Fiscal Capacity and Dualism in Colonial States : The French Empire 1830-1962

Denis Cogneau, Yannick Dupraz, Sandrine Mesplé-Somps

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau[1], Yannick Dupraz[2] and Sandrine Mesplé-Somps[3]

Abstract. What was the capacity of European colonial states? How fiscally extractive were they? What was their capacity to provide public goods and services? And did this change in the "developmentalist" era of colonialism? To answer these questions, we use archival sources to build a new dataset on colonial states of the second French colonial empire (1830-1962). French colonial states extracted a substantial amount of revenue, but they were under-administered because public expenditure entailed high wage costs. These costs remained a strong constraint in the "developmentalist" era of colonialism, despite a dramatic increase in fiscal capacity and large overseas subsidies.

Ackowledgements: This work was made possible thanks to the funding of the French National Agency for Research (ANR), Project Afristory ANR-11-BSHS1-006 and EUR grant ANR-17-EURE-0001. Supplementary funding from Cepremap was also very useful. We are grateful to Cédric Chambru, Anna Peixoto-Charles, Ariane Salem, Manon Falquerho, Cyprien Batut, Quynh Hoang and Björn Nilsson for excellent research assistance. We thank Elise Huillery for participation in the kickoff of the collection effort. Jean-Pascal Bassino was kind enough to give us access to his data on Indochina. We thank Gareth Austin, Guillaume Daudin, James Fenske, Ewout Frankema, Leigh Gardner, Bishnupriya Gupta, Pierre-Cyrille Hautcoeur, Elise Huillery, Sylvie Lambert, Peter Lindert, Eric Monnet, Alexander Moradi and Thomas Piketty for their helpful comments, as well as conference and seminar participants at WEHC Kyoto (2015) and Boston (2018), and at: Aix-Marseille School of Economics, Universities Bocconi, Bordeaux-IV, Carlos III, Delhi School of Economics, Groningen, Keele, Manchester, NES Moscow, NYU Abu Dhabi, Oxford, Paris-X Nanterre, Sussex, and Warwick. The usual disclaimer applies.

[1] Paris School of Economics, IRD, EHESS. denis.cogneau@psemail.eu

[2] University College Dublin. yannick.dupraz@ucd.ie

[3] Institut de Recherche pour le Développement (IRD), Université Paris-Dauphine, PSL Research University, UMR LEDa, DIAL. sandrine.mesple-somps@ird.fr

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

In the 19th century, European countries considerably extended their direct political control of large regions of Africa and Asia. The independent countries born from decolonization in the middle of the 20th century inherited the administrative structure of colonial states. But what exactly did they inherit, weak or strong state capacity?

A government's ability to provide public goods and implement efficient policies is a major ingredient of economic development, if only for "late-starters" (e.g., Gerschenkron 1962; Adelman and Morris 1997; Amsden 2001). Yet, the history of state building is still under-studied (Hoffman 2015), and, until recently, the available evidence has disproportionately represented the experience of Western Europe and Western offshoots (Tilly 1990; Lindert 2004), or non-colonized countries in Asia (Yun-Casalilla, O'Brien and Comín Comín 2012; He 2013). The theoretical literature on state capacity has focused on decisions made within formally independent countries (Besley and Persson 2011), while the majority of today's states are direct successors of colonial administrations.

Influential work in the historical and political science literature views colonial states, at the same time, as very powerful and very weak. Young (1995) describes the African colonial state as a Leviathan, displaying "the purest modern form of autonomous bureaucratic authority" (p. 160). In contrast, Herbst (2000) characterizes the African colonial state as "administration on the cheap" (p. 73) with "limited ambition" (p. 77) and an unwillingness and inability to extend its control. For Cooper (2002), African colonial states were "gate-keeper states" (p. 5), able to control the trade flows in and out, but unable to extend power inwards. Outside of Africa, Booth (2007) credits the colonial states of South-East Asia for some effective developmental action, though she underlines that most of the historiography before her describes them as minimalist "night watchmen."

In recent years, the literature on colonial states has received many additions. Earlier work has focused on the British empire in sub-Saharan Africa (Frankema 2010, 2011; Gardner 2012), but other colonial empires have received increased attention, like the Portuguese empire (Havik, Keese and Santos 2015; Alexopoulou and Juif 2017), or the Belgian Congo (Gardner 2013). The French empire is relatively understudied, with most works focusing on French West Africa. Huillery (2014) estimates the cost of colonizing West Africa for the French taxpayer. Andersson (2017) studies the determinants of tax revenue in four French West African colonies. Van Waijenburg (2018) estimates the contribution of forced labor to colonial state revenue from 1913 to 1937 in French sub-Saharan Africa. López Jerez (2019) studies fiscal development in French Indochina. As for comparative work, Frankema and van Waijenburg (2014) analyze fiscal capacity in British and French sub-Saharan Africa, while Frankema and Booth (2019) recently published an edited volume on the comparison of colonial fiscal capacity in Asia and Africa.

Three important questions on colonial states are not completely settled in the existing literature: 1) How fiscally extractive were colonial states? 2) What was the colonial states' capacity to provide public goods and services? 3) As the intentions of colonialism appeared to change in the last fifteen years of colonization, the era of "developmentalist colonialism" (Cooper 2002), did the capacity of colonial states change? The reason why these questions are not settled is that they come with specific methodological challenges, in particular in terms of data availability. In this paper, we contribute to answering these questions, taking the French empire as a case study. We produce a new database on French colonial states from the beginning of colonization to independence. This corresponds to 21 present-day countries in North Africa, sub-Saharan Africa, and Southeast Asia.

The first question we address is: how fiscally extractive were colonial states? The limited fiscal capacity of colonial states is a point that emerges quite consistently from the existing literature. Frankema and Booth (2019, p. 8) summarize the recent literature on fiscal

capacity in sub-Saharan Africa as arguing "that colonial state budgets were small and, if anything, led to understaffed bureaucracies and underinvestment in public services rather than high tax burdens." According to the same authors "the opportunities to engage in international or imperial trade were the single most important determinant of the cross-colony variation in budget size" (p.15).

The main challenge that emerges when studying the fiscal capacity of colonial states is the difficulty of producing comparable estimates of fiscal extraction. The vast majority of works on colonial fiscal capacity present estimates of real revenue per capita: this conflates the tax base and the tax rate, since it is a measure of both "the prosperity of colonial subjects" and "the ability of the colonial state to raise revenue" (Gardner 2013, p. 136). Two methods have been used to produce estimates of fiscal revenue taking into account differences in the tax base: the first is to deflate the tax revenue by wages and express the revenue per capita in terms of days of work (Frankema 2010, 2011, Frankema & van Waijenburg 2014, 2019). The second is to rely on historical estimates of GDP per capita (Booth 2007; Roy 2019; Andersson 2017): this is the approach we favor in this paper. Its main advantage is to allow comparison with estimates of fiscal capacity in other areas of the world, as these estimates are typically expressed in GDP shares.

Another methodological aspect in producing comparable estimates of fiscal capacity is the necessity to consider all levels of public revenue and not only the central government, to avoid conflating low fiscal capacity with decentralized administrative structure. Moreover, to ensure comparability, when estimating the revenue mix, it is always preferable to rely directly on detailed budget accounts rather than the classification of statistical abstracts that can vary over time.

We collected revenue data from approximately 1,700 primary sources, mainly detailed definitive budget accounts, considering all public authorities responsible for revenue and

expenditure in the French colonies, and all sources of public revenue. We produced estimates of GDP per capita in the French empire to express fiscal extraction in GDP shares.

We find that colonial states of the French empire had high extractive capacity. For instance, they extracted 9% of colonial GDP on average in 1925, and 16% in 1955. We show that these figures were above the average for independent countries in the same range of income per capita. Our tentative comparative analysis suggests that this high fiscal extraction was not a French specificity, but rather a general characteristic of colonial states in the 20th century, whether French, British or Japanese, and despite significant exceptions like British India or Nigeria, characterized by relatively low fiscal extraction. Within the French empire, local conditions mattered a lot for the type of fiscal instruments used but fiscal extraction was high everywhere, and the tax burden weighed heavily on autochthonous populations.[4]

The second question we address is: what was the colonial states' capacity to provide public goods and services? High fiscal extraction can be accompanied by low capacity to provide public goods and services. Effective states have, in the terms of Besley and Persson (2011), both the *extractive capacity* to collect revenue and the *productive capacity* to deliver public goods and services (Dincecco 2015). In a context where local populations had almost no control on colonial governments before World War II, there is no reason to believe that extractive and productive capacity went hand in hand. In the terminology used by Booth (2007) and Frankema (2011), a colonial state taxing little could be *minimalist* if it spent little, or *benign* if it used overseas redistribution to invest in public goods. Indeed, in a colonial context, transfers between the colonizer and its colonies (in the form of grants and loans) are key to understand spending capacity. A colonial state taxing a lot could be *developmental* if it invested in public goods and services for the whole population, or *extractive* if it served the

[4] We use the words "autochthons" and "autochthonous" to refer to the local populations of colonies, as opposed to settlers. The word "indigenous" (*indigène*) was used in the French colonial context and has often had a negative connotation.

interests of the colonizer, either using colonial revenue to finance metropolitan expenditure, or targeting colonial expenditure to European settlers and firms. The literature on economic dualism has underlined the role played by colonial governments in creating and supporting high-wage formal enclaves dedicated to the development of exports in otherwise poor and agricultural economies (Boeke 1953, Lewis 1954, Fei and Ranis 1969).

One aspect of colonial dualism could represent an important constraint in transforming fiscal capacity into productive capacity: colonial states faced high wage costs, in particular because of the high wages paid to European civil servants. The existing literature provides a few telling examples of the weight a single high-rank administrator could have in colonial revenue (e.g. Huillery 2014, p.30, Frankema 2011, p. 143). However, we lack systematic series on average public wages and numbers of government employees in European colonies.[5] As a result, we do not know to what extent these high wages constrained the spending capacity of colonial governments.

To understand what shaped the French colonial states' capacity to provide public goods and services, we complemented data on fiscal extraction with data on public expenditure and its sectoral allocation, and on transfers from France, extending the work of Huillery (2014) on West Africa to the whole Empire. These data were collected in regular definitive budget accounts, but also in special loan or development accounts, to capture all aspects of public expenditure. We also collected series on public employment and public wages in provisional budget accounts. Finally, we collected, in various statistical abstracts, development outcomes like road and railway length and school enrollment for Europeans and autochthons.

We find that the capacity of French colonial states to provide public goods and services was low. High wage costs meant that, despite substantial fiscal capacity, the colonies were

[5] Frankema (2011) gives data on the number of civil employees per 10,000 inhabitants in seven British colonies ca. 1929. Kirk-Greene (1980) and Richens (2009) give data on the number of European administrators (the "thin white line").

under administered. In 1925, the average government employee in the French empire was paid about nine times the colonial GDP per worker, and the number of government employees per inhabitant was six times lower than in metropolitan France. We also provide evidence that public expenditure was biased towards the needs of European settlers and firms. In Algeria for example, European settlers, representing about 10% of the population, received about 80% of total education expenditure.

The third question we address is: did colonial state capacity change in the developmental era? The second wave of French colonialism lasted from 1830 to the beginning of the 1960s, and the features of colonial states (level of fiscal extraction, public wages, targeting of expenditure) were not fixed through time. If the goal is to understand how colonial legacies shaped economic development after independence, the period of "developmentalist colonialism" after World War II is crucial (Cooper 1996, 2002, 2014b). It is a period when, in a global climate of mounting criticisms of colonization, the intentions of colonialism appeared to change. Political rights were conceded to autochthonous populations and overseas transfers increased. However, most quantitative studies of colonial states focus on the period before World War II.[6] How much did overseas transfers and fiscal capacity increase during the developmental phase of colonialism? Did high wage costs continue to be a constraint? Did "developmentalist colonialism" achieve some development?

We find that colonial fiscal capacity increased dramatically during the developmental era. While colonial states of the French empire were collecting 9% of colonial GDP on average in 1925, they were collecting 16% in 1955. This increase in fiscal capacity was accompanied by large overseas redistribution. While the colonies were self-financed during most of the colonial period (at least for their non-military expenditure), net civilian subsidies from France represented 2.7 percent of their GDP in the 1950s.

[6] Two exceptions are Gardner (2012) and Andersson (2017).

The analysis of public expenditure reveals a developmental turn. The share of education and health in expenditure increased, and average autochthonous primary enrollment rates were multiplied by four between 1925 and 1955. However, the capacity of French colonial states to provide public goods and services remained low, and the achievements of the developmental era were disappointing. In 1955, the gross primary enrollment rate of autochthonous children was only 14.5%, and road meters per capita were three times as high in France as in the colonies. Our analysis of public wages reveals that high wage costs remained a strong constraint on public spending during the developmental era: the ratio of average public wage to GDP per worker increased everywhere.

There are two main limitations to our work. The first is that, though we are always careful to compare our findings to the existing literature on colonial states, the primary objective of this paper is not a comparison of the French empire to other colonial empires. One reason is that a lot of the indicators we built (like total fiscal extraction as a share of GDP, average public wages or public employment) do not yet exist systematically for other colonial empires. A comparison of French and British colonialism in West Africa is the object of another paper (Cogneau, Dupraz and Mesplé-Somps 2018). The second limitation is that, though we collected public finance data until the 1970s, we are not able to fully tackle the question of the persistence of colonial features in independent states. This is the object of ongoing work.

In the rest of the paper, we start by briefly presenting the colonies studied and the data construction methodology. The second section focuses on tax extraction and distribution across space and time, the third section on external financing, and the fourth section on public expenditure and its cost.

Scope and data construction

We study France's second colonial empire located in Africa and East Asia (Figure 1).[7] The colonization of Algeria started in 1830. Tunisia and Morocco were added as protectorates in 1881 and 1912, respectively. Indochina and Africa south of the Sahara were colonized during the second half of the nineteenth century. The last additions to the empire were the former German colonies of Togo and Cameroon, ruled from 1919 as mandates of the League of Nations. In total, the former French colonies that are part of our database correspond to 21 contemporary countries: Algeria, Morocco, and Tunisia in North Africa, Benin, Burkina-Faso, Cameroon, Chad, Central African Republic, Congo-Brazzaville, Côte d'Ivoire, Gabon, Guinea, Madagascar, Mali, Mauritania, Niger, Senegal and Togo in sub-Saharan Africa, and Vietnam, Laos and Cambodia in South-East Asia.

[FIGURE 1 ABOUT HERE]

Our analysis relies on the collection of firsthand data in French archives. This section highlights the most important points, the online Appendix 1 describes in detail the sources and the methodology used to clean, compile, and homogenize the data.

We designed the collection methodology to obtain homogenously defined spending and tax headings. Our estimates do not depend on the level of decentralization in each region because we consider all public authorities responsible for revenue and expenditure in the colonies. These include the French government, federal governments, central colonial governments, provincial governments, municipalities (in some years), and auxiliary budget authorities that handled loans, health care, posts and telegraphs. We collected data yearly,

[7] A few short-lived or small-size colonies were not included in our data collection effort: the League of Nations mandates of Syria and Lebanon; Djibouti; the Comoros and Pacific Ocean islands. We also excluded the remains of the first colonial empire (acquired before 1830): the French West Indies and Guyana, the Réunion Island, and the five trade posts of India.

except in federations (*Afrique Occidentale Française* or AOF, *Afrique Equatoriale Française* or AEF, and Indochina), where we collected data yearly for the federal government (*Gouvernement général*), but every three years only for governments of individual colonies (*Gouvernements locaux*).

Our main variables are Net Public Revenue (NPR), which is public revenue net of loans and subsidies from outside the colonial territory, and Net Public Expenditure (NPE), public expenditure net of loans and subsidies outside the colonial territory. These variables are consolidated to avoid double counts arising from transfers between different administrative layers. Military expenditure was, with a few exceptions, undertaken by the French Ministry of War and Ministry of the Colonies. We exclude this expenditure from NPE and analyze it separately. Public revenue is broken down into different types of fiscal instruments, and public expenditure into its sectoral allocations. The net deficit (difference between NPR and NPE) is broken down into different financing instruments (loans, subsidies, transfers from reserve funds). We also collected data on public wages and employment in 1913, 1925, 1937, 1949, 1955 and 1960.

In the federations of Indochina, AOF and AEF, we produced systematic data at the level of the federation, but not at the level of each colony. The reason is that federal budgets were responsible for a large share of revenue and expenditure and that allocating federal revenue and expenditure to each colony throughout the period would require making strong assumptions. This is a limitation of our data as they do not allow us to systematically explore the intra-federation variation in fiscal capacity and expenditure.

For some variables, notably NPR and NPE, we extended the database past independence until 1970, using various sources. We also collected from statistical yearbooks development outcomes and policy variables such as school enrollment, health personnel, electricity output, road or railway length, and international trade.

To produce comparable figures of revenue and expenditure, we collected population data from various primary and secondary sources, as well as colonial price indices, and prices for the year 1937. This allows us to express variables in 1937 PPP-adjusted francs. To put fiscal figures in economic context and express colonial public revenue as a share of colonial GDP — a standard measure of fiscal capacity — we constructed GDP estimates for France and each colonial territory. Estimating historical GDP is a challenging task, especially for poor countries for which economic statistics are scarce. Our estimates combine the first national accounting exercises carried out by the colonies' statistical agencies in the post-WW2 period, the nominal GDP series of the World Bank (2017) starting in 1960 and the estimates of GDP growth in volume before World War II produced by Amin (1966) for North Africa, Bassino (2000) for Indochina, Amin (1971) and Maddison (2003) for sub-Saharan Africa. These inputs are then combined with our price deflator, PPP adjustor, and population series to obtain series of GDP in nominal terms and in 1937 francs per capita. We rely on the assumption that these primary and secondary sources (laid out in detail in the "Gross domestic product" section of the online Appendix 1) are of sufficient quality. For most colonies before WW2, this estimation procedure gives us GDP estimates for a couple of key years only. We then use variations in imports and exports to infer the variation in GDP between these key years.

As the reliability of our estimates of colonial fiscal capacity depends on the reliability of the GDP figures we take as inputs, we test the robustness of our main results to credible different values of GDP. To do so, we produce alternative estimates of per capita GDP using wage and urbanization data for four years (1925, 1939, 1947 and 1955). The detailed methodology for our main and alternative GDP estimates is given in the online Appendix 1, along with figures displaying GDP per capita in 1937 francs.

Though we produced data for (almost) all years of the colonial period, our presentation relies on the detailed analysis of two benchmark years, 1925 and 1955. In 1925, France's

second colonial empire had reached its greatest extent. The French civilian administration had fully replaced the military and could draw stable fiscal revenue from the colonial economies. 1955 corresponds to the late colonial period, the era of "developmentalist colonialism." After World War II, colonized populations obtained more political rights and France started running large development plans in the colonies, in a context of increasing anti-colonial pressure from the international community and independence movements. The Indochinese liberation war lasted from 1945 to independence in 1954 (our last figures for Indochina are from 1953/54). In 1955, Tunisia and Morocco were about to obtain their independence, and Algeria's liberation war had just started.

Fiscal extraction: high and rising

A sizeable colonial state

In 1925, we estimate that the share of net public revenue to GDP averaged 8.9 percent in the French empire (Table 1, line 1). We argue this was far from small. We will refer below to a comparison with countries in the same range of income, but for now a simple comparison with metropolitan France is informative. While the public revenue of France then represented 16.5 percent of French GDP, it was only 13 percent 25 years before, in 1900. Under the doctrine of self-financing that applied from 1900 to World War II, French colonies received practically no subsidies from France. They did not pay for military expenditure, and their debt service was limited. France spent some 3 percent of GDP in debt service and 4 percent on the army. As a result, when we consider net civilian public expenditure as a percentage of GDP, we find the same figure of 8 percent for France and its colonies (Table 1, line 3). Of course, because France was about ten times richer than its colonial empire in 1925, the size of the state is about ten times higher in France when we express expenditures in 1937 francs per capita.

The regions composing the French colonial empire were vastly different in terms of their geography, pre-colonial history, and economic development. One might therefore expect important variation in colonial fiscal capacity. Appendix Table A.1 gives estimates of population, urbanization and GDP in the empire in 1850, 1925 and 1955. In 1850, North Africa was already much more urbanized than the rest of the empire, with an urbanization rate of 6.6% against 1.4% in Indochina, 2.2% in Madagascar and 0.7% in West and Central Africa.[8] These differences in initial urbanization are in line with what we know of the economic history of these regions and their history of political centralization. North Africa benefitted from its very ancient integration into the Mediterranean economy, and from its connections with the Islamic world and the Ottoman Empire. In Indochina, Laos and Cambodia were centralized, though weakened kingdoms, and Vietnam had been unified under the imperial rule of the Nguyen dynasty. In the nineteenth century, Madagascar had been almost entirely united by the kings of Imerina. French West and Central Africa, in contrast, did not have a strong history of political centralization. The different regions of the empire also differed in their European settlements: while the French established settlement colonies in North Africa, where Europeans represented 8.1% of the population in 1925, settlers never represented more than 1.5% of the population in the rest of the empire (Appendix Table A.1). While before 1946, autochthons in the French colonies had, with a few exceptions, no political representation, French settlers had more political rights, especially in Algeria, officially annexed by France in 1848. Algerian settlers were represented in the French Parliament and Senate, and even obtained some autonomy in public finance in 1898 (Bouveresse 2008). If European settlers were able to successfully lobby for lower taxes, one

[8] Our purchasing power parity GDP per capita estimates for 1925 give a picture of differences in economic development similar to the one obtained by comparing urbanization rates in 1850: North Africa was about three times richer than the rest of the Empire. Madagascar was 25% richer than Indochina and 43% richer than West and Central Africa.

might expect settlement colonies to have lower levels of fiscal extraction on average (as well as a more unequal distribution of the tax burden). On the other hand, the formal economy in which European settlers took part was more easily observable to the government, and, provided public expenditure could be targeted to the settler enclave, settlers might have had a preference for high taxation and high public expenditure.

Despite these differences, we find that the variations in the ratio of net public revenue to GDP were relatively limited: 12.5 percent of GDP in Indochina, 9 percent in Madagascar, and 8.3 percent in North Africa (Table 1, line 1). Of course, even though fiscal extraction as a share of GDP was comparable everywhere, richer regions ended up with higher levels of revenue (and expenditure) expressed in constant francs per capita. If public expenditure in 1937 francs per capita was twice as high in the settler colonies of North Africa than in Indochina or Madagascar, it was because they were richer, and not because of higher taxation.

[TABLE 1 ABOUT HERE]

Our calculations show that net public revenue as a share of GDP was lower in West and Central Africa (5.4 percent), and particularly low in AEF (4.0 percent) and Cameroon (2.6 percent). However, the difference between these colonies and the rest of the empire is reduced when we take forced labor into account. In West and Central Africa, and in Madagascar, a labor tax, the *prestation*, required Africans to work a fixed number of days per year in local public works. In addition, some military conscripts worked on infrastructure projects (Fall 1993). Because labor payments are difficult to value, we do not consider them in Table 1 figures (except when they were rebought in cash). Marlous van Waijenburg (2018) computed the *corvée* revenue by multiplying the number of days of forced labor by her estimates of unskilled laborers' average wages. Using her valuations increases the share of public revenue in GDP in West and Central Africa from 5.4 percent to 6.8 percent. Including conscripted labor could bring the figure even closer to the rest of the empire. In Madagascar, including

corvée labor increases the share of public revenue in GDP from 9 percent to 9.9 percent, bringing it closer to the high level of fiscal extraction of Indochina.[9]

How did fiscal extraction change in the developmental era? World War II weakened the international position of France and its image in the colonies, while strengthening the international position of the U.S.A. and the U.S.S.R., two powers opposed to European colonialism in Africa and Asia. The year 1946 saw the replacement of the French empire by the French Union (*Union Française*) and the abolition of the status of "indigenous subject," which had drastically limited the political rights of colonized populations and permitted forced labor. Autochthonous populations obtained some representation in local assemblies, in the assembly of the French Union and in the French Parliament, though suffrage remained restricted.[10] Were these changed accompanied by a decrease or an increase in fiscal extraction?

[9] Why did Indochina and Madagascar exhibit the highest levels of fiscal extraction in 1925? This was likely the result of a combination of factors that are difficult to disentangle, from the already mentioned precolonial differences in centralization to the idiosyncrasies of the tax systems (monopolies in Indochina and high head tax rates in Madagascar, see next section). Furthermore, in contrast with West and Central Africa, a European sector had developed quite early in both colonies and provided a significant base for indirect taxation. In North Africa, settlers perhaps had more say in Algeria and Tunisia, and/or required more support as they were just settling in Morocco. As for taxing autochthons, the head tax was not used in Algeria and had low rates in Morocco and Tunisia. The uncertainty surrounding early GDP estimates should also be kept in mind, before elaborating too bold interpretations. In any case, the two colonies were caught up by North Africa in the 1930s and by West and Central Africa in the 1950s (see Figure 2).

[10] Suffrage was restricted to a heterogeneous list of occupations and social positions (Cooper 2014b pp. 137-138). Furthermore, French citizens and autochthons formed two separate electoral colleges that elected the same number of representatives, so that settlers were still vastly overrepresented. With the Defferre reform act ("*loi cadre*") in 1956, then with the Fifth Republic in 1958, the political representation of autochthons was dramatically improved.

We estimate that colonial public revenue almost doubled between 1925 and 1955, going from 8.9 to 15.9 percent of colonial GDP, or 17.1 percent if we include social security funds established after 1944 in North Africa (second panel of Table 1). This increase mirrors a similar expansion of the state in France, where public revenue rose from 16.5 percent of GDP in 1925 to 26.3 percent in 1955, 33.4 percent if we include social security transfers. Because the colonies started receiving large net transfers from France after World War II (see below), the increase in colonial state size is even more striking if we consider public expenditure, which boomed from 8.0 percent of GDP in 1925 to 19.3 percent in 1955. The only place where fiscal extraction decreased is Indochina, then at the end of the decade-long independence war that immediately followed World War II.[11]

To give a more detailed view of historical trends, Figure 2 shows the estimates of the year-to-year evolution of net public revenue as a share of GDP from 1890 to 1970 in each colony or federation. Contrary to Table 1, these series do not include the revenue of second-level administrative divisions (municipalities), because our series for them are patchy. This mainly affects Algeria, where municipalities represented 20-25 percent of public revenue (see online Appendix 1). Overall, public revenue decreased during World War II as it had during World War I. Public revenue then peaked dramatically in the 1950s, both in North Africa and in West and Central Africa. Madagascar stands as an exception with a rather stationary profile. At the end of the decade, as colonies gradually cut ties with France, no marked change in public revenue occurred. In West and Central Africa, net public revenue fell in the years leading to independence in 1960, possibly because of administrative disorganization as the French prepared to leave and dismantled the federations. Nevertheless, public revenue quickly recovered, and, at the end of the 1960s, it was back to the level reached around 1955.

[11] The last data point we have, in 1953, one year before independence, shows a decrease in GDP per capita (see Appendix Table A.1) and in net public revenue (from 12.5 percent of GDP in 1925 to 9.5 percent).

[FIGURE 2 ABOUT HERE]

In order to gauge the level of fiscal extraction in the French empire, we compared revenue to GDP ratios in French colonies to revenue to GDP ratios in independent countries and in other colonies, in particular British ones. We acknowledge the uncertainty affecting such a comparison: while our revenue series for French colonies are built using primary sources and a harmonized definition of public revenue, our revenue series for comparator countries come from secondary sources. This tentative analysis is detailed in online Appendix 2. We make use of the historical dataset of Mauro et al. (2013) at the International Monetary Fund (IMF), covering mainly independent countries, and complement it with estimates for 16 additional independent countries or colonies (British and Japanese), drawing in particular from the compilation of Mitchell (1998). Because state size tends to increase with GDP, an empirical regularity often called "Wagner's law" (Wagner 1893; Lindert 2004), we restricted the comparison to countries close enough in terms of GDP per capita, and we compared French and other colonies to a "Wagner's law" prediction of revenue to GDP ratios from GDP per capita estimated on the sample of independent countries. We implemented these comparisons for three decades, 1920-29, 1930-39 and 1950-59.

Whatever the decade considered, French colonies lie near or above the "Wagner prediction," the only two exceptions (Algeria in the 1920s and Madagascar in the 1950s) being explained by a high level of decentralization in revenue collection.[12] British and Japanese (Korea and Taiwan before 1945) colonies also exhibit relatively high revenue to GDP ratios, even if British India and British Nigeria make two salient exceptions to this rule. Most colonial states outperform many independent states in the same income range, as different as Thailand, South Korea, Philippines, Honduras, or Bolivia.

[12] As our comparators dataset reports the revenue of the central government only, we discard the revenue of lower administrative layers from the French colonies estimates.

The estimation of revenue to GDP ratios takes estimated GDP as an input. It is therefore important to pause to consider how errors in GDP would affect our conclusions. Because we find that French colonial states extracted a relatively high share of GDP, we are mainly worried about *underestimating* GDP in the colonies. As a robustness exercise, we use alternative GDP per capita figures computed using wage and urbanization data. In 1925, these alternative GDP per capita estimates are lower than our main estimates, which would reinforce our conclusion of high fiscal extraction (online Appendix 1, p. 36). We are more confident in our GDP per capita estimates for the 1950s because they are based on contemporary national accounting exercises rather than historical estimations, and because they are anchored on GDP figures in the 1960s. The alternative estimates for 1955 point to a potential underestimation of GDP per capita in the cases of Algeria, Tunisia and French West Africa, but not large enough to modify our conclusion of high fiscal extraction, for it is also in these colonies that fiscal revenue to GDP ratios were the highest.

We conclude that colonial states, and in particular the French ones, were not at all underperforming in terms of fiscal extraction, compared to independent countries. Even if they were on average relatively poorer than independent states, it was not the lack of fiscal capacity that limited their possibilities to produce public goods and promote economic development.

Fiscal adaptation

If there was variation in colonial fiscal capacity, it was not so much in fiscal extraction, which was high everywhere, but in the revenue mix: to extract a high and increasing share of GDP, the French colonizers adapted the fiscal structure to different contexts and historical periods. Instead of a coarse distinction between direct and indirect taxes, often used in the literature as a measure of fiscal capacity, but not really suited to the colonial case, we categorized fiscal instruments according to their implied degree of administrative capacity.

This encompasses a broad range: from tools involving only light administrative management (such as the head tax or *capitation*) or monopolies on the sale of certain goods (such as alcohol or salt) or services (revenue of posts and telegraphs); to taxes on external trade that did not require government presence outside the port of entry; to intermediate taxes requiring larger administrative capacity; to modern taxation (such as income and turnover taxes) requiring the frequent collection or self-declaration of detailed economic information on individuals and firms. (For a more detailed classification, see the online Appendix 1).[13]

Table 2 displays the share of different tax instruments in GDP in France and the four regions of the empire.[14] In 1925 France, modern and intermediate taxes represented 11.3 percent of GDP (80% of net public revenue), trade taxes represented only 0.8 percent of GDP, and there was no capitation. In the Empire, the fiscal structure of North African colonies and protectorates was the closest to France. Only in North Africa was modern taxation already important in 1925, representing 1.2 percent of GDP and 16 percent of net public revenue. Algeria, first, and Tunisia, second, had gradually replaced Ottoman taxes by copying French taxes, such as direct taxes on wages, benefits, and other types of incomes. A general income tax was introduced in 1919 in Algeria, and 1928 in Tunisia. In Morocco, the bulk of modern taxation before the 1940s was a tax on agricultural income called *tertib*. While modern taxation was inexistent in sub-Saharan Africa, it represented a very small percentage of GDP (0.2 percent) in Indochina. From 1920 onwards, European settlers in Indochina paid a wage tax and a minimal lump-sum tax on 12 income brackets. Between 1938 and 1941, a general income tax was introduced, and extended to the autochthonous population. Though European

[13] Monopoly revenue does not include the receipts of public railway companies, but it does include their excess revenue when they are transferred to the government's budget (see online Appendix 1).

[14] Table 2 (like Figures 2 to 4) does not consider the revenue of municipalities. This is why the various tax instruments do not sum to the net public revenue of Table 1.

settlers in Indochina were richer than European settlers in North Africa, they were too few to generate large fiscal revenue.[15]

To what extent were trade taxes used to finance colonial states? It first needs to be said that trade taxes were mainly weighing on imports. The tax revenue from exports was limited (22% of trade taxes in 1925), and before WW2 was only significant in Indochina (rice mainly) and Madagascar (vanilla, hides and other commodities). The opportunity of using trade taxes to finance colonial states was not only determined by the intensity of international trade, but also by the existence of customs unions. Algeria, Indochina and Madagascar formed customs union with France, which limited the taxation of bilateral exports and imports. Madagascar, however, managed to collect 2.3 percent of GDP through taxes on the consumption of a few imported goods (that we classify in import taxes), and taxes on exports. In West and Central Africa, import tariffs could be fixed according to domestic conditions (Cornevin 1972, pp. 294-295), although preferential treatment was granted to imports from France, when not forbidden by international treaties (Congo Basin). Yet trade flows were still limited before WW2. Within that region, we find that access to international trade explained differences in public revenue. Trade taxes explain most of the difference in public revenue between Central Africa (AEF and Cameroon) and West Africa (AOF and Togo); the latter was more outward oriented since at least the times of "legitimate commerce" in the first half of the nineteenth century (Law 1995).

Monopoly revenue represented a larger share of GDP in the empire than in France, but this was mainly due to the staggering weight of monopoly revenues in Indochina — 4.2 percent of GDP in 1925. Revenue of the government monopoly on opium alone represented 1.4 percent of GDP. Based mostly on the consumption of non-basic goods, monopolies were, like trade taxes, less regressive than the head tax (*capitation*).

[15] See population and income shares in online Appendix 4.

Outside of North Africa, colonies relied heavily on this head tax for public revenue. The capitation was a lump-sum tax levied on every individual except children, soldiers and their families, and the physically impaired. It represented 1.6 percent of GDP in Indochina, 2.9 percent in Madagascar, and 1.5 percent in West and Central Africa. The use of the capitation was certainly a sign of low administrative capacity, because its collection required very few Europeans administrators, but was not necessarily a sign of low extractive capacity. It brought in a substantial amount of revenue, about as much as trade taxes. The capitation was not costly in terms of administrative management: village-level colonial administrators were not needed because local chiefs levied the tax (Zucarelli 1973). The chiefs received a wage payment and a share of the amount collected, but we show that, at least in the case of French West Africa, these costs never represented more than 7.4% of total *capitation* revenue (online Appendix 3). At the same time, compliance rates were surprisingly high: using data collected by Huillery (2009), we compute, for each district in AOF, the theoretical tax bill (the district level tax rate multiplied by the eligible population) and compare it to the actual capitation revenue. We find that compliance rates (the actual revenue divided by the theoretical tax bill) were high, except in the two colonies with a large nomadic population that was instead taxed on cattle like Mauritania or Niger. Excluding these two colonies, the compliance rates average around 90% from the 1910s to the 1950s. One can hypothesize that this mix of low administrative capacity and relatively high extractive capacity was only possible in the kind of coercive military regime that was colonization, like for forced labor and conscription.[16]

On top of the capitation, inhabitants of sub-Saharan African colonies also paid a tax in labor, the *prestation*, requiring them to work a fixed number of days per year in local public works. Like the *capitation*, the *prestation* was relatively light in terms of administrative

[16] Military control, of course, had a cost (see the next section), which should be accounted for if one were to compute the true yield of the capitation. In any case, our point is not that the capitation was an efficient tax, but that French colonial states used it to extract a non-negligible share of colonial income.

management, and involved the cooperation of chiefs (Fall 1993). If we use van Waijenburg's (2018) monetary valuation of forced labor, we find that it represented 1.4 percent of GDP in 1925 West and Central Africa. It means that 2.9% of GDP (53 percent of revenue) was collected using the capitation and the labor tax, two regressive taxes weighing practically exclusively on autochthons. In Madagascar, we estimate that capitation represented 3 percent of GDP and forced labor 1 percent.

The French adapted the fiscal structure to local economic and social conditions: in the settler colonies of North Africa, they used more modern taxes like the income tax; in Indochina, monopolies, especially the monopoly on opium, provided large revenues; in sub-Saharan Africa, they relied on capitation and forced labor. In each local context, the colonizer sometimes built on existing pre-colonial taxes, which were gradually modernized. In Algeria and Tunisia, Ottoman taxes were gradually replaced by copies of French taxes, such as direct taxes on wages and benefits, before the introduction of a general income tax. In Tunisia, pre-colonial taxes on agricultural inputs such as trees, land, and cattle were gradually replaced by taxes on income drawn from agricultural exports (Nicolaï 1962, p. 443). In Morocco from 1915, the French administration revived the *tertib*, a tax on agricultural income originally introduced by the sultan Moulay Abdelaziz in 1901, and then withdrawn. The *tertib* represented the bulk of modern taxation before the 1940s. In sub-Saharan Africa, *corvée* labor built upon pre-colonial forms of coerced labor in a context of labor scarcity (Hopkins 1973). But the French colonizer was also happy to revive taxes from the French *Ancien Régime* toolkit: the *capitation* was a colonial invention in sub-Saharan Africa, and the opium monopoly in Indochina was also introduced by the colonizer (Kim 2020, pp. 157-161).

The high fiscal performance also meant that the tax burden weighed heavily on autochthons, especially in the early years. In Algeria and Tunisia, French settlers were numerous enough to make a high share of total income and a high share of total tax revenue, yet simulations presented in online Appendix 4 suggest that in proportion of their income they

were not taxed more than autochthons in 1925. We reach the same conclusion in West Africa where, in any case, the tax revenue extracted from the few French colonists was limited (below 10%).

[TABLE 2 ABOUT HERE]

Net public revenue increased everywhere between 1925 and 1955, and especially in the 15 years following World War II. In France, new revenue mostly came from an increase in direct and indirect modern taxation, which climbed from 4.4 percent to 12.1 percent of GDP (bottom panel of Table 2). In the colonies, the modernization of the tax structure was very apparent in North Africa. Modern taxes were responsible for almost half of the increase in fiscal extraction over the period, increasing from 1.2 to 5.1 percent of GDP. The capitation almost disappeared, while monopolies and intermediate resources also increased substantially. These evolutions also contributed to make the tax system a bit more progressive (the tax burden on Europeans increased more than on autochthons, see online Appendix 4). In sub-Saharan Africa, income and turnover taxes were introduced, raising the contribution of modern taxes from 0 percent of GDP in 1925 to 1.8 and 1.5 percent in Madagascar and West and Central Africa. At the same time, while forced labor was abolished in 1946, the share of *capitation* in GDP remained similar. In Indochina, capitation was abolished by the autonomous government of Vietnam and modern taxation had also increased, but Indochina is a particular case: our figures are for the year 1953, at the end of a decade-long independence war.

Where the modernization of the tax system remained limited, the colonizer primarily used trade taxes to increase public revenue. The share of trade taxes in GDP more than doubled everywhere except in North Africa, where it increased only modestly. In 1955, trade taxes represented about 6 percent of GDP and about 40 percent of total revenue in sub-Saharan Africa. The increase in trade tax revenue was mostly the result of a rise in tax rates,

in particular on imports, and not a mechanical effect of the postwar boom in African trade. In West and Central Africa, the share of imports and exports in GDP increased from 31 percent of GDP to 40 percent between 1925 and 1955, but the effective rate of taxation increased from 2.1 percent on exports to 9.3 percent and from 9.6 percent on imports to 18 percent.[17]

External financing: from self-financing to aid dependency

Figure 3 displays net grants from France as a proportion of a colonial territory's GDP. At the beginning of the twentieth century, for some colonies like Madagascar or AEF, grants could represent 15 to 25 percent of expenditure, at a time when the fiscal apparatus was still under construction. Yet, as expenditure was also low, this temporary contribution never went above 3 percent of local GDP, and the cost to France was very limited. In Indochina, net grants from France were systematically negative from 1904 onward, which means that surpluses from Indochinese budgets were financing the French state.

Between 1920 and 1944, the colonial empire was almost self-financed. The first exception was Morocco in the 1920s when the colonial state was still new. The second exception was Central Africa (AEF), where grants represented up to 0.8 percent of GDP over the period. Transfers to AEF peaked between 1920 and 1924, the period of Minister Sarraut's plan, taken by some as the first developmental attempt in the empire (Cornevin 1972 pp. 281-290). In the 1930s, as the Great Depression was unfolding, state-guaranteed long-term loans financed large infrastructure projects. Colonial governments used these loans mainly for the completion of railway lines like the "Congo-Océan" in AEF or the "Fianarantsoa–Côte Est" in Madagascar. These loans were still being reimbursed in the late 1950s, but the large inflation of the 1940s considerably softened the debt burden.

[17] To be more precise, in West and Central Africa, exports increased from 14 to 18 percent of GDP and imports from 17 to 22 percent. The increase in trade alone would then explain an increase in the share of trade taxes in GDP of only $0.021\times0.04+0.096\times0.05=0.56$ percentage points. In Madagascar, the share of imports and exports in GDP actually decreased from 56 percent in 1925 to 32 percent in 1955.

[FIGURE 3 ABOUT HERE]

In 1946, the Economic and Social Development Investment Fund (FIDES) was created to finance large-scale infrastructure projects in sub-Saharan Africa. Though the colonies also contributed to this fund, the contribution of France was 70 percent of the total. As a result, as can be seen in Figure 3, after 1946 net grants from France as a share of GDP took off in Madagascar (2.4 percent of GDP on average for 1946-1960) and even more impressively in West and Central Africa (3.5 percent). In North African colonies, development projects were financed by another Fund, the Economic Modernization Fund (FME), with loans at the highly subsidized rate of 1.5% (Saul 2016). As we only report direct grants, we do not take into account this indirect subsidy, nor the fact that these loans were not fully reimbursed after decolonization. It is why Figure 3 shows that Morocco and Tunisia received no French aid before independence in 1956. In contrast, Algeria started receiving large grants from France in 1956, two years into the liberation war. This culminated in 1959-1962 under the "Constantine Plan," aimed at industrializing the country, with a peak at 16.4 percent of Algerian GDP in 1961 (5.8 percent of GDP on average between 1946 and 1962).

The colonial empire definitely turned more costly for France in the last 15 years of colonization. Yet, even during this period, France's total financial contribution to colonial civilian expenditure reached 0.39 percent of its own cumulated GDP, below the aid target fixed today by the OECD for its members (0.7 percent). Contrary to Marseille's (1984) claim, the Empire was still not a financial burden for France. After decolonization, France continued to give international aid to its former colonies, but the amounts were reduced. Therefore, it is true that decolonization allowed France to save money, as argued by Marseille (1984) and Cooper (2014a,b). The amount of French aid directed to Algeria decreased quickly after 1963 to represent only 2 percent of Algerian GDP in 1969, Madagascar also experienced a large

downfall below 1 percent, while in West and Central Africa the share of French aid in GDP stabilized around 3 percent.

Figure 4 provides a synthetic view of all sources of public finance in the French empire, expressed as a percentage of the total empire's GDP.[18] Between 1900 and 1950, total civilian public expenditure in the empire was overwhelmingly financed by local public revenue. Financial transfers from France were large, but almost completely in the form of military expenditure, far larger than civilian subsidies. From 1833 to 1962, military expenditure in the empire represented on average 57.7 percent of civilian expenditure, 6.1 percent of the empire's GDP and 0.8 percent of France's GDP; the corresponding figures for civilian transfers were respectively 10.7, 1.1 and 0.14 percent. Military spending was high during the conquest of Algeria, peaked in the 1880s with the conquest of Tunisia and Indochina, and boomed again with the liberation wars of Indochina and of Algeria, while the French military presence was also increasing in other colonies of sub-Saharan Africa after 1946. Though France kept a few permanent military bases in its former empire, decolonization definitely decreased France's military expenditure. Except for some expenditure on infrastructure and health, we never consider the military expenditure of France as an item of public expenditure for the colonies (see online Appendix 1). Yet, once they became independent, the former colonies started developing a national defense budget, so that we could consider part of France's colonial military spending as subsidizing their defense expenditure. Military expenditure in the domestic budget of independent Morocco (after 1957) was 13 percent of total expenditure, or 1.5 percent of local GDP.[19] If we adopt this 1.5 percent ratio of GDP to

[18] As the empire expanded over time, so does the geographical coverage of the GDP denominator; colonies enter as soon as they become the object of expenditure (usually military in the conquest period), then exit when they obtain independence.

[19] It was 11.7 billion francs; Roy. du Maroc, *Tableaux économiques du Maroc 1915-1959*, p. 261. In contrast, according to Amin's estimates (1966 pp. 281-284), Algeria in 1963 had the largest army in Africa, and

define counterfactual military spending absent colonialism, then we find that the subsidization of defense expenditure by France represented a 0.18 percent transfer in terms of French GDP, bringing total subsidies to colonies to 0.14+0.18=0.32 percent over 1833-1962. Overall, French "aid" to its colonies was definitely modest. Even from this perspective, French colonies did not receive large public transfers from France, contrary to Marseille's (1984) view.

[FIGURE 4 ABOUT HERE]

Though French aid to its colonies was limited if we consider the entire colonial period, it increased in the last two decades of colonization, in particular in sub-Saharan Africa. In the same period, fiscal extraction, which was already substantial, increased to unprecedented levels. As a result, in 1955, net civilian public expenditure represented almost 20 percent of GDP in the French colonial empire. As the next section shows, the high and rising extractive capacity of the colonial state, accompanied in the late colonial period by large external financing, did not translate into a high capacity to provide public goods and services.

High wage cost and biased expenditure

The true limitation of the colonial state was not its fiscal capacity, but its colonial nature. Its expenditure was plagued with high unit costs, in particular because of high wages, firstly explained by the presence of highly paid French government employees. It was also biased, serving first the needs of French settlers and companies. High wage costs and biased expenditure were manifestations of a dualistic economic system where a traditional, mostly agricultural sector coexisted with high-wage enclaves inhabited by Europeans and

spent 70 billion francs on it, meaning 5.2% of GDP, not even counting the pensions of veteran *mujahedeen* (30 billion).

autochthonous elites and benefitting disproportionately from colonial public expenditure (Boeke 1953, Lewis 1954, Fei and Ranis 1969). We are by no means the first to note this, but we have developed new data series to substantiate this vision in the case of the French empire. In particular, we think the role of high public wages in constraining development efforts in the late colonial and early independence period (Dumont 1962, Amin 1966) is a point that deserves more attention.

High wage costs

Table 3 displays estimates of civilian expenditure per capita, public employment per 1,000 inhabitants and the annual average public wage in France and in the colonial empire in 1925 and 1955. We express monetary figures in 1937 francs adjusted for purchasing power parity, using a basket of consumption goods for deflation (see online Appendix 1). Because of vast differences in GDP per capita and wages, this way of expressing public expenditure clearly *overstates* differences in the volume of public goods and services provided. In the absence of detailed information on the price of various government goods and services, building a specific public spending deflator is impossible, but we show the number of government employees per 1,000 inhabitants. This indicator might *understate* differences in public services provision, as it does not consider the skill content of various occupations.

In 1925, non-military expenditure represented the same share of GDP in France and the colonial empire (8 percent). But the difference in public employment per capita was striking. France had 11.9 government employees for 1,000 inhabitants, more than five times the average for the empire (2.2).

[TABLE 3 ABOUT HERE]

If public wages were proportional to GDP per capita, differences in public employment between France and the colonies would reflect differences in revenue as a percentage of GDP.

This was not the case because differences in public wages were much smaller than differences in GDP per capita. In 1925, while GDP per capita was ten times lower in the colonies than in France, the average annual public wage was only 20 percent lower (Table 3, line 3). Though Indochina was 14 times poorer than France, the average public wage was the same as in France (see online Appendix 5 for a discussion of the high wages prevailing in Indochina in the 1920s).

We measure the public sector wage premium as the ratio of the average public wage to GDP per working age population (15-64 years old). In 1925, it was 1.2 in France, versus 8.6 in the colonies (Table 3, line 4). This ratio was particularly high in Indochina (14.8) and in West and Central Africa (7.4), lower in North Africa (4.3) and Madagascar (4.5). On average, public wages in the colonies were seven times higher than in France when expressed in terms of GDP per worker, and the number of government employees per capita was almost six times lower than in France. Under the doctrine of colonial self-financing, the level of wages severely restricted the volume of public service. As a result, while the non-military wage bill absorbed only 13% of net public revenue in France, it weighted for almost one third in the empire, and even more in Indochina (Table 3, line 5).

Average public wages were high firstly because of the presence of well-paid French government employees. On top of a base wage that was the same as in mainland France at the same rank, they received bonuses meant to compensate for expatriation ("*supplément colonial*"). These could be very high, from 25 to 70 percent of the gross wage, depending on the territory and the period. To these bonuses were added a variety of allowances for remoteness, riskiness, housing, family charges and cost of living. In North Africa, French settlers hired locally also received a 30 percent wage bonus ("*tiers colonial"*), even when they were born in the colony and did not suffer from homesickness. From a detailed analysis of public employment and wages by citizenship in Indochina and Madagascar (presented in

online Appendix 5) it appears that bonuses were set to keep French public wages in line with the earnings of settlers in the private sector, in order to attract sufficiently skilled candidates.

To what extent were the high wages paid to French civil servants a burden on the budgets of the colonies? This depended on how high French wages were, and on the share of French citizens in public employment. For example, in the settlement colonies of North Africa, wage bonuses paid to French citizens were lower, but their share in public employment was higher than in other colonies — autochthons made no more than 50 percent of civil servants, concentrated in low-skill and low-rank positions.[20] Elsewhere in the empire, the share of French citizens in public employment was lower, but their wages were higher, especially compared to local standards of living. In Indochina and Madagascar, whose budgets allow breaking down public employment by citizenship, the French represented about 10% of public employment and about half of the wage bill in 1925 and in 1943/45 (see online Appendix 5). Available evidence suggests that the same proportion applied to West and Central Africa, at least for the share of public employment.[21]

Were these high wages paid to Europeans offset by the low pay of autochthons? Even when they were skilled, autochthons were not paid on the same scale as Europeans. Degrees obtained in the colonies were not valued the same as those acquired in metropolitan France.

[20] Various sources: For Tunisia in 1925, European civil servants enumerated in the population census of 1921 (Régence de Tunis, *Statistique générale de la Tunisie 1925,* pp. 8-9) combined with our total employment figure. Among teachers, 35% were sent from France, 44% were French settlers recruited locally, and only 21% were autochthons (Min. des Aff. Etrangères. *Rapport au président de la République sur la situation de la Tunisie en 1925*, p. 47). In the population census of Algeria for 1936, Europeans were 62% of workers in the civil service and the army (Gouv. Gal de l'Algérie, *Annuaire Statistique de l'Algérie 1939-1947*, p.26).

[21] Various sources: a breakdown of personnel by "*cadre*" in the local budget of Côte d'Ivoire for 1925; Gbikpi-Benissan (2011, pp. 217-218) in the education sector of Togo in 1926; a census of Europeans for 1938 Cameroon (Ministère de la France d'Outre-Mer, 1947. *Annuaire Statistique du Cameroun 1938-1945*, volume I. Paris: Imprimerie Nationale, Tableau VIII p. 33), combined with our total employment figure for 1937.

For a given nominal position (for example, "teacher 2nd class"), the base wage paid to an autochthon could be 20 to 50 percent lower in the so-called "local" wage schedule.[22] Yet, it also seems that the high wages paid to French civil servants were pulling the autochthonous wage schedule upwards, because too much inequality in pay was politically difficult (see online Appendix 5). In skilled occupations like teachers, some allowances were extended to autochthons in some cases, even if they never received the expatriation bonuses. During the interwar period, the racial differentiation of wage schedules was gradually removed, or at least euphemized. In non-settler colonies, aside from the "general" "*cadre*" applying to French civil servants sent abroad, each colony could recruit locally in a "common" or "superior" "*cadre*", whose racial composition was mixed, and in a low-rank "local" "*cadre*", where only autochthons were found. For middle-rank positions, the mixing of French and autochthonous employees within the same "*cadre*" contributed to narrowing the pay gap.

Between 1925 and 1955, public expenditure measured in 1937 francs boomed, and public employment per 1,000 inhabitants roughly doubled everywhere. It increased from 11.9 to 21.6 in France, and from 2.2 to 4.6 on average in the empire. The public sector wage premium, however, remained high.

There are two reasons why we might have expected a fall in the public sector wage premium in the developmental era: the significant decrease in wage bonuses, and the fall in the share of French government employees. In Madagascar and in West and Central Africa after 1950, French executives saw their 70 percent bonus reduce to 40 percent.[23] At the same time, it is likely that, at least in non-settler colonies, the new government employees were mostly autochthons. However, data on the composition of employment by citizenship is much more difficult to reconstruct in the late colonial era, as explicit references to race or origin in wage schedules became forbidden by law. We could gather some figures for North Africa,

[22] One example is provided for teachers in Togo by Gbikpi-Benissan, (2011, vol. 2, p. 203).

[23] See in particular République Française, Décret n° 51-511 du 5 mai 1951.

and there, it appears that government employment barely Africanized.[24] However, in the rest of Africa, it is hard to see how government employment could have doubled without a significant increase in the share of African employees.

One might expect that the reduction in bonuses and the hiring of more autochthons decreased the public sector wage premium, but this was not the case. Everywhere, public wages increased faster than GDP per working age population, and the ratio of public wages to GDP per worker increased.[25] While average real public wages were multiplied by 1.8 in France, they were multiplied by 2.0 in North Africa, 2.2 in Madagascar and almost tripled (2.8) in West and Central Africa. There, the increase in the ratio of public wages to GDP per worker was particularly striking, from 7.4 to 10.6. As a result, the weight of the wage bill on public finances increased. Whereas it was limited to 18% of public revenue in France, it went as high as 43% of revenue in the empire (Table 3). The latter figure illustrates well that "developmentalist colonialism" was severely constrained by its wage costs. Development, especially social policies, required more public employment. Raising public employment required more revenue or even larger transfers. But fiscal extraction was already high, and colonialism was not "developmentalist" enough to bring itself to massive transfers.

What explains the increase in the colonial public sector wage premium? A first explanation could be a change in the skill composition of employment. But only in sub-Saharan Africa can part of the increase, a small part only, be accounted for by the change in

[24] Various sources: Amin (1966, p. 153, 161 and 174) reports respectively 67, 60 and 60% for Algeria, Tunisia and Morocco in 1955; in Morocco, 59% of primary school teachers were French in 1955 (Roy. du Maroc, *Tableaux économiques du Maroc 1915-1959*, p. 37). In the school year 1962-63, just after Algeria's independence and the departure of many French settlers, "foreigners" still made 41% of all teachers from primary to senior secondary level (Office National des Statistiques de l'Algérie, *Rétrospective 1962-2011*, p.121, Table 4, http://www.ons.dz/-Retrospective-1962-2011-.html).

[25] The decrease in the Empire's average is only due to the fact that data are missing for Indochina in 1955.

the sectoral composition of employment from low-skill, low-pay jobs in security toward higher-skill, higher-pay jobs in education or health.[26]

Pressing demands from trade unions for equality of pay also led to wage increases in favor of autochthonous civil servants. In 1950, a law proposed by Lamine Guèye, the representative of the four communes of Senegal in the French Parliament and the mayor of Dakar, granted equality in pay and allowances to all colonial government employees belonging to the same wage schedule ("*cadre*") (Cooper 1996, pp. 277-322 and pp. 407-431).[27] This law compressed the wage distribution at the top, as it mainly impacted skilled autochthons who belonged to the same wage schedule as Europeans, and it also contributed to increase wage costs. But its exact contribution is hard to measure in the absence of detailed data.[28]

Apart from this, the appreciation of the African franc after World War II largely accounts for the higher increase in real wages in West and Central Africa. For most of the colonial period, the franc of sub-Saharan African colonies was pegged to the French franc at parity. During World War II, inflation had been lower in West and Central Africa than in France (see the "Prices" section in the online Appendix 1). In order to boost the competitiveness of French exports, the franc in sub-Saharan Africa was appreciated and renamed CFA franc. One CFA franc was worth 1.7 French francs in 1946-47, then two French francs starting in 1948. Nominal wages did not change in the colonies, which meant

[26] When using the breakdown of public employment by administrative sector, the Fisher index of wages increases slightly less than the average wage, pointing to more frequent recruitment in high-pay sectors; correspondingly the Fisher index of employment increases more than total public employment. This is especially true in AEF and Cameroon.

[27] See République Française, Loi n° 50-772 du 30 juin 1950.

[28] We collected for each territory the wages of lowest - and highest- paid teachers and nurses, at six dates between 1913 and 1955. These series are particularly noisy, and from them we cannot identify any time trend on the range of variation of wages in those two occupations.

that real wages increased because French imports were now cheaper. On top of this, in the following years, nominal wages in African colonies were subjected to the same large increases as in France, where real wages had been eroded by World War II inflation (Piketty 2018, pp. 191-194). The appreciation of the franc and the decision to apply the same nominal wage increases in France and the African colonies generated large gains in real public wages in sub-Saharan Africa.

The high colonial public sector wage premium was a crucial legacy for independent countries. Authors including Amin (1966) on North Africa and Dumont (1962) on sub-Saharan Africa underlined, in the early 1960s, the high level of public wages. Both criticized the one-to-one replacement of French civil servants at the same wage.[29] This wage premium determined the features of socioeconomic and political inequalities in the young independent countries. In their first two decades of existence, an administrative bourgeoisie emerged, a "bourgeoisie of the civil service" in the words of Fanon (1961) — see also Simson (2019). The combined economic affluence and political influence of this group led to the entrenchment of patron-client relationships with the rest of society. Just after independence, the legitimacy of this new social class was high. However, its initial political capital depreciated and its authority was undermined because socioeconomic and political dualism persisted, and because development was not shared.

Were high wage costs a general feature of European colonialism, or a specific feature of French colonialism? Frankema (2011) gives telling examples of high-ranking British colonial administrators paid several orders of magnitude more than African workers (Frankema 2011,

[29] The extent to which wage dualism persisted in independent countries is not the object of this paper. Present-day estimates suggest that wage dualism is still high in former French Africa, even after the CFA franc devaluation of 1994 (Bossuroy and Cogneau 2013). Our companion paper on British and French colonies of West Africa shows that average public wages remained high in former French West Africa but were allowed to decrease in former British West Africa (Cogneau, Dupraz and Mesplé-Somps 2018).

p. 143). In the absence of systematic historical public wage series, putting our wage cost estimates in comparative perspective is challenging. However, as part of ongoing research, we produced comparative figures between West African British and French colonies, in particular between French Côte d'Ivoire and its British neighbor the Gold Coast (Cogneau, Dupraz and Mesplé-Somps 2018). Before World War II, the average public wage was always much higher in the Gold Coast. However, the difference inverted in the developmental era, as real average public wages fell in the Gold Coast and increased in Côte d'Ivoire. Similar patterns emerge from comparing other pairs of neighbors. Though these conclusions need to be strengthened, it appears that the specificity of French colonialism did not lie in the existence of high public wage costs in the first place, but in its persistence in the developmental era.

Biased expenditure

The colonial state first served the interest of French settlers and capitalists, by favoring costly investments in railways and harbors to connect mines and plantations, and by providing settlers, mainly agglomerated in cities, with public services (health, education, electricity) at the standards prevailing in France. Table 4 shows the sectoral allocation of public expenditure as well as a few development outcomes in France and the colonial empire in 1925 and 1955. Like for public revenue, we organized data collection, homogenization and aggregation to make expenditure headings comparable across space and time.

In all colonies, a large share, between 33 and 50 percent, of public expenditure went to infrastructure and what we call "production support" — subsidies to private and public companies and expenditure on public services that benefitted firms like posts, mining or agricultural research. In North Africa, colonial governments also directed public subsidies to the settlement of French farmers. A large fraction of production support expenditure went to railways, in the form of subsidies to private companies, in direct investments financed by loan or buying back the capital of private companies, or in subsidies to the operating national

company. The share of infrastructure and production support in expenditure was overall higher in the colonies than in France, but the years 1925 and 1955 are not representative of longer-term patterns, as the reconstruction effort after World War I and World War II were then absorbing a large part of French public spending. Before 1914 and between 1926 and 1939, the share of production and infrastructure expenditure was 10 to 20 percentage points higher in the colonies than in France. Yet, despite some catch-up between 1925 and 1955, the gap between France and its colonies in electricity output, roads and railways remained wide (Table 4). In 1955, kWh per capita were 30 times as high in France as in the colonies, road meters per capita three times as high, and railroad meters per capita 4.5 times as high.

[TABLE 4 ABOUT HERE]

North African colonies received more electricity than the rest of the empire. However, electrification was limited to urban centers, where European settlers lived. If we consider instead public investments that could not easily be targeted only at cities, like road meters per capita, North Africa was not particularly better endowed in 1955. Agricultural investments remained concentrated in regions with high potential and/or a significant presence of European farmers or traders, like the groundnut basin in Senegal, the inner Niger delta for cotton and rice in Soudan, or the rice-producing Mekong delta in Cochinchina.

Social spending was not a priority of colonial governments. In 1925, education represented 7.3 percent of public expenditure and 13 percent of public employment in the colonies, versus 20.3 percent and 32 percent in France. Among autochthons, primary school gross enrollment rates were extremely low: 3.5 percent on average. Education was a more important item of expenditure in North Africa than in other colonies. Yet this educational effort was dramatically biased towards European settlers. In Algeria, where the local government of settlers explicitly rationed the provision of education to autochthons (Ageron 1979, pp. 152-167 and 532-536), budget accounts report a specific credit line for the

European sub-sector: it received 78 percent of total education expenditure in 1925 (and 82 percent in 1955). In 1925 Morocco, the corresponding figure was 79 percent. In terms of expenditure per pupil, our calculations (not reported) show that European children in Algeria enjoyed the same level as children in France, while Algerian pupils received no more than in other parts of the empire. Health represented the same percentage of expenditure in the colonies as in France (5.9 percent), but in France, until the 1960s, the provision of medical services relied mainly on lower administrative levels and the private sector. Still, France had ten times more public health personnel per capita than the empire in 1925. When we consider the total number of health professionals per capita in the public and private sectors (physicians, pharmacists, dentists and midwives), France was 30 times above the empire in 1925.

Social spending increased in the developmental era, but its expansion was still limited. In 1955, education had increased to 11.2 percent of expenditure and 18 percent of employment in the colonies. Primary school gross enrollment rates had increased, yet only to 14.5 percent. Tunisia, Madagascar and Cameroon displayed the highest rates, around 30 percent. In Tunisia, after modernization attempts in the 19th century, the bilingual "Franco-Arab" and "modernized" koranic schools likely encouraged enrollment (Sraieb 1993). In Madagascar, the early action of Protestant missions and of the precolonial *Imerina* kingdom mattered (Campbell 2005, pp. 86-89). Cameroon experienced a big push in school construction in the 1950s (Dupraz 2019). In secondary education, the same three countries lay above the average, although at very low levels (respectively 3.4, 1.8 and 0.8 percent of 11-18 year-old autochthonous children, while at the same time this gross rate reached 19.2 percent in France). In 1955, health had increased to 8 percent of expenditure and the number of health professionals per capita had been multiplied by 7.5 since 1925 but was still seven times lower than in France.

Expenditure in general administration, financial services, justice and security, named "order" spending by Frankema (2011), represented a third of colonial public expenditure and half of colonial public employment in 1925. The share in employment lies far above the share in expenditure because security involved many low-pay autochthonous policemen. In 1955, "order" spending had lost its weight in Madagascar and in West and Central Africa, both in the budget and in the labor force. Overall, the ratio of education and health investments to "order" spending (Frankema 2011, p.144) had increased everywhere after 1945, signaling a more developmental orientation, and non-settler colonies had caught up with North Africa in this respect. Public expenditure remained biased towards the needs of Europeans, but autochthonous populations benefitted from more public services after WW2. However, the gaps in public service accessibility between French people living in France and colonized people remained, for electrification, transportation infrastructure, health or education. Even the most peripheral regions of mainland France, like Limousin or Corsica, received significantly more public goods and services.

Conclusion

The two apparently opposite views on colonial states present in the literature (Leviathan on the one hand, administration on the cheap on the other) can be reconciled, at least in the case of the French empire: French colonial states had a strong capacity for coercion, in particular for raising taxes; but due to high operation costs, their capacity to provide public goods and services was limited. Largely self-financed before 1945, they taxed at a relatively high level, adapting their fiscal tools to different socioeconomic contexts and varying historical conditions, but they were nonetheless under administered, notably because of the very high wage costs coming with the employment of expatriated French civil servants. Their public expenditure was also biased toward the interests of a small enclave of French settlers and firms.

After World War II, as the legitimacy of French rule was increasingly questioned, colonial governments did not tax and spend less; on the contrary, they taxed and spent more. In the hope of preserving their imperial dominance, they became more developmental. They increased their social spending, notably in education. They gave some political rights to local populations, adopted somewhat more progressive taxes, and conceded some wage equality claims. The self-financing doctrine was relaxed, and net grants from metropolitan France started representing a larger share of the colonies' GDP. Wage costs, however, remained high. The public sector wage premium, measured as the ratio of average public wage to GDP per working age population, increased between 1925 and 1955. Given these high unit costs, accelerating development would have required an even bigger push in French grants.

Independent states inherited the structures of colonial states. In 1970, new postcolonial states taxed the same share of their GDP as colonial states did in the 1950s, and they were still dependent on French aid for a significant share of their expenditure. Not all countries followed the same paths or had the same speed or characteristics in terms of reforms that veered between radical breaks and neo-colonial continuities. Some preserved high wages and elitist infrastructure. Others opted instead to extend public employment and decentralize at lower costs. Further research is warranted to analyze these postcolonial evolutions.

References

Adelman, Irma and Cynthia Taft Morris. "Editorial: Development history and its implications for development theory", *World Development* 25, n°6 (1997): 831-40.

Ageron, Charles-Robert. *Histoire de l'Algérie Contemporaine. Tome II : De l'insurrection de 1871 au déclenchement de la guerre de libération*. Paris: PUF, 1979.

Alexopoulou, Kleoniki and Dácil Juif. "Colonial State Formation without Integration: Tax Capacity and Labour Regimes in Portuguese Mozambique (1890s–1970s)", *International Review of Social History*, 62 n°2 (2017): 215-52.

Amin, Samir. *L'économie du Maghreb*. *La colonisation et la décolonisation.* Paris: Editions de Minuit, 1966.

Amin, Samir. *L'Afrique de l'Ouest bloquée. L'économie politique de la colonisation 1880-1970*, Paris: Editions de Minuit, 1971.

Amsden, Alice. *The Rise of "The Rest": Challenges to the West from Late-Industrializing Economies*, Oxford University Press, 2001.

Andersson, Jens. "Long-term dynamics of the state in francophone West Africa: Fiscal capacity pathways 1850–2010", *Economic History of Developing Regions*, 32, n°1, (2017): 37-70.

Bassino, Jean-Pascal. "Preliminary Estimates of Vietnam GDP 1800-1970: North-South Economic Divide in Historical Perspective." In *Constructing a Historical Macroeconomic Database for the Trans-Asian Regions*, edited by Konosuke, Odaka, Kyokawa, Yukihiko, and Kuboniwa, Masaaki, 9–41. Tokyo: Institute of Economic Research, Hitotsubashi University, 2000.

Besley, Timothy and Torsten Persson. *Pillars of Prosperity: The Political Economics of Development Clusters*, Princeton University Press, 2011.

Boeke, Julius H. *Economics and economic policy of dual societies, as exemplified by Indonesia*. New York: International Secretariat, Institute of Pacific Relations, 1953.

Booth, Anne. *Colonial Legacies: Economic and Social Development in East and Southeast Asia*, University of Hawaii Press, 2007.

Bossuroy, Thomas and Denis Cogneau. "Social Mobility in Five African Countries". *Review of Income and Wealth*, 59, n°S1 (2013): 84-110.

Bouveresse, Jacques. *Un Parlement colonial? Les délégations financières algériennes (1898-1945)*. Rouen: Presses universitaires de Rouen, 2008.

Campbell, Gwynn. *An Economic History of Imperial Madagascar 1750-1895. The Rise and Fall of an Island Empire*, Cambridge: Cambridge University Press, 2005.

Cogneau, Denis, Yannick Dupraz and Sandrine Mesplé-Somps. "African states and development in historical perspective: Colonial public finances in British and French West Africa." PSE Working Papers n°2018-29, 2018.

Cooper, Fredrick. *Decolonization and African Society. The labor question in French and British Africa*, Cambridge University Press, 1996.

_____. *Africa since 1940: The Past of the Present*, Cambridge: Cambridge University Press, 2002.

_____. *Africa in the World. Capitalism. Empire. Nation-State*, Harvard University Press, 2014a.

_____. *Citizenship between Empire and Nation. Remaking France and French Africa 1945-1960*, Princeton University Press. French edition: *Français et Africains? Etre citoyen au temps de la décolonisation*, Paris : Payot, 2014b.

Cornevin, Robert. « La France d'Outre-Mer », in Alfred Sauvy, *Histoire économique de la France entre les deux guerres*, tome 3 (« Divers sujets »), chapitre XI pp. 267-308, Paris : Fayard, 1972.

Dincecco, Mark. "The Rise of Effective States in Europe", *Journal of Economic History* 75 n°3 (2015): 901-917.

Dumont, René. *False Start in Africa*. New York: Frederick A. Praeger, 1966. French edition: *L'Afrique Noire est mal partie*, Paris: Seuil, 1962.

Dupraz, Yannick. "French and British Colonial Legacies in Education: Evidence from the Partition of Cameroon", *Journal of Economic History*, 79 n°3 (2019): 628-68.

Fall, Babacar. *Le travail forcé en Afrique occidentale française* (1900-1946). Paris : Karthala, 1993.

Fanon, Frantz. *Les damnés de la terre*, Paris: Maspero, 1961.

Fei, John C. H. and Gustav Ranis. "Economic Development in Historical Perspective", *American Economic Review* 59 n°2 (1969): 286-400.

Frankema, Ewout. "Raising revenue in the British empire, 1870–1940: how 'extractive' were colonial taxes?" *Journal of Global History*, 5, n°3 (2010): 447-77.

_____. "Colonial taxation and government spending in British Africa, 1880-1940: Maximizing revenue or minimizing effort?" *Explorations in Economic History*, 48, n°1 (2011): 136-49.

Frankema, Ewout and Anne Booth (eds). *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850-1960*, Cambridge Studies in Economic History, 2019.

Frankema, Ewout and Marlous van Waijenburg."Metropolitan Blueprints of Colonial Taxation? Lessons from Fiscal Capacity Building in British and French Africa, 1880-1940." *Journal of African History* 55, n°3 (2014): 371-400.

Gardner, Leigh A. *Taxing Colonial Africa: The Political Economy of British Imperial Rule*, Oxford University Press, 2012.

Gardner, Leigh A. "The Fiscal History Of The Belgian Congo In Comparative Perspective", in Frankema, Ewout and Franz Buelens (eds), *Colonial Exploitation and Economic Development: The Belgian Congo and the Netherlands Indies Compared*, London: Routledge, 2013.

Gbikpi-Benissan, François. *Le système scolaire au Togo sous mandat français*, Paris: L'Harmattan, 2011.

Gerschenkron, Alexander. *Economic Backwardness in Historical Perspective: A Book of Essays*, Harvard University Press, 1962.

Havik, Philip J., Alexander Keese and Maciel Santos. *Administration and Taxation in former Portuguese Africa 1900-1945*, Cambridge Scholars Publishing, 2015.

He, Wenkai. *Paths Toward the Modern Fiscal State. England, Japan, China*. Cambridge, MA: Harvard University Press, 2013.

Herbst, Jeffrey. *States and Power in Africa: Comparative Lessons in Authority and Control*, Princeton University Press, 2000.

Hoffman, Philip T. "What Do States Do? Politics and Economic History." *Journal of Economic History* 75, n°2 (2015): 303-32.

Hopkins, Antony G. *An Economic History of West Africa*. Routledge, 1973 [2nd edition 2019].

Huillery, Elise. "History Matters: The Long-Term Impact of Colonial Public Investments in French West Africa", *American Economic Journal - Applied Economics*, 1 n°2 (2009): 176-215, 2009.

Huillery, Elise. "The Black Man's Burden: The Cost of Colonization of French West Africa", *Journal of Economic History*, 74, n°1 (2014): 1-38.

Kirk-Greene, A. H. M. "The Thin White Line: The size of the British Colonial Service in Africa", *African Affairs* 79 n°314 (1980): 25-44.

Kateb, Kamel. "Les séparations scolaires dans l'Algérie coloniale", *Insanyat, Revue algérienne d'anthropologie et de sciences sociales*, 25-26 (2004): 65-100.

Kim, Diana S. *Empires of vice: the rise of opium prohibition across Southeast Asia*, Princeton, NJ: Princeton University Press, 2020.

Law, Robin (ed.). *From Slave Trade to 'Legitimate' Commerce. The commercial transition in nineteenth-century West Africa*. Cambridge University Press, 1995.

Lewis, W. Arthur. "Economic Development with unlimited Supplies of Labour." *The Manchester School* 22, n°2 (1954): 139-91.

Lindert, Peter. *Growing Public: Social Spending and Economic Growth Since the Eighteenth Century*, 2 vol., Cambridge University Press, 2004.

López Jerez, Montserrat. "Colonial and Indigenous Institutions in the Fiscal Development of French Indochina", in Frankema, Ewout and Anne Booth (eds). *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850-1960*, Cambridge Studies in Economic History, 2019.

Maddison, Angus. *The World Economy. Historical Statistics.* Paris: OECD, 2003.

Marseille, Jacques. *Empire colonial et capitalisme français. Histoire d'un divorce.* Paris: Albin Michel, 1984 [2nd edition 2005].

Mauro, Paolo, Rafael Romeu, Ariel Binder and Asad Zaman. "A Modern History of Fiscal Prudence and Profligacy," IMF Working Paper No. 13/5 (2013), International Monetary Fund, Washington, DC.

Mitchell, Brian R. *International historical statistics.* London: Macmillan; New York, NY: Stockton Press, 1998.

Nicolaï, André. "Tunisie : fiscalité et développement", *Tiers-Monde* 3, n°11 (1962) : 429-78.

Piketty, Thomas. *Top Incomes in France in the Twentieth Century*, Cambridge MA: Harvard University Press, 2018.

Richens, Peter. "The economic legacies of the "thin white line": indirect rule and the comparative development of sub-Saharan Africa", *African Economic History* 37 (2009): 33-102.

Roy, Tirthankar. "Why Was British India a Limited State?" in Frankema, Ewout and Anne Booth (eds). *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850-1960*, Cambridge Studies in Economic History, 2019.

Saul, Samir. *Intérêts économiques français et décolonisation de l'Afrique du Nord (1945-1962)*, Genève: Librairie Droz, 2016.

Simson, Rebecca. "Africa's clientelist budget policies revisited: public expenditures and employment in Kenya, Tanzania and Uganda 1960-2010", *Economic History Review*, 72, n°4 (2019): 1409-438.

Sraieb, Noureddine. "L'idéologie de l'école en Tunisie coloniale (1881-1945)", *Revue du monde musulman et de la Méditerranée*, 68-69 (1993): 239-254.

Tilly, Charles. *Coercion, Capital, and European States, AD 990–1992*, London: Basil Blackwell, 1990.

Wagner, Adolf. *Grundlegung der politischen Ökonomie*. 3th ed. Leipzig: Winter, 1893.

van Waijenburg, Marlous. "Financing the African Colonial State: The Revenue Imperative and Forced Labor", *Journal of Economic History*, 78, n°1 (2018):40-80.

Young, Crawford. *The African Colonial State in Comparative Perspective*, New Haven: Yale University Press, 1995.

Yun-Casalilla, Bartolomé, Patrick O'Brien (eds), with Francisco Comín Comín. *The Rise of Fiscal States. A Global History 1500-1914.* Cambridge, MA: Cambridge University Press, 2012.

Zucarelli, François. "De la chefferie traditionnelle au canton : évolution du canton colonial au Sénégal – 1855-1960", *Cahiers d'Etudes africaines* 50 (1973): 213-38.

Table 1 – Fiscal extraction and state size across the French empire in 1925 and 1955

	France	Empire	N.Afr.	Indoch.	Madag.	WCA
Year 1925						
Net Public Revenue / GDP (%)	16.5	8.9	8.3	12.5	9.0	5.4
Net Public Exp. (civilian) / GDP (%)	8.0	8.0	7.9	10.9	7.5	4.4
NPE (civilian) per capita (1937 FF)	703	69	143	68	58	24
French military exp. per cap. (1937 FF)	334	28	107	7	13	6
Year 1955						
Net Public Revenue / GDP (%)	26.3	15.9	19.1	9.5	14.6	14.0
with social security transfers	33.4	17.1	21.5	9.5	14.6	14.0
Net Public Exp. (civilian) / GDP (%)	23.1	19.3	24.1	7.6	18.9	17.0
NPE (civilian) per capita (1937 FF)	3,210	213	575	36	215	154
French military exp. per cap. (1937 FF)	1,034	143	170	257	58	23

Notes: N.Afr.: North Africa; WCA: West and Central Africa; NPE: Net Public Expenditure. North Africa 1925: data for Morocco is from 1926. Indochina 1955: data from 1953 (1954 for the PMS region). Madagascar 1955: data from 1956. WCA 1955: data for AEF is from 1954, data for Togo from 1956. Before World War II, social security transfers were very small in France and non-existent in the colonies. ***Sources***: See online Appendix 1.

Table 2 – Share of different tax instruments in GDP (%), 1925 and 1955

	France	Empire	N.Afr.	Indoch.	Madag.	WCA
Year 1925						
Capitation	0.00	0.97	0.08	1.62	2.91	1.52
Monopolies	1.85	2.41	2.21	4.22	1.40	0.55
Intermediate & Other	6.91	2.97	2.53	4.86	2.39	1.40
Trade	0.77	1.50	1.22	1.49	2.28	1.95
Modern direct & indirect	4.38	0.58	1.18	0.19	0.00	0.00
Total	13.92	8.44	7.21	12.37	8.97	5.43
Year 1955						
Capitation	0.00	0.72	0.01	0.04	2.56	1.97
Monopolies	1.70	2.98	4.22	1.99	2.13	1.51
Intermediate & Other	6.94	3.93	4.84	2.68	2.67	3.24
Trade	1.84	3.27	1.53	3.59	5.42	5.75
Modern direct & indirect	12.05	3.26	5.13	0.90	1.79	1.51
Total	22.53	14.16	15.73	9.21	14.57	13.98

Notes: N.Afr.: North Africa; WCA: West and Central Africa. See online Appendix 1 for the precise definition of each tax instrument. North Africa 1925: data for Morocco is from 1926. Indochina 1955: data is from 1953 (1954 for the PMS region). Madagascar 1955: data is from 1956. WCA 1955: data for AEF is from 1954, data for Togo is from 1956. The sum of all tax instruments does not sum to net public revenue / GDP as presented in Table 1 because Table 1 takes revenue of municipalities into account, while this table considers only the revenue of the central government and first level administrative divisions. ***Sources***: See online Appendix 1.

Table 3 – Public Employment and Wages in 1925 and 1955

	France	Empire	N.Afr.	Indoch.	Madag.	WCA
Year 1925						
NPE (civilian) per capita (1937 FF)	470	64	124	67	58	24
Public employment per 1.000 inhab.	11.9	2.0	2.9	1.7	3.9	1.3
Annual average public wage (1937 FF)	15,241	11,193	12,016	15,612	5,420	6,188
in units of GDP per 15-64 y.o. pop.	1.2	8.6	4.3	14.8	4.5	7.4
Wage bill to net public revenue (%)	13.4	32.1	28.5	36.8	29.9	28.0
Year 1955						
NPE (civilian) per capita (1937 FF)	2,773	192	490	34	215	154
Public employment per 1.000 inhab.	21.6	4.5	6.8	n.a.	4.9	3.1
Annual average public wage (1937 FF)	27,447	20,229	23,660	n.a.	11,959	17,691
in units of GDP per 15-64 y.o. pop.	1.3	7.6	5.5	n.a	5.8	10.6
Wage bill to net public revenue (%)	17.7	43.2	44.3	n.a.	36.9	41.8

Notes: N.Afr.: North Africa; WCA: West and Central Africa; NPE: Net Public Expenditure. Public employment, public wage and wage bill to GDP ratio exclude the military and are for the central government only, except in 1955 Madagascar. There, following the 1946 decentralization reform, provinces represented a large share of total public employment; hence, we extrapolated it from personnel expenditure, assuming that provincial employment was paid the same average wage as central government employment. France 1925: employment from 1922 and wage bill from 1923. N.Afr. 1925: Tunisian employment and wages from 1924. ***Sources***: See online Appendix 1.

Table 4 – Public expenditure and development outcomes in 1925 and 1955

	France	Empire	N.Afr.	Indoch.	Madag.	WCA
Year 1925						
Infrastructure & production support						
Share in expenditure (%)	41.8	43.4	49.8	37.6	32.5	46.4
kWh per inhabitant	318.5	n.a.	6.5[a]	n.a.	n.a.	n.a.
Roads meters per 1000 inhabitants	19.2	n.a.	1.0	0.9	n.a.	n.a.
Railroads meters per 1000 inhabitants	1.1	n.a.	0.6	0.1	n.a.	0.2[b]
Education						
Share in expenditure (%)	20.3	7.3	9.1	6.7	6.4	3.6
Gross primary enrollment, autochthons (%)	135.3	3.5	4.1	4.7	n.a.	1.7[c]
Government schools only (%)	108.4	n.a.	3.8	4.2	n.a.	n.a.
Health						
Share in expenditure (%)	5.9	5.8	6.7	4.3	11.5	5.8
Public health personnel per 1000 inhabitants	1.4	0.14	0.31[a]	0.08	0.26	0.09
Medical staff per 1000 inhabitants	1.27	0.04	0.15[a]	0.02	0.08	0.03[c]
Administration, Finance, Justice and Security						
Share in expenditure (%)	31.9	32.7	24.7	41.6	27.8	30.7
Share in employment (%)	25.0	56.2	46.1	63.5	55.1	58.9
Year 1955						
Infrastructure & support to production						
Share in expenditure (%)	54.9	48.2	47.4	29.9	46.4	54.2
kWh per inhabitant	1,148	39.5	91.0	n.a.	11.8	5.9
Roads meters per 1000 inhabitants	15	4.7	5.0	n.a.	5.9	4.4
Railroads meters per 1000 inhabitants	0.9	0.2	0.3	n.a.	0.2	0.1
Education						
Share in expenditure (%)	13.5	11.2	13.4	10.8	7.0	7.6
Gross primary enrollment, autochthons (%)	109.8	14.5	17.6	n.a.	32.2	12.4
Government schools only (%)	92.9	10.7	17.1	n.a.	20.9	6.4
Health						
Share in expenditure (%)	11.6	8.0	7.7	7.0	8.3	8.7
Public health personnel per 1000 inhabitants	n.a.	0.58	0.65[d]	n.a.	0.82	0.54
Medical staff per 1000 inhabitants	1.97	0.30	0.29	n.a.	0.50	0.27
Administration, Finance, Justice and Security						
Share in expenditure (%)	15.8	23.1	24.6	41.5	16.0	17.1
Share in employment (%)	25.9	42.6	47.4	n.a.	n.a.	38.5

Notes: N.Afr.: North Africa; WCA: West and Central Africa. *Expenditure shares*: excluding the military, central government only in metropolitan France, central government and first level administrative divisions in the colonies; N.Afr. 1925: Moroccan data from 1926; Indoch. 1955: data from 1953; Madag. 1955: data from 1956; WCA 1955: AEF data from 1954. Expenditure shares do not always add up to 100% because the destination of expenditure is not systematically recorded in the original public accounts (mainly for first-level administrative divisions). *Employment shares*: excluding the military, for the central government only everywhere; N.Afr. 1925: Tunisian data from 1924; WCA 1925: Togolese data from 1926. Gross primary enrollment rates = number of primary school pupils divided by the 6-13 year old population. They count only public and government-authorized private schools, not unofficial Koranic schools (which gathered 36,000 pupils in 1932 Algeria and 100,000 pupils in 1950 Algeria; Kateb, 2004), nor municipal schools in Indochina. In Tunisia and Morocco, Jewish children, who already enjoyed universal primary schooling like Europeans in 1925, are counted apart. a: Algeria and Morocco only. b: AOF only. c: AOF, Togo and Cameroon only. d: Tunisia only. ***Sources***: See online Appendix 1.

Figure 1 — Colonial territories present in our data

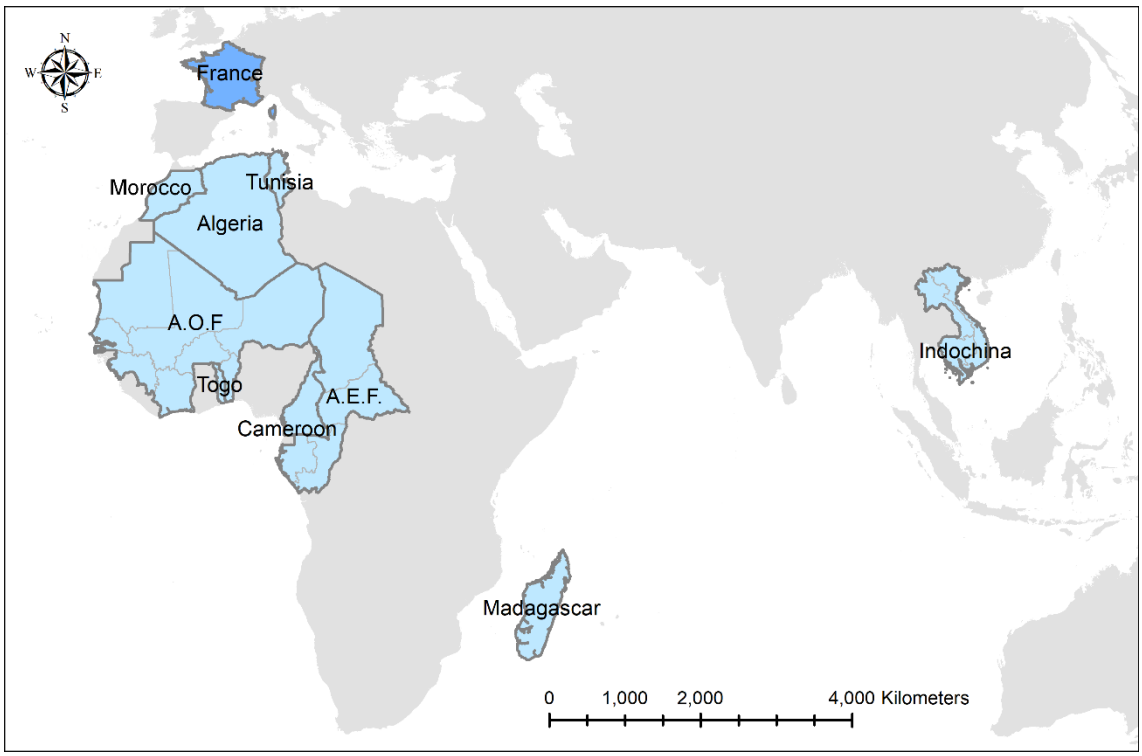
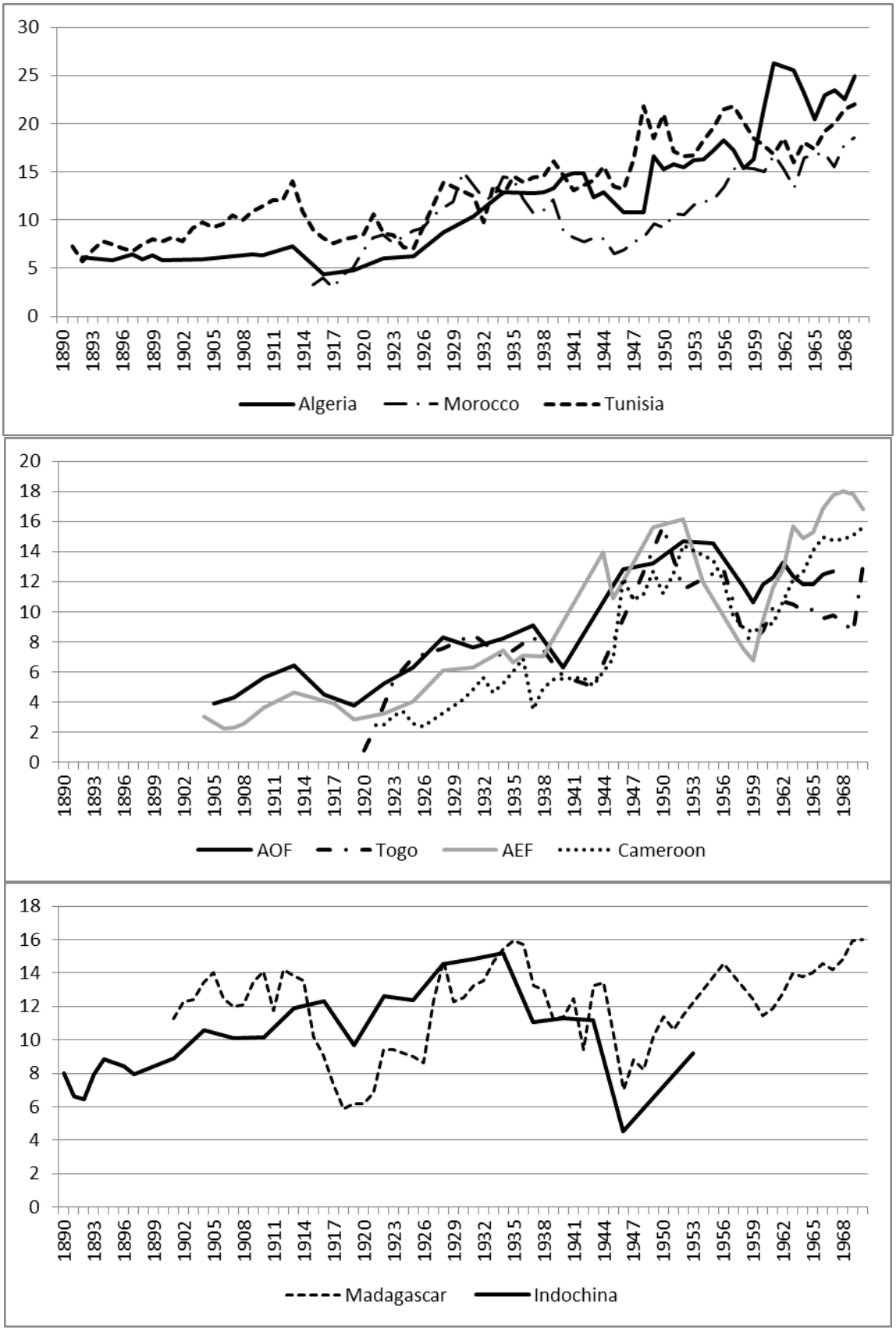
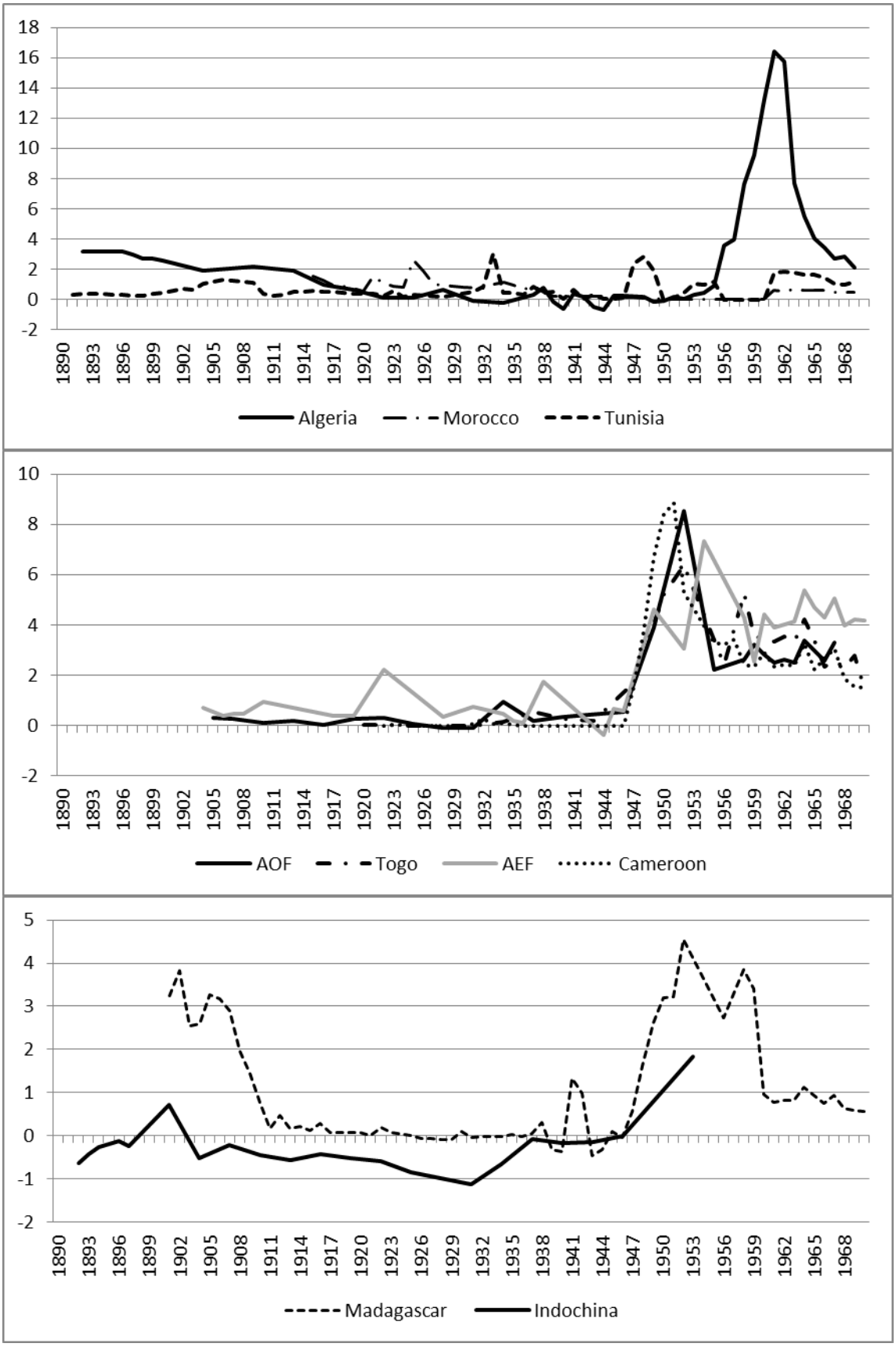


Figure 2 — Net public revenue as share of GDP from 1890 to 1970



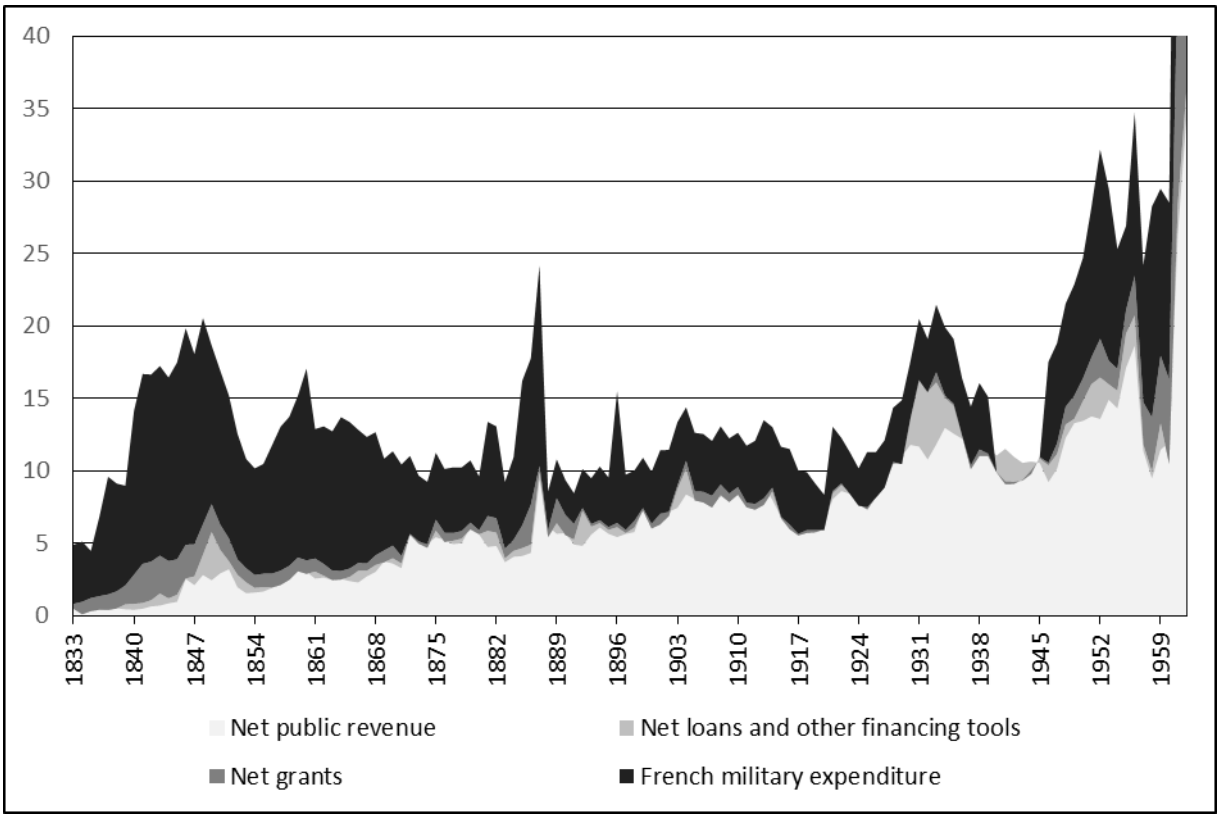
Notes: The revenue of first-level administrative divisions (*provinces*, *départements*, *régions*) is included and consolidated, but not the revenue of second-level administrative divisions (municipalities). Like in Table 1, estimates of *corvée* labor revenue are not included in the figures for West and Central Africa and Madagascar. ***Sources***: See online Appendix 1.

Figure 3 — Net grants from France as a share of GDP, 1890-1970



Notes. These are net grants from France, negative numbers mean the grants from the colony to France are larger than the grants from France to the colony (for instance Indochina 1905-1937). French military expenditure is not counted, except expenditure in infrastructure and health. The implicit grant associated to public loans at subsidized rates is not counted either (North Africa after WW2). ***Sources***: See online Appendix 1.

Figure 4 — Public revenue, loans, grants and military expenditure as percentage of the Empire's GDP



Notes: Civilian net grants include military expenditure in infrastructure and health. Military expenditure includes personnel and operating expenses of troops, and expenditure other than in infrastructure and health. French military expenditure in the colonies during World War II is missing. The military costs of the Indochinese and Algerian wars are rough estimates, likely to be underestimated in the case of Algeria. In federations, loans and grants were mostly managed by the federal budget, for which we have annual series; for net public revenue, our series are less frequent (see online Appendix 1); missing years were extrapolated linearly. The boundaries of the colonial Empire change: for example, the last two years correspond to Algeria only. Years 1961 and 1962 are out of range, and should anyway be regarded with caution due to many data uncertainties linked to the Algerian crisis. ***Sources***: See online Appendix 1.

Appendix

Table A.1 – Population, urbanization and GDP in France and its empire, 1850, 1925 and 1955

		France	N. Afr.	Indochina	Madag.	WCA
Population in millions	1850	36.2	9.0	14.2	2.2	15.2
	1925	40.5	13.7	26.1	3.6	21.3
	1955	43.4	22.4	34.6	4.9	34.0
Share of Europeans (%)	1850		1.6	ε	ε	ε
	1925		8.1	0.1	0.5	0.1
	1955		7.0	0.0	1.2	0.4
Urbanisation	1850	25.5%	6.6%	1.4%	2.2%	0.7%
	1925	48.8%	16.4%	2.1%	4.7%	1.4%
	1955	56.0%	24.3%	12.0%	9.0%	12.1%
GDP per capita (1937 FF PPP)	1925	8,776	1,811	623	782	546
	1955	13,879	2,383	469	1,137	902

Notes: N. Afr.: North Africa; WCA: West and Central Africa. ***Sources:*** see online Appendix 1 and also online Appendix 4 on urbanization.

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau, Yannick Dupraz and Sandrine Mesplé-Somps

Appendix 1 – Data

This version: October 2020

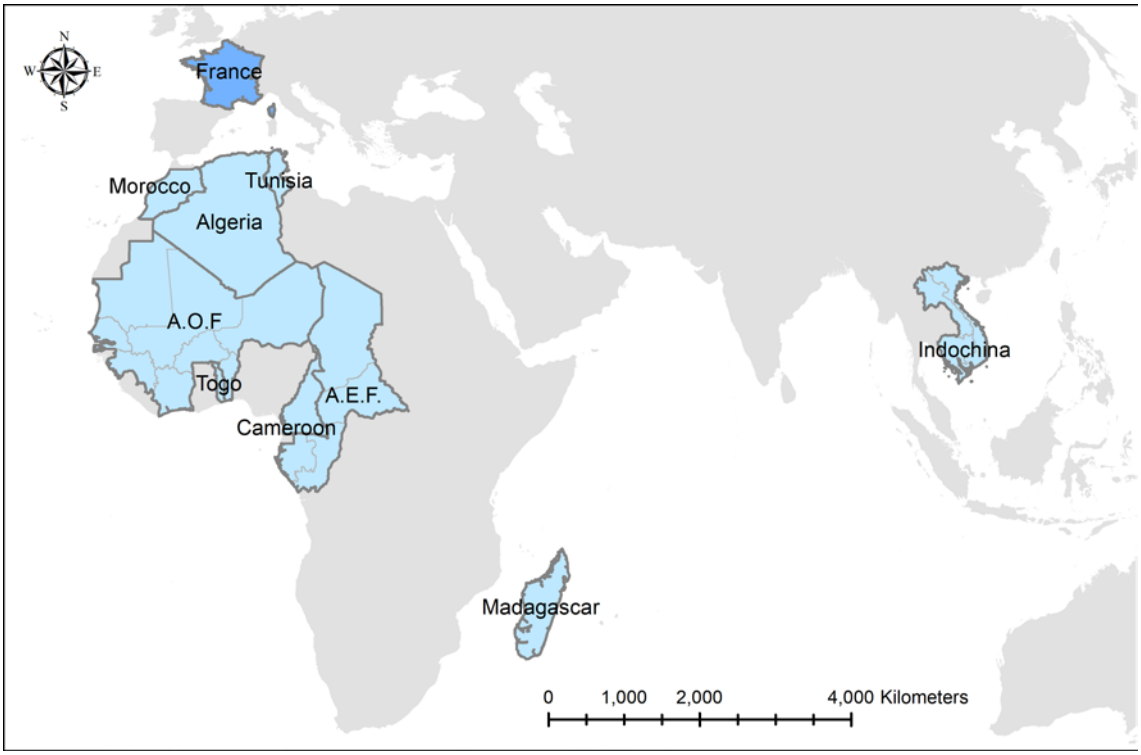
TABLE OF CONTENTS

EXTENT OF THE PUBLIC FINANCE DATABASE

GEOGRAPHICAL AND HISTORICAL RANGE

Geographical range. Our database covers almost the entire second French colonial empire, corresponding to the second wave of European colonisation from the middle of the 19th century. Except the Indochinese Union, most colonies are in Africa: Algeria, Tunisia and Morocco, the federations of French West Africa (*Afrique occidentale française*, AOF) and French Equatorial Africa (*Afrique Equatoriale Française*, AEF), Togo, Cameroon, and

Figure 1: Geographical extent of the dataset



Madagascar (see map on figure 1). Our database does not encompass smaller colonial territories such as the remains of the first colonial empire (Guadeloupe and Martinique in the West Indies, French Guyana, the Reunion Island and the five trade posts of India), New Caledonia, colonized by France in 1853, and the port of Djibouti, colonized in 1884. Lebanon and Syria, under French rule between the two world wars, are not included in the present database either. In total, the former French colonies that are part of our database correspond to 21 contemporary countries: Algeria, Morocco, and Tunisia in North Africa, Benin, Burkina-

Faso, Cameroon, Chad, Central African Republic, Congo-Brazzaville, Côte d'Ivoire, Gabon, Guinea, Madagascar, Mali, Mauritania, Niger, Senegal and Togo in Sub-Saharan Africa, and Vietnam, Laos and Cambodia in South-East Asia.

Table 1: Historical range of the dataset

Region	Range of colonial data	# observations	Range of Franc Zone data	# observations
Algeria	1833-1958	96	1959-1969	11
Morocco	1915-1956	41	1957-1969	13
Tunisia	1891-1955	61	1956-1969	13
Indochina	1871-1953	40		
West Africa[(a)]	1905-1958	18	1959-1967	9
Equatorial Africa[(b)]	1904-1954	22	1958-1970	13
Cameroon	1922-1957	28	1958-1970	13
Madagascar	1901-1956	52	1958-1970	13
Togo	1920-1956	14	1958-1970	13

(a) The West African federation includes Côte d'Ivoire, Dahomey (present Benin), Guinea, Haute-Volta (present Burkina-Faso), Mauritania, Niger, Senegal and Soudan (present Mali).

(b) Equatorial Africa includes Chad, Congo (present Congo-Brazzaville), Gabon, Oubangui-Chari (present Central African Republic)

Historical range. For each territory, the starting date depends on the specific history of colonization in the region and on the date at which colonial authorities started producing systematics records of public finances. The first region to be colonized was Algeria, whose conquest began in 1830, the last were Togo and Cameroon, who were given to France as League of Nation mandates after WWI. The end date also depends on the specific history of each region. In Indochina, our database stops in 1953, one year before independence. For African colonies, which became independent between 1956 (independence of Morocco) and 1962 (independence of Algeria after an eight year war), we are able to extend the database to the end of the 1960s, using the reports of the Franc Zone, the monetary union between France and some of its former colonies. Since the 1950s, the *Banque the France* in charge of the monetary policy of the Franc Zone has been publishing reports containing some information on the public finances of its member countries. These reports offer a picture of public revenue and expenditure less detailed and complete than the one built using budget accounts directly. Table 1 sums up, for each of the nine regions considered, the historical range of our public

finance data, distinguishing between the "colonial" dataset, built primarily from budget accounts, and the "Franc Zone" dataset, built primarily from the reports of the Franc Zone.

BUDGET ACCOUNTS CONSIDERED AND SOURCES USED

This section presents the budget accounts considered and the sources used to build the public finance database, as well as the main assumptions made, especially when dealing with missing data. The complete list of sources is displayed in the "Public finances" section of the "List of sources" below. In order to produce figures comparable across time and across regions, we did not only consider the central colonial governments, but tried to collect data for all public authorities responsible for revenue and expenditure in the colonies. This requires detailed knowledge of the administrative structure of the Empire. We collected data from various budget accounts: metropolitan (French), colonial, federal in colonies organised in federations, auxiliary (loan budget accounts, development funds, etc.), as well as the accounts of lower level administrative divisions. For each year and each region of the Empire, these budgets are consolidated, meaning that the various transfers between them (subsidies, loans, interests and reimbursements) are cancelled out to avoid double counting of revenue and expenditure items.

Metropolitan budget accounts. In Metropolitan France, two ministries were responsible for most of the spending in the colonies: the Ministry of the Navy and the Colonies (*Ministère de la Marine et des Colonies*), and the Ministry of War (*Ministère de la Guerre*). Military expenditure in the colonial empire was the responsibility of these ministries (the Ministry of War dealt with North Africa, the Ministry of the Colonies with the rest of the empire). For this reason, military expenditure almost never appears in colonial budget accounts.[1]

[1] There are a couple of exceptions. Military expenditure appears in the colonial budget accounts of the Southern Territories of Algeria between 1904 and 1937, in Morocco until 1937, and again in 1956 in preparation for independence (the amounts are very small compared to those recorded in the budget accounts of the Ministry of War). Military expenditure also appears in the budget accounts of Algeria between 1830 and 1900, but it is not financed locally and corresponds to the expenditure financed by the Ministry of War. Finally, military expenditure appears in the budget accounts of Indochina in 1953 (a year for which the budget accounts of the Ministry of War is not available). More precisely, this military expenditure is found in the national budgets of Vietnam, Laos and Cambodia, and in the regional budget of North Vietnam (Tonkin). Total security expenditure is not broken down between civilian and military, but personnel expenditure is. We use the share of military in personnel expenditure to infer total military expenditure from total security expenditure.

Figure 2: Share of various budgets in civilian public expenditure (North Africa and Indochina)

Note: the quasi-absence of auxiliary budgets in North Africa (Algeria, Morocco, Tunisia) reflects the fact that, in these colonies, auxiliary and colonial budgets were often presented alongside each other and were merged during data collection.

It is not obvious whether colonial military expenditure of metropolitan budget accounts should be considered an item of expenditure for the colonies. On the one hand, countries started developing a national defense budget once they became independent, and colonial military expenditure could be partly considered as France mutualizing the cost of national defense. On the other hand, the military conquest and domination of a colonial empire should be considered mainly an item of expenditure for France, the colonizing power. Additionally, military expenditure of the Ministry of Colonies includes the payment of colonial troops who contributed to France's national defense by fighting in Europe during WWI and WWII. In the end, we exclude military expenditure from our public expenditure aggregate, and make colonial military expenditure available separately (see "Variable

dictionary" below). However, our public expenditure aggregates do comprise expenditure of the Ministries of War and Colonies that can be thought of as civilian in nature, namely subsidies to private companies, and infrastructure and health expenditure. Only during the period of conquest, and in Indochina, did this Metropolitan expenditure represent more than a couple of percentage points of our aggregate civilian expenditure figure (see figures 2 and 3). Only part of this Metropolitan civilian expenditure can be allocated to a given region of the empire. We allocated the rest in proportion of the share of each region in allocated expenditure.[2] On the revenue side, we consider this as direct subsidies from France to its colonies.

From 1958 to 1962, there was a ministry in France in charge of the Sahara region (*Ministère du Sahara*). Its expenditure was added to the Algerian public expenditure available in the Franc Zone Reports and, on the revenue side, counted as a subsidy of Metropolitan France to Algeria. Other ministries were in charge of Morocco and Tunisia (*Ministère des affaires marocaines et tunisiennes*, 1955-1959) and of Algeria (*Secrétariat d'Etat aux affaires algériennes*, 1958-1963), but their expenditure already appears in the colonial budget accounts and the Franc Zone reports.

Federal structure. Three regions of the empire, Indochina, French West Africa (*Afrique Occidentale Française*, AOF) and French Equatorial Africa (*Afrique Equatoriale Française*, AEF), were organized in federations. The AOF federation was created in 1895. In 1922, it included eight colonies: Senegal, Soudan (present-day Mali), Guinea, Côte d'Ivoire, Dahomey (present-day Benin), Mauritania, Haute-Volta (present-day Burkina Faso) and Niger.[3] Between 1932 and 1946, the Haute-Volta colony disappeared and its territory was divided between Côte d'Ivoire and Niger. The AEF federation was created in 1910 and included four colonies: Congo, Gabon, Chad, and Oubangui-Chari (present-day Central African Republic). The Indochinese Union was created in 1887 and included Cochinchina (South Vietnam), Annam (Central Vietnam), Tonkin (North Vietnam) and Cambodia. Laos

[2] The share of each region in allocated expenditure was computed over 10-year periods. In the budget accounts of the Ministry of the Colonies, regional allocation is not known at all between 1932 and 1959. We use allocated expenditure using the regional allocation of the 1920s. In the budget accounts of the Ministry of War, figures are aggregated for Tunisia and Algeria in 1915, 1921, 1928-1929 and 1933-1937: we allocate between Tunisia and Algeria using average allocation in the 1920s. In 1938 and 1939, figures are given for the whole of North Africa. We allocate between Algeria, Tunisia and Morocco using average allocation in the 1920s.

[3] New colonies were added progressively as the French were conquering more and more territories. The borders of colonies also kept evolving. Before World War I, Soudan, Niger and Haute-Volta were forming the colony of "Haut-Sénégal-Niger."

was added in 1899. The Indochinese Union became the Indochinese Federation in 1946 and was dissolved in 1949. The AOF and AEF were dissolved in 1958-59.[4]

Figure 3: Share of various budgets in civilian public expenditure (Sub-Saharan Africa)

These federations were organized in a pyramidal structure, with colonial governments (*Gouvernements locaux*) in each colony, responsible for local revenue and expenditure, and a federal government (*Gouvernement général*) responsible for general interest spending (mostly

[4] Indochina was divided in three "Associated States" (Cambodia, Laos, and Vietnam). Colonies of AOF and AEF became autonomous Republics belonging to the French Community, a political association of France and its former African colonies, except Guinea which became independent in 1958. The French Community was dissolved in 1960 when all French colonies south of the Sahara gained independence.

in infrastructure and administration) and financed mostly by custom duties and rents on government monopolies. Within a federation, there were many financial transfers (loans, advances, subsidies) between the different colonies and the federal government. Federal revenue and expenditure represented a large share of total revenue and expenditure (see figures 2 and 3 for the expenditure side). For that reason, we consider these federations as a whole and do not attempt to reallocate federal revenue and expenditure to the different colonies that were to become autonomous republics or independent countries. In a given federation in a given year, consolidated expenditure (revenue) is obtained by summing expenditure (revenue) in the federal budgets and the various colonial budgets, cancelling the transfers within the federation.[5] Though the federations of AOF and AEF were dissolved in 1958, there was residual expenditure and revenue until 1959, recorded in the Franc Zone report for 1959 (*Comité monétaire de la zone franc*, 1959). In the same report we found the revenue and expenditure of the short-lived Mali Federation, which united Mali and Senegal between 1959 and 1960.

Auxiliary budgets. Infrastructure projects financed by loans were often registered on separate auxiliary budgets. Ports, railways, and the health sector also sometimes saw their expenditure and revenue recorded in a separate budget. Because railway companies were not always public, we did not collect data from the auxiliary budgets of railways. In the case of a public railway company, excess revenue was transferred to the colonial budget and is taken into account in our data (in the category "Monopoly revenue", see "Variable dictionary" below), subsidies to the railway company were also recorded in the colonial budget and are taken into account in our data (in the category "Production support"). Capital expenditure for the construction of railway lines was mostly financed publicly and appears in the colonial budgets rather than the railway budgets. Posts and telegraphs, which were always public, are fully taken into account in our aggregates: their receipts are in the variable "Monopoly revenue", and their expenditure in the variable "Production support".[6] As for the various development plans established in the 1950s, their accounts sometimes appear directly in the colonial budget, as is the case for the Constantine plan in Algeria, and are sometimes recorded in special budgets managed directly by France, as is the case for the special development fund created for Sub-Saharan Africa, the FIDES (*Fonds d'Investissement pour le Développement*

[5] Each colony of a federation had its own colonial budget, except in AEF between 1935 and 1945, where all revenue and expenditure items were written in the federal budget.

[6] The receipts and expenditure of the posts and telegraphs are usually recorded in the colonial budget, but in Algeria from 1925, they are recorded in a separate budget, available at the *Bibliothèque nationale de France* between 1925 and 1939. We rely on the summary provided in the statistical yearbooks afterwards (see "List of sources").

Economique et Social). The expenditure of the FIDES in each year and each colony was found in a retrospective document published by IEDES (1964). On the revenue side, because the FIDES was financed only by contributions from France and from the colonies, we were able to reconstitute the French subsidy by subtracting the colonies' contributions from the total expenditure.[7]

First and second-level administrative divisions. Below the colony (corresponding to present-day countries), we consider first-level (districts) and second-level (municipalities) administrative divisions. The level of decentralization of public expenditure varied within the French colonial Empire. It was very low in West and Equatorial Africa, and more important in North Africa, Madagascar, and Indochina.

Our figures always take into account first-level administrative divisions. Algerian *départements* (district) started having distinct budgets in 1859, Malagasy *provinces* in 1931, and Moroccan *régions* in 1939. In Indochina, we use the provincial budget accounts of Cochinchina from 1910 on, and all provincial budgets starting in 1931, when a number of items of revenue and expenditure were decentralized from colonial to provincial budgets. In Tunisia, AOF, AEF, Togo, and Cameroon, first-level administrative divisions (districts) did not have budgets of their own. We can see on figure 2 and 3 that the share of first-level administrative divisions in total expenditure was significant only in Algeria, Indochina, and Madagascar. In Madagascar, the contribution of provincial budgets to total public expenditure became particularly important after the decentralization reform of 1946, reaching 50% in some years.

Table 2: Share of municipalities in total net expenditure and revenue

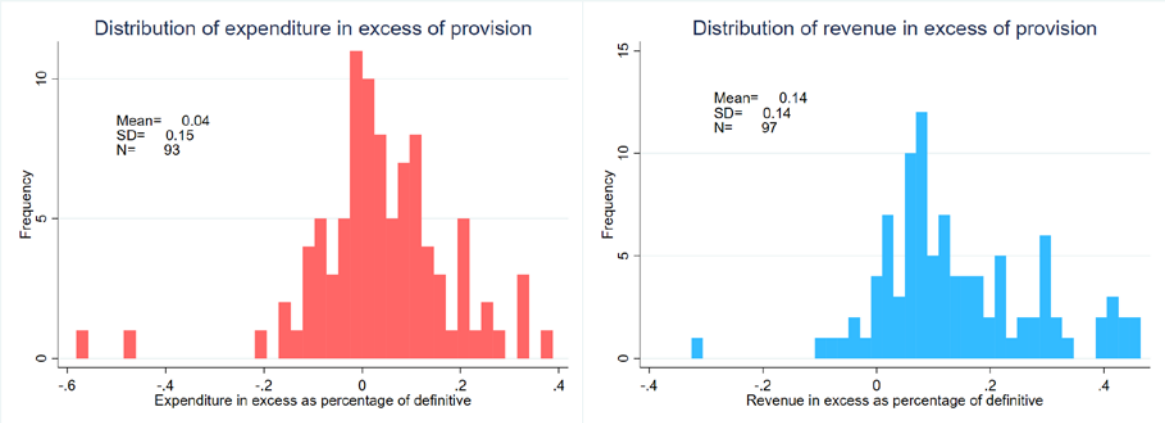
	1925		1955	
	Share in expenditure	Share in revenue	Share in expenditure	Share in revenue
Algeria	23.4%	20.5%	21.2%	24.4%
Morocco	n.a.	n.a.	7.8%	11.4%
Tunisia	9.3%	13.7%	6.3%	7.5%
W. Africa	4.9%	0.2%	n.a.	n.a.
Indochina	1.1%	1.0%	n.a.	n.a.
France	33.1%	n.a.	13.6%	n.a.

Sources for France: André et Delorme (1983), INSEE (1966)

[7] The French contributions are also recorded in the French budgets, but in a less systematic way.

Second-level administrative divisions (municipalities) had distinct budgets in North-Africa and Indochina. In Sub-Saharan Africa, no municipality was empowered to raise revenue and allocate expenditure before 1955, with the exception of the four Senegalese *communes* which obtained the same status as metropolitan municipalities: Saint-Louis and Gorée (in 1872), Rufisque (in 1880), and Dakar (in 1887). In 1955, 44 new municipalities were created in AOF, AEF, Madagascar, Cameroon and Togo.[8] We found some budget accounts for second-level administrative divisions, but our series are patchy and incomplete. They are therefore not included in our main aggregates, though we make them available in a separate variable (see "Variable dictionary"). Table 2 displays the share of municipalities in total public expenditure and revenue for North Africa, West Africa, Indochina, and France.

Figure 4: Distribution of revenue and expenditure in excess of provision



Municipalities were particularly important in North Africa. In 1955 for instance, they represented 7.5% of revenue in Tunisia, 11.4% in Morocco, and 24.4% in Algeria. In the rest of the Empire, municipalities did not weigh as much. In 1925, they represented 0.2% of revenue and less than 5% of expenditure in West Africa, and about 1% of expenditure and revenue in Indochina (we could not find data for 1955).

Definitive and provisional accounts. Several types of documents were produced during the budget process: provisional accounts (usually called "*Budgets*") were previsions produced in advance of the fiscal year, while definitive accounts (usually called "*Comptes défnitifs*") were published after the end of the fiscal year and recorded the actual amounts collected and spent. Whenever possible, we rely on definitive accounts, but use provisional accounts in a few years when definitive accounts are missing. Provisional accounts are typically much more detailed, and notably contain information on wages and the number of

[8] France. *Journal official de la République française du 19 novembre 1955*. Paris: Imprimerie des Journaux officiels, 1955, p. 11274. https://www.legifrance.gouv.fr/jo_pdf.do?id=JORFTEXT000000313008

employees, which is why we also use them to collect information on average public sector wages and the size of the civil service (see "Personnel data" below). For the 97 colony-years in common between the two datasets, we can check the discrepancy between provisional and definitive accounts: provisional accounts underestimate final expenditure by 4% on average and final revenue by 14% on average (figure 4). When provisional or definitive accounts are not available, we sometimes use Statistical Yearbooks (*Annuaires Statistiques*) or other official publications, which present definitive figures (see the "list of sources" below).

Social security. Though social security transfers are not part of our main aggregates, we provide separate figures for social security contributions and benefits. There was no social security in the French colonial Empire before 1945. After 1945, social security funds were introduced in the settler colonies of Algeria, Morocco and Tunisia, but not in the colonies of Sub-Saharan Africa and Southeast Asia.[9] The accounts of various social security funds were found in the statistical abstracts of the relevant colonies.

Postcolonial data. To extend the dataset to the postcolonial period, we use mainly the reports of the Monetary Committee of the Franc Zone (*Comité Monétaire de la Zone Franc*, various dates), and the OECD development assistance committee (OECD-DAC) data (OECD, 2017). The information contained in the Franc Zone reports is not as detailed as the information contained in the budget accounts of various colonies. In consequence, after independence, aggregate revenue net of subsidies and loans cannot systematically be broken down into different tax instruments, and aggregate expenditure net of subsidies and loans cannot systematically be broken down into different sectors. Guinea gained its independence from France in 1958 and cut ties with the former colonizer, refusing to be part of the monetary union headed by France. As a result, Guinean public finances are not recorded in the Franc Zone reports, and we use the figures given in Amin (1971) instead.

One other important limitation of the Franc Zone reports is that they do not systematically take into account the budgets of various development funds. This is not a problem to estimate fiscal revenue, as these funds were typically financed by loans and aid, but this is a problem to estimate net expenditure. Table 3 compares development (capital) expenditure in the few development plans budget accounts we were able to find with development expenditure in the Franc Zone reports in the corresponding years. Franc Zone reports appear to systematically miss a large share of development expenditure, about half in

[9] Algeria had a family allowance fund (*Caisse d'allocations familiales*) and a social security fund (*Caisse de sécurité sociale*). Morocco had a help fund (*Caisse d'aides*) later renamed social security fund (*Caisse de sécurité sociale*). Tunisia had a family allowance fund (*Caisse d'allocations familiales*).

Senegal (1969) and Madagascar (1964-1966), more than 80% in Haute-Volta (present-day Burkina Faso) between 1967 and 1970.

Table 3: Development expenditure in the 1960, comparison of different sources

(current FCFA billions)	Development plan(1)	Franc zone report(2)
Senegal (1969)	10.92	4.66
Haute-Volta(1967-1970)	19.76	3.30
Madagascar (1964-1966)	39.38	21.52

(1) *Sources:* Haute-Volta, Direction du plan et des études de développement (1971); Madagascar, Commissariat général au plan (1965-69); Sénégal, Secrétariat d'Etat au plan (1972).
(2) *Sources* : Comité monétaire de la Zone Franc (various dates)

To approximate development expenditure in the 1960s, we assume that they were mostly financed by international aid (grants and loans) and complement the Zone Franc reports with the OECD-DAC dataset. Net public expenditure in a given country after 1960 is computed as total expenditure minus debt service as recorded in Franc Zone reports, minus all external loans and subsidies received by the country recorded in the Franc Zone report (except when we know these emanate from a private source or a non-OECD country), plus net OECD ODA (loans and grants) received by the country.[10] This does not affect our measure of net revenue, which is simply the sum of fiscal revenue and revenue of industrial operations, domains and monopolies recorded in the Franc Zone reports.[11]

There are other discrepancies between the series built using colonial budget accounts and the postcolonial series. Franc Zone reports to not record the auxiliary accounts of parastatal sectors such as posts and telecommunications. In Tunisia between 1961 and 1966, we were able to take into account the expenditure and revenue of the posts and telecommunications service recorded in the statistical yearbook of Tunisia 1964-1965 (Tunisia, Secrétariat d'Etat au plan et aux finances, 1964-1965). Franc Zone reports do not always take into account the revenue and expenditure of first-level administrative divisions. It

[10] On top of aid to individual countries, the OECD-DAC dataset records regional aid allocated to world regions such as "Africa, South of Sahara" or "Africa, North of Sahara." We allocate regional aid to each individual country in proportion of its share in total allocated aid. Before 1964, French aid to Sub-Saharan Africa is not broken down by individual countries at all. We allocate it to each individual country in proportion of its share in 1964 total allocated French aid to Sub-Saharan African countries.

[11] As Franc Zone reports become less precise in the end of the 1960s, the revenue of industrial operations, domains and monopolies often becomes missing (fiscal revenue is always given). To avoid a break in the series, we extrapolate the revenue of industrial operations, domains and monopolies using their share in total net revenue the last year it was available.

is an important concern for Madagascar only, where the share of provinces in total public expenditure and revenue was quite high in the 1950s (see figure 3, panel 4). Malagasy provincial accounts are recorded in the Franc Zone reports until 1960. Between 1963 and 1966, we find them in Madagascar, *Commissariat général au plan* (1965-1969). Other years are extrapolated (see "Missing data" below).

Comparison with Metropolitan France. For comparisons with Metropolitan France, we use the series on the expenditure of the central government and local governments (*départements* and *communes*) in André and Delorme (1983). For the years 1925 and 1955, we add the expenditure of posts and telegraphs from annual reports (see "list of sources" below). André and Delorme (1983) give the sectoral allocation of expenditure for the central government only. Their categorization is slightly different from ours, except for education. We allocate "public authorities" to general administration, "social action" to health, "transport" and "housing" to infrastructure, and "agriculture" and "trade and manufacturing" to production support, to which we add the expenditure of posts and telegraphs. We separate civilian expenditure from military expenditure ("defense" and "veterans"). We remove debt service to get as close as possible to our definition of Net (civilian) Public expenditure (see "variable dictionary" below). We assume that debt service represented 10% of the expenditure of local governments in 1925 and 5% in 1955 (André and Delorme 1983, p. 75). André and Delorme (1983) also give figures for social security benefits. On the revenue side, we assume that social security contributions are equal to social security benefits.

Net public revenue and the fiscal structure of the central government in 1925 and 1955 is taken from INSEE (1966, p. 486-87) and from the annual reports of posts and telegraphs. Revenue of *départements* and *communes* is found in INSEE (1966, pp. 504-505, year 1923 for *communes*).

MISSING DATA

This section details the different assumptions and extrapolations made in order to consolidate various data and avoid breaks in statistical series when particular budget accounts could not be found.

Colonial budget accounts. For Algeria, Morocco, Tunisia, Indochina, Madagascar and Cameroon, we set up the goal of collecting data at an annual frequency, though we sometimes could not find budget accounts for a particular year. For the two African federations (AOF and AEF), we collected federal budget accounts (*budgets généraux*) every

year, but colonial budget accounts (*budgets locaux*) every three years only. We also collected data on Togo every three years only. Aggregating expenditure and revenue at the level of the federation (AOF, AEF, and Indochinese Union) requires having the budget accounts of all the colonies of the federation in a given year. When we could not find the budget account of a colony, we used the account of an adjacent year.[12] In rare cases, we could not find adjacent years: budget accounts of the colony of French Soudan (AOF, present day Mali) are missing between 1922 and 1928 and in 1946, the budget accounts of Gabon (AEF) are missing in 1947 and 1949, and the one of Oubangui-Chari (AEF) is missing in 1954. In these cases, we make an educated guess for the revenue and expenditure of the missing colony using its share in the total revenue and expenditure of the federation in a close enough year.[13] For French Soudan in 1946, we know total revenue and expenditure (recapitulated in the 1949 budget), and we break them down into different items of revenue and expenditure using the distribution of 1949. We could not find the budget accounts of Haute-Volta in 1958, but we use the information recorded in the Franc Zone report for that year. We infer the sectoral allocation of expenditure, not given in the Franc Zone report, using the allocation of 1956.

There is some missing information in Morocco's special budget ("*Budget spécial*", an investment budget accounting for an average 7% of total expenditure). Between 1926 and 1931, and in 1953, our source gives only revenue, and not expenditure. We set expenditure equal to revenue. Between 1932 and 1937, our source gives only the total expenditure of the special budget, and the sectoral allocation is not given. Between 1926 and 1937, we use the sectoral allocation of 1938. In 1953, we use the sectoral allocation of 1952.

Metropolitan budget accounts. In Metropolitan budget accounts (Ministry of the Colonies and Ministry of War) we collected, for each colonial territory, military expenditure, subsidies to private companies, infrastructure expenditure, and health expenditure. Residual expenditure was allocated to each category in proportion of its weight in allocated expenditure in the same year. Expenditure that was not allocated to a specific territory was allocated to

[12] In AOF, affected years and budget accounts are: Cote d'Ivoire (1917 instead of 1916 and 1926 instead of 1925), Dahomey (1944 instead of 1943 and 1957 instead of 1958), Haute Volta (1920 instead of 1919, 1929 instead of 1928, and 1954 instead of 1955), Niger (1942 instead of 1943), Senegal (1959 instead of 1958), French Soudan (1932 instead of 1931). In AEF: *budget général* (1903 instead of 1904), Gabon (1953 instead of 1954), Oubangui-Chari (1912 instead of 1913), Tchad (1912 instead of 1913). In Indochina: Annam (1945 instead of 1946), Cambodia (1945 instead of 1946), Cochinchina (1906 instead of 1907), Laos (1897 instead of 1896 and 1902 instead of 1901, 1945 instead of 1946), Tonkin (1945 instead of 1946), PMS region (1954 instead of 1953), municipalities (1942 instead of 1943).

[13] We use the shares of 1919 for French Soudan 1922 and 1925, the shares of 1931 for French Soudan 1928, the shares of 1955 for Togo and Haute Volta 1958, and the shares of 1952 for Gabon 1947 and 1949, and Oubangui-Chari 1954.

each territory in proportion of its weight in geographically allocated expenditure.[14] In years were expenditure was not allocated geographically at all, we followed the geographical allocation of a close enough year.[15]

We collected Metropolitan budget accounts every year systematically from 1870 onwards. Before this date, we collected data every 3 years for the Ministry of War, and every ten years for the Ministry of the Colonies. Budget accounts are also missing for a handful of years after 1870. In order to have consistent estimates, we filled in the missing years using linear interpolation.[16] After 1939, budget accounts of the Ministry of War are missing for all years except 1946. We do not try to fill in the gap during World War II (1940-1945), when the North Africa was a battleground of the fight between Vichy France and Free France.[17] We found the military expenditure of Metropolitan France in 1954, 1957 and 1961 Algeria in Amin (1966), and interpolated interim years using the number of soldiers present in Algeria (including conscripts, using Mahieu 2001). French military expenditure in 1953 Tunisia are also from Amin (1966), and we kept this figure constant in real terms until 1956. French military expenditure in 1951 Morocco are from Amin (1966). Between 1952 and 1956, we use balance of payments data (Morocco, 1960), assuming that 90% of the public expenditure paid by Metropolitan France were for the military. Though France fought the Cameroonian independentists starting in 1955 (Domergue et al. 2011), the cost of this "hidden war" does not appear isolately in the accounts of the Ministry of the Colonies. Because Cameroon was a trust territory of the U.N., France was in theory not allowed to undertake military expenditure there. We do not know whether the cost of the Cameroonian war is included in the total French colonial military expenditure.

[14] For strictly military expenditure, the bulk of expenditure, we followed the geographical allocation of the same year. For subsidies to private companies, infrastructure and health expenditure, which are more volatile, we followed the average geographical allocation of the decade.

[15] In the budget accounts of the Ministry of the Colonies, the geographical allocation of expenditure is not given between 1932 and 1959 (except for Indochina 1950-54 and AOF 1950-51). We allocated military expenditure using the geographical allocation of 1931. For non-military expenditure (subsidies, health and infrastructure), we followed the geographical allocation of the period 1920-1931. In the budget accounts of the Ministry of War, the geographical allocation does not distinguish between Algeria and Tunisia in 1915, 1920-21, and 1928-1937. We allocated between the two territories using the proportions of 1914. In 1938 and 1939, the accounts of the Ministry of War give expenditure for the whole of North Africa. We allocated between Algeria, Morocco and Tunisia using the proportions of 1937. Finally, in 1946, the accounts of the Ministry of War give one figure for North Africa and the Middle East. We allocated between the different colonies using the proportions of 1939.

[16] Missing years are, for the Ministry of the Colonies, 1884, 1886 (AEF only), 1888, 1889, 1892, 1893, 1896 (Madagascar only), 1900 and 1945, and, for the Ministry of War, 1877-1879, 1889, 1892, 1902 (except Indochina), 1906, 1914 (Morocco only), 1916-1919, 1930, 1931.

[17] For the Ministry of the Colonies, responsible for military expenditure outside North Africa, our source (the statistical yearbook of the French Union) gives us expenditure during World War II, including the expenditure of Free France (*comité français de la libération nationale*), but strictly military expenditure are missing in 1940 and 1941.

As can be seen in figures 2 and 3, the direct, non-military expenditure of Metropolitan ministries was only important in the early colonial period (especially in Algeria), and gradually lost importance over time. Subsidies to colonial government were more important, especially after 1945 (see main paper), but we do not rely on Metropolitan budget accounts to estimate them. Direct military expenditure of Metropolitan ministries were even more important (see main text), and it is important to keep in mind that, after 1939, our figures are only rough estimates.

First-level administrative divisions. We use linear interpolation to fill in gaps in our public finance series for first-level administrative divisions: Malagasy *provinces* between 1932 and 1937 and between 1960 and 1963, Cochinchinese *provinces* between 1923 and 1930, Algerian *départements* between 1938 and 1948, Moroccan *régions* between 1940 and 1944 and between 1946 and 1948. These assumptions are quite innocuous to our final aggregates because, except in Madagascar after WW2, these budget accounts never represent a large share of total public expenditure and revenue (figures 2 and 3). In Madagascar in 1952, the budget accounts of the province of Tananarive are missing: we make an educated guess using the share of Tananarive in total provincial expenditure and revenue in 1951. We extrapolate the revenue and expenditure of Malagasy provinces between 1967 and 1970 by assuming that the share of provinces in total revenue and expenditure was the same as in 1966. We extrapolate the revenue and expenditure of Malian provinces between 1960 and 1965 by assuming that the share of provinces in total revenue was the same as in 1966.

For Algerian *départements* between 1859 and 1889, our source gives us only aggregate expenditure and revenue. We infer the fiscal structure and sectoral allocation of expenditure using the distribution of 1892.

In the budget accounts of Malagasy *provinces* between 1947 and 1951, some items of revenue are missing (indirect taxes, revenue of industrial operations and administrative services). We infer them using their shares in total revenue in 1952 (1956 for the province of Tananarive).

Post-independence budget accounts. In Tunisia, posts and telegraphs expenditure is missing in the Franc Zone reports. We use the figures in Tunisia's statistical yearbook to fill in the gaps (see "list of sources" below). From 1958 to 1960, we extrapolate the expenditure of posts and telegraphs assuming that their share in total expenditure was the same than in 1961.

PERSONNEL DATA

Provisional budget accounts are usually more detailed than definitive accounts, which allow us to collect some personnel data, such as total number of employees and total personal expenditure per sector. Because counting the total number of employees represents an important collection effort, we limited ourselves to five dates as close as possible to 1913, 1925, 1937, 1949, 1955, and 1960.[18] In each sector, we computed the average wage by dividing total personnel expenditure by the number of employees. We also tried to collect five specific wages in a systematic way: the governor's wage, wages of the highest and lowest paid nurse, and wages of the highest and lowest paid teacher.

Provisional budget accounts are very detailed and personnel expenditure can in the majority of cases be matched to an exact number of workers, so that the average wage can be computed. However, some items of personnel expenditure are not attached to a precise number of employees. In that case, we infer the corresponding number of employees by dividing the monetary amount by the average wage of the sector, or, when we can infer that these are low-paying jobs such as servants or manual workers, by the average of the lowest wages in the education and health sectors. Figure 5 and 6 display for each region the number of government employees enumerated in the budget accounts and the number of government employees according to our computations. The discrepancy between the two series is never very important.

Personnel data was collected for central budgets only (federal and colonial in the case of federations), which means that our personnel figure do not include the workers paid for public works on auxiliary budgets, nor the employees paid on the budget accounts of first-level administrative divisions. This is particularly problematic in Indochina and in Madagascar. In Indochina, the number of employees of the federal and colonial governments decreased after the decentralization reform of 1931 which gave more spending responsibilities to provinces. The drop in the number of government employees per 1,000 inhabitants from more than 1.7 to less than 1.4 between 1925 and 1937 is therefore misleading (figure 5). In Madagascar, the decentralization reform of 1946 considerably increased the share of provinces in total public expenditure, explaining the fall in the number of government employees between 1938 and 1955 (figure 6).

[18] Only dates before World War II for Indochina.

In West and Central Africa, the number of government employees also falls between 1955 and 1960 (figure 6 again), after the colonial territories had been granted more autonomy by the *loi cadre* of 1956 and the federation had been dismantled in 1959. The magnitude of the decrease cannot be only explained by the departure of French civil servants. We do not know whether it corresponds to an actual drop in the number of public employees or to some decentralization, like in the case of Madagascar, in a context of rapid administrative transformation.

Figure 5: Estimated vs. enumerated number of government employees in North Africa and Indochina

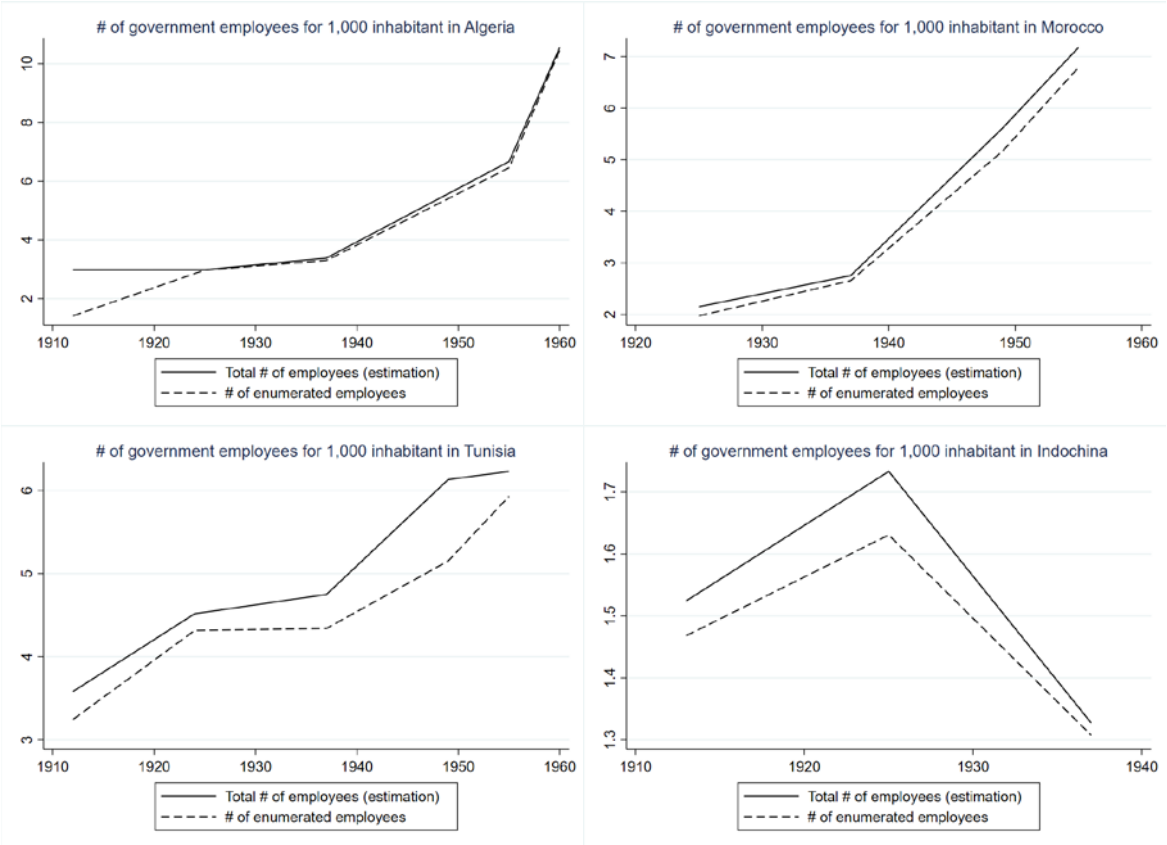
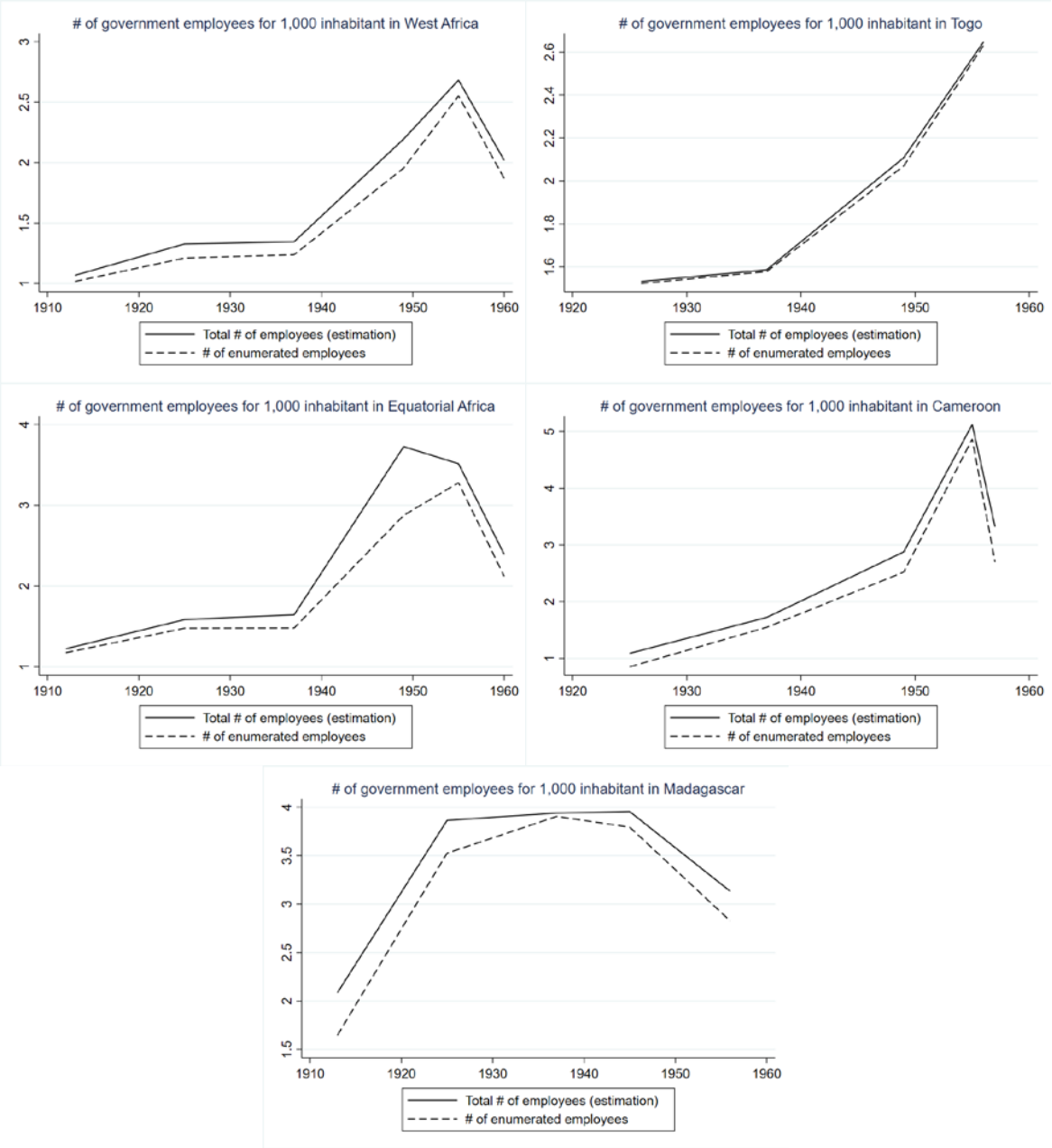


Figure 6: Estimated vs. enumerated number of government employees in Sub-Saharan Africa



Aggregation and year substitutions. For Indochina, West and Equatorial Africa, figures are aggregated at the level of the federation. As with monetary expenditure, when we could not find provisional budget accounts for a particular colony in a given year, we used the accounts of a close enough year.[19] We could not find the budget account of French Soudan

[19] In AOF, affected years and budget accounts are: budget général (1936 instead of 1937), Cote d'Ivoire (1926 instead of 1925), Dahomey (1957 instead of 1960), Guinée (1950 insteadof 1949), Mauritania (1958 instead of 1960), and Niger (1958 instead of 1960). .In AEF: Gabon (1958 instead of 1960), Oubangui-Chari (1959 instead of 1960), and Tchad (1958 instead of 1960). In Indochina: budget général (1914 instead of 1913), Cochinchina (1915 instead of 1915 and 1924 instead of 1925).

(present-day Mali) in 1925, 1949 and 1960. In these years in AOF, average wages per sector do not take French Soudan/Mali into account. In 1925 and 1949, total employment in AOF is computed using the share of Soudan in the total employment of the federation in 1937 and 1955. In 1960, aggregate figures for AOF are computed without Soudan/Mali, and without Guinea — in 1958, the federation of AOF was dissolved, and Guinea gained independence. We could not find the budget account of Chad in 1949: average wages per sector in AEF do not take Chad into account for this year, and total employment in AEF is computed using the share of Chad in the total employment of the federation in 1955.

Comparison with Metropolitan France. For the years 1925 and 1955, we compute public employment and average wage per sector for the central government of Metropolitan France. Public employment by category in 1922 and 1956 is given in INSEE (1966, p. 114). The wage bill by sector in 1923 and 1956 is given in André and Delorme (1983, pp. 734 and 739). The wage bill of posts and telegraphs in 1925 and 1955 is given in the annual reports of posts and telegraphs. We use the growth rate of total population to extrapolate the total number of employees and the wage bill for the relevant years (1925 and 1955).

POPULATION, PRICES, AND GDP

POPULATION

To produce comparable estimates of expenditure and revenue per capita, we gathered data on total population. We also gathered data on European and other ethnic minority populations (Jews in North Africa, Chinese in Indochina, Chinese and Indians in Madagascar). For a handful of years (1925, 1945, and 1955), we estimated the population share of 15-64-year-olds (in order to express public wages in units of GDP per worker). For the years 1850, 1925 and 1855, we also estimated urbanization rates. The “Population” section of the “List of sources” below gives a more detailed list of all references used and where to find them.

Algeria

In Algeria, population in 1850 comes from CICRED (1974a). Population figures from the censuses of 1911, 1921, 1926, 1931, 1936, 1948 and 1954 come from the 1955 statistical yearbook of Algeria (Algeria, *Sous-direction des statistiques*, 1955). Population in 1960 comes from the 1960 UN demographic yearbook (United Nations, 1960). Population in 1966

comes from CICRED (1974a). Population from 1977 comes from The World Bank (2017).[20] European population is defined as non-Muslim population, comprising French citizens (including Algerian Jews who were granted French citizenship by the 1870 Crémieux decree) and other Europeans. Population figures for non-Muslims are more detailed and come from the Algerian statistical yearbooks of 1933, 1948-1949 and 1955 (Algeria, *Sous-direction des statistiques*, 1933, 1948-49, 1955) who present retrospective figures as well as contemporary ones. Figures for 1958-1960 come from the 1961 and 1962 French statistical yearbooks (INSEE, 1961 & 1962). 1960 non-Muslim population comes from CICRED (1974a). Population figures between two dates are estimated by exponential interpolation, except for 1) Muslim population before 1850, where we assume a growth rate of 0.5% per year, the rate given by CICRED (1974a) between 1850 and 1866; 2) Muslim population between 1866 and 1911, where our figures reflect a decrease in population between 1866 and 1872 due to epidemics and the Kabyle revolt of 1871-1872[21]; 3) Muslim population between 1954 and 1960, where we take into accounts the temporary departure of Algerian refugees to Tunisia and Morocco (UNHCR 2000); 4) non-Muslim population between 1960 and 1966, where our figures reflect the departure of 800,000 French settlers in 1962.

The share of 15-64-year-olds in the non-European population comes from CICRED (1974a). The share in 1955 is assumed to be equal to the share of 1954 from CICRED (1974a). The share in 1925 is extrapolated using the share in 1936 and the trend between 1936 and 1948. The share of 15-59-year-olds in the European population is given in the statistical yearbooks of Algeria, and we assume that the share of 60-64-year-olds is the same as in Metropolitan France.

Urban population figures come from Eggiman (1999) for 1850, from the population census of 1926 for 1925, and from the population census of 1954 for 1955 (46 communes).

Morocco

During the colonial period starting in 1912, Morocco was divided between a French Protectorate and a Spanish Protectorate in the North representing about a tenth of total population.[22] Morocco gained its independence from France in 1956 and Moroccan control over (part of) the Spanish zone was restored in 1958. Our population estimates comprise only

[20] To stay consistent with the colonial figures, which never comprise military population, we subtract from the WDI figures estimates of military population (representing around 1% of total population).

[21] If we assume again a population growth rate of 0.5% a year between 1872 and the first reliable population census of 1911, we find that population decreased by 12% between 1866 and 1872.

[22] The Spanish were also granted a Protectorate in the South, but its population was negligible.

the southern (French) zone until 1957, and both zones from 1958 onwards. Population in 1936 comes from CICRED (1974b). Earlier population figures are extrapolated backwards using the population growth rates of Frankema and Jerven (2014). Population in 1952 comes from Morocco (1960). Population in 1960 and 1971 comes from CICRED (1974b). Population after 1982 comes from The World Bank (2017). European population is French population (unlike in Algeria, Moroccan Jews were not granted French citizenship), given by the Moroccan statistical yearbook in 1921, 1926, 1931, 1936, 1947, and 1952 (Morocco, various dates). Jewish population comes from CICRED (1974b), Morocco (1960) and Moroccan statistical Yearbooks (Morocco, various dates). Population figures between two dates are estimated by exponential interpolation.

The shares of 15-64-year-olds in the European and non-European population are assumed to be the same as in Tunisia.

Urban population figures come from Eggiman (1999) for 1850 and for 1925 (interpolation of 1920 and 1930 figures), and from Eggiman (1999) and The World Bank (2017) for 1955 (average of Eggiman's figure for 1950 and World Bank figure for 1960).

Tunisia

In Tunisia, population in 1911 comes from the 1947 statistical yearbook (Tunisia, *Institut national de la statistique*, 1947).[23] Earlier population figures are extrapolated backwards using a yearly growth rate of 0.7%, fitting the estimates given by CICRED (1974c). Population figures in 1921, 1926, 1931, 1936, 1946, 1956, 1966, and 1971-1973 come from CICRED (1974c). Population after 1971 comes from The World Bank (2017). European population is mostly French, Italian, and Maltese (unlike in Algeria, Tunisian Jews were not granted French citizenship). It is given by the 1947 Tunisian statistical yearbook for 1880, 1886, 1891, 1896, 1906, 1911, 1921, 1926, 1931, 1936, and 1946. It is given by the 1957/58 statistical yearbook for 1956. It is given by CICRED (1974c) for 1961 and 1966. Jewish population comes from Tunisian statistical yearbooks. Population figures between two dates are estimated by exponential interpolation.

The share of 15-64 year olds in the Muslim population comes from CICRED (1974c). The share in 1955 is assumed to be equal to the share of 1956 from CICRED (1974a). The share in 1925 is extrapolated from the share in 1946 using the evolution of the share of 15-64-year-olds in the Muslim population of Algeria between 1925 and 1946. The share of 15-59-

[23] Because colonial population figures tend to underestimate population, we multiply the 1911 population figure by the ratio of the CICRED (1974) figure over the 1947 statistical yearbook figure in 1921, a year for which we have both figures.

year-olds in the European population is given in the statistical yearbooks of Tunisia, and we assume that the share of 60-64-year-olds is the same as in Metropolitan France.

Urban population figures come from Eggiman (1999) for 1850, from the population census of 1921 for 1925, and from the population census of 1956 for 1955 (cities above 10,000 inhabitants).

Indochina

In Indochina, population figures for Vietnam (Cochinchina, Annam, and Tonkin) come from Bassino (2000) and Banens (2000). For Cambodia and Laos, we use The World Bank (2017) after 1960. Before 1960, population figures are extrapolated backwards using the population growth rate of Vietnam. The figures thus obtained are slightly larger than the ones provided in the statistical yearbooks of French Indochina (French Indochina, *Bureau de la statistique générale*, various dates). European population and Chinese population are given by the statistical yearbooks of French Indochina. European population is composed mostly of French, but the figures given by statistical yearbooks also include a small minority of Americans and Japanese.

The share of 15-64-year-olds in the non-European population comes from Banens (2000). The share of 15-64-year-olds in the European population comes from the 1921 population census and the 1948 statistical yearbook of Indochina and is extrapolated to 1925, 1945 and 1955.

Urban population figures come from Chandler (1987) for 1850, for 1925 from an interpolation of the population censuses of 1921 and 1931, and for 1955 from a backward interpolation of the World Development Indicators figure of 1960.

West and Central Africa

Population in *Afrique Occidentale Française*, *Afrique Equatoriale Française*, Togo and Cameroon comes from Frankema and Jerven (2014) between 1850 and 1960 and from The World Bank (2017) after 1960. The population given by Frankema and Jerven (2014) for Mali and Niger at independence in 1960 is lower than the population given by the World Bank. We therefore opted for higher population growth rates from 1948 to 1960 in order to make the two series consistent. Frankema and Jerven (2014) give figures for African countries in their post-independence borders, but French Cameroon was smaller during the colonial period because it was reunited with former British Cameroon in 1961. We adjust colonial population figures by removing 15% of French Cameroon's population, which corresponds to the ratio obtained by combining French and British colonial estimations (France, *Ministère de*

la France d'Outre-mer, 1959; Great Britain, Colonial Office, various dates). European population comes from the statistical yearbooks of AOF and AEF, and, for Togo and Cameroon, from France, *Ministère de la France d'Outre-mer* (1959).

The share of 15-64-year-olds in the European population in 1925 and 1955 is obtained by averaging the Algerian and Tunisian shares. The share of 15-64-year-olds in the non-European population in 1925 is supposed to be equal to the Algerian share (Muslim population). The share of 15-60-year-olds in the non-European population in 1955 is a weighted average (by total population) of the country-level estimates reported by Tabutin & Schoumaker (2004) for the year 1950 (Table A.11). The relative share of 60-64-year-olds is assumed to be the same as in 1954 Algeria (Muslim population).

Urban population figures come from Eggiman (1999) for 1850, from an exponential interpolation of Africapolis data for 1920 and 1930 for 1925 AOF and Togo[24], from Eggiman again for 1925 AEF and Cameroon (1930 figures extrapolated backward), and The World Bank (2017) for 1955 (1960 figures).

Madagascar

In Madagascar, population comes from the statistical yearbooks of Madagascar and from The World Bank (2017) after 1970. Population between two dates is estimated by exponential interpolation. Before 1906, we extrapolate backwards using the population growth rate of 0.3% given by Frankema and Jerven (2014). European population and Asian population are given in statistical yearbooks and France, *Ministère de la France d'Outre-mer* (1959).

The share of 15-64-year-olds in the European population in 1925 and 1955 is obtained by averaging the Algerian and Tunisian shares. The share of 15-64-year-olds in the non-European population in 1925 is supposed to be equal to the Algerian share (Muslim population). The share of 15-60-year-olds in the non-European population in 1955 is the estimate reported by Tabutin & Schoumaker (2004) for the year 1950. The relative share of 60-64-year-olds is assumed to be the same as in 1954 Algeria (Muslim population).

Urban population figures come from Eggiman (1999) for 1850 and for 1925 (interpolation of 1920 and 1930 figures), and from Eggiman and The World Bank (2017) for 1955 (average of Eggiman's figure for 1950 and World Bank figure for 1960).

[24] We thank Eric Denis (UMR Géographie-Cités) and the Africapolis project for sharing their unpublished data on West African cities for the years before 1950.

Metropolitan France

In Metropolitan France, total population comes from Vallin and Meslé (2001) and population censuses. The share of 15-64-year-olds in total population comes from INSEE (1966).

PRICES

In Northern and Sub-Saharan Africa, monetary amounts collected in various budget sources are given in francs ("of the territory"); each territory had its own bank of issue, but each colonial franc was fully convertible at parity with the French franc. On Christmas day 1945, the French Parliament having just ratified the Bretton Woods agreements, the French government declared a new exchange rate between the French franc and the dollar to the International Monetary Fund, which corresponded to a 60% devaluation with respect to the exchange rate of 1940. The day after (December 26th), the franc of sub-Saharan Africa was renamed CFA franc ("*franc des colonies françaises d'Afrique*") and appreciated at 1.7 French francs. The francs of Algeria, Morocco and Tunisia remained convertible at parity with the French franc. In 1948, after a new devaluation of the franc (of 44% with the dollar), the CFA franc was again appreciated at two francs. Then from 1948 onward, and until the devaluation of 1994, the CFA franc kept the same exchange rate with the French franc. The main objective of the appreciations of 1945 and 1948 was to boost the competitiveness of French exports to colonies, which had lost ground during WWII. Our own series indeed show that the official exchange rate roughly compensated for the inflation differential between Metropolitan France and French West Africa between 1939 and 1948, but that the CFA franc was likely overvalued in other regions where domestic inflation had been higher: French Equatorial Africa, Cameroon and Madagascar. In the French Indochinese Union, the official currency from 1884 onwards was the *piastre*, a silver currency similar in weight to the Mexican peso and the Trade dollar. The *piastre* remained on a silver standard until 1920 and was then pegged to the franc at a variable rate. In 1930, the exchange rate was fixed at one *piastre* for ten francs. After the Second World War and the Japanese occupation, the exchange rate was fixed at one *piastre* for 17 francs, but it was largely overvalued, as evidenced by a black market exchange rate of less than ten francs. Our own series show that inflation was far greater in Indochina than in Metropolitan France during the independence war years.

When considering public finance series, how should we deflate and adjust for purchasing power parity? The answer partly depends on the type of questions asked, and

practical solutions are greatly constrained by the availability of price and wage data for the period considered. Under the angle of revenue, it makes sense to use something akin to a GDP deflator, especially when considering the share of public revenue in GDP as an indicator of fiscal capacity. Because of the limited availability of price data, we deflate and adjust for purchasing power using a basket of consumer goods. Under the angle of expenditure, if we want to compare across time and across space the quantity of public goods and services provided, a specific public spending deflator would be more appropriate, especially for taking into account differences in public sector wages. Building such a deflator would require detailed information on the skill composition of government sector jobs and corresponding salary scales. The lack of such detailed data leads us to deflate public expenditure with the same Consumer Price Index (CPI) deflator we use for public revenue. This has the additional advantage of simplicity: because expenditure and revenue are expressed in the same unit of account, deficits can be computed by subtracting net expenditure from net revenue. However, in our cross country comparisons as well as in our time series, a large share of the variation in public expenditure is accounted for by differences in public sector wages, something we evidence by also providing series on the number of government employees per capita and on average wages. In fact, every possible public expenditure deflator taking into account public sector wages will be a weighted average of two extreme scenarios: in the first one (CPI based adjustment), we assume that differences in real wages are a perfect indicator of differences in labour productivity, in the second one (number of employees per head), we give the same value to each government job, regardless of differences in skills and productivity.

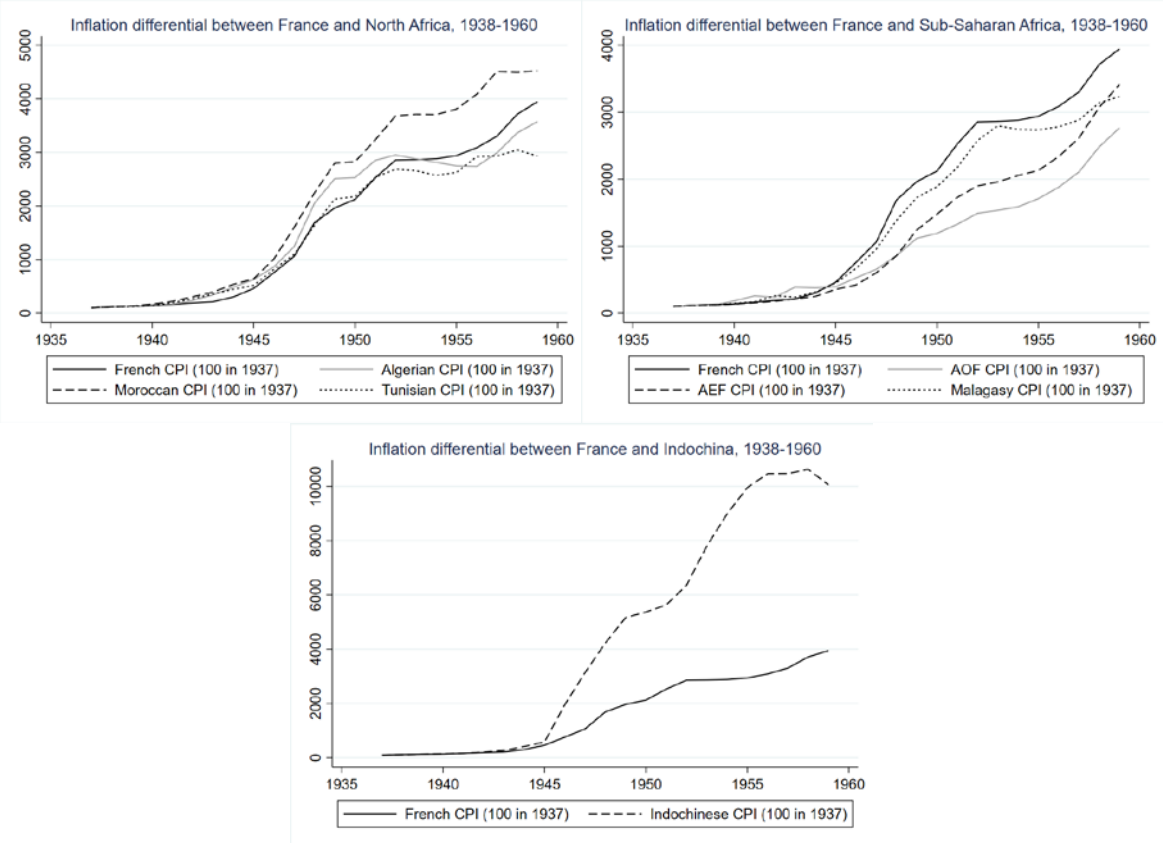
In the end, we adjust all our monetary aggregates using the following method: we use local CPIs to express monetary amounts in 1937 local currency (francs and *piastres*), and then use the relative cost of a basket of goods to adjust for purchasing power parity in 1937. Local CPIs were found in various statistical abstracts (see the "Prices" section of the "List of sources" below). The earliest ones start in 1913, and most of them start in 1938. Before this date, we convert monetary amounts in French francs and deflate using a French GDP deflator obtained by chaining the INSEE deflator after 1949, Villa (1997) between 1900 and 1948, and Toutain (1987) before 1900. The conversion matters only for Indochina, as in all other colonies before World War II, the official currency was the French franc. In Sub-Saharan Africa (AOF, AEF, Togo, Cameroun and Madagascar), we could not find information on price inflation in the second half of the 1950s. We infer price inflation between 1953 and 1960 by taking the difference between the nominal GDP growth and real GDP growth (see

section on GDP below).[25] After 1960, we rely on GDP deflators from The World Bank (2017).

Figure 7 compares the evolution of prices in France and its colonial empire between 1939 and 1960. The first panel displays the evolution of local consumer price indices in France and the North African territories of Algeria, Morocco, and Tunisia. During WW2, inflation was higher in North Africa than in Metropolitan France, yet in Algeria prices had converged to the level of Metropolitan France in 1954, and were slightly lower afterwards. In Tunisia, the CPI converged in 1960 only, that is after independence, and in Morocco, it had not converged in 1960. 1937-1946 inflation was lower in France's Sub-Saharan possessions (panel 2). Madagascar was an exception, as its CPI was only slightly lower than that of France at the end of the war. The introduction of the CFA franc in December 1945 (see above), worth 1.7 Metropolitan francs, and its revaluation in 1948 to two Metropolitan francs, compensated exactly for the accumulated inflation differential in 1948, for all Sub-Saharan territories except Madagascar. Between 1948 and 1960, prices caught up with Metropolitan levels, especially in AEF, and it seems that the CFA franc turned strongly overvalued. In Indochina (panel 3), the divergence between the two price indices is very wide, especially after World War 2. Despite this inflation differential, the exchange rate was fixed a one Indochinese *piastre* for ten francs from 1930 to 1945, and was increased instead of decreased in 1945, at one *piastre* for 17 francs. The discrepancy between the official exchange rate and the black market rate gave rise to the trafficking documented in Despuech (1953). The rate of one for ten was restored in 1953.

[25] Nominal GDP in 1953 is from France, Direction des Affaires économiques et du Plan du ministère de la France d'outre-mer (1955), nominal GDP in 1960 is from The World Bank (2017). Real GDP growth in the 1950s is from the Maddison Project. In Togo, we did not find nominal GDP figures nor prices before 1960. Before this date, inflation is assumed to be the same as in AOF.

Figure 7: Inflation differential between France and its colonies



Once we have expressed all monetary amounts in 1937 local currency using the local CPIs, we adjust for purchasing power parity (PPP) in 1937 using the relative cost of a basket of good. The products and weights used (displayed in table 4) closely follow those used by the French statistical office in the 1950s (INSEE, 1951).[26] They match the consumption pattern of a European or a member of the colonized elite. Table 5 presents the price of our basket of goods relative to Algeria, using the official conversion rate for the *piastre*.[27] In Sub-Saharan Africa, where the Metropolitan franc was used in 1937, we actually would not be far off to assume that one franc had the same purchasing power everywhere. In Indochina, the purchasing power of the franc implied by the official exchange rate of ten francs for a *piastre* is far greater than in the rest of the Empire.

[26] Since we always consider relative prices of baskets of goods, there is no need to specify units and quantities.

[27] We assume that in 1937, the price level in Algeria was very close to the price level in Metropolitan France.

Table 4: products and weights used to adjust for PPP in 1938

Product	Weight
Starch (flour, rice)	11
Meat (chicken, beef)	18.4
Eggs and milk	14.5
Cooking oil	3.8
Grocery (sugar, salt)	12.1
Petroleum	3.4
Electricity	0.7
Soap	8.2
Shoes	12.4
Haircut	15.5
Total	100.0

Table 5: Price of the consumer basket relative to Algeria in the French Empire

Algeria	1.00
Morocco	0.89
Tunisia	0.95
Indochina	0.63
West Africa and Togo	0.91
Equatorial Africa	0.85
Cameroon	0.82
Madagascar	0.80

GROSS DOMESTIC PRODUCT

Though evidence on historical GDP in Africa is scarce, some measure of GDP is needed to put fiscal figures in economic context and express public revenue as a share of GDP, a standard and useful measure of fiscal capacity (Besley and Persson, 2014). To obtain yearly estimates of real GDP per capita, we combine two main sources. Contemporary national accounting exercises give us nominal GDP from the 1950s onwards, while historians' estimations of GDP growth in volume give us real GDP growth before 1950. These sources, laid out in details in the "Gross domestic product" section of the "List of sources" below, are combined with our price deflator, PPP adjustor, and population series to obtain series of real GDP per capita in 1937 francs. The deflator and PPP adjustor used to convert nominal GDP in 1937 PPP francs are the same as those used to deflate our public finance data, making the computation of GDP shares straightforward.

In Algeria, we take yearly nominal GDP between 1950 and 1957 from Algeria, *Service de statistique générale* (1958, p. 54), in 1958 and 1959 from Amin (1966, p. 194-195), and from 1960 onwards from The World Bank (2017).To obtain real GDP figures before 1950, we use real GDP growth estimated by Amin (1966, p.101) between 1880 and 1950 and by Maddison (2003) between 1820 and 1880.

In Morocco, we use the nominal GDP series of The World Bank (2017) from 1960 onwards. We use the growth of real GDP of Amin (1966) between 1920 and 1960, and of Maddison (2003) between 1820 and 1920. We do not use the nominal GDP series of Amin directly because the figure he gives for 1960 is 25% higher than the one given by The World Bank (2017).

In Tunisia, we take nominal GDP in 1957 and 1960 from Amin (1966, p. 297), and nominal GDP after 1965 from The World Bank (2017). Real GDP in other years is computed using the real growth rates of Zarka (1964, p. 214) between 1950 and 1960, and the growth rate of Maddison between 1960 and 1965. Before 1950, we use the growth rate of real GDP given by Amin (1966, p. 35 & p. 101) between 1920 and 1950, and Maddison (2003) between 1820 and 1920.

In Indochina, we take the nominal GDP series of Bassino (2000) for Vietnam (Cochinchina, Annam, and Tonkin) between 1820 and 1970, that we deflate using our CPI. The real GDP per capita of Cambodia and Laos is assumed to be equal to the real GDP per capita of Annam.

In Sub-Saharan Africa (A.O.F, AEF, Togo, Cameroon, and Madagascar), we rely on the nominal GDP series of The World Bank (2017) after 1960. World Bank GDP series start later in Mali (1968) and Guinée (1987), hence we rely on the nominal GDP figures given in Amin (1971). In 1953, we rely on national accounts established by the French Overseas Ministry for AOF, A.E.F, Cameroun, and Madagascar (France, *Direction des Affaires économiques et du Plan du ministère de la France d'outre-me*r, 1955). Growth rate of real GDP per capita between 1953 and 1960 are taken from the Maddison Project. Because we do not have good data on inflation in the 1950s, the difference between the growth rate of nominal GDP per capita and the growth rate of nominal GDP per capita gives us a measure of price inflation that we use to deflate our public finance series.[28] Real GDP per capita before 1953 is obtained using the real GDP growth rates given in Maddison (2003).

[28] Because we did not find estimates of nominal GDP in the 1950s in Togo, inflation in the 1950s is assumed to be the same as in AOF. Nominal GDP in 1960 is deflated in 1937 PPP F using the prices of AOF, and real GDP is then computed using the real growth rates of Maddison (2003).

Finally, in Metropolitan France, we take the GDP at market prices from INSEE national accounts between 1949 and 2010, deflated using our GDP deflator. Between 1900 and 1949, we extrapolate backwards using the annual growth rates of market GDP estimated by Villa (1997), taking into account the gradual increase in the share of non-market GDP using estimates from Vincent (1972, p. 334) for 1913, 1929, and 1938. Between 1820 and 1900, we extrapolate backwards using annual growth rates estimated by Toutain (1987).

Extrapolation of GDP fluctuation from import and export series. Most of our sources estimate real GDP growth before 1950 only between a couple of key years.[29] We extrapolate deviations around an exponential trend using the fluctuations of imports and exports, for which we have yearly observations from Marseille (1984). We proceed in the following way: in the period 1950-1973 (when we have yearly observations of GDP, exports and imports), we estimate the following relationship for each country (or group of countries in the case of federations)[30]:

$$\ln(GDP_t) = \beta + a\ln(exports_t) + \ln(imports_t) + c \times t + u_t$$

Where GDP, exports and imports are deflated in 1937 francs using the same deflator, and expressed in per capita terms. By the Frisch-Waugh theorem, this is equivalent to first estimating the deviations of GDP, exports and imports around an exponential trend:

$$\ln(GDP_t) = d_{GDP} + c_{GDP} \times t + e_{GDP,t}$$

$$\ln(exports_t) = \beta_{exports} + c_{exports} \times t + e_{exports,t}$$

$$\ln(imports_t) = \beta_{imports} + c_{imports} \times t + e_{imports,t}$$

Then estimating a and b from the residuals:

$$\hat{e}_{GDP,t} = a\,\hat{e}_{exports,t} + b\,\hat{e}_{imports,t} + v_t$$

We then use parameters a and b estimated for each country or group of countries to extrapolate the variations of GDP around an exponential trend from yearly series on exports and imports. For a given country, we observe GDP in year t and year $t+h$. We start by detrending the series of imports and exports between t and $t+h$ by estimating

$$\ln(exports_{t+i}) = \gamma_{exports} + k_{exports} \times i + e_{exports,t+i}$$

$$\ln(imports_{t+i}) = \gamma_{imports} + k_{imports} \times i + e_{imports,t+i}$$

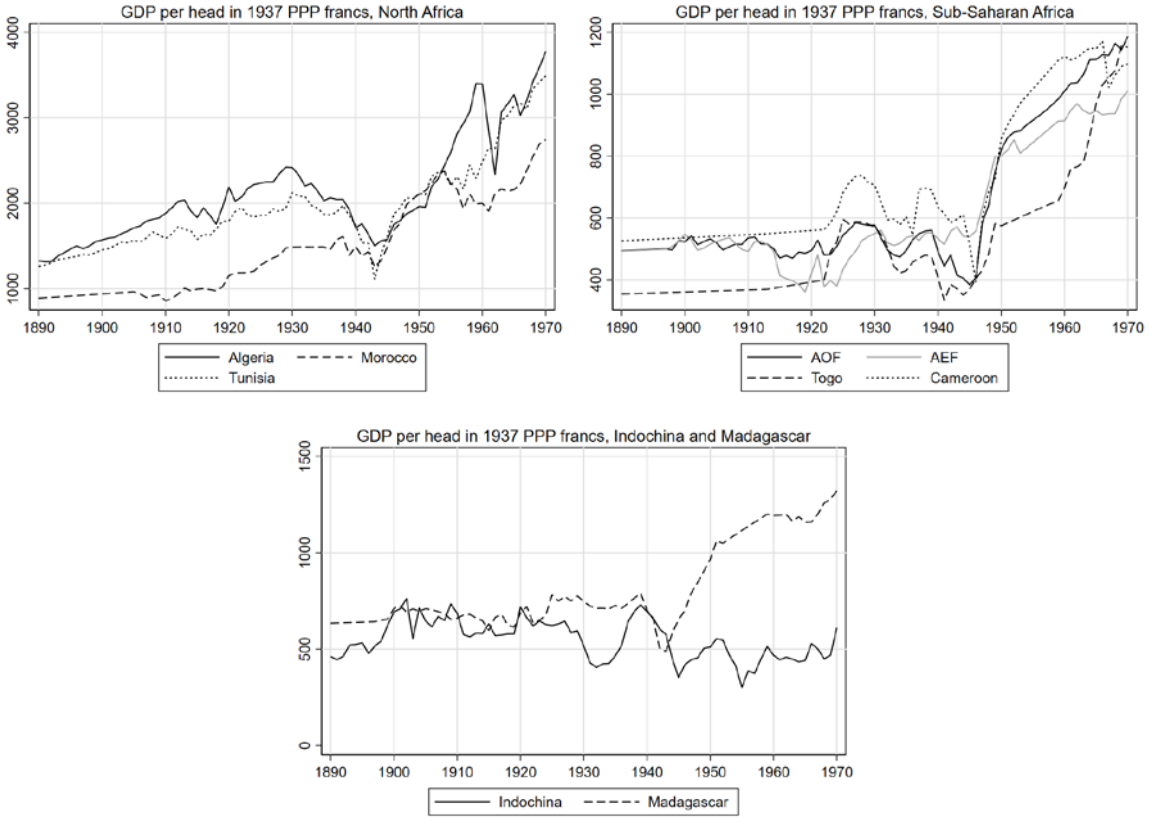
[29] Maddison (2003) gives an estimate of real GDP per capita for "Other countries of Black Africa" in 1820, 1870, and 1913. Amin (1966) gives estimates of real GDP in 1880, 1910, 1920, 1930, 1955 and 1960 in the Maghreb.

[30] We stop in 1973 to avoid the period following the oil shock, which might be very specific. The years on which this equation is estimated are 1950-1973 for Algeria, Tunisia and Morocco; 1947 and 1953-1973 for AOF, AEF, Cameroon and Madagascar; 1948 and 1950-1973 for Togo. We do not need to extrapolate GDP from imports and exports in Indochina as complete series are already given in Bassino (2000).

For i between 0 and h. We then compute the deviation of GDP from an exponential trend from the residuals: $\hat{e}_{GDP,t+i} = \hat{a}\,\hat{e}_{exports,t+i} + \hat{b}\,\hat{e}_{imports,t+i}$. Then we can write GDP at time $t+i$ as $\ln(GDP_{t+i}) = \gamma_{GDP} + k_{GDP} \times i + \hat{e}_{GDP,t+i}$. Because we know GDP at the two endpoints t and $t+h$, we can compute parameters γ_{GDP} and k_{GDP} and compute GDP at every intermediate point.[31]

Our GDP estimations can be seen in figure 8, displaying the evolution of GDP per capita in 1937 francs in the nine regions of our database.

Figure 8: Estimation of GDP per head in the nine regions of the French Empire



ALTERNATIVE ESTIMATES OF GROSS DOMESTIC PRODUCT

As a robustness exercise, we build alternative GDP per capita figures using wage and urbanization data that were not used in the construction of our main estimates. Because wage data are scarce, we only produce these alternative estimates for the years 1925, 1937, 1949 and 1955, and for North Africa, AEF, AOF and Indochina.

[31] In a previous version of the paper, we did not try to estimate GDP fluctuations and assumed constant annual growth rates between key years. Our GDP estimates were therefore moving averages missing the yearly variations in GDP growth due to, for example, fluctuations in the prices of exported primary products.

We start by estimating the wage rate for four groups of workers: Europeans (and other minorities like Jews in North Africa), skilled urban workers, unskilled urban workers, and rural workers. Unless noted, all wage data come from statistical abstracts. Wages are given in different time units (hours, days). We harmonize assuming 8 hours of work a day and 312 days of work a year, like Frankema and van Waijenburg (2012) who follow Robert Allen (2009).

Europeans: In North Africa, the average wage of the European worker is estimated as the average wage in France (from Piketty 2019). Indeed, the distribution of occupations among North African settlers was very similar to the distribution in Metropolitan France (Alvaredo, Cogneau and Piketty 2020). In each North African colony, this puts the average wage of Europeans below the average wage of French civil servants, who were more skilled and earned a colonial bonus ("*tiers colonial"*). Outside of North Africa, we estimate the average European wage as the average wage of French expatriate civil servants, that we collected in the budgets of Indochina and Madagascar in 1925 and circa 1945. In Indochina, we use the 1945 wage for 1949 and we interpolate 1937. In AOF and AEF, we use the average wage of French civil servants in 1925 Madagascar and, to obtain subsequent years, we use the nominal growth rate of the average wage in France, but we apply a decrease in the colonial bonus ("*supplément colonial*") from 70% to 40% after World War II.

Urban autochthons: For North African colonies, statistical abstracts give the minimum wage for a male urban unskilled worker ("*manœuvre homme*") in the years 1936-39, 1948 (1952 for Morocco) and 1955 (1954 for Morocco). After WW2, the minimum wage is differentiated by city size, but the variance is not large, so we compute a simple average. For the year 1925, we take the minimum wage (in real terms) of 1938 in Algeria, of 1936 in Tunisia, and in Morocco the estimate of the wage of unskilled laborers given in Ayache (1957, p. 421) for 1931. For the five colonies of Indochina, statistical abstracts give the average wage of male unskilled laborers in the years 1931, 1937 and 1948 (only 1948 for Cambodia and Laos). We compute a weighted average of the colony-level wages using the population weight of the main cities in 1948 (using the statistical abstract for that year).[32] For 1925, we use the figure of 1931 (in real terms). In West and Central Africa, statistical abstracts give the minimum wages set in the main cities in 1938 or 1939 (including a typical food ration). We compute a weighted average using the city populations in 1950 (using the

[32] Saigon and Cholon for Cochinchina, Hue for Annam, Hanoi and Haiphong for Tonkin, Pnomh-Penh for Cambodia and Vientiane for Laos.

Africapolis database for AOF, and Eggiman 1999 for AEF).[33] For 1925 in AOF, we use the minimum wage applying to Côte d'Ivoire in 1924, given in Labouret (1936). We obtain figures for the years 1949 and 1955 using the nominal growth rate of the minimum wage in Dakar (1930-1954) given in Thioub (1994, p. 444).[34] For 1925 in AEF, we use the wage of the lowest-rank policeman ("*garde de cercle de 4ème classe"*). For 1955, we use the minimum wage in Libreville (Gabon) given in Lasserre (1958, p. 280), that we multiply by the ratio of the AEF average to the Libreville wage in 1938/39. For 1949, we interpolate. In all colonies, we assume that most urban workers are paid the unskilled wage, but that a minority (20%) earn twice the unskilled wage.

Rural autochthons: For North African colonies, statistical abstracts give the agricultural minimum wage in 1948 and 1955 (1952 and 1954 for Morocco). In Algeria and Tunisia, the minimum wage is differentiated by area, but the variance is not large, so we compute a simple average. In 1925 and 1937 (when there was no agricultural minimum wage), we estimate the ratio of the rural wage to the urban unskilled wage to be the same as in 1948.[35] Outside of North Africa, no agricultural minimum wage was ever set. We estimate the rural wage to be half of the unskilled urban wage in each year (this corresponds to the ratios observed in North Africa).[36]

To get at total labor income, we need an estimate of the number of workers in each group. First, we assume that one third of the population received a labor income. This is a standard assumption in the "welfare ratios" literature, where individual wages are compared to a consumption basket for a family of three people (Allen 2009; Frankema and van Waijenburg 2012). Then, to compute the share of the population in each group, we use our estimates of European population and urbanization rates. We assume that 20% of urban workers were skilled workers. This assumption is quite arbitrary, as is the corresponding assumption that skilled workers earned twice the unskilled wage. For Indochina, AEF and AOF, we explore another route: we obtain very similar estimates of GDP per capita if, instead of breaking down urban autochthonous population between skilled and unskilled, we break it

[33] Dakar, Bamako, Conakry, Abidjan, Bobo Dioulasso, Niamey and Cotonou in AOF; Brazzaville, Pointe Noire, Libreville, Bangui, Fort-Lamy and Fort-Archambault in AEF.

[34] For 1955, we can use instead the minimum wage in Dakar for 1956 (Fall 2011, p. 219) and extrapolate to AOF by multiplying by the ratio of the AOF average to the Dakar figure in 1938. The difference is minute.

[35] Ratios for 1948 are 59% in Algeria, 56% in Tunisia, and 52% in Morocco. Ratios for 1955 are respectively 55, 52 and 57%.

[36] The figures obtained are close to those reported in Alfani and Taddei (2017) on urban unskilled monthly income and farm monthly income for Senegal (1939, 1949 and 1954), Côte d'Ivoire (1939, 1949 and 1954) and for Oubangui-Chari (1953), provided that we take 2/3 of farm income in order to discount the land rent.

down between government employees and all other urban workers. We compute the average wage of autochthonous government employees from the average public wage by assuming (i) that the French made 12% of public employment, like in Indochina or Madagascar in 1925 and 1945, (ii) that French civil servants were paid the average European wage.

Finally, to obtain GDP, we multiply total labor income by 3/2, following a classical rule of thumb in macroeconomics (e.g. Johnson 1954) according to which labor income makes 2/3 of GDP while capital income and land rents make the remaining 1/3.

Table 6 reports these alternative GDP per capita estimates, and how they compare to our main estimates, for the years 1925 and 1955 (Table 7 reports estimates for the intermediary years 1937 and 1949).

Table 6: Alternative GDP per capita estimates using wage data (1925 & 1955)

	1925			1955		
	(A)	(B)	(A)/(B)	(A)	(B)	(A)/(B)
	Alternative estimate	Main estimate	Ratio	Alternative estimate	Main estimate	Ratio
Algeria	2,061	2,235	0.92	3,241	2,594	1.25
Tunisia	1,736	1,858	0.93	2,911	2,207	1.32
Morocco	857	1,278	0.67	1,659	2,228	0.74
Indochina	514	623	0.83	n.a.	302	n.a.
AOF	522	545	0.96	1,094	916	1.19
AEF	424	434	0.98	736	844	0.87

Notes: all GDP per capita estimates are in 1937 francs (PPP)

In 1925, the alternative estimate is always lower than the main one, but only in Morocco is the difference between the two estimates substantial. There, the alternative estimate is only two thirds of the main one. It might be that our main estimate of Moroccan GDP is overestimated, but it might also be that minimum wages in Morocco were set at very low levels. In any case, adopting these lower figures of GDP per capita would increase our estimated revenue to GDP ratios, and therefore reinforce our conclusion of high fiscal extraction.

In 1955, the alternative estimate is lower that the main one for Morocco and for AEF.[37] However, it is 20 to 30% higher for Algeria, Tunisia and AOF.[38] Yet, a correction of

[37] In Morocco, the alternative estimate is also lower in 1949, and particularly low in 1937, at 50% only of the main figure, which might underestimate the impact of the Great Depression (Ayache 1957). In AEF, the alternative estimate is also much lower in 1937 and 1949.

our revenue to GDP ratios by 20 or 30% would not undermine our conclusion of high fiscal extraction, as these three territories are displaying the highest revenue to GDP ratios in 1955.

Table 7: Alternative GDP per capita estimates using wage data (1937 & 1949)

	1937			1949		
	(A)	(B)	(A)/(B)	(A)	(B)	(A)/(B)
	Alternative estimate	Main estimate	Ratio	Alternative estimate	Main estimate	Ratio
Algeria	2,261	2,044	1.11	2,037	1,914	1.06
Tunisia	2,091	1,895	1.10	2,102	2,051	1.02
Morocco	757	1,572	0.48	1,378	2,045	0.67
Indochina	586	642	0.91	370	504	0.73
AOF	537	549	0.98	806	748	1.08
AEF	243	527	0.46	508	800	0.64

Notes: all GDP per capita estimates are in 1937 francs (PPP)

DEVELOPMENT OUTCOMES AND TRADE DATA

Development outcomes (kWh produced, road and railway meters, primary enrolment and number of medical staff) come from various statistical yearbooks — see the list of sources below. Trade data (exports and imports) come from Marseille (1984), the Franc Zone reports (*Comité Monétaire de la Zone Franc*, various dates), and The World Bank (2017).

VARIABLE DICTIONARY

PUBLIC FINANCE DATABASE

Variables in the public finance database are given per head in 1937 PPP Francs. To recover nominal amounts as they appear in the budget accounts, one needs to divide by the price deflator (deflator) and the purchasing power parity adjustor (PPP_adjustor) and multiply by population (pop).

[38] It is also the case in 1937 and 1949, though the gap between the two estimates is smaller in these years.

Region

One of nine colonies, protectorates, mandates, or federations or colonies: Algeria, Morocco, Tunisia, Indochina, West Africa, Togo, Equatorial Africa, Cameroon, and Madagascar.

Year

Net public expenditure (NPE)

Net public expenditure is total public expenditure net of transfers to reserve funds, external loans, subsidies and debt service. It is a consolidated aggregate, meaning that it is net of the various financial transfers (loans, subsidies, etc.) between different public budgets accounts within the same region (federal, colonial, and auxiliary budgets, and budgets of first-level administrative divisions). However, NPE includes subsidies and loans to firms and institutions located within the region, as well as subsidies and loans to second-level administrative divisions (municipalities). NPE also includes the civilian expenditure recorded in the budget accounts of the French Ministry of Colonies and Ministry of War. It does not include social security transfers. After independence, when Franc Zone reports are used as sources, NPE is computed as total expenditure minus debt service as recorded in Franc Zone reports, minus all external loans and subsidies received by the country recorded in the Franc Zone report (except when we know these emanate from a private source or a non-OECD country), plus net OECD ODA (loans and grants) received by the country (see “Budget accounts considered and sources used” above).

Administration expenditure (exp_administration)

Administration expenditure comprises personnel and material expenses destined to general and territorial administration. It comprises financial transfers to autochthonous political authorities, such as the king of Laos, or the sultan of Morocco.

Security expenditure (exp_security)

Security expenditure comprises personnel and material expenses of the police and prisons.

Justice expenditure (exp_justice)

Justice expenditure comprises personnel and material expenses destined to Autochthonous and European justice.

Financial services expenditure (exp_finserv)

Financial services expenditure comprises personnel and material expenses destined to tax collection, the management of the public debt, and the management of government monopolies (on salt, opium, etc.)

Education expenditure (exp_education)

Education expenditure comprises personnel and material expenses destined to public education, subsidies to private schools, and scholarships. School construction expenses are classified as infrastructure expenditure. In all French colonies, schools were segregated into a European system and a system for the autochthonous population. In Algeria between 1904 and 1948, and in Morocco between 1926 and 1930, it is possible to identify education expenditure for Autochthons (**exp_education_au**) and for Europeans (**exp_education_eu**). The two subcategories do not necessarily sum to total education expenditure because some expenses were common to both education systems. Education expenditure for Autochthons and Europeans are expressed per head of the relevant population: expenditure for Europeans are divided by European population (pop_eu) and expenditure for Autochthons are divided by autochthonous population (pop minus pop_eu).

Religion expenditure (exp_religion)

Religion expenditure is positive only in Algeria, where the government took charge of the personnel and material expenses of the four monotheist religions (Islam, Judaism, Protestantism, and Catholicism). The law of separation of church and state was only partially applied in Algeria, where the government continued subsidising religions after 1907, and notably continued paying the wages of the Muslim religious personnel in an effort to control Islam and avoid political turmoil (Saaidia, 2016).

Health expenditure (exp_health)

Health expenditure comprises the personnel and material expenses destined to health, sanitation, labor inspection, and welfare. It does not include social security transfers. Hospital and health centers construction expenses are classified as infrastructure expenditure.

Infrastructure expenditure (exp_infrast)

Infrastructure expenditure comprises expenses for public works, both the construction of new infrastructure and buildings and the maintenance of existing ones. The

construction of new railway lines or telegraphic lines falls in this category, but subsidies to railway companies are classified as production support expenditure, as well as the operating expenses of posts and telecommunications. Infrastructure expenditure also comprises the subsidies to second-level administrative divisions destined to the maintenance of local roads (in Algeria only).

Production support expenditure (exp_prodsup)

Production support expenditure comprises subsidies to private and public or semi-public entities whose budgets are not already part of the public expenditure aggregate (like railway companies). It also includes expenses on public services destined to enhance or support production, like posts and telecommunications, power plants, printing department, meteorological department, civil aviation, forestry and mining departments, agricultural research, merchant navy, etc.

Other expenditure (exp_other)

Other expenditure is equal to the difference between net public expenditure (NPE) and the sum of all previous items of expenditure: administration, security, justice, financial services, education, religion, health, infrastructure, and production support. Expenditure remaining from the previous financial year (*Dépenses d'exercices antérieurs / d'exercices clos*) is allocated between the different items of expenditure in proportion of their weight in total expenditure.

Military expenditure (exp_mili)

Our measure of net public expenditure includes civilian expenditure only. Military expenditure is given separately by the variable **exp_mili**. The bulk of colonial military expenditure appears in the budget accounts of the French Ministry of the Colonies and Ministry of War. Some items of military expenditure given by the Metropolitan budget accounts are civilian in nature and were added to the relevant categories of net public expenditure (**exp_health**, **exp_infrastructure**, and **exp_prodsup**). On the revenue side, they are considered as subsidies from France (**netsubto**). Military expenditure appears directly in colonial budget accounts only for the Southern Territories of Algeria between 1904 and 1937, Morocco between 1921 and 1937, and again in 1956 (the amounts are very small compared to those recorded in the budget accounts of the Ministry of War). Military expenditure also appears in the budget accounts of Algeria between 1830 and 1900, but it is not financed locally and corresponds to the expenditure financed by the Ministry of War. Finally, military expenditure appears in

the budget accounts of Indochina in 1953 (a year for which the budget accounts of the Ministry of War is not available). More precisely, this military expenditure is found in the national budgets of Vietnam, Laos and Cambodia, and in the regional budget of North Vietnam (Tonkin). Total security expenditure is not broken down between civilian and military, but personnel expenditure is. We use the share of military in personnel expenditure to infer total military expenditure from total security expenditure.

Net public revenue (NPR)

Net public revenue is public revenue net of transfers from reserve funds, external borrowing, subsidies, interests and reimbursements. It is a consolidated aggregate, meaning that it is net of various financial transfers (loans, subsidies, etc.) between different public budgets accounts within the same region (federal, colonial, and auxiliary budgets, and budgets of first-level administrative divisions). However, NPR includes transfers (subsidies, loans, and reimbursements) from firms and institutions located within the region, as well as transfers from second-level administrative divisions (municipalities). NPR does not include social security transfers.

Tax revenue (taxrevenue)

Tax revenue is the sum of head taxes, external trade taxes, intermediate taxes, and modern taxes

Head taxes (re_headtax)

Revenue from the head tax (*capitation*), in theory a lump-sum tax, in practice a tax levied at the village level by local chiefs and roughly proportional to population. This category also includes cattle taxes (in Tunisia, Indochina, West and Equatorial Africa, Togo, Cameroon, and Madagascar), and labor tax redemptions.

External trade taxes (re_trade)

External trade taxes comprise export taxes (**re_trade_exp**) and import taxes (**re_trade_imp**), as well as harbor dues not attributable to export or import taxes (*octroi de mer* in Algeria). Taxes on the consumption of imported products are considered as import taxes (re_trade_imp).

Intermediate taxes (re_intermediate)

Intermediate taxes comprise taxes with an element of proportionality, but which do not require the frequently collection of statistical information on firms or individuals.

They include direct intermediate taxes (**re_interm_di**), such as land taxes and business licenses (*patente*), and indirect intermediate taxes (**re_interm_in**), such as circulation taxes and taxes on the consumption of specific luxury goods (alcohol, sugar, tobacco).

Modern taxes (re_modern)

Modern taxes comprise taxes which require the frequent collection or self-declaration of detailed economic information on individuals and firms. Direct modern taxes (**re_modern_di**) are personal income taxes (*impôt sur le revenu*, as well as the Moroccan tax on agricultural income called *tertib*), taxes on benefits, and the tax on interests and dividends (*impôt sur le revenu des valeurs mobilières*). Indirect modern taxes (**re_modern_in**) are broad-based consumption taxes, taxes on sales revenue (*impôts sur le chiffre d'affaire*), and turnover taxes (called *taxes sur la production, taxe unique à la production* in Algeria, and *taxe sur les transactions* in Tunisia).

Monopoly revenue (re_monopoly)

Monopoly revenue includes revenue from any economic activity on which the government had a legal monopoly. It comprises revenue from industrial operations (including post and telegraph receipts) and administrative services, and revenue from the sale of various goods on which the colonial government had a monopoly, such as salt (in Tunisia and Indochina), tobacco (in Morocco, Tunisia, Indochina, and Madagascar), alcohol (in Madagascar and Indochina), and opium (in Indochina). It also includes excess revenue of public railway companies transferred to the government's budget, as well as various registration fees.

Other sources of internal revenue (re_other)

Other sources of internal revenue are the difference between Net public revenue (NPR) and the sum of all previous sources of internal revenue: head taxes, monopoly revenue, external trade taxes, intermediate taxes, modern taxes. Revenue collected in the current fiscal year on account of the previous fiscal year's budget (*Recettes d'exercices antérieurs / d'exercices clos*) is allocated between the different items of revenue in proportion of their weight in total revenue.

Net surplus/deficit (deficit)

Net surplus/deficit is the difference between net public revenue and net public expenditure ($deficit = NPR - NPE$). The net deficit is, by construction, financed by

net transfers from reserve funds, net borrowing, and net subsidies (another way to put it is that the net surplus is composed of net transfers to reserve funds, net loans, and net subsidies given out). Unfortunately, net transfers from reserve funds cannot be systematically computed, but we provide variables for the other components of the net deficit.

Net subsidies (netsubto)

Net subsidies are subsidies received from abroad net of subsidies sent abroad. During the colonial period, the bulk of net subsidies are net subsidies from metropolitan France (**netsubfr**), equal to subsidies from France to the colony minus subsidies from the colony to France. After 1960, net subsidies are aid grants from OECD-DAC aid data

Net borrowing (netborto)

Net borrowing per capita is equal to loans received minus loans given out, minus interests and reimbursements paid out, plus interests and reimbursements paid in. After 1960, net borrowing is net loan aid from OECD-DAC aid data.

NPE of first-level administrative divisions (NPE_adm1)

First level administrative divisions are *départements* in Algeria, *régions* in Morocco, and *provinces* in Indochina and Madagascar. Their expenditure is already taken into account in the consolidated aggregate (NPE).

NPR of first-level administrative divisions (NPR_adm1)

First level administrative divisions are *départements* in Algeria, *régions* in Morocco, and *provinces* in Indochina and Madagascar. Their revenue is already taken into account in the consolidated aggregate (NPR).

Tax revenue of first-level administrative divisions (tax_adm1)

First level administrative divisions are *départements* in Algeria, *régions* in Morocco, and *provinces* in Indochina and Madagascar. The tax revenue of first level administrative divisions is already taken into account in the consolidated aggregate (NPR). Tax revenue of the central government only is simply$taxrevenue - tax_a dm1$.

NPE of second-level administrative divisions (NPE_adm2)

Second-level administrative divisions are municipalities (*communes*). Their expenditure is not taken into account in the consolidated aggregate (NPE), because it

is often missing. NPE_adm2 is net of all transfers, including subsidies from the central government and first-level administrative divisions.

NPR of second-level administrative divisions (NPR_adm2)

Second-level administrative divisions are municipalities (*communes*). Their revenue is not taken into account in the consolidated aggregate (NPR), because it is often missing. NPR_adm2 is net of all transfers, including subsidies to the central government and first-level administrative divisions.

Net subsidies from central government to municipalities (sub_gcadm2) and from municipalities to central government (sub_adm2gc)

For years in which NPE_adm2 and NPR_adm2 are not missing, it is possible to compute total consolidated public expenditure and revenue. When computing total net public expenditure and revenue, one should subtract from net public expenditure the subsidies to municipalities (**sub_gcadm2**), and subtract from net public revenue the transfers from municipalities (**sub_adm2gc**). NPE_adm2 and NPR_adm2, however, are already net of transfers to and from the central government and first-level administrative divisions. Denoting with a star total consolidated net public expenditure and revenue, we have $NPE^* = NPE - sub\_gcadm2 + NPE\_adm2$, and $NPR^* = NPR - sub\_adm2gc + NPR\_adm2$.

Social security transfers (re_socsec and exp_socsec)

Social security transfers are not part of net public expenditure (NPE) and net public revenue (NPR). There were no social security transfers in the colonies before World War II. In 1945, social security funds were created in the colonies and protectorate of North Africa. The variable **re_socsec** gives social security contributions and the variable **exp_socsec** social security benefits.

Total population (pop)

See section “Population, prices, and GDP” above and the “List of sources” below.

European population (pop_eu)

See section “Population, prices, and GDP” above and the “List of sources” below. In Algeria, European population includes Jews who were given French citizenship by the 1870 Crémieux decree. In Morocco and Tunisia, Jews were not given French citizenship and are included in the non-European minority population (pop_min). In

Indochina, European population comprises a small number of Japanese and Americans.

Non-European minority population (pop_min)

See section “Population, prices, and GDP” above and the “List of sources” below. Non-European minority population is Jewish population in North Africa (except in Algeria where Jews were given French citizenship), Chinese population in Indochina, and Asian (Chinese and Indian) population in Madagascar.

Share of 15-64-year-olds (share1564)

See section “Population, prices, and GDP” above and the “List of sources” below. The population share of 15-64 year-olds is estimated only in 1925, 1945 and 1955. In North Africa and Indochina, we estimate the share of 15-64-year-olds in the Autochthonous population (**share1564_au**) and in the European population (**share1564_eu**).

Price deflator (deflator)

See section “Population, prices, and GDP” above and the “List of sources” below. The price deflator, base one in 1937, was used to deflate nominal amounts, along with the PPP adjustor. All public finance variables are given per head in 1937 PPP Francs. To recover nominal amounts, one needs to divide by deflator and by PPP_adjustor. In West Africa after 1960, doing so will produce a nominal amount in current CFA francs (Mali, Mauritania and Guinée went off the CFA franc after 1960, but we converted all nominal amounts in CFA francs for these countries before applying the regional deflator).

Purchasing power parity adjustor (PPP_adjustor)

See section “Population, prices, and GDP” above and the “List of sources” below. The PPP adjustor adjusts for purchasing power parity in 1937. All public finance variables are given per head in 1937 PPP Francs. To recover nominal amounts, one needs to divide by deflator and by PPP_adjustor. In West Africa after 1960, doing so will produce a nominal amount in current CFA francs (Mali, Mauritania and Guinée went off the CFA franc after 1960, but we converted all nominal amounts in CFA francs for these countries before applying the regional deflator).

GDP per capita in 1937 PPP francs (GDP)

The many assumptions behind the building of yearly GDP per capita figures are laid out in details in the section “Population, prices and GDP” above. We used the same deflator to deflate nominal GDP and public finance figures, so that GDP shares can be computed directly by dividing the relevant variable by GDP.

Value of exports per capita in 1937 PPP francs (export_val)

See section “Development outcomes and trade data” above and the “List of sources” below.

Value of imports per capita in 1937 PPP francs (import_val)

See section “Development outcomes and trade data” above and the “List of sources” below.

PERSONNEL DATABASE

Region

One of nine colonies, protectorates, mandates, or federations or colonies: Algeria, Morocco, Tunisia, Indochina, West Africa, Togo, Equatorial Africa, Cameroon, and Madagascar.

Year

Total revenue (re_to)

Total revenue, not consolidated. This is simply the sum of gross revenue over all the budget accounts (federal and colonial) in the region.

Total expenditure (exp_to)

Total expenditure, not consolidated. This is simply the sum of gross expenditure over all the budget accounts (federal and colonial) in the region.

Average wage of government employees (avwage_to)

Average wage of government employees, all sectors, including bonuses and allowances, in 1937 PPP Francs. Computed by dividing total personnel expenditure attached to a given number of employees by the number employees. Government is only colonial government in colonies, federal and colonial governments in federations of colonies, excluding the local governments of first- and second-level administrative divisions.

Total number of government employees per 1,000 inhabitants (nbemppc_to)

Total number of employees is the sum of total number of enumerated employees and estimated number of employees when items of personnel expenditure are not attached to a precise number (the monetary amount is divided by the average wage). Government is only colonial government in colonies, federal and colonial governments in federations of colonies, excluding the local governments of first- and second-level administrative divisions.

Average wage and number of employees by sector

Average wages are in 1937 PPP francs (divide by deflator and PPP_adjustor to recover the nominal wage). Number of employees is given per 1,000 inhabitants (multiply by pop to recover the actual number of employees). The definition of each sector corresponds exactly to the definition given in the variable dictionary for the public finance database.

Total population (pop), share of 15-64-year-olds (share1564), price deflator (deflator), purchasing power parity adjustor (PPP_adjustor), GDP per capita (GDP)

See definition in the variable dictionary for the public finance database.

LIST OF SOURCES

To build our public finances and personnel database, we gathered data from around 1,700 official publications. These publications were accessed in several libraries and public archives: the *Bibliothèque Nationale de France* (BnF) in Paris, the *Bibliothèque Universitaire des Langues et Civilisations* (BULAC) in Paris, the *Bibliothèque Cujas* (BC) in Paris, the *Bibliothèque de documentation internationale contemporaine* (BDIC) in Nanterre, the *Centre des Archives Economiques et Financières* (CAEF) in Savigny-le-Temple, the *Bibliothèque Universitaire de Grenoble* (BUG) in Grenoble, and the *Centre des Archives de l'Outre-Mer* (CAOM) in Aix-en-Provence. We indicate in brackets the place (or places) where we accessed the source and the location number, when relevant. For the *Bibliothèque Nationale de France*, a location number starting with NUMP indicates that the publication was digitized and made available on the BnF's digital library Gallica (http://www.gallica.bnf.fr). If no location number is indicated, the source comes from a private collection. When a series of publication was printed by several publishers, we give only the first publisher and place of publication.

PUBLIC FINANCES

Metropolitan France

André, Christine and Delorme, Robert. *L'Etat et l'économie. Un essai d'explication de l'évolution des dépenses publiques en France (1870-1980)*. Paris: Seuil, 1983.

INSEE (Institut national de la statistique et des études économiques). *Annuaire statistique de la France, résumé rétrospectif*. Paris, 1966. [BnF: NUMP-10025]

France, Ministère de la France d'Outre-mer, Service des statistiques. *Annuaire statistique de l'Union française outre-mer*. Paris: Impr. nationale, 1951. [4-LC25-321 (2)]

France, Ministère des affaires économiques et financières, Secrétariat d'Etat aux postes, télégraphes et téléphones. *Rapport sur la gestion financière des services pendants l'année 1955*. Paris: Imprimerie des journaux officiels, 1957. [BnF: FOL-LF186-443]

France, Ministère du commerce et de l'industrie. *Rapport sur la gestion financière et la marche générale des services des postes, télégraphes et téléphones pendant l'année 1925*. Paris: Imprimerie des journaux officiels, 1927. [BnF: NUMP-16601]

Budget accounts of the Ministry of the Navy and Ministry of the Colonies

France, Ministère de la marine et des colonies. *Compte définitif des dépenses de l'exercice…* Paris : Impr. royale, then Impr. nationale, 1833-1938. [BnF: 4-LF224-7]

France, Ministère des colonies. *Compte définitif des dépenses de l'exercice…* Paris, 1884-1938. [BnF: 4-LF224-119]

France, Ministère de la France d'Outre-Mer (services civils et militaires). *Compte définitif des dépenses de l'exercice…* Paris : Impr. nationale, 1953-1954, 1955-1959 [BnF : FOL-LF156-184, CAEF]

Budget accounts of the Ministry of Defense

France, Ministère de la guerre. *Comptes généraux présentés par le ministre de la guerre pour l'exercice…* Paris: Impr. royale, then Impr. nationale, 1819, 1821-1937. [BnF: NUMP-3685 & 4-LF194-10, CAEF]

France. Ministère de la Défense. *Compte définitif des dépenses*. Paris, 1946, 1955. [CAEF]

Budget accounts of the Ministry of the Sahara

France, Ministère du Sahara. *Loi de finance, compte définitif*. 1958-1962. [BnF: FOL-LF156-184]

Algeria

Statistical abstracts

Algeria, Gouvernement général civil. *Statistique générale de l'Algérie*. Algiers: Impr. de l'Association ouvrière, various dates between 1867 and 1925. [BnF: LK8-1043]. (The second volume for the year 1900 contains retrospective data from 1830, as well as communal and departmental data.)

Algeria, Sous-direction des statistiques. *Annuaire statistique de l'Algérie*. Algiers: Impr. Administrative Emile Pfister, various dates between 1926 and 1960. [BnF: 4-O3W-583]

Algeria. *Statistique financière de l'Algérie. Algérie du Nord et territoires du Sud*. Algiers: Impr. agricole et commerciale, 1900-1902, 1904-1905, 1909-1932, 1934-1935, 1937. [BnF: NUMP-3485]

Algeria, Service de statistique générale. *Statistique générale de l'Algérie. Tableau de l'économie Algérienne*. Algiers: Impr. Baconnier, 1958. [BnF: 16-LC32-174]

Definitive budget accounts

Algeria. *Compte définitif des dépenses de l'exercice…* Paris: Impr. Impériale, then Nationale, 1858-1880. [BnF : 4-LF269-3]

Algeria. *Compte définitif des recettes du budget de l'Algérie pour l'exercice…* Algiers: Impr. Algérienne, various dates between 1914 and 1957. [BnF: NUMP-4918, CAEF]

Algeria. *Budget de l'Algérie. Compte définitif des dépenses de l'exercice…* Algiers: Impr. Algérienne, various dates between 1914 and 1957. [BnF : NUMP-3572, CAEF]

Provisional budget accounts

Algeria. *Projet de budget… - Gouvernement général de l'Algérie*. Algiers: Impr. de V. Heintz, 1925, 1937, 1955-1956. [BnF: FOL-LK19-400 & NUMP-3535]

Algeria. *Délégation générale en Algérie. Services civils en Algérie. Budget voté de 1960*. Algiers: Impr. officielle, 1960. [BnF: 4-LF156-200]

Auxiliary budget accounts

Algeria, Gouvernement général de l'Algérie. *Budget annexe des postes, télégraphes et téléphone de l'Algérie : Compte définitif des résultats de l'exercice…* Algiers: J. Carbonel, 1927-1939. [BnF: FOL-LK19-609 & NUMP-4652]

Algeria, Gouvernement général de l'Algérie. *Budget annexe des postes, télégraphes et téléphone des territoires du Sud : Compte définitif des résultats de l'exercice…* Algiers: J. Carbonel, 1927-1939. [BnF: FOL-LK19-609 & NUMP-4652]

Morocco

Statistical Abstracts

Morocco. *Annuaire économique et financier*. Casablanca: Impr. G. Mercié, various dates between 1917 and 1929. [BULAC: BIULO PER.5552]

Morocco, Direction générale de l'agriculture, du commerce et de la colonisation. *Annuaire de statistique générale du Maroc*. Casablanca: Impr. réunies de la Vigie Marocaine et du Petit Marocain, various dates between 1925 and 1936. [BULAC: BIULO PER.6096]

Morocco, Direction de l'industrie. *Annuaire de statistique générale de la zone française du Maroc*. Casablanca: Impr. réunies de la Vigie Marocaine et du Petit Marocain, various dates between 1937 and 1953. [BDIC: Q6400]

Morocco, Royaume du Maroc, Ministère de l'Economie Nationale, Division de la Coordination Economique et du Plan, Service Central des Statistiques. *Tableaux économiques du Maroc, 1915-1959*. Rabat, 1960.

Provisional budget accounts

Morocco. *Empire Chérifien. Protectorat français. Budget de l'exercice…* Various dates between 1925 and 1955. [CAEF: F4120]

Tunisia

Statistical abstracts

Tunisia. *Statistique générale de la Tunisie*. Tunis, various dates between 1881 and 1939. [BnF: NUMP-7491 & MFILM 8-O3I-371]

Tunisia, Institut national de la statistique. *Annuaire statistique de la Tunisie*. Tunis: Institut national de la statistique, various dates between 1940 and 1999. [BnF: 4-O3W-35, 8-SG PER U-160 & MICROFICHE M-25451]

Provisional budget accounts

Tunisia. *Budget Général de la Tunisie*. Various dates between 1931 and 1952. [CAEF]

Tunisia. *Régence de Tunis. Protectorat français. Budget de l'Etat et des Etablissements publics annexes pour l'exercice…* Various dates between 1912 and 1955-56. [CAEF: 4329]

Tunisia. *Régence de Tunis. Protectorat français. Projet de budget de l'Etat pour l'exercice 1924.* [CAEF: F4473]

Other

Tunisia. *Rapport au Président de la République sur la situation de la Tunisie*. Paris: Imprimerie nationale, 1890-1916, 1918-1925, 1927, 1929, 1931, 1934. [BnF: NUMP-11318]

Tunisia. *Rapport au Président de la République sur la situation de la Tunisie*. Paris: Imprimerie Nationale, 1938. [CAEF]

Indochina

Statistical abstracts

Indochine française, Bureau de la statistique générale. *Annuaire Statistique de L'Indochine …*. Hanoï: Impr. d'Extrême-Orient, various dates between 1927 and 1949. [BnF: MICROFILM M-14883]

Annuaire statistique du Laos. Troisième volume. 1951-1952. Saigon: Vo-Van-Van, 1954. [BDIC: Q15925]

Federal budget accounts — definitive

Indochine, Gouvernement général. *Compte Administratif du Budget Général*. Saïgon: Impr. Colonial, various dates between 1900 and 1913. [BC: 9.915-2]

Indochine, Gouvernement général. *Compte Administratif du Budget Général de l'Indochine pour l'exercice* … Hanoï-Haïphong: Impr. d'Extrême Orient, 1911-1943, 1946-1949. [BnF: NUMP-3483 & FOL-LK19-547]

Federal budget accounts — provisional

Indochine, Gouvernement général. *Budget Général pour l'exercice…* Hanoï: F.-H. Schneider, various dates between 1904 and 1913. [BC: 9.915-5]

Indochine française, Haut-commissariat. *Budget général : exercice…* Hanoï, then Haïphong: Impr. d'Extrême-Orient, 1914, 1925. [BnF: FOL-LK19-482]

Indochine française. *Projet de budget général : exercice 1937*. Hanoï: Impr. d'Extrême-Orient, 1937. [BnF: NUMP-4948]

Colonial budget accounts: Annam (Centre Vietnam) — definitive

Annam. *Compte* administratif *du budget local de l'Annam pour l'exercice…* Various places: Impr. d'Extrême-Orient, 1894, 1896, 1899, 1904, 1905, 1910-1943. [BnF: MFILM LK19-478]

Colonial budget accounts: Annam (Centre Vietnam) — provisional

Annam. *Budget local de l'Annam pour l'exercice…* Various places, 1887-1893, 1897, 1899-1945. [BnF: MFILM FOL-LK19-479]. (Contains the provisional budget accounts of Tonkin for the years 1887-1890 and 1897.)

Vietnam. *Budget Régional du Centre Vietnam pour l'exercice 1953*. [BnF: FOL-O2W-19]

Colonial budget accounts: Cochinchina (South Vietnam) — definitive

Cochinchina. *Compte administratif du budget local de la Cochinchine pour l'exercice…* Saïgon, 1871-1891, 1893-1906, 1915-1941, 1943. [BnF: NUMP-3524 & FOL-LK19-633]

Colonial budget accounts: Cochinchina (South Vietnam) — provisional

Cochinchina. *Budget local de la Cochinchine pour l'exercice…* Saïgon: Impr. du Gouvernement, 1876, 1878-1901, 1921-1922, 1924, 1927-1942, 1944. [BnF: NUMP-3149 & LK19-124, BC: 9.899]

Colonial budget accounts: Tonkin (North Vietnam) — definitive

Tonkin. *Compte administratif du budget local du Tonkin pour l'exercice…* Hanoï : Impr. Tonkinoise, 1900-1923, 1925-1943. [BnF: NUMP-3451 & 4-LK19-539]

Colonial budget accounts: Tonkin (North Vietnam) — provisional

Tonkin. *Budget local du Tonkin pour l'exercice…* Hanoï-Haïphong, various dates between 1898 and 1944. [BnF: MFILM FOL-LK19-480]

Vietnam. *Budget Régional du Nord Vietnam pour l'exercice 1953*. Impr. nationale du Viêt-Nam, 1952. [BnF: GR FOL-O2W-1]

Colonial budget accounts: Vietnam (after 1945)

Vietnam. *Budget National de l'Etat du Vietnam pour l'exercice 1953*. Saïgon: Impr. française d'Outre-mer, 1952. [BnF: 4-O2W-40]

Colonial budget accounts: Cambodia — definitive

Cambodia. *Compte administratif du budget local du Cambodge pour l'exercice…* Pnomh-Penh: Impr. A. Portail, 1904-1907, 1910-1943. [BnF: MFILM LK19-476]

Colonial budget accounts: Cambodia — provisional

Cambodia. *Budget local du Cambodge pour l'exercice…* Various places, 1883, 1884, 1888-1945. [FOL-LK19-311]

Cambodia. *Budget National du Cambodge pour l'exercice…* 1950, 1952-1954. [BnF: FOL-O2W-16]

Colonial budget accounts: Laos — definitive

Laos. *Compte administratif du budget local du Laos pour l'exercice…* Various places and publishers, 1904-1907, 1910-1921, 1923-1942. [BnF: NUMP-3514 & FOL-LK19-594]

Colonial budget accounts: Laos — provisional

Laos. *Budget local du Laos pour l'exercice…* Hanoï: Impr. d'Extrême-Orient, 1897-1943. [BnF: NUMP-3481 & FOL-LK19-528]

Laos. *Budget National du Laos pour l'exercice…* Hanoï: Impr. d'Extrême-Orient, 1950, 1952-54. [BnF: FOL-O2W-17]

Auxiliary budget accounts

Indochine française. *Budget de l'emprunt de 53 millions pour l'exercice 1915*. [BC: 9.915-6a]

France, Inspection générale des Travaux publics. *Budget de l'emprunt de 90 millions pour l'exercice…* Hanoï-Haïphong: Impr. d'Extrême-Orient, 1913, 1914. [BC: 9.915-7]

Indochine française. *Budget de l'emprunt de 90 millions pour l'exercice…* Hanoï-Haïphong: Impr. d'Extrême-Orient, 1917, 1922-1929. [BnF: NUMP-3463 & 4-LK19-534]

Indochine française. *Compte administratif du budget de l'emprunt de 90 millions pour l'exercice…* Hanoï-Haïphong: Impr. d'Extrême-Orient. 1922, 1923, 1925-1929. [BnF: NUMP-3869 & FOL-LK19-550]

Indochine française. *Compte administratif du budget de l'emprunt de 6 180 000 piastres pour l'exercice…* Hanoï: Impr. d'Extrême-Orient, 1922-1927. [BnF: FOL-LK19-540 (BIS)]

Indochine française. *Budget spécial sur fonds d'emprunt des grands travaux et dépenses sanitaires pour l'exercice…* Hanoï: Impr. d'Extrême-Orient, 1931-1942, 1945. [NUMP-4136 & FOL-LK19-642]

Indochine française. *Compte administratif du budget spécial sur fonds d'emprunt des grands travaux et dépenses sanitaires pour l'exercice…* Hanoï: Impr. d'Extrême-Orient, 1913-1943. [BnF: NUMP-4822 & FOL-LK19-697]

Indochine française. *Compte Administratif du Budget spécial pour la reconstruction et le rééquipement de l'Indochine pour l'exercice 1946*. Hanoï-Haïphong: Impr. d'Extrême-Orient, 1946. [BnF: FOL-LK19-547]

Other (notably for provincial and municipal budget accounts)

Spooner, Andrew. *Situation financière en Cochinchine*. Unknown place, 1874. [BnF: NUMM-5842883 & 4-LK10-90]

Indochine française. *Rapports au Conseil Supérieur (Gouverment général de l'Indochine)*. Hanoï-Haïphong: Impr. d'Extrême-Orient, 1910-1939. [BnF: NUMP-3209 & 4-LK19-463]

Indochine française. *Rapport sur la situation administrative, économique et financière au Laos durant la période…* Hanoï: Impr. d'Extrême-Orient, 1929-1939. [BnF: NUMP-3424 & 4-LK19-611]

Ville de Hanoï : bulletin municipal. Hanoï: unknown publisher, 1916, 1922-1924. [BnF: NUMP-4440 & 8-LK19-565]

Afrique Occidentale Française

Federal budget accounts — definitive

Afrique occidentale française. *Compte définitif des recettes et dépenses du budget général de l'Afrique occidentale française pour l'exercice…* Gorée, then Rufisque: Impr. du Gouvernement general, 1905-1939, 1941-1957. [BnF: NUMP-3506 & FOL-LK19-398]

Federal budget accounts — provisional

Afrique Occidentale Française. *Budget général de l'Afrique occidentale française.…* Various places: Impr. du Gouvernement général, 1913, 1925, 1936, 1949, 1955. [BnF: FOL-LK19-372 & NUMP-3509]

Colonial budget accounts: Côte d'Ivoire — definitive

Côte d'Ivoire. *Compte définitif des recettes et dépenses du budget local de la Côte d'Ivoire pour l'exercice…* Bingerville, then Abidjan: Impr. du Gouvernement, 1901-1904, 1906-1915, 1917-1921, 1923-1924, 1928-1940, 1942-1943, 1945-1954. [BnF: FOL-LK19-404]

Colonial budget accounts: Côte d'Ivoire — provisional

Côte d'Ivoire. *Budget du service local de la Côte d'Ivoire pour l'exercice…* Various places and publishers, various dates between 1893 and1960. [BnF: FOL-LK19-407 & NUMP-3512, BC: 9.882-1]

Colonial budget accounts: Dahomey — definitive

Dahomey. *Compte définitif des recettes et dépenses du budget local du Dahomey pour l'exercice…* Porto-Novo: Impr. du Gouvernement, 1897-1902, 1904, 1906, 1908-1938, 1940-1942, 1944-1955. [BnF: NUMP-3480 & FOL-LK19-412]

Colonial budget accounts: Dahomey — provisional

Dahomey. *Budget local du Dahomey pour l'exercice…* Porto-Novo: Impr. du Gouvernement, 1895-1898, 1900-1945, 1947-1957. [BnF: NUMP-3288 & 4-LK19-409]

Colonial budget accounts: Guinea — definitive

Guinea. *Compte définitif des recettes et dépenses du budget local de la Guinée pour l'exercice…* Conakry: Impr. du Gouvernement, 1890-1902, 1904-1940, 1942-1943, 1946-1954. [BnF: NUMP-3543 & FOL-LK19-390]

Colonial budget accounts: Guinea — provisional

Guinea. *Budget local de la Guinée française pour l'exercice…* Conakry: Impr. du Gouvernement, 1892, 1894-1955, 1958. [BnF: NUMP-3409 & FOL-LK19-269]

Colonial budget accounts: Haute-Volta — definitive

Haute-Volta. *Compte définitif des recettes et dépenses du budget local de la Haute-Volta pour l'exercice…* Koulouba: Impr. du Gouvernement, 1920-1922, 1929-1932, 1948-1954, 1956. [BnF: NUMP-3534 & FOL-LK19-515]

Colonial budget accounts: Haute-Volta — provisional

Haute-Volta. *Budget local de la Haute-Volta pour l'exercice…* Koulouba: Impr. du Gouvernement, 1920-1928, 1931-1932, 1938-1956. [BnF: NUMP-3387 & FOL-LK19-501]

Colonial budget accounts: Mauritania — definitive

Mauritania. *Compte définitif des recettes et dépenses du budget local de la Mauritanie pour l'exercice…* Gorée, then Rufisque: Impr. du Gouvernement general, 1906-1955. [BnF: NUMP-3127 & 4-LK19-419]

Colonial budget accounts: Mauritania — provisional

Mauritania. *Budget local de la Mauritanie pour l'exercice…* Gorée, then Rufisque: Impr. du Gouvernement general, 1908-1914, 1915-1940, 1942, 1946-1958. [BnF: FOL-LK19-447]

Colonial budget accounts: Niger — definitive

Niger. *Compte définitif des recettes et dépenses de la colonie du Niger pour l'exercice…* Gorée, then Koulouba: Impr. du gouvernement (général), various dates between 1921 and 1955. [BnF: FOL-LK19-569]

Colonial budget accounts: Niger — provisional

Niger. *Budget local du Territoire militaire du Niger pour l'exercice…* (title varies). Various places and publishers, 1913-1958. [BnF: FOL-LK19-408 (BIS)]

Colonial budget accounts: Senegal — definitive

Senegal. *Compte définitif des recettes et dépenses du budget local du Sénégal Pays de Protectorat pour l'exercice…* Saint-Louis: Impr. du Gouvernement, 1905-1914, 1916-1936. [BnF: NUMP-3098 & FOL-LK19-441]

Senegal. *Compte définitif des recettes et dépenses du budget local du Sénégal pour l'exercice…* Saint-Louis: Impr. du Gouvernement, 1873, 1875-1890, 1892-1893, 1895-1896, 1898, 1900-1901, 1905-1959. [BnF: NUMP-3403, NUMP-3134, FOL-LK19-142, FOL-LK19-440 & FOL-LK19-441]

Colonial budget accounts: Senegal — provisional

Senegal. *Budget local de la colonie du Sénégal pour l'exercice…* Saint-Louis: Impr. du Gouvernement, 1905-1920, 1922-1943, 1945-1946, 1948-1958. [BnF: NUMP-3407 & FOL-LK19-405]

Colonial budget accounts: Soudan and predecessors — definitive

Haut-Sénégal-Niger. *Compte définitif des recettes et dépenses du budget local du Haut-Sénégal et Moyen-Niger pour l'exercice…* Bamako: Impr. du Gouvernement, 1902, 1908-1914, 1916-1919. [BnF: NUMP-11411 & FOL-LK19-373]

Soudan français. *Compte définitif des recettes et dépenses du budget local du Soudan français pour l'exercice…* Koulouba: Impr. du gouvernement, various dates between 1945 and 1951. [BnF: FOL-LK19-530]

Colonial budget accounts: Soudan and predecessors — provisional

Afrique occidentale française. *Budget local du Haut-Sénégal et Niger : exercice…* Bamako, 1901, 1902. [BC: 9.955-2]

Haut-Sénégal-Niger. *Budget local du Haut-Sénégal et Niger* (title varies). Various places: Impr. du Gouvernement (général), 1903-1920. [BnF: NUMP-3306, 4-LK19-363 & 4-LK19-408]

Soudan français. *Soudan français, budget du service local, exercice…* Saint-Louis: Imprimerie du Gouvernement, 1898-1899. [BnF: NUMP-3445 & FOL-LK19-507]

Afrique occidentale française. *Budget du service local. Soudan français : exercice…* Saint-Louis: Impr. du Gouvernement, 1898-1899. [BC: 9.955-1]

Soudan français. *Budget local du Soudan français pour l'exercice…* Bamako, then Koulouba: Impr. du Gouvernement, 1921-1941, 1943-1960. [BnF: NUMP-3445 & FOL-LK19-507]

Auxiliary budget accounts

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Budget des fonds d'emprunt… Emprunt de 65 millions*. Gorée: Impr. du Gouvernement general, 1909-1912. [BnF: NUMP-7005 & 4-LK19-451]

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Budget des fonds d'emprunt… Emprunt de 14 millions… chemin de fer de Thiès vers Kayes*. Gorée: Impr. du Gouvernement general, 1910-1917. [BnF: NUMP-3467 & FOL-LK19-423]

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Budget des fonds d'emprunt… Emprunt de 167 millions*. Gorée: Impr. du Gouvernement general, 1914-1926. [BnF: NUMP-8145 & 4-LK19-452]

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Budget spécial des grands travaux et dépenses sanitaires sur fonds d'emprunt, annexe au budget général. Exercice…* Gorée, Rufisque: Impr. du gouvernement general, 1932-1941, 1946. [BnF: NUMP-3530 & FOL-LK19-636]

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Compte définitif des recettes et des dépenses du budget des fonds des emprunts de 65 et 100 millions*. Gorée: Impr. du Gouvernement general, 1906-1923. [BnF: FOL-LK19-455]

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Compte définitif des recettes et des dépenses du budget des fonds de l'emprunt de 100 millions*. Various places, 1908-1912. [BnF: FOL-LK19-456]

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Compte définitif des recettes et des dépenses du budget des fonds de l'emprunt de 14 millions*. Various places, 1910-1917. [BnF: FOL-LK19-467]

Afrique occidentale française. *Gouvernement général de l'Afrique occidentale française. Compte définitif des recettes et des dépenses du budget des fonds de l'emprunt de 14 et 167 millions*. Various places, 1914-1926. [BnF: FOL-LK19-492]

Afrique occidentale française. *Compte définitif des recettes et des dépenses du budget spécial des grands travaux et dépenses sanitaires sur fonds d'emprunt : annexe au budget général : exercice…* Rufisque: Impr. du Gouvernement general, 1931-1937, 1939-1941, 1944-1946. [BnF: NUMPR-7653 & FOL-LK19-684]

Other

Dakar (Circonscription). *Budget de la circonscription de Dakar et dépendances (annexe au bidget général). Exercice…* Gorée, then Rufisque: Impr. Du Gouvernement general, 1925-1944, 1946-1947. [NUMP-3533 & FOL-LK19-535]

Togo

Colonial budget accounts — definitive

Togo. *Compte définitif des recettes et dépenses du budget local du Togo pour l'exercice…* 1923-1938, 1947, 1950, 1952. [BnF: FOL-LK19-857]

Colonial budget accounts — provisional

Togo. *Budget local du Togo pour l'exercice…* Gorée: Impr. du Gouvernement général. 1920-1922, 1924-1944, 1947-1950, 1952-1954, 1956. [BnF: NUMP-3562 & FOL-LK19-504]

Afrique Equatoriale Française

Statistical abstracts

Afrique Equatoriale Française, Service de la statistique générale. *Annuaire statistique de l'Afrique équatoriale française. Volume 1936-1950*. 1952. [BnF: 4-LC32-158]

Oubangui-Chari, Bureau de la Statistique générale. *Annuaire statistique de l'Oubangui-Chari. Années 1940 à 1955. Vol. 1*. Bangui: Impr. Notre-Dame, 1957. [BnF: 4-LC32-182]

Federal budget accounts — definitive

Congo Français. *Compte définitif des recettes et des dépenses*. Libreville : Imprimerie du Gouvernement, 1899-1908. [BnF : FOL-LK19-387]

Afrique Equatoriale Française. *Compte définitif des recettes et des dépenses*. Brazzaville : Imprimerie du Gouvernement Général, 1912-1958. [BnF : NUMP-3385 & 4-LK19-434]. (This location number also covers colonial budget accounts for some dates).

Federal budget accounts — provisional

Afrique Equatoriale Française. *Projets de budgets exercice…* (title varies). Brazzaville: Impr. du Gouvernement general, 1912, 1915, 1917. [BnF: FOL-LK19-469 & NUMP-3508]. (This location number also covers colonial budget accounts for some dates).

Afrique Equatoriale Française. *Budget général…* Brazzaville: Imprimerie du Gouvernement, various dates between 1911 and 1958. [BnF: FOL-LK19-778 & NUMP-3428]. (This location number also covers colonial budget accounts for some dates).

Colonial budget accounts: Moyen-Congo — definitive

Afrique Equatoriale Française. *Budget local du territoire du Moyen-Congo : compte définitif des recettes et des dépenses. Exercice…* Brazzaville: Impr. Officielle du gouvernement general, 1927-1956. [BnF: NUMP-3520 & FOL-LK19-579]

Colonial budget accounts: Moyen-Congo — provisional

Congo. *Budget local: exercice… / Gouvernement général de l'Afrique équatoriale française, Territoire du Moyen-Congo*. Brazzaville: Impr. du Gouvernement général, various dates between 1947 and 1960. [BnF: FOL-LK19-773]

Colonial budget accounts : Gabon — definitive

Afrique Equatoriale Française. *Comptes définitifs des recettes et des dépenses : budget local du Gabon : exercice…* Paris, then Brazzaville: E. Larose, then Impr. Du Gouvernement, 1920-1921, 1925-1926, 1933, 1952-53. [BnF : NUMP-3546 & FOL-LK19-578]

Colonial budget accounts : Gabon — provisional

Gabon. *Budget local : exercice… / Afrique équatoriale française, Territoire du Gabon.* Various places and publishers, various dates between 1890 and 1958. [BnF: FOL-LK19-371, FOL-LK19-778 & FOL-LK19-796]

Colonial budget accounts : Oubangui-Chari — definitive

Afrique Equatoriale Française. Oubangui-Chari. *Compte définitif des recettes et des dépenses : budget local : exercice…* . Paris : E. Larose, 1925, 1926, 1951. [BnF: NUMP-3526 & FOL-LK19-576]

Colonial budget accounts : Oubangui-Chari — provisional

Oubangui-Chari. *Budget local : exercice… / Afrique équatoriale française, Oubangui-Chari*. Various places and publishers, various dates between 1900 and 1959. [BnF: FOL-LK19-371, FLO-LK19-778, FOL-LK19-802]

Colonial budget accounts : Chad — definitive

Chad. *Compte définitif des recettes et des dépenses. Exercice…* Paris, then Brazzaville: E. Larose, then Impr. officielle, 1925, 1926, 1947, 1949-1954. [BnF : FOL-LK19-580]

Colonial budget accounts : Chad — provisional

Chad. *Afrique équatoriale française. Territoire du Tchad. Budget local. Exercice…* Various places and publishers, 1951-1958. [FOL-LK19-858]

Cameroon

Definitive budget accounts

Cameroon. *Compte définitif des recettes et dépenses du budget des territoires du Cameroun pour l'exercice…* Paris : E. Larose, 1922-1925, 1929-1931, 1933-1936, 1945-1952. [BnF: NUMP-3573 & FOL-LK19-536]

Provisional budget accounts

Cameroon. *Budget du Cameroun : exercice…* Yaounde: Impr. du Gouvernement, 1920, 1922, 1924-1926, 1929-1939, 1943, 1945-1957. [BnF: NUMP-3511 & FOL-LK19-506]

Auxiliary budget accounts

Cameroon. *Budget annexe de la construction du Port de Douala et du chemin de fer du centre du Cameroun pour l'exercice…* Yaounde: Impr. du Gouvernement, 1925,1926. [BnF : NUMP-3511 & FOL-LK19-506]

Cameroon. *Budget annexe de la santé publique et de l'assistance médicale indigène pour l'exercice…* Yaounde: Impr. du Gouvernement, 1925, 1926, 1929, 1932. [BnF : NUMP-3511 & FOL-LK19-506]

Cameroon. *Budget annexe de la santé publique. Compte définitif des recettes et des dépenses. Exercice….* Paris: Imprimerie-Librairie Militaire Universelle L. Fournier, 1924, 1931. [BnF: NUMP-3573 & FOL-LK19-536]

Cameroon. *Budget spécial des grands travaux et dépenses sanitaires sur fonds d'emprunt: exercice…* Yaounde: Impr. du Gouvernement, 1931-1939. [BnF: NUMP 5167 & FOL-LK19-861]

Madagascar

Statistical abstracts

Madagascar, Institut national de la statistique. *Annuaire statistique de Madagascar 1938-1951*. Antananarivo: Impr. officielle, 1953. [BnF: LC32-167]. (Contains information on the budget accounts of the provinces in 1931 and from 1938 to 1951).

Budget accounts of Madagascar — definitive

Madagascar. *Compte définitif du budget des recettes et des dépenses du service local de Madagascar et Dépendances pour l'exercice…* Antananarivo, 1898-1900. [BC: 9.912-2]

Madagascar. *Territoire de Madagascar. Budget général. Compte définitif des recettes et des dépenses. Exercice…* Antananarivo: Impr. officielle, 1901-1917, 1920, 1922-1923, 1925-1928, 1930-1938, 1940-1945, 1956. [BnF: FOL-LK19-446]

Budget accounts of Madagascar — provisional

Madagascar. *Budget des recettes et des dépenses du Service local… Madagascar et dépendances*. Antananarivo: Gouvernement général de Madagascar et dépendances, 1900-1905, 1909-1941, 1943-1946, 1948-1953, 1956-1957. [BnF: NUMP-4474 & FOL-LK19-428]

Budget accounts of Mayotte and dependencies

Mayotte (Colonie). *Comptes définitifs des recettes et des dépenses des services locaux de la Colonie de Mayotte et des protectorats des Comores. Exercice…* Paris: Imprimerie nationale, 1898-1906, 1911-1914. [BnF : NUMP-3382 & FOL-LK19-356]

Mayotte (Colonie). *Budget des recettes et des dépenses… Colonie de Mayotte, Service local*. Saint-Denis (Reunion Island), then Hell-Ville, then Paris, then Antananarivo, 1881-1898, 1900-1912. [BnF: FOL-LK19-271]

Budget accounts of provinces

Province de Fianarantsoa. *Compte définitif du budget provincial de Fianarantsoa*. Fianarantsoa, 1949-1952, 1945-1956. [BnF: FOL-LK19-953]

Mahajanga (Province). *Province de Majunga. Compte définitif des recettes et des dépenses. Exercice…* 1949, 1951-1956. [BnF: FOL-LK19-95]

Province de Tamatave. *Province de Tamatave. Compte définitif.* Tamatave. 1949-1956. [BnF: FOL-LK19-951]

Province de Tananarive. *Compte définitif du budget provincial de Tananarive. Exercice 1956*. [BnF: FOL-LK19-950]

Province de Tuléar. *Province de Tuléar. Budget provincial. Compte définitif.* Tuléar, 1949, 1951-1956. [BnF: FOL-LK19-949]

Auxiliary accounts

Madagascar. *Compte définitif du budget spécial des grands travaux et dépenses sanitaires sur fonds d'emprunt : exercice… Madagascar et dépendances*. Antananarivo: Impr. officielle, 1931, 1935-1942. [BnF: FOL-LK19-863]

Madagascar. *Budget spécial des grands travaux et dépenses sanitaires sur fonds d'emprunt. Exercice…* Antananarivo: Gouvernement général de Madagascar et dépendances, 1931-1942. [BnF: NUMP 5038 & FOL-LK19-685]

FIDES

Institut d'Etude du Développement Economique et Social (IEDES). *Les investissements publics d'origine locale et d'origine extérieure dans les pays francophones d'Afrique tropicale. 1946-1960. Volume II : Tableaux Statistiques.* [BUG: D0342608839]

Post colonial

Amin, Samir. *L'Afrique de l'Ouest bloquée: l'économie politique de la colonisation, 1880-1970*. Paris: Editions de Minuit, 1971.

Comité monétaire de la zone franc. *La Zone Franc en … : Rapport publié par le Secrétariat du Comité monétaire de la zone franc*. Paris: Imprimerie nationale, 1953-1995. [BnF: NUMP-10930]

Haute-Volta, Direction du plan et des études de développement. *Bilan du plan cadre, 1967-1970*. Ouagadougou, 1971. [BnF: MICROFICHE M-15031]

Madagascar, Commissariat général au plan. *Rapport sur l'exécution du plan quinquennal 1964-1968*. Antananarivo: 1965-1969. [BnF: MICR M-25337]

OECD. OECD development co-operation directorate development assistance committee (DCD-DAC) official development assistance (ODA) data. http://www.oecd.org/dac/financing-sustainable-development/development-finance-data/ (accessed 08/24/2017).

Senegal, Secrétariat d'Etat au plan. *Rapport d'évaluation du 3e plan quadriennal de développement économique et social, année 1969-1970*. Dakar, 1972. [BnF: 4-O3W-553]

Tunisia, Secrétariat d'Etat au plan et aux finances. *Annuaire statistique de la Tunisie*. Tunis: Institut national de la statistique, 1964-65. [BnF: 4-O3W-35]

POPULATION

Africapolis. http://www.africapolis.org/

Algeria, Sous-direction des statistiques. *Annuaire statistique de l'Algérie*. Algiers: Impr. Administrative Emile Pfister, various dates between 1926 and 1960. [BnF: 4-O3W-583]

Banens, Maks. "Vietnam: a reconstitution of its 20th century population history." In *Vietnam Economic History*, edited by Jean-Pascal Bassino, Jean-Dominique Giacometti and Konosuke Odaka, 1-45. Tokyo: Hitotsubashi University, 2000.

Bassino, Jean-Pascal. "Preliminary estimates of Vietnam GDP 1800-1970: North-South economic divide in historical perspective". International research workshop on Asian historical statistics database, 7-8 January 2000.

Chandler, Tertius, 1987. *Four Thousand Years of Urban Growth: An Historical Census.* Lewiston, NY: St. David's University Press.

CICRED (Comité International de Coordination des Recherches Nationales en Démographie). *La Population de l'Algérie*. Paris: CICRED, 1974a.

CICRED (Comité International de Coordination des Recherches Nationales en Démographie). *La Population du Maroc*. Paris: CICRED, 1974b.

CICRED (Comité International de Coordination des Recherches Nationales en Démographie). *La Population de la Tunisie*. Paris: CICRED, 1974c.

Eggiman, Gilbert. *La population des villes des tiers mondes, 1500 - 1950 : Afrique, Asie, Amérique latine.* Genève: Droz, 1999.

Frankema, Ewout and Morten Jerven. "Writing History backwards or sideways: towards a consensus on African population, 1850-2010". *The Economic History Review*, 67, no. 40 (2014): 907-31.

France, Ministère de la France d'Outre-mer. *Tableau économique et social des Etats et territoires d'Outre-mer à la veille de la mise en place des nouvelles institutions*. Paris: Presses universitaires de France, 1959. [BnF: 8-LK9-1398]

Indochine française, Bureau de la statistique générale. *Annuaire statistique de l'Indochine*. Hanoï: Impr. d'Extrême-Orient, 1927-1949. [BnF: 4-LC32-125]

Great Britain, Colonial Office. *Report by H.M. Government in the United Kingdom of Great Britain and Northern Ireland to the Council of the League of Nations on the Administration of the British Cameroons*. London: H.M. Stationery Office, 1922-1938. [BnF: 8-NW-79]

Great Britain, Colonial Office. *Report by H.M. Government in the United Kingdom to the General Assembly of the United Nations on the Administration of the Cameroons under United Kingdom Trusteeship*. London: H.M. Stationery Office, 1949-1959. [BnF: 8-NW-79]

INSEE (Institut National de la Statistique et des Etudes Economiques). *Annuaire Statistique de la France.* Paris: Imprimerie nationale,1961, 1962. [BnF: NUMP-10025]

INSEE (Institut national de la statistique et des études économiques). *Annuaire statistique de la France, résumé rétrospectif*. Paris, 1966. [BnF: NUMP-10025]

Madagascar, Institut national de la statistique. *Annuaire statistique de Madagascar. Vol. 1: 1938-1951*. Antananarivo: Impr. officielle, 1953. [BnF: LC32-167]

Morocco, Protectorat de la République française au Maroc, Gouvernement chérifien, Direction générale de l'agriculture, du commerce et de la colonisation, Service du commerce et de l'industrie. *Annuaire de Statistique Générale du Maroc*. Casablanca: Imp. Réunies de la Vigie Marocaine et du Petit Marocain, 1925-1926, 1928-1939/1944. [BnF: NUMP-14878 & 4-O3J-343]

Morocco, Royaume du Maroc, Ministère de l'Economie Nationale, Division de la Coordination Economique et du Plan, Service Central des Statistiques. *Tableaux économiques du Maroc, 1915-1959*. Rabat, 1960.

Tabutin, Dominique and Bruno Schoumaker. "The Demography of Sub-Saharan Africa from the 1950s to the 2000s [A Survey of Changes and a Statistical Assessment]". *Population*, 59, no. 3-4 (2004): 457-555.

Tunisia, Institut national de la statistique. *Annuaire statistique de la Tunisie*. Tunis: Institut national de la statistique, various dates between 1940 and 1999. [BnF: 4-O3W-35, 8-SG PER U-160 & MICROFICHE M-25451]

The World Bank. *World Development Indicators*. https://data.worldbank.org/data-catalog/world-development-indicators , 2017

United Nations. *Demographic Yearbook 1960*. New York, 1960.

UNHCR (United Nations High Commissioner for Refugees (UNHCR). *The State of The World's Refugees 2000: Fifty Years of Humanitarian Action*. 2000. http://www.unhcr.org/afr/publications/sowr/4a4c754a9/state-worlds-refugees-2000-fifty-years-humanitarian-action.html

Vallin, Jacques, et France Meslé. *Tables de mortalité françaises pour les XIXe et XXe siècles et projections pour le XXIe siècle. Données statistiques 4*. Paris: Institut National d'Études Démographiques, 2001.

PRICES

General

The World Bank. *World Development Indicators*. https://data.worldbank.org/data-catalog/world-development-indicators, 2017.

Metropolitan France

INSEE. "Les nouveaux indices de prix de détail à Paris." *Supplément au BMS, janvier-mars 1951*. 1951.

Toutain, Jean-Claude. « Le produit intérieur brut de la France de 1789 à 1982 », *Economie et Sociétés*, 21, n°5 (1987): 1-237.

Lévy-Leboyer, Maurice and François Bourguignon. *L'économie Française au XIXe siècle—Analyse Macroéconomique*. Economica, 1985.

Villa, Pierre. "Un siècle de données macroéconomiques." *INSEE-Résultats* no. 303-304, April, 1994.

Villa, Pierre. *Séries macroéconomiques historiques: méthodologie et analyse économique*. Insee Méthodes no. 62-63, March, 1997.

Vincent, André L. A. « Les comptes nationaux », in Alfred Sauvy, *Histoire économique de la France entre les deux guerres*, tome 3 (« Diverse sujets »), chapitre XII pp. 309-43, Paris : Fayard, 1972.

Algeria

Retail price index in Algiers, 33 products (1938-1957)

Algeria, Sous-direction des statistiques. *Annuaire statistique de l'Algérie. Nouvelle Série. Volume 1 (1939-1947).* Table XIII, p. 250. [BnF: LK8-1043 (BIS)]

Algeria, Sous-direction des statistiques. *Annuaire statistique de l'Algérie. Nouvelle Série. Volume 9 (1956-57).* Table XIV, p. 176. [BnF: LK8-1043 (BIS)]

Morocco

Retail price index in Casablanca (1914-1959)

Morocco, Royaume du Maroc, Ministère de l'Economie Nationale, Division de la Coordination Economique et du Plan, Service Central des Statistiques. *Tableaux économiques du Maroc, 1915-1959*. Rabat, 1960. Table 1, p.214.

Tunisia

Retail price index (1938-1968)

Tunisia, Institut national de la statistique. *Annuaire statistique de la Tunisie. Volume 14. 1963.* Tunis. Table IV, p. 159. [BnF: MICROFICHE M-25451]

Tunisia, Institut national de la statistique. *Annuaire statistique de la Tunisie. Volume 15. 1964 & 1965.* Tunis. Table IV, p. 141. [BnF: MICROFICHE M-25451]

Tunisia, Institut national de la statistique. *Annuaire statistique de la Tunisie. Volume 18. 1968.* Tunis. Table 10.7, p. 161. [BnF: MICROFICHE M-25451]

Indochina

Price of white rice in Saigon (1891-1910)

Indochine française, Bureau de la statistique générale. *Résumé statistique relatif aux années 1913 à 1940*. Hanoi: Impr. d'Extrême-Orient, 1941, p. 43. [BnF: 4-LK10-906]

Cost of living index for Europeans in Saigon and in Hanoi (1911-1940)

Indochine française, Bureau de la statistique générale. *Résumé statistique relatif aux années 1913 à 1940*. Hanoi: Impr. d'Extrême-Orient, 1941, p. 32. [BnF: 4-LK10-906]

Consumer price index for blue collars in Saigon (1941-1948)

Bassino, Jean-Pascal. "Preliminary Estimates of Vietnam GDP 1800-1970: North-South Economic Divide in Historical Perspective." In *Constructing a Historical Macroeconomic Database for the Trans-Asian Regions*, edited by Konosuke, Odaka, Kyokawa, Yukihiko, and Kuboniwa, Masaaki, 9–41. Tokyo: Institute of Economic Research, Hitotsubashi University, 2000.

Consumer price index for Europeans in Saigon and Hanoi (1949-1954)

Institut national de la statistique et des études économiques (France). *Annuaire statistique de la zone franc*. Paris, 1958. Table 1, p.159 [BnF: 4-LC25-321]

Afrique Occidentale Française

In Afrique Occidentale Française, we use import prices to measure inflation between 1938 and 1944. We track the price evolution of a yearly subsistence basket composed of 195 kg of flour, 5 liters of oil, 1.3 kg of sugar, 1.3 kg of soap and 600 grams of cotton cloth. See Allen (2009) and Frankema and van Waijenburg (2012) for discussions of the methodology of subsistence baskets. Starting in 1945, we rely on CPI computed by the statistical office of AOF.

Import prices of flour, oil, sugar, soap, and cotton (1938-1944)

Afrique occidentale française, Service de la statistique générale. *Annuaire statistique de l'Afrique occidentale française. Vol. 4 : 1939-1951*. Dakar: Impr. de la Mission. Table IV, p. 264-67. [BnF: 4-LC32-139]

Cost of living index for Europeans in Dakar (1945-1955) and Abidjan (1947-1955)

Afrique occidentale française, Service de la statistique générale. *Annuaire statistique de l'Afrique occidentale française. Vol. 5 : 1950-1954*. Dakar: Impr. de la Mission. Tables 1-3-21 and 1-3-22, p. 330-31. [BnF: 4-LC32-139]

Togo

We did not find prices for Togo before 1960 and we use the consumption price index of AOF (see above).

Afrique Equatoriale Française

Consumption price index for Europeans in Brazzaville (1938-1955)

Afrique équatoriale française. *Annuaire Statistique de l'Afrique équatoriale française. Volume 1936-1950*. 1951. Table 3, p. 223. [BnF: MFICHE 4-LC32-158 (1, 1936-1950)]

Consumption price index for Europeans in Bangui (1951-1955) and Fort-Lamy (1950-1955)

Afrique équatoriale française, Territoire de l'Oubangui-Chari, Statistique générale. *Annuaire statistique de l'Oubangui-Chari. Vol. 1 : 1940-1955*. Bangui. Table 2, p. 179 and table 4, p.181. [BnF: MFICHE 4-LC32-182]

Cameroun

In Cameroun, we use the consumption price index of Brazzaville to infer inflation between 1938 and 1951.

Consumption price index in Douala (1952-1955)

Institut national de la statistique et des études économiques (France). *Annuaire statistique de la zone franc*. Paris, 1958. Table 1, p.159. [BnF: 4-LC25-321]

Madagascar

Consumption price index for Europeans in Antananarivo (1938-1951)

Institut national de la statistique et de la recherche économique (Madagascar). *Annuaire statistique de Madagascar. Vol.1: 1938-1951*. Antananarivo: Impr. officielle, 1953. Table 5, p.158. [BnF: LC32-167]

Consumption price index for Europeans in Antananarivo (1952-1955)

Institut national de la statistique et des études économiques (France). *Annuaire statistique de la zone franc*. Paris, 1958. Table 1, p.159. [BnF: 4-LC25-321]

GROSS DOMESTIC PRODUCT

Algeria, Service de statistique générale. *Tableau de l'économie Algérienne*. Algiers: Impr. Baconnier, 1958. [BnF: 16-LC32-174]

Amin, Samir. *L'économie du Maghreb*. Paris: Editions de Minuit, 1966.

Amin, Samir. *L'Afrique de l'Ouest bloquée: l'économie politique de la colonisation, 1880-1970*. Paris: Editions de Minuit, 1971.

France, Direction des Affaires économiques et du Plan du ministère de la France d'outre-mer, *Essai de détermination du revenu national des principaux territoires d'outre-mer en 1947 et en 1953*. Paris, 1955. [CAOM 1fides/69/530]

Bassino, Jean-Pascal. "Preliminary estimates of Vietnam GDP 1800-1970: North-South economic divide in historical perspective". International research workshop on Asian historical statistics database, 7-8 January 2000.

Zarka, Claude. "L'économie tunisienne à l'heure de la planification impérative. " In *Annuaire de l'Afrique du Nord*, edited by Centre national de la recherche scientifique, 207-241. Paris: Editions du CNRS, 1964.

Maddison, Angus. *L'économie mondiale: Statistiques historiques*. Paris: OECD, 2003.

The Maddison Project. http://www.ggdc.net/maddison/maddison-project/home.htm

The World Bank. *World Development Indicators*. https://data.worldbank.org/data-catalog/world-development-indicators , 2017

Toutain, Jean-Claude. « Le produit intérieur brut de la France de 1789 à 1982 », *Economie et Sociétés*, 21, n°5 (1987): 1-237.

Villa, Pierre. *Séries macroéconomiques historiques: méthodologie et analyse économique*. Insee Méthodes no. 62-63, March, 1997.

Vincent, André L. A. « Les comptes nationaux », in Alfred Sauvy, *Histoire économique de la France entre les deux guerres*, tome 3 (« Diversakle sujets »), chapitre XII pp. 309-43, Paris : Fayard, 1972.

DEVELOPMENT OUTCOMES AND TRADE DATA

Afrique équatoriale française. *Annuaire Statistique de l'Afrique équatoriale française. Volume 1936-1950*. 1951. [BnF: MFICHE 4-LC32-158 (1, 1936-1950)]

Afrique occidentale française, Service de la statistique générale. *Annuaire statistique de l'Afrique occidentale française. Vol. 4 : 1939-1951*. Dakar: Impr. de la Mission. [BnF: 4-LC32-139]

Indochine française, Bureau de la statistique générale. *Annuaire statistique de l'Indochine*. Hanoï: Impr. d'Extrême-Orient, 1927-1949. [BnF: 4-LC32-125 & MICROFILM M-14883]

Algeria. *Exposé de la situation en Algérie*. Algiers: Impr. Juillet Saint-Lager, 1875-1955. [BnF: 8-LK19-167]

Algeria. *Exposé de la situation de l'Algérie par M. le Gouverneur général…* Algiers: Impr. Juillet Saint-Lager, 1875-1955. [BnF: NUMP-3212, 8-LK19-167 & 8-LK19-85]

Algeria, Gouvernement général civil. *Statistique générale de l'Algérie*. Algiers: Impr. de l'Association ouvrière, various dates between 1867 and 1925. [BnF: LK8-1043]

Algeria, Sous-direction des statistiques. *Annuaire statistique de l'Algérie*. Algiers: Impr. administrative Emile Pfister, 1926-1937, 1939-1960. [BnF: LK8-1043 (BIS)]

Comité monétaire de la zone franc. *La Zone Franc en … : Rapport publié par le Secrétariat du Comité monétaire de la zone franc*. Paris: Imprimerie nationale, 1953-1995. [BnF: NUMP-10930]

France, Direction de la Statistique Général, then INSEE. *Annuaire statistique*. Paris : Imprimerie nationale, 1901-1952. [BnF: NUMP-3859, 4-LC25-276]

France, Ministère de la France d'Outre-mer. *Tableau économique et social des Etats et territoires d'Outre-mer à la veille de la mise en place des nouvelles institutions*. Paris: Presses universitaires de France, 1959. [BnF: 8-LK9-1398]

France, Ministère des Colonies. *Rapport à la S.D.N. sur l'administration sous mandat des territoires du Cameroun*. Paris, 1921–1938. [BnF: NUMP-3553, FOL-LK19-563]

France, Ministère des Colonies. *Rapport annuel du Gouvernement français à l'Assemblée générale des Nations Unies sur l'administration du Cameroun placé sous la tutelle de la France*. Paris, 1947-1957. [BnF: NUMP-3553, FOL-LK19-563]

Madagascar, Institut national de la statistique. *Annuaire statistique de Madagascar 1938-1951*. Antananarivo: Impr. officielle, 1953. [BnF: LC32-167]

Marseille, Jacques.*Empire colonial et capitalisme français. Histoire d'un divorce.* Paris: Albin Michel, 1984 [2nd edition 2005].

Morocco, Protectorat de la République française au Maroc, Gouvernement chérifien, Direction générale de l'agriculture, du commerce et de la colonisation, Service du commerce et de l'industrie. *Annuaire de Statistique Générale du Maroc*. Casablanca: Imp. Réunies de la Vigie Marocaine et du Petit Marocain, 1925-1926, 1928-1939/1944. [BnF: NUMP-14878 & 4-O3J-343]

Tunisia, Direction des renseignements et des contrôles civils. *Statistique générale de la Tunisie*. Tunis, 1881-1939. [BnF: NUMP-7491 & 4-O31-371]

Tunisia, Institut national de la statistique. *Annuaire statistique de la Tunisie*. Tunis: Institut national de la statistique, various dates between 1940 and 1999. [BnF: 4-O3W-35, 8-SG PER U-160 & MICROFICHE M-25451]

The World Bank. *World Development Indicators*. https://data.worldbank.org/data-catalog/world-development-indicators , 2017

REFERENCES

Alfani, Guido and Federico Tadei. "Income Inequality in Colonial Africa: Building Social Tables for Pre-Independence Central African Republic, Ivory Coast, and Senegal." Working Paper 594, IGIER, Bocconi University, 2017.

Allen, Robert C. *The British Industrial Revolution in Global Perspective*. Cambridge: Cambridge University Press, 2009.

Alvaredo, Facundo, Denis Cogneau and Thomas Piketty. "Income Inequality under Colonial Rule. Evidence from French Algeria, Cameroon, Indochina and Tunisia, 1920-1960." CEPR Discussion Paper 14969, 2020.

Ayache, Albert. "Les grèves de 1936 au Maroc." *Annales. Economies, sociétés, civilisations* 12, no. 3 (1957) : 418-29.

Besley, Timothy, and Torsten Persson. "Why Do Developing Countries Tax So Little?" *Journal of Economic Perspectives* 28, no. 4 (2014): 99-120.

Domergue, Manuel, Jacob Tatsitsa and Thomas Deltombe. *Kamerun! Une guerre cachée aux origines de la Françafrique (1948-1971).* Paris: La Découverte, 2011.

Despuech, Jacques. *Le trafic des piastres*. Paris: Deux rives, 1953.

Fall, Babacar. *Le travail au Sénégal au XXe siècle*. Paris: Karthala, 2011.

Frankema, Ewout, and Marlous Van Waijenburg. "Structural Impediments to African Growth? New Evidence from Real Wages in British Africa, 1880–1965." *The Journal of Economic History* 72, no. 04 (December 2012): 895-926.

Johnson, D. Gale. "The functional Distribution of Income in the United States, 1850-1952." *The Review of Economics and Statistics* 36, no. 2 (1954): 175-82.

Labouret, Henri. "Le problème de la main-d'œuvre dans l'Ouest Africain français." *Politique étrangère* 1, no. 3 (1936): 37-47.

Lasserre, Guy. *Libreville et sa région, Etude de géographie humaine*. Paris: Armand Colin, 1958.

Mahieu, Alban. "Les effectifs de l'armée française en Algérie (1954-1962)." In *Militaires et guérilla dans la guerre d'Algérie*, edited by J.-C. Jauffret and M. Vaisse. Paris: Ed. Complexe, 2001.

Piketty, Thomas. *Capital et Idéologie*. Paris: Editions du Seuil, 2019.

Saaidia, Oissila. "L'invention du culte musulman dans l'Algérie coloniale du xixe siècle." *L'Année du Maghreb*, no. 14 (2016) : 115-32.

Thioub, Ibrahima. "Économie coloniale et rémunération de la force de travail : le salaire du manœuvre à Dakar de 1930 à 1954." *Revue française d'histoire d'outre-mer* 81, no. 305 (1994): 427-53.

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau, Yannick Dupraz and Sandrine Mesplé-Somps

Appendix 2 – Comparisons of fiscal extraction

In order to gauge the level of fiscal extraction in the French empire, we compare revenue to GDP ratios in French colonies to revenue to GDP ratios in other colonies, British ones in particular, and in independent countries.

Revenue to GDP data

We make use of the historical dataset constructed by Mauro et al. (2013), which provides us with central government revenue to GDP ratios for an unbalanced panel of 55 countries over 1800-2011, all independent countries except British India (1861-1947) and Hong-Kong (1961-1997). The IMF dataset draws in particular from the compilation of Mitchell (1998). Yet, as the authors also needed data on public expenditure and debt, they disregarded many countries-years for which central government revenue is reported in Mitchell, and for which estimates of nominal GDP at market prices can be found. We then complement Mauro et al. with the data points listed in Table A2.1. This allows us to add observations for some British colonies in Africa from the late 1930s to independence, British Malaya (1950-1963), and for two Japanese colonies, Korea and Taiwan before 1945.

All central government revenue figures are from Mitchell, with the exception of Ghana 1939 to 1950, 1955 and 1958 which are from Cogneau, Dupraz, Mesplé-Somps (2018).[1] Malawi (former Nyasaland), Zambia (former Northern Rhodesia) and Zimbabwe (former Southern Rhodesia) formed the Central African Federation (CAF) between 1953 and 1963, with part of its revenue, in particular trade taxes, being reported as a federal aggregate (reported in Mitchell 1955 to 1963; see also IBRD 1958). We treat the CAF as a single country between 1950 and 1969.

Before 1960, nominal GDP figures are mainly from Atkinson (2015a, b & c) for British colonies in Africa, and otherwise from Mitchell. Like we did for French colonies (see Online Data Appendix 1), we anchor our GDP estimates on the level of nominal GDP for the year

[1] Between 1939 and 1949, revenue data of Ghana from Mitchell include the gross revenue of state railways and a harbor, without netting out their outlays. This makes Mitchell figures exceed our estimates by 30 to 80%. Before 1939 and after 1949, the two series are much closer.

1960 reported in the World Development Indicators from the World Bank (2017), when available (all, except Mauritius and Tanzania): we import the World Bank figures for 1960-1969 and extrapolate them backward using the variation in nominal terms found in Atkinson or Mitchell.

Table A2.1 – Additional data points to complement Mauro et al. (2013)

Country	Years	Sources for nominal GDP estimates before 1960
Ghana	1939, 1943, 1945-1969	Atkinson (2015a)
Iraq	1950-1969	Mitchell
Kenya	1936, 1943-45, 1950-69	Atkinson (2015c)
Korea	1911-1938	Mitchell
Malawi	1938, 1948-69	Atkinson (2015b)
Malaysia	1950-1969	Mitchell
Mauritius	1950-1969	Mitchell
Myanmar	1950-1969	Mitchell
Nigeria	1950-1969	Mitchell & Atkinson (2015a)
Sri Lanka	1950-1969	Mitchell
Sudan	1950-1969	Mitchell
Taiwan	1903-1938, 1951-1969	Mitchell
Tanzania	1948-1969	Atkinson (2015c) & Mitchell
Uganda	1948-1969	Atkinson (2015c)
Zambia	1929-1969	Atkinson (2015b) & Mitchell
Zimbabwe	1919-1939, 1944-1969	Atkinson (2015b) & Mitchell

Finally, as our comparators dataset reports the revenue of the central government, we discard the revenue of lower administrative layers from the French colonies estimates. For sub-Saharan Africa, we include the estimates of *corvée* revenue, using van Waijenburg (2018), as described in the main text (page 11).[2]

[2] We use van Waijenburg estimates of *corvée* revenue relative to total budgetary revenue (2018, p. 65) and Frankema and van Waijenburg (2014, p.383) estimates total revenue of to get at the level of *corvée* revenue, that we translate from £ 1911 to current franc and express as a share of our own estimates of net public revenue. From van Waijenburg table, we use the year 1925 for the 1920s and the year 1934 for the 1930s. In 1925, revenue is reevaluated upward by 24% in FWA, 18% in FCA, 63% in Cameroon, 17% in Togo and 10% in Madagascar. In 1934, the same figures are respectively 14, 16, 20, 44 and 2%.

Of course, we acknowledge the uncertainty affecting these estimates. Apart from French colonies, the only revenue data that we could check in original archives are the ones of Ghana and Nigeria. Even if we only compare central government revenue, the level of decentralization can vary across countries and years.

Wagner's law

Because state size tends to increase with GDP, an empirical regularity often called "Wagner's law" (Wagner 1893; Lindert 2004), we restrict the comparison to countries close enough in terms of GDP per capita, i.e. lying in the 0 to 2,000 US dollars range (in 1990 dollars PPP). We compare actual revenue to GDP ratios to a "Wagner's law" prediction from GDP per capita. As we want to compare states of the French empire with an independent international standard, we exclude all colonies from the sample that serves to generate this prediction. It means we not only exclude French colonies, but also British and Japanese colonies, using only independent countries (including former colonies after their independence). In any case, the estimated Wagner's law is not much different when we include non-French colonies in the estimation. To estimate a Wagner's law, we adopt the following procedure.

First, we match revenue to GDP data with real GDP per capita estimates. For all countries except French colonies, real GDP per capita after 1950 is from Angus Maddison (Maddison project database version 2013; Bolt and van Zanden 2014). For the British colonies in Africa, Broadberry and Gardner (2019) extend Maddison's estimates before 1950. For the French colonies, in order to translate our estimates of GDP per capita (in 1937 francs PPP) into the Maddison's metric (in 1990 dollars PPP) we compute a conversion factor as the ratio of Maddison's estimate to ours for France in 1937. We apply this conversion factor to our GDP per capita estimates for the French colonies.

Second, we compute simple decadal averages.

Third, on these averages and for the sub-sample of independent countries, we regress revenue to GDP ratios on a quartic of GDP per capita and decadal dummies, for the nine decades between 1880 and 1969.[3] This regression provides us with parallel "Wagner's law" predictions of revenue to GDP ratios, one for each decade. Decadal shifts are meant to reflect

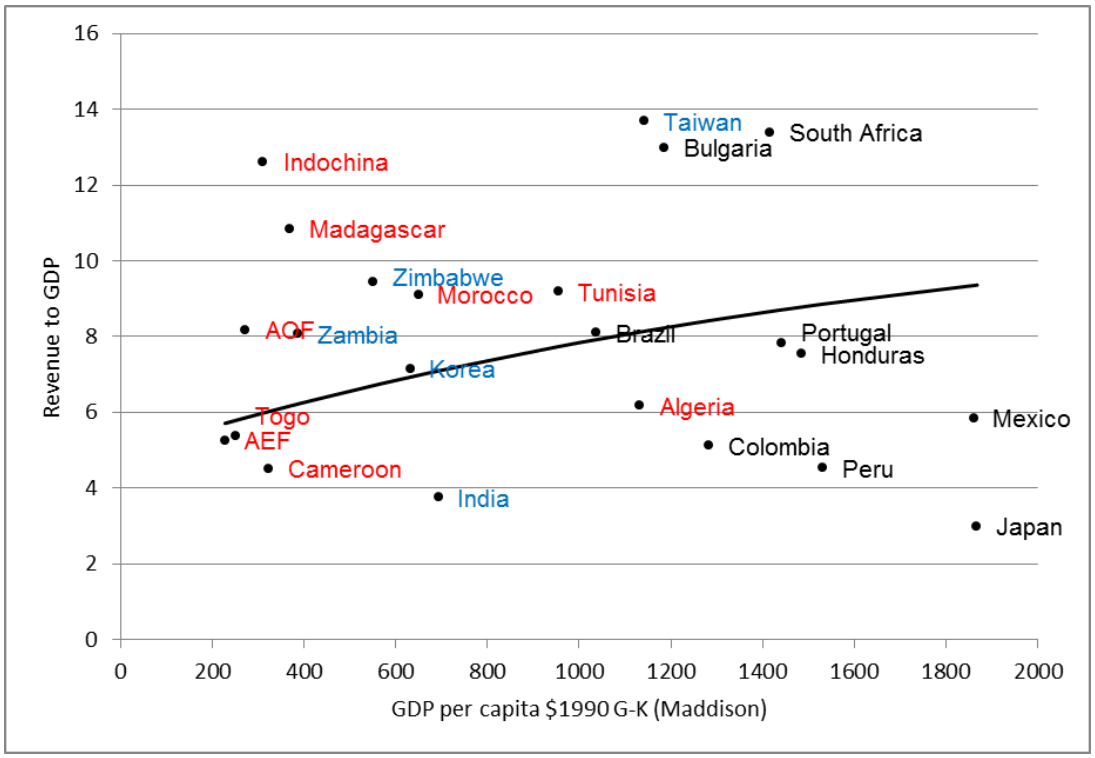
[3] As we work with decadal data, we record a country-decade as independent if there is a minority of years under colonial rule in the decade. Asian colonies are considered as decolonized in the 1950s, except Hong-Kong and Malaysia; African colonies and Malaysia in the 1960s; Hong-Kong only in the 2000s.

technological progress in tax collection, thanks in particular to the improvement of transportation and communication technologies.

Results

Figure A2.1 plots average revenue to GDP ratios against GDP per capita in the decade 1920-29. All French colonies lie near or above the "Wagner prediction", except Algeria, where lower administrative layers represented a substantial share of revenue, and Cameroon, where the French mandate had just started. They compare very well with richer independent countries in Latin America.

Figure A2.1 – Revenue to GDP ratios and GDP per capita in the 1920s



Notes: Revenue is central government revenue, and includes an estimate of *corvée* revenue for AOF, AEF, Cameroon, Madagascar and Togo. French colonies are in red, other colonies in blue, independent countries in black. ***Sources****:* Authors' data and Mauro et al. (2013), see text.

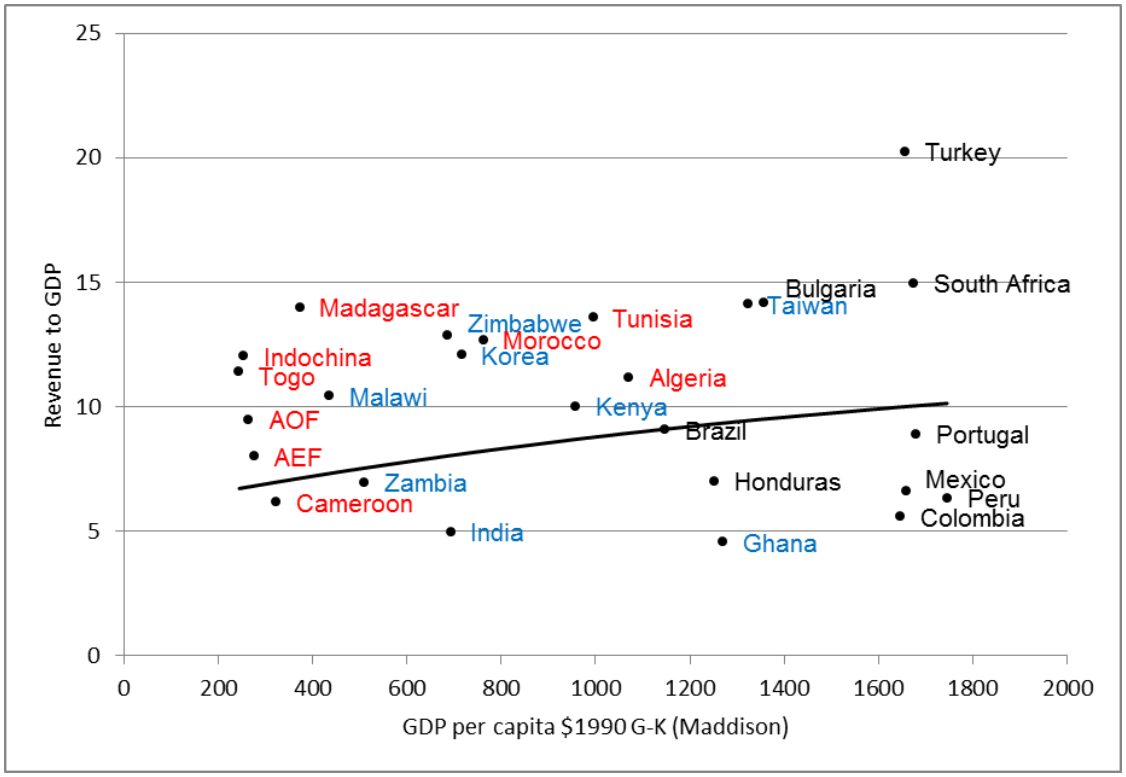
Below the 1000 dollars threshold, only poor colonies are found. Among the British ones, the Northern (Zambia) and Southern (Zimbabwe) Rhodesias lie well above the predicted international average, while India lies significantly below.[4] Japanese Korea (annexed in 1910) is close to the prediction, but Japanese Taiwan (annexed earlier in 1895), having almost twice higher income capita, exhibits outstanding fiscal extraction. We conclude that there was no

[4] For British India, Roy (2019, p. 79) gives a close enough figure of 5% of GDP. For British Burma in 1926-27, Booth (2007) gives a figure of 11.3% of NDP, close to French Indochina, although the ratio to NDP is overestimating the ratio to GDP.

French exceptionalism in fiscal extraction, and rather that colonies outperformed independent countries; one significant exception was British India.

How would errors in GDP estimates affect our results? Because we find that colonial states of the French empire extracted a relatively high share of GDP, we are mainly worried about *underestimating* GDP in the colonies. As a robustness exercise, we use the alternative GDP per capita figures computed using wage and urbanization data to estimate GDP per capita. In 1925, these alternative GDP per capita estimates are lower than our main estimates, which would reinforce our conclusion of high fiscal extraction (see Online Data Appendix, Table 6, p. 35). We conclude that fiscal extraction of French colonial states was indeed above the independent countries' average in the 1920s.

Figure A2.2 – Revenue to GDP ratios and GDP per capita in the 1930s

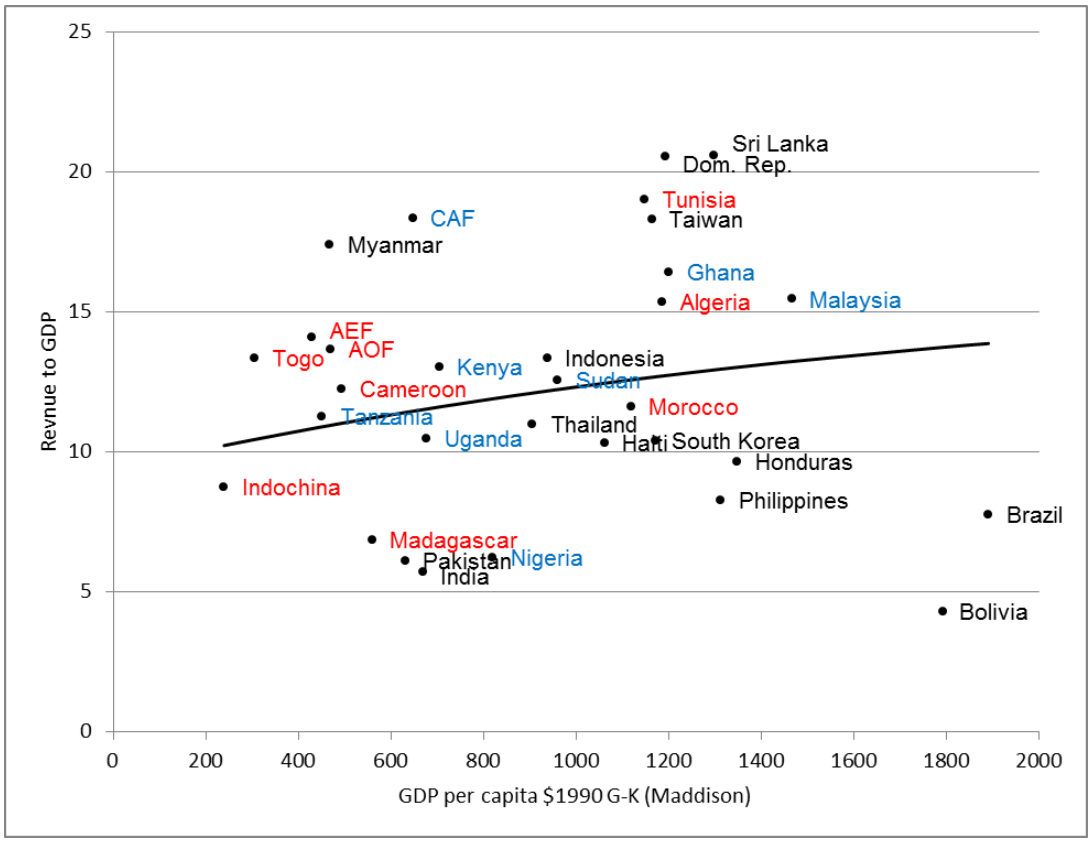


Notes: Revenue is central government revenue, and includes an estimate of *corvée* revenue for AOF, AEF, Cameroon, Madagascar and Togo. French colonies are in red, other colonies in blue, independent countries in black. ***Sources***: Authors' data and Mauro et al. (2013), see text.

Figure A2.2 presents the same international comparisons as Figure A2.1, here for the decade 1930-1939. Again, with the only exception of Cameroon this time, all French colonies lie above the "Wagner prediction". Like for the 1920s, using alternative estimates of GDP (for the year 1937, see Online Data Appendix, Table 7, p. 36) would not change this conclusion. Among other colonies, five out of eight also exhibit high fiscal extraction; British India and

British Gold Coast (Ghana) appear as significant outliers, characterized by low fiscal performance (revenue to GDP ratios around 5%).

Figure A2.3 – Revenue to GDP ratios and GDP per capita in the 1950s



Notes: Revenue is central government revenue. French colonies are in red, other colonies in blue, independent countries in black. ***Sources****:* Authors' data and Mauro et al. (2013), see text.

Finally, figure A2.3 presents the comparisons for the 1950s. Madagascar lies significantly below the "Wagner prediction," yet revenue collection had been substantially decentralized at the province level since 1946, and taking into account provincial revenue would place it above. Indochina in independence war unsurprisingly exhibits low fiscal extraction. Morocco is also slightly below the international average, yet our alternative computation of GDP suggests that our main GDP estimate might be overstated (online Appendix 1, Table 6, p. 35). All French colonies still lie much above independent India or Pakistan, and most of them do better than Thailand, South Korea, Philippines, Honduras, or Bolivia. British colonies in the 1950s also exhibit high revenue to GDP ratios. Wealthy Ghana (Gold Coast) and Malaysia (British Malaya) stand close to Algeria and below Tunisia; Sudan is at par with Morocco, and the poorer East African colonies (Kenya, Tanzania, Uganda) compare with Cameroon, Togo, French Central Africa and French West Africa. The Central African Federation (or Federation of Rhodesia and Nyasaland, composed of Malawi, Zambia

and Zimbabwe) exhibits outstanding fiscal revenue, thanks to the boom of copper and gold mining. Only Nigeria lies much below the international average, with a minimal revenue to GDP ratio estimated at 6.2% of GDP, at par with newly independent India and Pakistan.[5,6] We again conclude that fiscal extraction in colonial states was in general above the independent countries' average in the 1950s, with only a few exceptions among French or British colonies.

We are more confident in our GDP per capita estimates for the 1950s because they are based on contemporary national accounting exercises rather than historical estimations, and because they are anchored on GDP figures in the 1960s. Once again, we nonetheless checked the robustness of our results by using alternative estimates of GDP per capita based on wage and urbanization data (see online Appendix 1, Table 6, p. 35). The alternative estimates for 1955 point to a potential underestimation of GDP per capita in the cases of Algeria, Tunisia and French West Africa, but not large enough to modify our conclusion of comparatively high fiscal extraction, for it is also in these colonies that fiscal revenue to GDP ratios are the highest.

We conclude that the colonial states, and in particular the French ones, were not at all underperforming in terms of fiscal extraction, compared to independent countries. Even if they were relatively poorer, it is not the lack of fiscal capacity that limited their possibilities to produce public goods and promote economic development, rather the cost and the biasedness of their action.

[5] Starting in 1952 in Nigeria, the revenue collected by administrative regions (Northern, Western, Eastern, Southern and Cameroons) is no longer included in central government revenue. However, data for 1955 show that the total revenue collected by regions only represents 10% of central government revenue.

[6] In contrast with India and Pakistan, independent Burma (Myanmar) and Sri Lanka rank high in terms of fiscal extraction, with respectively 17.4 and 20.6 % of GDP.

References:

Atkinson, Anthony B., 2015a. The Distribution of Top Incomes in Former British West Africa. WID.world Working Paper 2015/3.

_____, 2015b. Top Incomes in Central Africa: Historical Evidence. WID.world WP 2015/4.

_____, 2015c. Top Incomes in East Africa Before and After Independence. WID.world WP 2015/2.

Broadberry, Stephen and Leigh Gardner, 2019. "Economic growth in sub-Saharan Africa, 1885-2008," LSE Research Online Documents on Economics 100473, London School of Economics and Political Science, LSE Library.

Bolt, Jutta and Jan Luiten van Zanden. The Maddison Project: collaborative research on historical national accounts. *The Economic History Review*, 67, n°3 (2014): 627–51.

Booth, Anne. *Colonial Legacies: Economic and Social Development in East and Southeast Asia*, University of Hawaii Press, 2007.

Cogneau, Denis, Yannick Dupraz and Sandrine Mesplé-Somps, 2018. "African states and development in historical perspective: Colonial public finances in British and French West Africa", PSE WP n°2018-29.

Frankema, Ewout and Marlous van Waijenburg. "Metropolitan Blueprints of Colonial Taxation? Lessons from Fiscal Capacity Building in British and French Africa, 1880-1940." *Journal of African History* 55, n°3 (2014): 371-400.

IBRD, 1958. Economic position and prospects of the Federation of Rhodesia and Nyasaland, International Bank for Reconstruction and Development Department of Operations, Europe, Africa and Australasia.
http://documents1.worldbank.org/curated/en/489631468167979775/pdf/multi-page.pdf

Mauro, Paolo, Rafael Romeu, Ariel Binder and Asad Zaman. "A Modern History of Fiscal Prudence and Profligacy," IMF Working Paper No. 13/5 (2013), International Monetary Fund, Washington, DC.

Mitchell, Brian R. *International historical statistics.* London: Macmillan; New York, NY: Stockton Press, 1998.

Roy, Tirthankar. "Why Was British India a Limited State?" in Frankema, Ewout and Anne Booth (eds). *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850-1960*, Cambridge Studies in Economic History, 2019.

van Waijenburg, Marlous. "Financing the African Colonial State: The Revenue Imperative and Forced Labor", *Journal of Economic History*, 78, n°1 (2018):40-80.

The World Bank. *World Development Indicators*. https://data.worldbank.org/data-catalog/world-development-indicators , 2017.

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau, Yannick Dupraz and Sandrine Mesplé-Somps

Appendix 3 – *Capitation*: compliance and collection cost

In this appendix, we use district-level data on population, *capitation* rate, and *capitation* revenue to compute rates of compliance to the *capitation* (the ratio of revenue to the theoretical tax bill) in French West Africa (AOF). We also use district-level data on wages paid to chiefs and the fraction of tax revenue kept by chiefs as a reward to compute the collection cost of *capitation* in AOF.

Compliance

To compute the theoretical tax bill, we need precise information on the tax rate (the lump sum amount due by each individual) and the tax base (the population eligible to pay the *capitation*). Both varied across space and over time.

Tax rates: Rates in francs were fixed at the district-level ("*cercle*"). They were higher in wealthier or more urbanized districts. Women, men and children sometimes paid different rates, and rates could even vary across subdivisions of the same district or across ethnic groups. We compute district-level rates for AOF from 1910 to 1956 using data collected by Huillery (2009).[1]

Tax base: In AOF, the *capitation* initially applied to all individuals older than eight or ten, with some exceptions.[2] In 1937, the age threshold was moved to 14 almost everywhere.[3] Military conscripts, veterans, and policemen (and their families) were exempt from the tax, as well as schoolchildren and disabled persons. Nomadic people, who represented a large share of the population in colonies like Mauritania and Niger, paid a tax on cattle (*zekkat*), and were therefore exempt from the *capitation* or paid lower rates. To obtain the eligible population in each district at each date, we use our colony-level estimates of population and we distribute

[1] When rates varied within districts, we produced weighted averages of these rates to get at district-level rates, using the number of taxpayers in each subdivision as weights.

[2] In Senegal before 1911, and in Niger and Guinea before 1918, all individuals were eligible, even small children. In Côte d'Ivoire and Senegal after 1926, the eligibility age threshold was increased to ten.

[3] In Dahomey, the eligibility age threshold was increased to 16 as early as 1926.

population across districts using a 1925 district-level population enumeration.[4] This means we might underestimate the population of more urbanized districts that attracted migrants after 1925. This would lead to a slight underestimation of the theoretical tax bill. We also must make assumptions on the share of population above the age eligibility threshold, which decreased over time because of demographic growth. These assumptions come from the age distribution of the autochthonous population in Tunisia and Algeria in 1925 and from Tabutin and Schoumaker (2004) for 1950 (see online Appendix 1).[5] For instance we assume that the population older than 8 represented 83% of total population in 1925, 80% in 1935, 77% in 1945 and 73% in 1955.

Theoretical tax bill, actual tax revenue and compliance rate: For each district in each year, multiplying tax rates by the eligible population provides an estimate of the theoretical tax bill. The district-level actual *capitation* revenue from 1920 to 1956 comes from Huillery (2009).[6,7] We define compliance as the ratio of the actual revenue to the theoretical tax bill.

Table A3.1 – Compliance ratio (%) for the *capitation* tax in French West Africa

	1910-19	1920-29	1930-39	1940-49	1950-56
Dahomey	66	76	74	79	
Côte d'Ivoire	85	104	106	96	80
Guinea	111	118	107	96	92
Senegal	81	76	82	83	88
French Sudan	91	90	88	90	88
Upper Volta	105	108	95	84	89
All non-nomadic colonies	**91**	**94**	**93**	**88**	**88**
Mauritania	17	17	8	17	6
Niger	50		77		

Notes: Compliance ratio is the ratio of the revenue raised to the estimate of the tax bill. In some years, some districts have missing data for the tax rate or the tax revenue. However, in each year, districts with non-missing data make at least 70% of the total population of each colony, and most often more than 95%. ***Sources:*** see text and online Appendix 1.

Table A3.1 displays *capitation* compliance ratios by colony for five periods between 1910 and 1956. They are very high. If we exclude Niger and Mauritania and consider only

[4] These population estimates include Europeans, who also paid *capitation*, but represented a very small minority of taxpayers. In some cases, the data on amounts collected do not distinguish the two kinds of taxpayers.

[5] We make assumptions for the years 1925, 1935, 1945 and 1955 and let the shares vary linearly between these dates.

[6] In some cases, the district-level amount is the forecast rather than the actual amount collected. It is not really a concern: from one year to the other, forecasts were closely met, as they were simply updates of the revenue collected in the previous year.

[7] The sum of the district-level amounts equals to the colony-level revenue collected in our data.

non-nomadic colonies, the average lies between 88% and 94%. Colonies like Côte d'Ivoire, Guinea and Upper Volta display compliance ratios above 100% in the early decades. This suggests that their population could be underestimated.[8] Population data for 1955 is quite reliable, because it is anchored on the population censuses of the 1960s. Estimated compliance is still high in the 1950s, but never above 100%. Even assuming higher population figures in the 1920s, we obtain high compliance ratios: if we halve demographic growth between 1925 and 1955, we obtain a compliance ratio of 74% in the 1920s. If we make the extreme assumption that population in 1925 was as high as in 1955, we still obtain a relatively high compliance ratio of 58% on average.[9]

Collection Cost

The capitation was collected by local chiefs who received a wage payment and a share of the amount collected (called "*remise*"). Does it mean that the collection cost was high or low? To answer this question, we use district-level data from Huillery (2009) on wages and *remises* and compare them to the *capitation* revenue. As seen in Table A3.2, wages paid to chiefs represented 2 to 3% of the capitation revenue, while rewards were around 4%, for a total between 6 and 7%. We conclude that the cost of capitation collection was limited.

Table A3.2 – Collection costs for the capitation in French West Africa

Ratio to revenue: (%)	1910-19	1920-29	1930-39	*1940-49*	*1950-56*
Wages paid to chiefs	3.3	2.0	2.4	*2.2*	*3.1*
Tax kept by chiefs as reward	4.1	4.3	3.7	*3.6*	*4.0*
Total	7.4	6.3	6.1	*5.8*	*7.1*

Notes: Mauritania and Niger excluded. Only colony-years with non-missing values for both wages and rewards are considered. The composition of the sample is different across decades: Dahomey and Côte d'Ivoire have no data for the 1940s and 1950s; Upper Volta has not data for the 1940s; Senegal has no data for the 1950s. ***Sources:*** see text and online Appendix 1.

[8] If we use instead of our estimates the district-level enumeration of 1925, the compliance ratios for 1920-29 are even higher because our population estimates are slightly higher than the enumeration (except in Sudan and Guinea).

[9] In our data, AOF population increased by 62% between 1925 and 1955.

References

Huillery, Elise. “History Matters: The Long-Term Impact of Colonial Public Investments in French West Africa”, *American Economic Journal - Applied Economics*, 1(2): 176-215, 2009.

Tabutin, Dominique and Bruno Schoumaker. “The Demography of Sub-Saharan Africa from the 1950s to the 2000s [A Survey of Changes and a Statistical Assessment]”, *Population*, 59, no. 3-4 (2004): 457-555.

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau, Yannick Dupraz and Sandrine Mesplé-Somps

Appendix 4 – Income distribution in French colonies and estimates of the fiscal burden on Europeans and autochthons

We attempt to estimate the distribution of the fiscal burden in the French empire, not only between Europeans and autochthons, but also, within autochthons, between the poor, mostly subsistence farmers, and the non-poor, those who took part in the formal sector and were therefore more likely to contribute to modern taxation like the income tax or taxes on sales revenue. To obtain the fiscal contribution of each group (Europeans, the autochthonous non-poor, and the autochthonous poor), we first estimate their income share in total income. We then make assumptions on the incidence of the different tax instruments on each group. The exercise remains speculative, as available data are patchy and many assumptions are needed. Estimates for 1955 are more reliable than for 1925.

Income shares of Europeans and autochthons in 1955

We first estimate the share of European settlers in national income. Data availability makes this estimation easier for 1955 than for 1925.

In North Africa, the social tables we use to estimate income shares include Jews in the group of European settlers (in Algeria, Jews were granted French citizenship in 1870). For comparability, we also include the Chinese and Indian minorities in Madagascar in the group of European settlers. In Indochina, the Chinese population, far more numerous than the European population, is treated as autochthonous.

For the year 1955, Samir Amin gives estimates of the income shares of European settlers (and Jews) in Algeria (47%), Morocco (37%), and Tunisia (43%), drawing from household consumption surveys, studies on agricultural incomes and estimates of savings (Amin 1966, pp.114-117). Using these figures and our estimates of GDP per capita and population shares, we estimate the income per capita of Europeans in Algeria, Morocco and Tunisia at respectively 11,850, 10,300 and 12,000 francs (all figures in 1937 PPP terms). This is to be compared with a GDP per capita of 13,900 in Metropolitan France. It seems plausible that average incomes in Metropolitan France and of Europeans/Jews in North African

colonies were close, as the occupational structure of Europeans/Jews in North Africa was similar to the French occupational structure (Amin 1966, pp. 156-158, 167-168, 177).

In the cases of Tunisia and Algeria, we can check the consistency of these figures with income tax tabulations collected by Alvaredo, Cogneau and Piketty (2020). In 1955 Tunisia, they give the average income of those eligible to pay the income tax, who represented the 39% richest of the group of Europeans (excluding Jews). To recover the income per capita of the whole group, including those who did not pay the income tax, we assume that the income distribution of Europeans in Tunisia was the same as in Metropolitan France (taken from the WID.world database[1]).We find an average income per capita of 10,700, not far from the above estimate of 12,000 using Amin's share. In 1955 Algeria, income tax tabulations do not distinguish Europeans, or non-Muslims, from Muslims. Yet, we can assume that almost all of those rich enough to pay the income tax were Europeans or Jews — in 1955 Tunisia, non-Europeans represented just 26% of those eligible to pay the income tax, and it is not impossible that a majority of them were Jews. Then, assuming again that income distribution among Europeans/Jews was the same as in Metropolitan France, we obtain an income per capita of 12,300, very close to our 11,850 figure.

For other colonies, we start from Amin's estimates of income by group in 1959 Senegal and 1950 Côte d'Ivoire (Amin 1971, pp. 48, 62, 96-98); the income of Europeans is estimated as the total of wages, benefits of medium and small-size firms and housing rents in the foreign sector ("*secteur étranger*"). Europeans earned on average 25,250 francs in Senegal (20% of total income for 1.5% of population) and 49,800 francs in Côte d'Ivoire (19% of total income for 0.5% of population). European settlers in Senegal represented the majority of Europeans in AOF (53%), and they were on average less skilled than in the rest of the federation. Côte d'Ivoire was also the second wealthiest colony in AOF after Senegal. Europeans living in other colonies of AOF were likely more similar to those in Côte d'Ivoire than to those in Senegal; yet they also likely earned less, so that we estimate their average income per capita by applying the same ratio (41) to average GDP per capita as in Côte d'Ivoire. We obtain, for the whole AOF, an average European income of 30,228 francs and a European income share of 12% (for less than 0.4% of population). In other African colonies we assume that the average income per capita of Europeans was the same as in AOF in nominal terms and only adjust for differences in price levels. We estimate European income shares at respectively 4, 14 and 9% in Togo, AEF and Cameroon, which gives for the whole of West and Central

[1] https://wid.world

Africa an income share of 12%, and an average European income of 29,118 francs, twice the GDP per capita of Metropolitan France (Table A4.1). In Madagascar where Europeans/Asians represented a much larger share of the population (1.5%, with Asians representing less than a third), we estimate that they earned 27% of total income, with an average income of 19,434 francs.

Income shares of Europeans and autochthons in 1925

In 1925 Indochina, income tax tabulations from Alvaredo, Cogneau and Piketty (2020) cover almost all Europeans and provide us with a direct estimate of their income share: 9%, for 0.13% of the population, corresponding to a very high income per capita of 44,500 francs (all figures in 1937 PPP terms). Note that a similar calculation for 1945 indicates a decrease in income per capita to 16,000 francs, as the economy was collapsing during the war, and a lower income share of 7%.

In the other colonies, we lack data on the distribution of income in 1925. To obtain European income shares, we assume that the income per capita of Europeans grew at the same rate as local GDP per capita between 1925 and 1955; in other terms, we assume that the income share of Europeans moved in line with their population share. We tried more sophisticated calculations isolating the public sector, and making use of our public wage and employment data. However, everywhere civil servants never represented more than 30% of total European employment and most often no more than 15%[2]; furthermore, the growth in real public wages was not entirely at odds with that of GDP per capita. As we have no additional information on private incomes to bring in, we prefer to stick with the simplest assumption. We obtain income shares of respectively 66, 17 and 49% for Europeans in 1925 Algeria, Morocco and Tunisia. Income tax tabulations for 1932 Algeria provide us with a check; assuming that all eligible taxpayers were Europeans/Jews (the top 19% richest) and

[2] In North Africa, the share of Europeans in public employment is estimated at 60% in 1925 and in 1955. This figure is consistent with Amin's for 1955 (pp.153, 161 & 174: 67% in Algeria, 60% in Tunisia & Morocco), and with a 62% figure from the 1936 population census of Algeria. Yet only a small minority of Europeans worked in the public sector, the maximum share being 12% in 1955 Morocco. For 1925 Madagascar, we know the share of Europeans in total public employment: 12% (Table A5.1, Online Appendix 5), and even in each administrative subsector. For 1955, we estimate the number of French civil servants by applying the 1925 shares (the 1946 shares are very similar) to the 195 distribution of employment by subsector; we find that Europeans made 12.9% of total employment (12% in 1946, Table A5.1, Online Appendix 5). Yet, as the population share of Europeans nearly doubled, the weight of the public sector in European employment went down from 10 in 1925 to 5% in 1955. For the colonies of West and Central Africa, we apply the same procedure and estimate that Europeans represented 9% of public employment in 1925, and 12% in 1955. The share of the public sector in European employment is then estimated at 28% in 1925 WCA, and again goes down to 18% in 1955 with migration inflows to the private sector; our estimate for 1955 Cameroon fits with the share of civil servant households according to a European census in 1938.

that the income distribution was the same as in 1925 France, we obtain the same income share (65%) as with our estimation procedure. In contrast with 1955, European income in Algeria lay above French GDP per capita (10,200 vs. 8,800), close to it in Tunisia (9,700) and below in Morocco (6,700). In 1925 Madagascar, we estimate a European income share of 14.2% for 0.81% of the population, corresponding to an average income per capita of 13,615 francs (Table A4.1). Last, for 1925 West and Central Africa, we estimate an income share of 2.7% for 0.08% of the population, and an average income of 17,705. Hence, according to these very tentative estimates, French settlers in Sub-Saharan Africa were richer than the French average, by 40 to 80%, but it was only in Indochina that settlers were extremely rich, earning five times the French GDP per capita.

Table A4.1 — Income distribution estimates for the years 1925 and 1955

	N. Afr.	Indochina	Madag.	WCA
Year 1925				
Europeans: Population share (%)	9.19	0.13	0.81	0.08
Income share (%)	49.3	8.7	14.2	2.7
Average income per capita (FF 1937 PPP)	9,629	43,837	13,615	17,705
Non-Europeans Average income (FF 1937 PPP)	1,004	578	677	531
Year 1955		***Year 1945***		
Europeans: Population share (%)	8.37	*0.16*	1.54	0.36
Income share (%)	41.1	*7.4*	26.8	11.8
Average income per capita (FF 1937 PPP)	11,709	*15,855*	19,434	29,118
Non-Europeans Average income (FF 1937 PPP)	1,531	*327*	830	801

Notes: N. Afr.: North Africa; WCA: West and Central Africa. ***Sources*:** Social tables from Samir Amin (1966 and 1971), income tax tabulation data from Alvaredo, Cogneau and Piketty (2020). *Notes*: Europeans include Jews in North Africa, and Indians and Chinese in Madagascar.

Income and population shares of the autochthonous poor and non-poor

In a second step, we endeavor to break down the autochthonous population in two social classes: the "non-poor" and the "poor". The autochthonous non-poor will be assumed to pay what we call modern taxes, whereas the poor, mostly subsistence farmers, will be assumed to pay none. As data are even scarcer for this second step, we restrict ourselves to Algeria, Tunisia, and AOF.

For 1955 North Africa, Samir Amin provides population and income shares for rural and urban Muslims in each colony (Amin 1966, pp. 114-117).[3] He also provides a three-class

[3] We checked that Amin's figures are consistent with data from the population census of Algeria in 1954 and of Tunisia in 1956: Muslims in municipalities with more than 20,000 inhabitants make respectively 16.5% and 15.2% of total population. In Tunisia, Muslims in the 10,000-20,000 range make an additional 6.4%.

population and income breakdown of the rural and urban societies (pp. 130, 136, 141, 155-156 and 166). Our "non-poor" group is composed of the two richest classes of the urban Muslim population and the richest class of the rural Muslim population (wealthy farmers). Our "poor" group is composed of the two poorest classes of the Muslim rural population and the poorest class of the Muslim urban population (servants and unskilled laborers). We obtain that the autochthonous non-poor make 16% of the population and earn 24% of income in Algeria. They make 20% of the population and earn 30% of income in Tunisia. Their average income is about a third of the average European income and four times as high as the average income of the poor (Table A4.2).

Amin also provides estimates of the share of urban Africans in population and income for 1959 Senegal and 1950 Côte d'Ivoire. In absence of a more detailed breakdown, we use the urban share to estimate the share of the non-poor. We treat Côte d'Ivoire as representative of other AOF colonies and take a population weighted average of the shares. From this we estimate that the African non-poor in AOF made around 11% of total population and 36% of total income in 1955. It means they earned about the same income as the Muslim non-poor in North Africa, ten times less than the tiny minority of European settlers, and five times more than the African poor (Table A4.2).

Building estimates for 1925 is quite a heroic task. In North Africa, to estimate the population share of the non-poor, we estimate the urbanization rate of the Muslim population and assume the same share of rural non-poor and of urban poor as in 1955.[4] In AOF, we use the urbanization rate computed from Africapolis to estimate the share of the African non-poor (see also online Appendix 1 on urban population figures).[5]

Finally, to break down the estimated income share of the autochthonous population into the shares of the non-poor and the poor, we make the simple assumption that the income per capita of the non-poor grew at the same rate as the income per capita of all autochthons; in other terms, we assume that the income share of the non-poor moved in line with their population share among autochthons. To check that we obtain plausible estimates of average income, we compare the figures of Table A4.2 with the price of a yearly ration of 1,600 kcal of wheat (584 francs in Algeria, 575 in Tunisia, 474 in AOF). In Algeria and Tunisia the

[4] The 1926 Algerian population census indicates that only 11% of the Muslim population live in the 46 biggest cities. The 1921 Tunisian population census reports the number of Muslims for the five biggest cities only. We assume the ratio of Muslims to non-Muslims in the 24 smallest cities to be the same as in the four biggest cities outside of Tunis. We obtain that 10% of the Muslim population lives in the 29 largest cities.

[5] https://africapolis.org.We thank Eric Denis for sharing unpublished data on AOF before 1950. We interpolate Africapolis estimates between 1920 and 1930. We obtain an urbanization rate of 1.7%, vs. 1.3% if we take Eggiman's figures (Eggiman 1999).

average income of the poor lies 20% above the price of a yearly ration. In AOF, it lies 7% below. According to the estimates presented in Table A4.2, income inequality increased sharply in AOF between 1925 and 1955, in parallel with the urbanization boom. In the two North-African colonies, the evolution is more ambiguous: while the income gap between Europeans and autochthons narrowed, it seems that inequality among autochthons increased.

Table A4.2 — Income distribution estimates for the years 1925 and 1955

	Algeria	Tunisia	AOF
Year 1925			
Europeans: Population share (%)	14.41	9.49	0.09
Income share (%)	65.8	49.4	3.2
Average income per capita (FF 1937 PPP)	10,214	9,672	18,503
Autochthonous non-poor: Pop. (%)	*10.9*	*17.4*	*1.7*
Income share (%)	*10.8*	*23.3*	*6.0*
Average income per capita (FF 1937 PPP)	*2,208*	*2,485*	*1,984*
Autochthonous poor: Population (%)	*74.7*	*73.1*	*98.3*
Income share (%)	*23.4*	*27.3*	*90.8*
Average income per capita (FF 1937 PPP)	*700*	*694*	*503*
Year 1955			
Europeans: Population share (%)	10.24	8.23	0.36
Income share (%)	46.8	42.9	12.3
Average income per capita (FF 1937 PPP)	11,854	11,487	31,107
Autochthonous non-poor: Pop. (%)	16.3	20.2	10.9
Income share (%)	24.0	30.1	36.0
Average income per capita (FF 1937 PPP)	3,806	3,287	3,029
Autochthonous poor: Population (%)	73.4	71.6	88.8
Income share (%)	29.2	27.1	51.7
Average income per capita (FF 1937 PPP)	1,033	835	533

***Sources*:** Social tables from Samir Amin (1966,1971), income tax tabulation data from Alvaredo, Cogneau and Piketty (2020), and urbanization data from various sources (see text). ***Notes*:** Europeans include Jews in North Africa.

Tax rates

In the settlement colonies of Algeria and Tunisia, the European and Jewish population paid a disproportionate share of the direct taxes; for example in 1955 Tunisia, Europeans represented 74% of income tax payers (78% of taxable income), and the remaining 26% were perhaps overwhelmingly Jews (Alvaredo, Cogneau and Piketty 2020).[6] They also paid quite a lot of the taxes on imported consumer goods, alcoholic drinks in particular. Generally speaking, most of the modernized taxation apparatus applied to a formal sector built around

[6] See also Nicolaï (1962, pp. 447-450).

the settlers' enclave, so that Europeans also paid a large share of turnover taxes and of registration fees.[7] Yet their income share was also very high, always above 40%, and even as high as 66% in 1925 Algeria, according to our estimates (Tables A4.1 and A4.2 above).

In the rest of the colonial empire, where settlers were few, autochthons had to pay the bulk of the tax bill. Though European settlers were richer than their counterparts in North Africa, and much richer than autochthons (Table A4.1), they were not enough to generate large revenue.[8] Before World War II, direct taxation of income was limited.[9] In AOF, the Metropolitan general income tax had been gradually introduced after 1930, and schedular taxes on wages, profits and investment income appeared in 1942 (Doublet 1952, pp.109-112). The "*prestations*" system of forced labor taxation was abolished in 1946. Head tax rates were already different between districts, depending on urbanization and affluence; at the beginning of the 1950s they started to be fixed according to individual occupation or income, hence becoming mildly progressive (Doublet 1952).[10] Yet, the rates were also significantly raised: between 1925 and 1955 the revenue per capita from *capitation* more than doubled in AOF (from 9 to 21 francs in 1937 PPP).

In North Africa like in Sub-Saharan Africa, between 1925 and 1955 the weight of modern taxes in total revenue increased, and the weight of the most archaic tax, *capitation*, decreased (see Table 3 in the main text). Modern taxes being the most progressive and *capitation* the most regressive of all taxes, one could expect that tax systems turned more progressive overall. Yet, the apparent modernization of the tax structure could very well only reflect colonial inequality and/or the structural change of colonial societies. Where Europeans obtained a higher share of income, the share of revenue from modern taxes or from import duties was mechanically higher. Likewise, where or when more autochthons migrated to cities

[7] For 1956 Tunisia, Nicolaï estimates that indirect taxes paid by Europeans could be more than 50% of total indirect tax revenue (Nicolaï 1962, p. 453).

[8] Even under upper bound assumptions for their contribution (see below), Europeans contribute to only a tiny share of total tax revenue in AOF, both in 1925 (11%) and in 1955 (18%).

[9] In Indochina 1920-1937, Europeans only paid a minimal lump-sum tax on income based on twelve brackets. The land tax weighed disproportionately on autochthons, while trading licenses were shared more or less equally: see Gouv. Gal de l'Indochine, 1931. *Annuaire Statistique de l'Indochine, deuxième volume, 1923-1929*, Hanoi : Imprimerie d'Extrême Orient, pp. 311 (Annam) & 327 (Tonkin). In 1938, a general income tax was introduced, that also extended to rich Chinese and Indochinese.

[10] For instance in 1950 Côte d'Ivoire, four categories of occupations were distinguished, going from high-rank civil servants, large landowners and big traders to unskilled wage earners or petty traders, with head tax rates ranging from 1,000 francs to 4,500 francs. A fifth class gathered the rest of the population above 15 years of age, including all the smallholders and all the women without occupation. The latter class represented more than 97% of the total population of tax payers and paid a *capitation* ranging from 95 to 280 francs, depending on the district of residence (Doublet 1952, pp.71-80). Dahomey, Guinea and Niger had similar schedules, and Togo distinguished taxpayers according to three brackets of income. Despite the discrepancy in rates, the progressivity was attenuated by the fact that even rich men would pay the base rate for their wife or their children above 15 year-old (and actually 0 for schooled teenagers).

and obtained wage jobs, the tax structure looked more modern due to the same composition effect. This is why we need to combine our estimates of population and income shares of the three social groups with the incidence of taxes on each of them, to disentangle actual increases in progressivity from composition effects stemming from structural change.

To estimate the fiscal burden weighing on each of the three groups, we lack the statistical basis (social accounting matrices) and a well-founded general equilibrium model to perform a proper tax incidence analysis. We instead make a couple of simple extreme assumptions to obtain lower and upper bound estimates of tax progressivity.

To obtain lower bound estimates, we make three assumptions regarding the head tax (*capitation*) and forced labor, the taxes that we categorized as "modern", and the remaining sources of revenue (monopolies, trade taxes, "intermediate" taxes, and other).

(1) Head tax payments are allocated in proportion of the population older than 15. Only the autochthonous poor contribute to forced labor, and we adopt the monetary equivalents proposed by van Waijenburg (2018) for AOF in 1925 (forced labor was abolished in 1946).

(2) The poor pay none of the modern taxes. Europeans and the autochthonous non-poor pay the same percentage of their income in modern taxes.

(3) For all other sources of revenue (monopolies, intermediate internal taxes and trade taxes), the three groups contribute in the same proportion of their income.

All these assumptions understate progressivity. The first one neglects the transition to a less regressive head tax in AOF after World War II. Regarding the second, Europeans must have faced higher rates, given the higher level and the higher formality/visibility of their earnings.[11] As for the third assumption, the propensity to consume imports, goods produced by the formal sector, or monopoly goods (alcohol, sugar, tobacco) likely increased with income. We thus consider that this set of three extreme assumptions provides us with a lower bound of tax progressivity in each year.

Under these lower bound assumptions (1)-(3), Table A4.3 gives the tax rates on the income of each group in 1925 and 1955, as well as two progressivity indicators: the ratio of the after/before tax ratios of autochthons and Europeans, and the ratio of the after/before tax ratios of the autochthonous poor and non-poor — indicators larger than one are the sign of a progressive tax system. The tax system of 1925 Algeria appears mildly progressive, thanks to

[11] In 1945 Cameroon, some 1,300 Europeans paid the general income tax and schedular taxes on wages and profits, while 10,000 autochthons earning more than 6,000 francs (i.e. around four times the GDP per capita) paid a tax on income with a flat rate of 4%; 1,400,000 other poor autochthons were subject to standard *capitation*. Revenues collected amounted respectively to 37, 2 and 59 million. Our calculations suggest that Europeans paid 6.7% of their income on these taxes, against 1.2% for autochthons. Min. de la France d'Outre-Mer, 1947. *Annuaire Statistique du Cameroun, vol. 1 1938-1945*, Paris : Imprimerie Nationale, pp. 128-129.

the absence of *capitation*, and as the modern taxes exempting the poor already represented 20% of revenue.[12] The tax system of 1925 Tunisia is just neutral: *capitation* still represents 4% of total revenue and modern taxes are not as developed (5% only). Last, the lower bound of progressivity in 1925 AOF is below 1, indicating a regressive tax system, given the weight of *capitation* and forced labor (41% of total revenue) and the absence of progressive modern taxes.

Table A4.3 — Lower bound estimates of progressivity

	Algeria	Tunisia	AOF
Year 1925			
Estimated tax rates on income (%):			
Europeans	6.6	6.9	4.7
autochthons	5.5	7.1	7.9
autochthonous non-poor	6.6	7.1	5.1
autochthonous poor	5.0	7.2	8.1
Progressivity indicators (ratios):			
autochthons vs Europeans	1.01	1.00	0.97
poor vs non-poor	1.02	1.00	0.97
Year 1955			
Estimated tax rates on income (%):			
Europeans	20.1	22.0	13.7
autochthons	14.6	17.9	14.6
autochthonous non-poor	20.1	22.0	14.4
autochthonous poor	10.1	13.4	14.7
Progressivity indicators (ratios):			
autochthons vs Europeans	1.07	1.05	0.99
poor vs non-poor	1.13	1.11	1.00

***Notes*:** Europeans include Jews in NA. The first progressivity indicator is $(1-t_a)/(1-t_e)$, where t_a is the average tax rate on autochthons (second line of each panel), and t_e the tax rate on Europeans (first line). The second progressivity indicator is $(1-t_p)/(1-t_{np})$, where t_p is the tax rate on the autochthonous poor (fourth line) and t_{np} the tax rate on the autochthonous non-poor (third line). ***Sources*:** See text.

Under the same lower bound assumptions, the year 1955 looks more progressive in the three colonies, yet it is in AOF that the change appears the least pronounced. In Algeria the weight of modern taxes reached 41% of total revenue in 1955. In Tunisia, *capitation* had disappeared and modern taxes weighed 32%. In these two countries, according to our estimates the income share of those paying modern taxes (Europeans and the autochthonous non-poor), if anything, decreased slightly (Table A4.2), so that the apparent modernization of the tax system reflected a true increase in progressivity. Indeed, under our assumption, the

[12] For Algeria, Ageron (1990, p. 66) estimates that Europeans paid 53% of the total tax bill before World War I and 73% after the suppression of "Arab taxes" in 1919 and the introduction of the income tax. Although he does not explain his method, his figure is close the one corresponding too our lower bound for 1925 (70%).

modern tax rates on the income of the two non-poor groups increase from 1.6 to 10.0% in Algeria, and from 0.5 to 8.7% in Tunisia. In AOF, thanks in particular to the abolition of forced labor, the share of archaic taxes (*capitation* and *corvée* labor) drops from 41 to 16%; in parallel, the share of modern taxes goes from 0 to 10%. Yet, our estimate of the income share of the non-poor jumps from 9 to 48%, and this boom of the tax base probably explains most of the modernization of the tax structure.[13] According to our estimates, modern tax rates on the non-poor (Europeans and autochthons) rose from 0.1 to 3.0% only, while the archaic tax rate on the poor also increased from 3.5 to 4%; recall however that under assumption (1) the reforms of *capitation*, making it less regressive, are not taken into account here.

In Algeria and Tunisia, the tax system of 1955 is unambiguously progressive between our three groups, primarily along the poor/non-poor line among autochthons (the progressivity indicator reaching 1.13 in Algeria, and 1.11 in Tunisia), and secondarily along the racial line (1.07 and 1.05 in Tunisia). In AOF, under lower bounds assumptions it reaches neutrality; in contrast with 1925, we can at least exclude that is was regressive.

Can we robustly conclude that progressivity unambiguously increased between 1925 and 1955? The main concern is our assumption (3) that the three groups contributed in the same proportion of their income to all sources of revenue other than the head tax and modern taxes. In fact, this could have changed between 1925 and 1955 as the autochthons, especially the non-poor, became more involved in the formal economy, as tax enforcement improved, and as consumption patterns changed towards more imported goods or monopoly goods. To have a significant impact on our estimates of progressivity dynamics, these evolutions should affect taxes other than modern taxes, as modern taxes were not very developed in 1925 (see above).

We alternatively compute a much more progressive estimate of the distribution of taxes by replacing assumptions (1) to (3) by the following ones:

(1') Europeans' average head tax rate (per capita) is twice the non-poor's, and ten times the poor's (only for 1955);

(2') Europeans face a modern tax rate (on income) that is twice the non-poor's;

(3') Half of the revenue from other taxes is only collected on the non-poor (Europeans and autochthons), like modern taxes, with the same tax rate (on income) for the two groups.

We believe this alternative set of assumptions provides us with an upper bound of tax progressivity. Of course, a more extreme upper bound would have all taxes except *capitation*

[13] The income share of Europeans increases from 3 to 12%, and the share of non-poor autochthons from 6 to 36%.

paid by the non-poor (or even by the Europeans only). Yet such an extreme assumption generates tax rates on the non-poor groups as high as 50% in 1925 AOF, which seems quite unrealistic.

Table A4.4 reports the results of the numerical simulations under assumptions (1')-(3').

Table A4.4 — Upper bound estimates of progressivity

	Algeria	Tunisia	AOF
Year 1925			
Estimated tax rates on income (%):			
Europeans	7.5	8.2	27.1
autochthons	3.8	5.9	7.1
autochthonous non-poor	6.6	8.1	27.5
autochthonous poor	2.5	4.0	5.8
Progressivity indicators (ratios):			
autochthons vs Europeans	1.04	1.04	1.27
poor vs non-poor	1.04	1.03	1.30
Year 1955			
Estimated tax rates on income (%):			
Europeans	24.3	26.7	21.7
autochthons	11.0	14.4	13.4
autochthonous non-poor	18.3	21.2	21.2
autochthonous poor	5.1	6.8	8.1
Progressivity indicators (ratios):			
autochthons vs Europeans	1.18	1.17	1.11
poor vs non-poor	1.16	1.18	1.17

***Notes*:** See Table A4.3. ***Sources*:** See text.

To obtain a lower bound for the *evolution* of progressivity between 1925 and 1955, we can compare the upper bound of progressivity for 1925 from Table A4.4 top panel with the lower bound for 1955 from Table A4.3 bottom panel. In Algeria and Tunisia, the progressivity indicator still increases, from 1.04 to 1.05-1.07 along racial lines and from 1.03-1.04 to 1.11-1.13 along the poor/non-poor line among autochthons. Along the racial line, the conclusion of an increase in progressivity even survives assuming a zero tax rate on the poor in 1925, i.e. a very extreme version of assumption (3').

In AOF, the same comparison indicates a large decrease in progressivity, while the reverse one (lower bound of 1925 to upper bound of 1955) points to a large increase. It is therefore impossible to draw any robust conclusion. Similarly, when we try to compare AOF with the two North African colonies, the "confidence interval" for AOF encompasses the one for Algeria or Tunisia in 1925, and they overlap over a large range in 1955. Though the importance of the head tax and the underdevelopment of modern taxes make it likely that the

tax system in AOF was more regressive than in North Africa, this conclusion hinges on the fact that other taxes were not more progressive in AOF, which is not granted.[14]

A second uncertainty and concern is that the income share of the autochthonous non-poor in 1925 was extrapolated under a strong assumption. We also explored the sensitivity of our comparisons to this parameter. In Algeria and Tunisia, halving this income share, that is assuming that the tax base of modern taxes was narrower, barely increases progressivity in 1925 because modern taxation was still limited. Our conclusion of a progressivity increase again survives.[15] In AOF, halving or doubling the income share does not reduce ambiguity.

We conclude that despite the uncertainties attached to the income distribution and to the sharing of the tax burden in each year and especially in 1925, it is likely that tax progressivity increased in Algeria and Tunisia, even if the improvement was perhaps modest. Further, our lower bound estimates make it implausible that the colonial tax system was purely regressive along racial lines, even in 1925, yet its progressivity could also have been very limited. In the case of AOF, the importance of *capitation* and forced labor means it is possible the tax system was regressive in 1925, but the confidence intervals are too large to draw any robust conclusion on progressivity comparisons, across time or across space.

References

Alvaredo, Facundo, Denis Cogneau and Thomas Piketty. "Income Inequality under Colonial Rule. Evidence from French Algeria, Cameroon, Tunisia and Vietnam, 1920-1960", CEPR Discussion Paper 14969, 2020.

Ageron, Charles-Robert. *Histoire de l'Algérie Contemporaine*, Paris: PUF, 1990.

Amin, Samir. *L'économie du Maghreb*. *La colonisation et la décolonisation.* Paris : Editions de Minuit, 1966.

Amin, Samir. *L'Afrique de l'Ouest bloquée. L'économie politique de la colonisation 1880-1970*, Paris : Editions de Minuit, 1971.

Doublet, Pierre. *Traité de législation fiscale dans les territoires d'outre-mer, II : Régimes fiscaux de l'Afrique Occidentale Française et du Togo*, Paris : Sirey, 1952.

Nicolaï, André. "Tunisie : fiscalité et développement", *Tiers-Monde* 3 n°11 (1962) : 429-78.

[14] Regarding assumption (2') compared to (2), it might seem quite unlikely that modern taxes turned less progressive between 1925 and 1955. We checked that keeping the same assumption (either 2 or 2') in both years did not modify our conclusions. This mechanically reinforces our conclusion on the improvement of progressivity in North Africa, and leaves the ambiguity in AOF unchanged.

[15] The upper bounds of progressivity indicators for 1925 are then 1.05/1.05 instead of 1.04/1.04 in Algeria, and 1.05/1.06 in Tunisia.

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau, Yannick Dupraz and Sandrine Mesplé-Somps

Appendix 5 — Public wages in Indochina and Madagascar 1925-1946

Dualism decomposed: public wages of French and autochthons in civil service

A systematic breakdown of public employment and wages by citizenship is possible for Madagascar and Indochina in the 1920s and 1940s. As shown in Table A5.1 (first and second rows), while in both colonies French civil servants represented 12% of total employment in 1925, they made up 52 to 56% of the wage bill. Similar data for 1943-1946 show that the autochthons' share in public employment remained stable over two decades.[1]

Not only were French wages much higher on average than autochthonous wages (7 times higher in Indochina and 10 times in Madagascar), they were, in 1925, higher than the average public wage in Metropolitan France. In Madagascar, the French public wage of 35,000 francs was 2.2 times higher than the average public wage in Metropolitan France (15,000). In Indochina, it was more than four times as high (62,500).

The second section of this appendix gives a more detailed account of the rise in public wages in Indochina after World War I. In a nutshell, the colonial government of Indochina set up a specific schedule of bonuses for French public wages to retain their purchasing power and stay in line with private earnings. A version of the schedule of bonuses used to compensate French civil servants in Indochina was also used to increase the wage of autochthonous civil servants. Increasing inequalities in pay within the colonial civil service even further was politically infeasible — colonial administrators mention the "necessary parallelism" between French and Indochinese civil servants. It is therefore likely that the very high wages paid to French civil servants were pulling the autochthonous wage schedule upwards. Though bonuses were originally reserved for French citizens, in skilled occupations like teachers, some allowances could be extended to autochthons.[2] Measures of wage dualism

[1] Data for 1912-13 Indochina suggest that the share of French was just a bit higher, at 13%. Whereas it had expanded by more than 40% from 1913 to 1925, public employment did not increase between 1925 and 1937, and fell by around 15% during WWII.

[2] For instance, West African teachers exerting outside of their colony of origin, i.e. in the intermediate "federal" schedule, benefited from a remoteness allowance ("*indemnité de dépaysement*") equal to 4/10 of base wage. Further, from 1925 to 1935 all African teachers in Togo were granted a special bonus ("*indemnité spéciale*

from Table A5.1, however, are very much decreased when we consider only the wages of autochthons. In 1925 Madagascar, wage dualism goes from 4.5 to 3.0 (3.5 when we exclude Europeans from GDP per working age population). In 1925 Indochina, it goes from 14.8 to 7.2 (7.8).

Table A5.1 – French and autochthons in civil service 1925 & 1945, Indochina and Madagascar

	Indochina		Madagascar	
	French	autochthons	French	autochthons
Year 1925				
Share in total employment (%)	12	88	12	88
Share in wage bill (%)	52	48	56	44
Average annual public wage (1937 FF)	62,509	7,879	34,653	3,609
in units of GDP per 15-64 pop.	59.3	7.5	28.7	3.0
in units of GDP per 15-64 of each group[a]	0.9	8.2	1.0	3.5
Years 1943-1946				
Share in total employment (%)	10	90	12	88
Share in wage bill (%)	42	58	49	51
Average annual public wage (1937 FF)	27,697	4,189	25,326	3,512
in units of GDP per 15-64 pop.	47.9	7.2	21.5	3.0
in units of GDP per 15-64 of each group[a]	1.0	7.8	1.2	3.8

***Notes*:** In Madagascar, 1925 is the average of 1921 and 1929 (the distribution of employment and wages by citizenship is not given in 1925); data for the 1940s is 1946. Figures for Indochina in the 1940s do not comprise the federal government, only the local budgets of Cochinchina (1944), Annam (1945), Tonkin (1945), Cambodge (1945) and Laos (1943). In 1925, wages are higher by 80% for autochthons at the federal level, yet employment is only 9% of total, so that not including the federal budget is innocuous. a: using estimates of average income of French and autochthons, see Online Appendix 4, Table A4.1 (the estimate for Indochina uses income tax data from 1942). ***Sources*:** See online Appendix 1.

The rise and fall of Indochinese public wages from World War I to World War II

As already mentioned, average public wages were particularly high in 1925 Indochina. The average French public wage was 80% higher than the average French public wage in Madagascar, and more than twice the average French public wage in 1945 Indochina. Autochthonous public wages were very high as well, again about twice higher than in Madagascar or 1945 Indochina. We lay down here the particular sequence of policies that led to these extremely high real wages.

At the top of the hierarchy, the general governor was paid 1937 PPP FF 406,000 in 1925 Indochina vs. 280,000 in Madagascar — a 45% difference. The base nominal wage in current

du Togo"), first equal to 6/10, then 7/10 in 1927, and gradually diminished to 3/10 in 1933 before being cancelled due to financial restrictions. Gbikpi-Benissan (2011, vol. 2, p. 205).

francs was in fact different by 25% only (50,000 vs. 40,000). Both governors received the same large bonuses, about 2.8 times the base wage (at the 1925 exchange rate of the Indochinese currency, the piaster), comprising not only the "colonial supplement" but also travel and entertainment expenses. The rest of the difference then stemmed from the price level, 18% lower in Indochina according to our estimates. However, in 1925 Indochina the same level of bonuses applied to all other French civil servants, more than tripling the base wage in francs. In Madagascar, like in other colonies of Sub-Saharan Africa, bonuses and allowances only reached 70% of base wages.

The story of these very high Indochinese wages is the following. At the start of World War I, France had suspended the convertibility of the French franc into gold. France financed the war by monetary expansion, resulting in high inflation. In Indochina, the piaster remained silver based and inflation was low throughout the war and in the 1920s. As a result, the piaster appreciated from 2.5 francs for one piaster in 1913 to 17 francs for one piaster in 1926. The exchange rate stabilized around 12 under the Poincaré government, before being pegged at ten after 1930 (Brocheux & Hémery, pp. 134-135; Giacometti, 1998).

From 1913 to 1917 in Metropolitan France, nominal wages of civil servants had stayed fixed and had lost a lot of purchasing power. Nominal wages were gradually increased from 1918 to the end of the 1930s, starting with the lowest wages of postmen, teachers, etc. By 1925, the top wages of university professors or administration executives were still lower by 40% than their 1913 level (Piketty 2018 pp. 182-191 & pp. 833-834). For expatriate French civil servants, the wage schedule of Metropolitan France applied directly to all colonies, so that in Indochina base wages in francs were converted in piasters.

In Indochina, the colonial government decided to set up a specific schedule of colonial supplements in piasters to compensate for inflation in Metropolitan France (Dareste et al. N°4, Oct.-Dec. pp. 1080-1083). The schedule was progressive, in that wages at the bottom of the scale received proportionally higher supplements. It was revised each year all along the 1920s. The Indochinese supplement fixed in piaster ended up representing the bulk of the pay: in 1925, it ranged between two to four times the base wages, when going down the scale from the top (governor) to the bottom. In contrast with Metropolitan France, the average wage of French civil servants in Indochina even increased between 1913 and 1925, from 1937 PPP FF 52,649 to 62,509 (i.e. by 19%).[3]

[3] The general governor and the governors of four territories (not Cochinchina) make one exception, but it is that their base nominal wages in francs were lowered between 1913 and 1925.

According to a September 1920 decree, the "colonial supplement" had to be six tenth of the base wage in francs in Madagascar, and seven tenth in Indochina (Dareste et al. N°1, Jan.-Mar. pp. 89-98). Our data indicate that in Madagascar the applied supplement was actually seven tenth.[4] In Indochina, the specific supplement schedule did not fit the seven tenth rule and was more advantageous, especially for low wages. For example, a French civil servant paid at the Madagascar 1925 average wage of around 9,325 francs, corresponding to a middle rank executive or to a second class teacher, received a 6,527 francs supplement in Madagascar, but 3,990 piasters in Indochina, worth 31,290 francs at the 1925 exchange rate. The bulk of the gap in French public wages between Madagascar and Indochina in 1925 can be attributed to the specific schedule of bonuses in Indochina.

Why did the government of Indochina adopt such a generous bonus schedule? Strikingly enough, our estimates of the average income of Europeans (Table A4.1 in online Appendix 4), when expressed in per worker terms, stand at par with average wages in the civil service in both colonies (Table A5.1, last row of each panel).[5] Then, everything is as if the large bonuses paid to civil servants in Indochina were meant to offset a high reservation wage, as Europeans in the private sector were much richer and in lower numbers than in Madagascar, where many relatively poor French men from neighboring *Réunion* Island had immigrated. Hence, the rationale for the Indochinese exception must have been the wish to attract skilled civil servants in the most profitable and strategic, yet remote, colony.

It is only at the end of 1930s that the difference between the arbitrary piaster supplement and the seven tenth bonus turned small, at all base wages. Nominal wages in francs had recovered, so that the special supplement schedule had gradually lost its motivation. Furthermore, the bankruptcies of the Great Depression had also diminished private benefits, hence the civil servants' reservation wage (Brocheux and Hémery 1994, pp. 260-269). World War II finished pulling down public wages in Indochina, back to the same levels as in Madagascar. According to Bassino's estimates, the once buoyant Indochinese economy collapsed under the Japanese occupation — GDP per capita was halved between 1940 and 1945. Between 1937 and 1945, inflation was extremely high in both colonies — prices were multiplied by 5.8 in Indochina and 6.7 in Madagascar, but nominal wages did not follow in Indochina. In both colonies, between 1925 and 1943/46, French public wages kept up with

[4] The colonial supplement was supposed to be seven tenth in AOF and nine tenth in AEF. Our data rather suggest it was seven tenth in all sub-Saharan Africa colonies until the end of WW2. Before WW1, it seems to have doubled the base wage in SSA and Indochina.

[5] At least for Indochina, these are rather precisely measured thanks to income tax data collected by Alvaredo, Cogneau & Piketty (2020).

Europeans' average earnings, which fell by 60% in Indochina, but only by 25% in Madagascar (in Madagascar the average earnings of Europeans fell mostly because of the arrival of new, less affluent settlers in the 1930s).

The setting of French wages also influenced the wages of autochthons. In 1925, the average French civil servant was paid eight to ten times what the average autochthon received in both colonies (Table A5.1, third row). This means that autochthonous civil servants were paid twice more in Indochina. It is quite surprising, as Indochinese civil servants were not paid the colonial supplement, reserved for French citizens. Sources indicate that some "parallelism" was sought between the French and local wage schedules. During the period of the depreciation of the franc (1918-1930), a generous and progressive exchange rate was applied to translate wages from francs into piasters. In 1926 for instance, when the actual exchange rate was around 10 francs per piaster, an exchange rate 3 to 3.5 (depending on base wage level) was applied, meaning a bonus of 10/3-1=2.33 in terms of the base wage in francs.[6] The wages of subaltern personnel, which had no correspondence in francs, were presumably also pulled upward. Overall, the real wages of autochthonous civil servants also went up between 1913 and 1925, from 1937 PPP FF 4,219 to 7,086 — a 87% increase.[7]

This "parallelism" between Europeans' and autochthons' wage schedules then explains why our measure of wage dualism is so high in 1925 Indochina compared to Madagascar. In Indochina, the average autochthon in civil service earned 7.5 times the GDP per worker, while the same ratio was only 3.0 in Madagascar (Table A5.1, fourth row).

In 1946, the autochthons' average wage had improved significantly in Madagascar. It was now 7.2 times lower than the French average wage, versus 9.6 times in 1925. In Indochina, the autochthons once generous schedule was, like the French schedule, shifted down drastically. Average public autochthonous wages were 6.6 times lower than French wages in 1943/46, versus 7.9 times in 1925.

References

Alvaredo, Facundo, Denis Cogneau and Thomas Piketty. "Income Inequality under Colonial Rule. Evidence from French Algeria, Cameroon, Indochina and Tunisia, 1920-1960", CEPR Discussion Paper, 2020.

[6] See for instance, where the term "parallelism" is used: Gouvernement Général de l'Indochine, 1931. *Recueil général de la législation et de la réglementation de l'Indochine, Supplément de 1926-1927, Deuxième partie (Arrêtés, décisions et circulaires du gouverneur général et des chefs d'administration locale) et Troisième partie (Ordonnances des souverains de l'Annam, du Cambodge et de Luang-Prabang)*, pp. 154-156. [National Library of Vietnam]. "Un taux d'abondement dégressif a dû être adopté pour conserver le parallélisme nécessaire entre les deux traitements."

[7] Employment increased more in administrative sectors paying initially higher wages, like education and health, yet the composition effect was limited.

Brocheux, Pierre and Daniel Hémery. *Indochine, la colonisation ambigüe 1868-1954*, Paris: La Découverte, 1994 [2nd ed. 2001].

Dareste P., G. Appert, L. Rotureau-Delaunay et A. Marcille (dir.), *Recueil de législation, de doctrine et de jurisprudence coloniale*, 24ème année, Paris: G. Godde.

Giacometti, Jean-Dominique. « La bataille de la piastre 1918-1928. Réalités économiques et perceptions politiques dans l'Empire colonial Français. » Humboldt-Universität zu Berlin, Philosophische Fakultät III, Institut für Asien und Afrikawissenschaften, working paper No. 9, Berlin, 1998.

Gbikpi-Benissan, François. *Le système scolaire au Togo sous mandat français*, 2 volumes, Paris: L'Harmattan, 2011.

Fiscal Capacity and Dualism in Colonial States: The French Empire 1830-1962

Denis Cogneau, Yannick Dupraz and Sandrine Mesplé-Somps

Appendix 6 - General historical references on the "Second" French Colonial Empire

General History

French Empire

Ageron, Charles-Robert. *La décolonisation française*. Paris: Armand Colin, 1991.

Binoche-Guedra, Jacques. "Le rôle de l'Algérie et des colonies au Parlement sous la Troisième République (1871-1940)". *Revue française d'histoire d'outre-mer*, 75, n° 280 (1988): 309-46.

Bouche, Denise. *Histoire de la colonisation française, Tome second : Flux et reflux (1815-1962)*. Paris: Fayard, 1991.

Brunschwig, Henri. *Mythes et réalités de l'impérialisme colonial français*, Paris: Armand Colin, 1960.

Cantier, Jacques and Eric Jennings (dir.). *L'Empire colonial sous Vichy*, Paris: Odile Jacob, 2004.

Clayton, Anthony. *France, Soldiers and Africa*. Brassey's Defense Publishers Ltd, 1988.
_____. *Histoire de l'armée française en Afrique 1830-1962*, Paris: Albin Michel, 2014.

Frémeaux, Jacques. *Les colonies dans la Grande Guerre*, Paris: Editions 14-18, 2006.

_____. *De quoi fut fait l'Empire. Les guerres coloniales au XIX^e^ siècle*. Paris: CNRS Editions, 2010.

Jennings, Eric. *Vichy in the Tropics: Pétain's National Revolution in Madagascar, Guadeloupe, and Indochina, 1940-1944*, Stanford University Press, 2001.

Thobie, Jacques, Gilbert Meynier, Catherine Coquerey-Vidrovith and Charles-Robert Ageron. *Histoire de la France coloniale 1914-1990*, Paris: Armand Colin, 1990.

North Africa

Ageron, Charles-Robert. *Histoire de l'Algérie Contemporaine. Tome II : De l'insurrection de 1871 au déclenchement de la guerre de libération*. Paris: PUF, 1979.

Ageron, Charles-Robert. *Histoire de l'Algérie Contemporaine*, Paris: PUF, collection QSJ, 1990.

Bouchène, Abderrahmane, Jean-Pierre Peyroulou, Ouanassa Siari, Tengour and Sylvie Thénault (eds). *Histoire de l'Algérie à la période coloniale (1830-1962)*, Alger: Barzach & Paris: La Découverte, 2012.

Chouikha, Larbi and Eric Gobe. *Histoire de la Tunisie depuis l'indépendance*, Paris: La Découverte, coll. Repères, 2015.

Collot, Claude. *Les institutions de l'Algérie durant la période coloniale (1830-1962)*. Paris: CNRS & Alger: Office des publications universitaires, 1987.

Connelly, Matthew. *A Diplomatic Revolution: Algeria's Fight for Independence and the Origins of the Post–Cold War Era*. New York: Oxford University Press, 2002.

Germouni, Mohamed. *Le protectorat français au Maroc,* Paris: L'Harmattan, 2015.

Grangaud, Isabelle and M'hamed Oualdi. "Tout est-il colonial dans le Maghreb ? Ce que les travaux des historiens modernistes peuvent apporter", *L'Année du Maghreb* 10 (2014): 233-54.

Julien, Charles-André. *Histoire de l'Algérie contemporaine. Tome I : La conquête et les débuts de la colonisation*. Paris: PUF, 1964.

Katan Bensamoun, Yvette. *Le Maghreb : De l'empire ottoman à la fin de la colonisation française*, Paris: Belin, 2007.

Martin, Jean-Philippe. *Histoire de la Tunisie contemporaine. De Ferry à Bourguiba.* Paris: L'Harmattan, 2003.

Masri, Safwan M. *Tunisia. An Arab Anomaly*. Columbia University Press, 2017.

McDougall, James. *A History of Algeria*. Cambridge University Press, 2017.

Rivet, Daniel. *Le Maghreb à l'épreuve de la colonisation*, Paris: Hachette, coll. Pluriel, 2002.

_____. *Histoire du Maroc de Moulay Idris à Mohamed VI*, Paris: Fayard, 2012.

Stora, Benjamin. *Histoire de l'Algérie coloniale (1830-1954)*. Paris: La Découverte, 1991.

_____. *Histoire de la guerre d'Algérie (1954-1962)*. Paris: La Découverte, 1992.

Valensi, Lucette. *Le Maghreb d'avant la prise d'Alger*. Paris: Flammarion, 1969.

Sub-Saharan Africa

Almeida-Topor, Hélène. *L'Afrique au XXè siècle*. Paris: Armand Colin, 1999.

Cooper, Fredrick. *Decolonization and African Society. The labor question in French and British Africa*, Cambridge University Press, 1996.

_____. *Citizenship between Empire and Nation. Remaking France and French Africa 1945-1960*, Princeton University Press, 2014. French edition: *Français et Africains? Etre citoyen au temps de la décolonisation*, Paris: Payot.

Guillemin, Philippe. "Les élus d'Afrique noire à l'Assemblée nationale sous la Quatrième République", *Revue française de science politique*, 8, n°4 (1958): 861-77.

Coquery-Vidrovitch, Catherine and Henri Moniot. *L'Afrique Noire, de 1800 à nos jours*. Paris: PUF, 1974.

Manning, Patrick. *Francophone Sub-Saharan Africa*. Cambridge University Press, 1998.

Randrianja, Solofo and Stephen Ellis. *Madagascar. A Short History*. London: Hurst & Company, 2009.

Reid, Richard J. *A History of Modern Africa, 1800 to Present*. Wiley-Blackwell, 2012.

M'Bokolo, Elikia. *Afrique Noire, Histoire et civilisations du XIXè siècle à nos jours*, Paris: Hatier, 1992.

Economic History

Almeida-Topor, Hélène. *Histoire économique du Dahomey (Bénin), 1890-1920*, vol. 1 & 2. Paris: L'Harmattan, 1995.

Amin, Samir. *L'économie du Maghreb*. *La colonisation et la décolonisation.* Paris: Editions de Minuit, 1966.

Amin, Samir. *L'Afrique de l'Ouest bloquée. L'économie politique de la colonisation 1880-1970*, Paris: Editions de Minuit, 1971.

Andersson, Jens. "State Capacity and Development in Francophone West Africa", Lund Studies in Economic History No 86, University of Lund, 2018.

Barbe, Adam. When France Used the Public Debt to Colonise Morocco, *Orient XXI (2017)*.

Bassino, Jean-Pascal, Jean-Dominique Giacometti and Konosuke Odaka (eds). *Quantitative Economic History of Vietnam 1900-1990. An International Workshop*, Nishi-Futsu Kaikan /Maison Franco-Japonaise, Tokyo, Institute of Economic Research, Hitotsubashi University, 2000.

Berthélemy Jean-Claude. "L'économie de l'Afrique occidentale française et du Togo, 1946-1960", *Revue française d'histoire d'outre-mer*, 67, n° 248-249, 1980: 301-37.

Bonzom, Lucien. *Du régime fiscal en Algérie. Ses conséquences sur la situation et le développement économique de cette colonie.* Thèse pour le doctorat ès Sciences politiques et économiques, Université de Paris, Faculté de droit, Paris: Arthur Rousseau, 1899.

Brocheux, Pierre and Daniel Hémery. *Indochine, la colonisation ambigüe 1868-1954*, Paris: La Découverte, 1994 [2nd ed. 2001].

Brocheux, Pierre. *Une histoire économique du Vietnam 1850-2007. La palanche et le camion*. Paris: Les Indes Savantes, 2009.

Cooper, Frederick. *Africa since 1940: The Past of the Present*, Cambridge: Cambridge University Press, 2002.

_____. *Africa in the World. Capitalism. Empire. Nation-State*, Harvard University Press, 2014.

Coquery-Vidrovitch, Catherine. *Le Congo au temps des grandes compagnies concessionnaires*, Paris: EHESS, 1972 [2nd edition 2011].

Douël, Martial. *Un siècle de finances coloniales*, Paris: Librairie Félix Alcan, 1930.

Fall, Babacar. *Le travail forcé en Afrique occidentale française* (1900-1946). Paris: Karthala, 1993.

Fremigacci, Jean. *Etat, économie et société coloniale à Madagascar (De la fin du XIXè siècle aux années 1940)*. Paris: Karthala, 2014.

Frankema, Ewout and Marlous van Waijenburg. "Metropolitan Blueprints of Colonial Taxation? Lessons from Fiscal Capacity Building in British and French Africa, 1880-1940." *Journal of African History*, 55, n° 3 (2014): 371-400.

Huillery, Elise. "The Black Man's Burden: The Cost of Colonization of French West Africa", *Journal of Economic History*, 74, n° 1 (2014): 1-38.

Hopkins, Anthony G. *An Economic History of West Africa*, New York: Columbia University Press, 1973.

Jacob, Guy. "Gallieni et « l'impôt moralisateur » à Madagascar. Théorie, pratiques et conséquences (1901-1905)", *Revue française d'histoire d'outre-mer* 74, n°277 (1987): 431-73.

Kim, Diana S. *Empires of vice: the rise of opium prohibition across Southeast Asia*, Princeton, NJ: Princeton University Press, 2020.

Marseille, Jacques. *Empire colonial et capitalisme français. Histoire d'un divorce.* Paris: Albin Michel, 1984 [2nd edition 2005]

Nicolaï, André. "Tunisie : fiscalité et développement", *Tiers-Monde*, 3, n° 11 (1962): 429-78.

Nouschi, André. "En Algérie : portrait social de la colonisation", *Annales, Économies, Sociétés, Civilisations*, 20, n° 6 (1965): 1242-52.

Polanyi, Karl. *Dahomey and the Slave Trade*. Seattle & London: University of Washington Press, 1966.

Saul, Samir. *Intérêts économiques français et décolonisation de l'Afrique du Nord (1945-1962)*, Genève: Librairie Droz, 2016.

Suret-Canale, Jean. *Afrique Noire, l'ère coloniale 1900-1945*, Paris: Editions Sociales, coll. Terrains, 1962.

Tertrais, Hugues. *La piastre et le fusil : le coût de la guerre d'Indochine, 1945-1954*, Vincennes: Institut de la gestion publique et du développement économique, 2002.

Todd, David. "The impôts arabes: French Imperialism and Land Taxation in Colonial Algeria, 1830-1919". In Tiley, John (ed.), *Studies in the History of Tax Law: Volume 3*, edited by John Tiley, 113-38. Oxford: Hart Publishing, 2009.