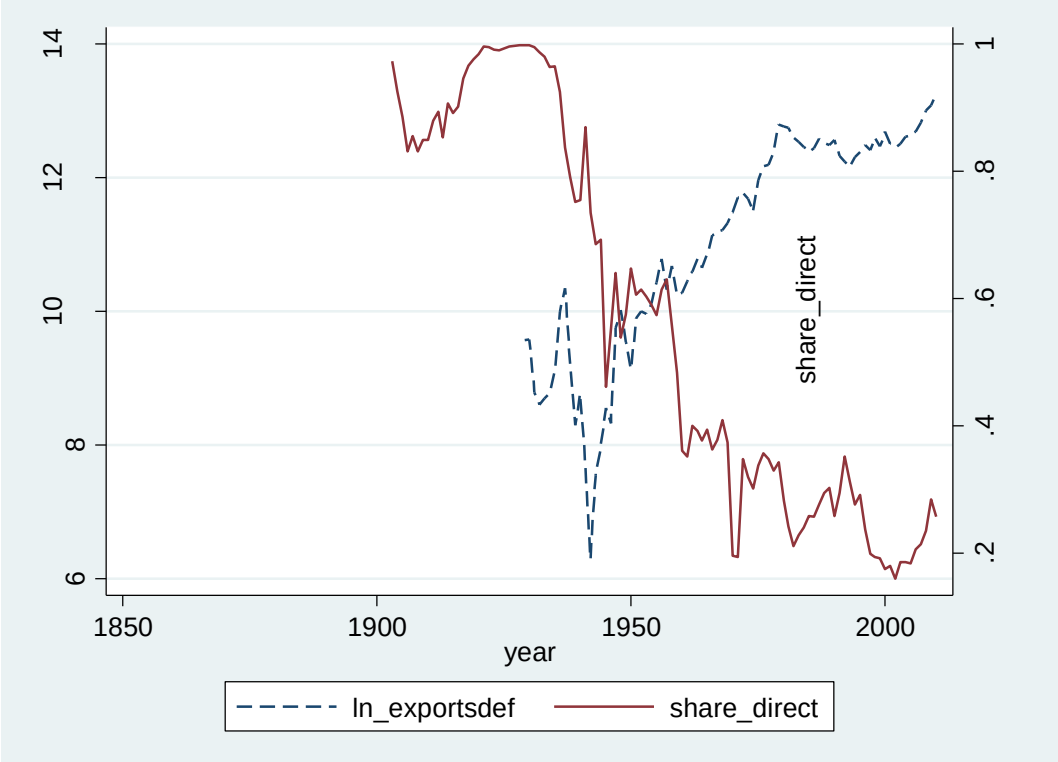
Benin



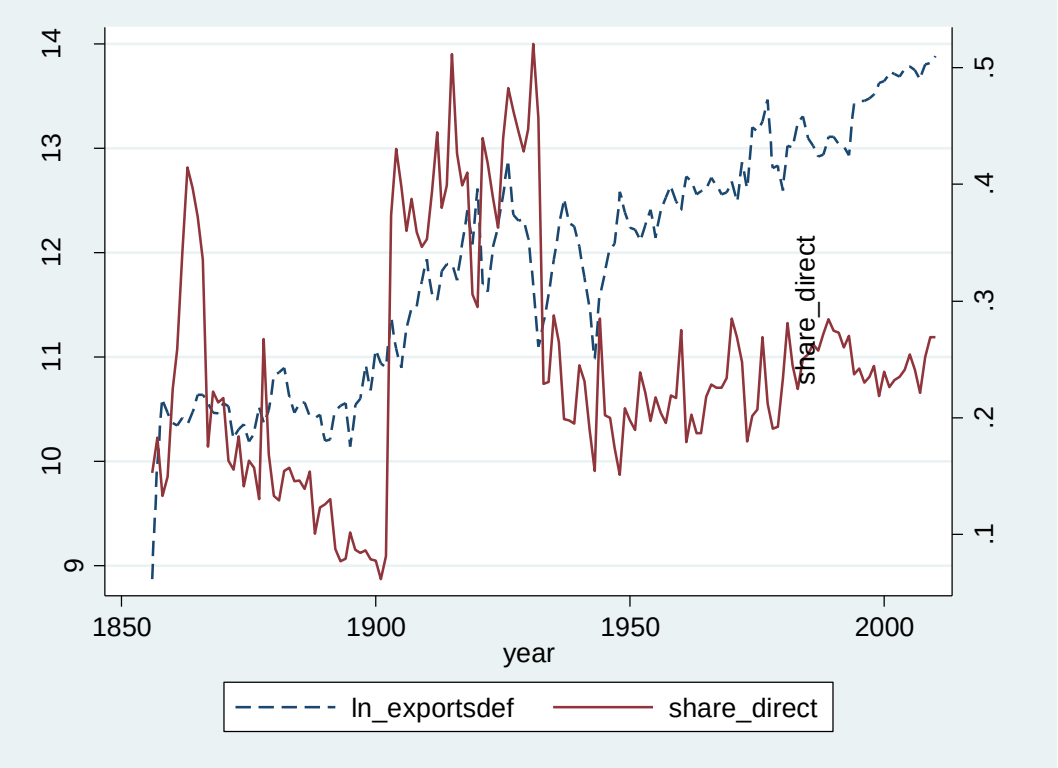
Côte d'Ivoire



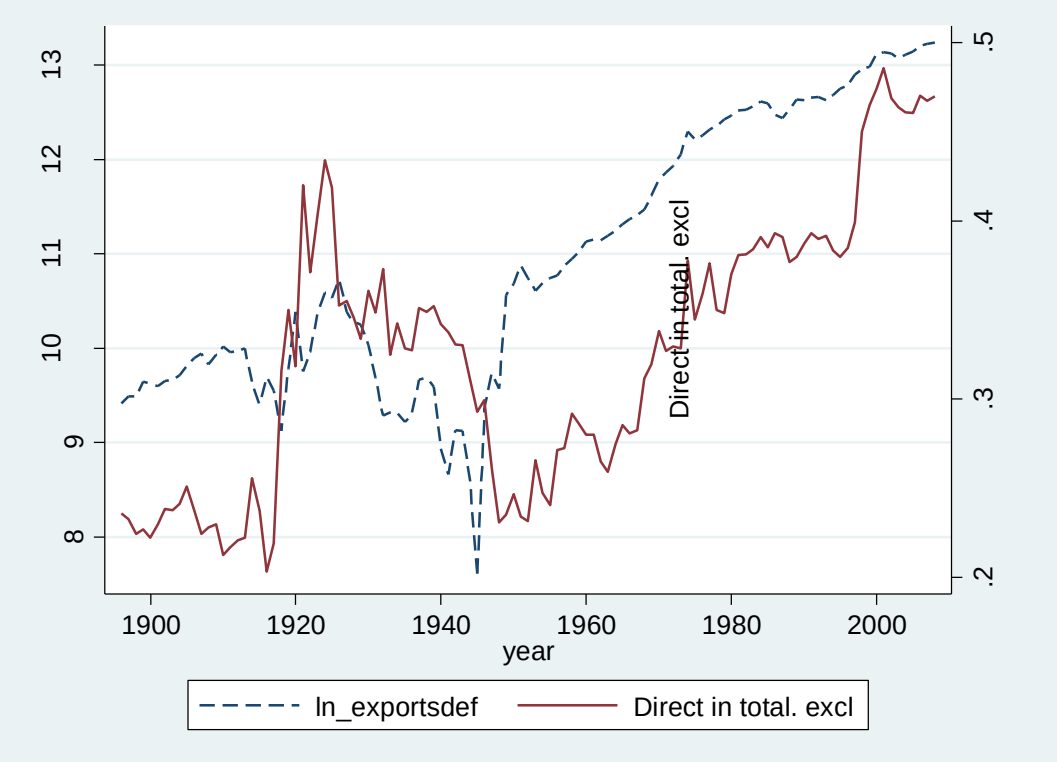
Niger



Senegal



France



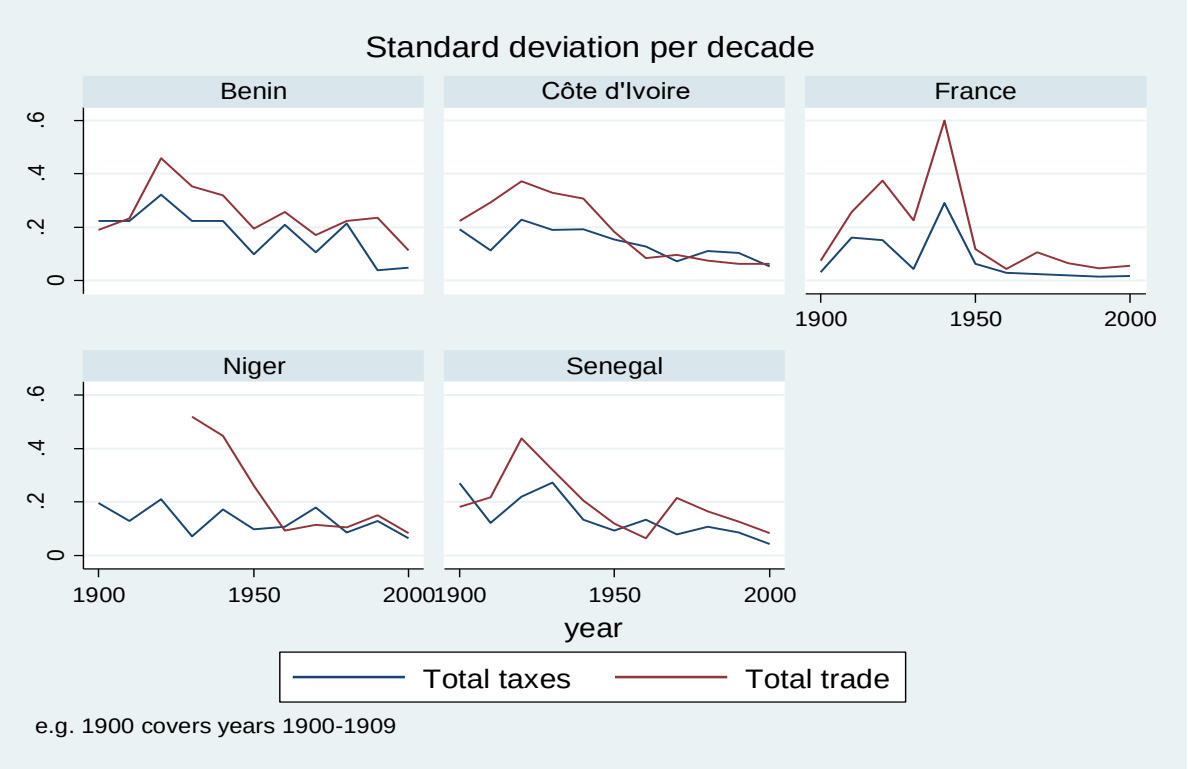
Note: Social contributions are excluded from both direct taxes and total taxes.

Annex 3 Johansen test for cointegration

Variables	Constant in VAR			Constant in VAR and CE			Constant in VAR, constant and linear trend in CE		
	Trace stat	5% crit values	Conclusion	Trace stat	5% crit values	Conclusion	Trace stat	5% crit values	Conclusion
Côte d'Ivoire									
E S 1891-2010	27.27	19.96	H0 reject	14.83	15.41	H0	25.44	25.32	H0 reject
E S 1891-1959	20.74	19.96	H0 reject	14.28	15.41	H0	28.49	25.32	H0
E S 1960-2010	36.54	19.96	H0	27.00	15.41	H0	34.34	25.32	H0 reject
gdp S 1960-2010	31.50	19.96	H0	24.98	15.41	H0	30.17	25.32	H0 reject
Senegal									
E S 1856-2010	14.85	19.96	H0	12.80	15.41	H0	50.33	25.32	H0 reject
E S 1856-1959	14.60	19.96	H0	13.73	15.41	H0	38.59	25.32	H0 reject
E S 1960-2010	10.03	19.96	H0	7.90	15.41	H0	35.42	25.32	H0 reject
gdp S 1960-2010	34.52	19.96	H0 reject	20.30	15.41	H0 reject	24.10	25.32	H0
Benin									
E S 1889-2010	13.19	19.96	H0	11.73	15.41	H0	19.76	25.32	H0
E S 1889-1959	23.79	19.96	H0 reject	23.63	15.41	H0	24.45	25.32	H0
E S 1960-2010	11.75	19.96	H0	8.84	15.41	H0	14.81	25.32	H0
gdp S 1960-2010	27.67	19.96	H0 reject	6.84	15.41	H0	18.00	25.32	H0
Niger									
E S 1929-2010	18.69	19.96	Ho	14.75	15.41	H0	17.24	25.32	H0
E S 1960-2010	23.39	19.96	H0 reject	16.39	15.41	H0	20.33	25.32	H0
gdp S 1960-2010	13.32	19.96	H0	9.70	15.41	H0	17.37	25.32	H0
France									
E S 1895-2008	9.25	19.96	H0	6.50	15.41	H0	13.22	25.32	H0
E S 1895-1944	6.67	19.96	H0	4.33	15.41	H0	17.04	25.32	H0
E S 1945-2008	122.88	19.96	H0	97.86	15.41	H0 reject	104.68	25.32	H0 reject
gdp S 1895-1944	11.48	19.96	H0	6.25	15.41	H0	11.32	25.32	H0
gdp S 1945-2008	38.20	19.96	H0	26.84	15.41	H0 reject	33.46	25.32	H0 reject

Annex 4 Volatility of tax revenue by country and decade (1900-2010)

Decadal standard deviation of first difference of total real tax revenue and trade



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