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

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Preliminary version June 2018, under revision

Abstract –
A novel data collection provides comparative evidence on colonial states of the 'second' French colonial Empire, since their foundation to their devolution in the 1960s. Colonial states were neither omnipotent Leviathans nor casual night watchmen. On the one hand, we emphasize the extractive efficiency and capacity of adaptation of colonial states to varied socioeconomic contexts and to varying historical conditions. On the other hand, we put forward dualism as the main common feature and legacy.

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The French Empire 1830-1962

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A sufficiently autonomous government, able to implement large scale efficient policies and to bargain deals with domestic and foreign capital, is most likely a major ingredient of economic development, if only for late-starters (e.g., Gerschenkron 1962; Amsden 2001; Adelman & Morris 1997 provide a review). Therefore the consolidation of state capacity, involving in particular the building of a strong tax base, is today widely considered as one of the most important challenges that poor countries must face (Besley & Persson 2011). Yet, as argued by Hoffman (2015), historical state building experiences, in all their diversity, are very much under-studied. A great deal of the history of the State overwhelmingly relies on the experience of Western European countries (Tilly 1990) or of today's developed countries (Lindert 2004); the same is true for neo-institutionalist analyses (Dincecco 2015).

Even if the ways to improving state capacity can be deemed multiple and context-specific, "extractive" colonization is seen to have determined a bad start, distorting tax structure and expenditure patterns towards the interests of colonizers (Acemoglu & Robinson 2012). The recent literature draws its empirical evidence from fiscal and legal decisions taken within formally independent countries (Besley & Persson 2009, 2013 & 2014), so that it actually disregards the colonial context. Yet, independent states' structures did not start from scratch. Unfortunately, not much is known about colonial states on a comparative basis and about their evolution from the late 19th century to independence and beyond, especially in the case of Africa.

The use of the term "state" in a colonial context has been much discussed. Young (1995) emphasizes that the colonial state indeed lacked a few attributes of stateness: sovereignty, national doctrine and international existence. Yet, Young describes the African colonial state as a Leviathan (*"Bula Matari"* = crusher of rocks in kikongo language) displaying "the purest modern form of autonomous bureaucratic authority" (p. 160), especially at its supposed apex between the two World Wars. In contrast, Herbst rather characterizes it as "administration on the cheap" (p.73) with "limited ambitions" (p.77), and despite its brutality, unwilling and unable to extend its control. After the independences, Young sees a legacy of authoritarianism, Mamdani (1996) of "decentralized despotism" (pp. 37-61), whereas Herbst instead sees "non-hegemonic rule" persisting within (henceforth UN-protected) colonial boundaries, and Cooper (2002) the continuation of "gatekeeper" structures. To Bayart (1993) and Cooper (2014a), the African colonial state was to some extent a co-production of colonial rulers and autochthonous elites. Questions about the formation and action of colonial states and about postcolonial hysteresis of course extend outside Africa, if only for instance to South-East Asia studied by Booth (2007).

A novel data collection allows us to provide comparative evidence on colonial states of the 'second' French colonial Empire, since their foundation to their devolution in the 1960s. We extracted exhaustive and detailed public finance data from administrative archives, numbers and

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wages of civil servants by sector, as well as a set of outcomes of public investment like school enrolment, health inputs, infrastructure; covering the whole colonial period, and all French colonies in Northern and Sub-Saharan Africa and South-Eastern Asia (Indochina). We were also able to extend some of these data until the 1970s. In contrast with previous contributions on the British Empire, we believe it is fruitful to approach the colonial state not only from the side of taxation (Frankema 2010 & 2011; Gardner 2012), but also from the side of expenditure. The efficiency and sectoral allocation of public expenditures, "productive efficiency" in Besley and Persson (2011) terminology, are as important as the level and structure of taxes, i.e. "extractive efficiency", for "growing public" (Lindert 2004). Besides, as already argued by Cooper, we argue that the years 1945-1965 correspond to a critical juncture that is crucial to document and analyze in order to deal with the "legacy question".

We argue against a too naïve state capacity approach and provide a rather nuanced view of colonial states, that neither identifies them with omnipotent Leviathans nor with "night watchmen". On the one hand, we emphasize the extractive efficiency and *capacity of adaptation* of colonial states to varied socioeconomic contexts and to varying historical conditions. On the other hand, we put forward *dualism* as the main common feature and legacy.

First, it is not that colonial states had very limited resources. We show that fiscal extraction was rather high. Hence even under a strict doctrine of self-financing, they could afford spending, and not only in order and control; they could even borrow and honor their debts. Further, colonial administrations did not stop investing in fiscal capacity when independence was foreseeable, after WW2; the causality rather ran the other way, with a needed "extension of franchise" implying more expenditures hence more taxation. Then colonial states modernized their fiscal apparatus and succeeded in increasing tax revenue, in order to invest in development in the hope of preserving imperial dominance. Fiscal capacity meant precisely the ability to adapt to context. The French Republic was able to resurrect *Ancien Régime* fiscal and legal features or to recycle precolonial states ways-of-doing, so that autochthonous population could be taxed, and in some places rather heavily. But, as political and socioeconomic climates changed, law and tax also changed, and turned more "progressive" by all meanings, at least after WW2. The context dictated the degree of modernization of the fiscal apparatus. Initially richer settler colonies of North Africa ended up with a more modern tax structure than poor countries of Sub-Saharan Africa where the dependence on international trade taxation turned high, consistently with the "gatekeeper" characterization.

Second, the true limitation of the colonial state was its very colonial nature. Expenditure was biased and costly. On the biasedness side, it had to serve first the interests of French colonists and capitalists, by favoring costly investments in railways and harbors to connect mines and plantations, but also by providing settlers with urban public services at metropolitan standards (education, health assistance, electricity). The larger the settlers' enclave was the more public spending was needed. On the cost side, it had to rely on expensive French civil servants and army men, for tax enforcement, peacemaking, etc. This high cost meant that despite substantial fiscal capacity the colonies were still under-administered, in terms of the number of civil servants who could be financed and of the volume of public goods that could be produced. While development was costly from the start, it turned more and more costly as Autochthons began demanding more equality in pay or in access to metropolitan-level facilities; both "order" and "social" spending had to increase at the same time. And it turned costly to the metropolis, as extending the settlers' enclave to the rest of the population meant large overseas redistribution and ever increasing transfers. Dualistic economies and societies were born, as well as aid dependency, and both features survived the decolonization era. The independence years 1956-1962 indeed did not bring any new discontinuity: at the beginning of the 1970s, the new independent States had maintained the same size, and remained dependent of French aid for 5 to 15% of their expenditures.

The remainder of this paper is organized as follows. Section 1 provides a short historical background. Section 2 summarizes the data construction effort, described further in a large data appendix. Section 3 looks at tax extraction and distribution across space and time. Section 4 looks at spending, costs, and financing issues. Section 5 concludes.

1. Historical background and structural features

Our database covers colonies acquired during the 19th and 20th centuries, making the bulk of the so-called "second colonial Empire" of France. We disregard Syria and Lebanon that the French ruled between 1920 and 1945 under a League of Nations mandate, Djibouti a small trade post South of Eritrea, Comoros Islands, and Pacific Ocean islands. We also exclude the remains of the "first colonial Empire": West Indies (Guadeloupe, Martinique), French Guyana, Réunion Island in the Indian Ocean, and the five trade posts of India.

The settlement colonies of North Africa (NA) [7]

Algeria was formally part of the Ottoman Empire, although with a large autonomy, before it was claimed by France in 1830.[8] Conquest wars lasted four decades, the last large insurrection being the one of the *Kabylie* province in 1871. The population of French and other European (Spanish, Italian, Maltese) settlers more than doubled between 1871 and WW1. With the advent of the Third Republic at the same time, the settlers gained momentum against the military, and in 1900 obtained some autonomy in public finance, as a local assembly, the "*Délégations Financières*" would vote the budget.[9] Algeria was divided in four major constituencies – three "*départements*" in the North, and a military territory in the South; French settlers were represented in the metropolis by a few deputies and senators. Formally speaking, since 1865 Algerian Muslims could apply for citizenship provided they complied with the French *Code Civil* (no polygamy or repudiation, equal inheritance for daughters etc.), but administrative procedures were cumbersome and more difficult than for the average foreign born in metropolitan France (Weil 2005). A lottery-based three-year military conscription was instituted in 1912, so that many young Algerian males were involved in the two world wars and in other battles starting with the conquest of Morocco (Clayton 1988). It is only after WW2, under the Fourth Republic, that Algerian indigenous subjects acquired some political representation in the metropolitan parliament. With the Fifth Republic in 1958, their representation was brought closer to their

[7] For Maghreb-wide historical comparisons, see Valensi 1969, Rivet 2002, Katan Bensamoun 2007.
[8] Algeria's colonial history: Julien 1964; Ageron 1979 & 1990 Stora, 1991 & 1992 Rivet 2002; Bouchène et al. 2012; Mc Dougall 2017. On public finance one of the first references is Douël 1930.
[9] In this assembly, indigenous representatives were granted a minority of 21 seats over 69, mostly composed of *caids* who collaborated with the French administration. Cf. Bouveresse 2008.

actual population weight.[10] Yet the liberation war had already started in 1954; casualties were most often restricted to rural areas and did not disrupt too much the economy. Algeria's independence was finally obtained in 1962, under strong international pressure (Connelly 2002).

Tunisia was also formally a possession of the "Sublime Porte", but had an autonomous government with diplomatic visibility. The French invasion of 1881 interrupted a process of modernization of the State, similar to the Ottoman *tanzimat* or to the reforms initiated by Muhammad Ali in Egypt.[11] Tunisia remained a protectorate, the official ruler of which was the *bey* of Tunis, even if actual power was exerted by the French administration.[12] French and Italian immigrants settled in numbers until WW1.

Morocco was until 1913 a formally independent kingdom, yet European imperialist interference, especially from UK, France and Spain, had grown heavier all along the second half of the 19th century; the kingdom was plagued by internal conflicts, resistance to reforms, and trade deficits, and got very much indebted towards the French bank Paribas between 1904 and 1910.[13] Despite German opposition, the Southern part fell under French protectorate just before WW1 - a small Northern part being conceded to Spain, and received the same administrative organization as Tunisia: the king became a *sultan* holding formal power, and a governor was appointed by the French ministry of Foreign Affairs. Conquest wars in the Rif (Spanish part) and Atlas mountains lasted until the mid-1930s. European settlers were never as many as in Algeria or Tunisia.[14]

In both protectorates, French settlers were not represented in the metropolitan parliament until 1946, when they got two deputies for each colony, and had less say on policies than in Algeria. Regarding the Autochthons, a lottery-based military conscription had started as early as in 1883 in Tunisia, as a continuation of military service under the *bey*; it was not the case in Morocco where the army was formed of volunteers due to restrictions imposed by the protectorate treaty (Clayton 1988). Yet, in contrast with Algerians, Tunisians and Moroccans were never opened a special access to French citizenship, excepting soldiers with military decorations. Both Tunisia and Morocco almost peacefully obtained their independence in 1956, in the footsteps of Indochina (1954).

In North Africa, European settlers made before WW2 a very large share of urban population, and even after the majority of civil servants; in agriculture they produced wine and grew wheat, barley, oranges, lemons and olives, for export. Yet each of these colonies displayed structural trade deficits, due to consumer goods imports by settlers, financed in particular by metropolitan wage payments to expatriate military forces (see imports and exports to GDP figures in Table 2). Jews of Algeria were granted the French nationality in 1871; this was not the case in Tunisia and Morocco. In 1925, Europeans and Algerian Jews accounted for 8% of total population in the three North African colonies taken as a whole; this share had decreased to 7%

[10] Third Republic: 6 deputies from 1870 to 1875, then 3 1876-1881, 6 again 1882-1927, 9 1928-36, 10 1937-40; 3 senators since 1876 until 1940. Cf. Binoche-Guedra 1988. Fourth Republic: two electoral colleges, one for female and male French citizens (among whom not more than 15% of Muslims were ever found), another for the rest of Algerians (only males), with 15 deputies and 7 senators each. Cf. Ageron 1990, p. 91. Fifth Republic (1958): male and female Muslims get 46 deputies over a total of 67, and 22 senators over 31. Cf. Collot 1987 pp. 16-17, cited by Weil 2005 p. 108.

[11] Rivet 2002 pp.136-155. Britain agreed on a French Tunisia as it invaded Egypt at the same time (1882) and remained there until 1956, like France in Tunisia.

[12] Tunisia's colonial,history: Rivet 2002, Martin 2003, Chouikha & Gobe 2015. Masri, 2017.

[13] Rivet 2002 pp. 155-174; on Morocco's indebtedness: Barbe 2016.

[14] Morocco's colonial,history: Rivet 2002, Germouni 2015.

in 1955. In Algeria, the non-Muslims, three quarters of whom were French, accounted for 14% of 1925 population, gone down to 10% in 1961. In Tunisia, French and Italian settlers weighted around 7%, while in Morocco, the share of French never went above 5%. Jews in Tunisia were one quarter of non-Muslims; in Morocco they were more than one half in 1925, then more than one third in 1955. Just after the Evian agreements on Algeria independence, 800,000 "*pieds-noirs*" (French settlers) fled in mass to the metropolis; in Tunisia and Morocco, the emigration of French settlers started in 1956 and was more gradual, yet at the end of the 1960s most of them also had left, the same for Jews who went either to France or to Israel.

Indochina[15]

Indochina was composed of five territories that were successively conquered between 1858 and 1899. Cochinchina (South Vietnam) was the first in 1862, and was directly ruled as a colony. Annam (Center Vietnam), Tonkin (North Vietnam), Cambodia, and Laos, were officially protectorates, although the room left to indigenous authorities (kings) was perhaps even more limited than in Tunisia or Morocco; Tonkin was finally managed as a colony.[16] The federal government of Indochina was established in 1897. Federal budgets were mainly financed by trade taxes and were separate from individual colonies budgets financed by direct and indirect internal taxation. Lower layers of administration were provinces (only after 1931 outside of Cochinchina) and municipalities. There were a bit more than 30,000 French people in 1925, including around 10,000 military soldiers, a bit more than 50,000 at the end of the 1940s, with 20,000 soldiers. One half of the French resided in Cochinchina in 1925, two thirds in 1948; the rest was mainly in Tonkin. They never represented more than 0.25% of total population, except in Cochinchina, and even within civil service they were a minority (10 to 15%), although concentrated in highest positions. After 1881, French colonists of Cochinchina were represented at the metropolitan parliament by one deputy. Chinese people made a larger minority, counting around 300,000 people in 1925 and more than 600,000 in 1948, many of them living also in the South. Like in Algeria and Tunisia, a lottery-based military conscription was implemented after WW1 (1923). The French invested in rice production and exports, rubber, tea, pepper and coffee plantations, and in Tonkin exploited coal, zinc and tin mineral resources. Until WW2, Indochina, and in particular Cochinchina, was quite a profitable colony displaying large trade surpluses, in contrast with others. After the short-lived invasion by the Japanese in March 1945, the French lost ground and could not recover control over the North held by communist and independentist forces. Indochina was divided in three "associate States" (Cambodia, Laos and Vietnam) which were granted more autonomy. More than 100,000 soldiers, from the metropolis and African colonies, arrived between 1945 and 1954 to fight the Viet-Minh. French presence in Indochina ended with the defeat of Dien-Bien-Phu in 1954.

Sub-Saharan Africa (SSA): West and Central Africa (WCA)[17] *and Madagascar*[18]

[15] Indochina's colonial,history: Brocheux & Hémery 1994, Brocheux 2009.
[16] The territory of Kouang-Tcheou-Wan at the border of China was occupied since 1899 and retroceded to China in 1945. It is not included in our figures.
[17] French SSA's colonial history: Suret-Canale 1962; Coquery-Vidrovitch 1974; M'Bokolo 1992; Manning 1998; Almeida-Topor 1999. Economic history of West Africa: Hopkins 1973.

The French had established a trade post in Saint-Louis of Senegal in the middle of the 17th century, then in a few locations on the Atlantic coast, mainly for buying slaves. In the Indian Ocean around Madagascar, France also owned the island of *La Réunion*, then took hold of the other islands of Nosy-Be, Sainte-Marie and Mayotte in the 1840s.[19] The conquest of SSA started with the scramble for Africa in the 1880s and was more or less completed in 1905, except for Cameroon and Togo which came after WW1 from the sharing of two German colonies with Britain. French SSA was composed of four blocks: West Africa (*Afrique Occidentale Française,* or *AOF*) and Togo, Central Africa (*Afrique Equatoriale Française*, or *AEF*), French Cameroon and Madagascar.

AOF and AEF were federal structures, whose "general government" were respectively in Dakar and Brazzaville, and were composed respectively of eight and four colonies: Senegal, Mauritania, Soudan – present Mali, Niger, Haute-Volta – present Burkina Faso, Dahomey – present Benin, Cote d'Ivoire and Guinea on the one hand[20]; Chad, Oubangui-Chari – present Central African Republic, Congo, and Gabon on the other hand. Like in Indochina, federal budgets were mainly financed by trade taxes and were separate (except for AEF 1935-45) from individual colonies' budgets financed by internal taxation. Some spending and tax decisions were even decentralized at the level of districts (called 'circles' in AOF), managed by a French administrator. Togo and Cameroon were ruled by France under a mandate from the League of Nations then United Nations. This made little difference with full-fledge colonies in practice, except that military conscription was precluded; Togo's administration was very much connected to AOF. Madagascar had its own general governor, and was divided into some twenty provinces all headed by a French administrator; after 1931, eight super-provinces were granted an individual budget, and decentralization went even further after WW2.

Like in Indochina, French colonists were in SSA a small minority; they never represented more than 0.5% of total population in SSA mainland. In Madagascar a larger proportion was met: 0.5 in 1925 to 1.2% in 1955, with in particular settlers coming from neighboring *Réunion* island; there was also a significant Indian minority (0.3% for all Asians). SSA colonies were plantation economies, starting with groundnuts (Senegal and other Sahel colonies mainly), palm kernels and palm oil, wood, Arabic gum; coffee, cocoa, and cotton mainly took off in the 1950s, and oil only came in the late 1960s or 1970s in Congo and Gabon, then Cameroon. Madagascar had quite diversified agricultural exports: cassava, peas, coffee, rice, vanilla, cloves, and tobacco. Trade deficits were the rule, although to a much lesser extent than in North Africa. Under the Third Republic, until 1940, the natives from the "*Quatre Communes*" of Senegal (Dakar, Saint-Louis, Gorée and Rufisque) were considered as French citizens and could send one deputy to the metropolitan parliament. Starting in 1912, improvised conscription brought some 150,000 Africans to Morocco and to the fronts of WW1. After 1920, a lottery-based military conscription applied until 1960 in AOF, AEF and Madagascar, but not in Cameroon or Togo due to treaties. Between 1920 and 1945, fit men not drafted were reservists to be mobilized in wartime, and were also used as a free labor force in public works like railways construction (Fall 1993). Apart from soldiers having won military honors, other indigenous subjects had no privileged access to

[18] Madagascar's colonial history: Randrianja & Ellis 2009; Fremigacci 2014.
[19] The latter island and the Comoros archipelago were merged with the Madagascar colony in 1912.
[20] This is the post-WW1 structure, after the former colony of "Haut-Sénégal-Niger" was split between Soudan, Niger and Haute-Volta. The latter disappeared between 1932 and 1946, being dismantled between Cote d'Ivoire and Niger.

citizenship. Under the Fourth Republic, between 1946 and 1956, like in Algeria indigenous subjects obtained some political representation at the metropolitan parliament, local assemblies, and at the confederative imperial assembly ("*Union Française*"), under a system of suffrage restricted to a heterogeneous list of occupations and social positions, given in particular the limitations of civil registration (Guillemin 1958; Cooper 2014b p. 137-138). In 1956, the so-called "*loi cadre*" granted universal suffrage to male and female Autochthons, suppressed segregation of electoral colleges, and gave large autonomy in government to territorial assemblies. Then between 1958 (Guinea) and 1960, all Sub-Saharan territories became independent countries, rather peacefully on the whole. The 1947 insurrection in Madagascar and the war against UPC in Cameroon (1955-62) make the two major exceptions to this rule.

Initial conditions

According to our rough demographic estimates, with around 9.0 millions of people in 1850 North Africa (NA) was the least populated area (22% of total), while Indochina and Sub-Saharan Africa (SSA) respectively counted 14.2 (35%) and 17.7 (43%) millions. Population shares changed little across the colonial period.

Table 1 – Estimates of population and GDP per capita for the year 1850

	France	Empire		NA		Indochina			SSA		
								Madag.		WCA	
			Algeria	Tunis.	Mor.	Coch.	Oth.		AOF	AEF	Cam.
Population[a]	36.2	40.2	4.2	1.3	3.4	1.0	13.2	2.2	9.3	3.5	2.4
				9.0		14.2				15.2	
Urbanization (%)	26.0	2.5	4.8	9.6	7.7	5.1	1.1	2.2	0.9	0.6	0.0
				6.6		1.4				0.7	
GDP per capita[b]	3,793	532	944	821	726	862	371	581	465	429	482
			844			406			464		

a: millions; b: francs 1937, PPP

Sources and methodology: Metropolitan France: GDP at market prices from INSEE annual national accounts 1949-2010; from 1949 to 1900, extrapolated backward using annual growth rates for market GDP estimated by Pierre Villa (1997) while taking into account the gradual increase of the share of non-market GDP using estimates of this share from Vincent (1972, p. 334) for 1913, 1929 and1938; from 1900 to 1820, retropolated backward using annual growth rates estimated by Toutain (1987). Urbanization data are from Eggiman (1999) and Chandler (1987). Population and GDP data for colonies: see data appendix.

Then, according to even rougher estimates of PPP GDP per capita, NA was twice wealthier than Indochina and SSA in 1850.

Algeria comes out as the wealthiest colony, yet it is the one who in 1850 had already endured 20 years of French colonialism; figures for 1850 are then contaminated by the presence of some 125,000 European civilian settlers (60,000 French; 3% of total population) plus 110,000 army men, larger public expenditures, etc. Backward extrapolation to 1830 would lead to a figure around 700, not far from its two neighbors in Maghreb. Within Indochina, extreme South Vietnam (Cochinchina) is estimated to be twice richer than the other parts, putting it at par with North Africa. Within Sub-Saharan Africa, Madagascar ranks first.

These gaps in GDP per capita fit with our prior that North Africa benefited from its millennial integration in the Mediterranean economy, and from its connections with the Islamic world and the Ottoman Empire (Valensi 1969). The contrast with WCA also fits with differences in urbanization rates or population density. In Indochina, the Nguyen dynasty had extended its imperial rule over the whole Indochina during the 19th century, and had its capital city (Hue) in Central Vietnam (Annam), counting perhaps around 50,000 people, as well as Hanoi in the North (Tonkin). Yet the Mekong delta in the extreme South benefited from superior ecological conditions for rice cultivation, and had already attracted a pretty large Chinese immigration (Bassino, Giacometti & Odaka 2010). In the 19th century, the whole Madagascar island had been almost united by the kings of *Imerina* (highlands around the capital city Antananarivo; Campbell 2005). In the parts of WCA that the French conquered, the three most salient political structures of the 19th century were probably the Dahomey kingdom in present-day Benin (Polanyi 1966; Almeida-Topor 1995), the Toucouleur empire of El Hadj Omar Tall in Senegal and Mali, and the moving empire of Samory Ture from forest Guinea to Northern Cote d'Ivoire and Ghana, all of which required some military effort to be defeated. The two places outside North Africa where more French colonists could be found were also *ex ante* the wealthiest and the most urbanized, Cochinchina and Madagascar.[21]

2. Data construction

Our analysis relies on the collection of first-hand data in French colonial archives. Extraction compilation, homogenization, cleaning and cross-checking took years. For details we refer the interested reader to the large data appendix.

Over the 1830 to 1962 time period, we collected detailed public finance data on revenue and expenditure for all colonies of the "second French" colonial Empire. Collection methodology was designed to get homogenously defined spending and tax headings. Data at the general government layer (federative or not) are annual; this allows us to precisely measure civilian transfers received from the metropolis. Metropolitan budgets of the two ministries of Navy/Colonies/Overseas and of War/Defense (NA and Indochina War) provide military expenditure and our collection distinguishes spending on health and infrastructure from personnel and operational expenses of troops.

Data on lower layers of administration, colonies, provinces, regions or departments, are triannual. Municipal budgets were also collected when found. Auxiliary budgets for the allocation of funds from loans, for medical assistance or for posts and telegraphs were also collected. Our net revenue and net expenditure variables are consolidated to avoid double-counts arising from transfers between administrative layers.

Public wages and employment in each colony and administrative sector were also collected for the years 1913, 1925, 1937, 1949, 1955 and 1960.

For the transition period to independence and until 1970, we also extracted budgetary data from the franc zone reports, and linked them with colonial accounts.

[21] For the year 1937, data on wages paid to unskilled (indigenous) laborers fit with our estimates of GDP per worker (15+ y.o. population), in that these minimum urban wages are not too far (and in most cases above) the GDP per worker. Tonkin makes the most salient exception, average unskilled wages being more than twice our GDP per worker estimate. It might be that Bassino's estimates for Tonkin are too pessimistic, if only for the year 1937 following the Great Depression.

Development outcomes or policy variables like school enrollment, health personnel, electricity output, roads or railways length, international trade, were extracted from statistical annals.

Population series draw from Frankema and Jerven (2014) and other sources like population censuses and World Bank, and correct for obvious mistakes like the absence of a demographic shock in the World Bank series in 1962 Algeria when 800,000 French settlers left. Territorial extension of population, due to colonial conquest or changes in boundaries, is thoroughly scrutinized.

Two specific data collections were devoted to consumer prices indexes on the one hand, and to price levels on the other hand. This allowed us to compute a Purchasing Power Parity index for the year 1937 and to build colony-specific price indexes.

Finally, a special effort was dedicated to devise our own estimates of GDP for France and each colonial territory. For NA and SSA, these estimates are obtained by backward extrapolation using 1950s national accounts and real growth estimates by Samir Amin (NA) and Angus Maddison (NA & SSA). For Indochina, we draw from nominal GDP figures provided by Jean-Pascal Bassino, and use our own price deflator.

3. A rather high, adaptive and increasing fiscal extraction

A sizeable colonial state

Table 2 provides descriptive figures on the size of the colonial state in each region, for the years 1925 and 1955. Comparisons are also made with the metropolitan State, and with year 2010. 1925 is a year when (i) the second colonial Empire has reached its largest extension with the inclusion of Morocco in 1913 and Cameroon and Togo in 1920; (ii) the French civilian administration has replaced the military, has implemented indigenous conscription almost everywhere, and is able to draw stable fiscal revenues from the colonial economy. In 1955, Indochina has already set free, Tunisia and Morocco are about to get their independence and post-WW2 development plans are run both in NA and in SSA.

In 1925, the total fiscal revenue collected by central and upper-tier local administrations reached 8.6% of GDP in the Empire as a whole, half of the metropolitan figure (17.5). Fiscal extraction was not ridiculously low in the colonies. It was just the same as the metropolis in 1870 [check]. National government tax revenue ranged between 6 and 8% of GDP in 1930 Argentina, Brazil and Mexico (Sokoloff and Zolt 2007, p. 123). For the same variable, the French Empire just stands at 5.8%, i.e. at the bottom of the Latin American interval. Metropolitan France spent some 3% of GDP in debt service, and 5% in the army. Colonies did borrow yet did not pay for military expenditures, and under the doctrine of self-financing that applied until WW2, their capacity to levy taxes directly determined their capacity to spend and to reimburse their loans. At the end of the day, civilian expenditures to GDP were close: 6.7% in France against 7.6 in the Empire; municipal expenditures push the metropolitan figure higher, at 10.1%, whereas among colonies they only matter for Algeria (8.2%). Of course, as France is nine times richer than its Empire, when measured in per capita terms the size of the metropolitan State is eleven times larger. If military expenditures are added this ratio gets even higher, as those directly allocated to the colonies, in particular through conscription, represent only a tiny share of the money spent by France for the defense of the metropolitan territory and for its imperial projection.[22]

Between 1925 and 1955, state size tremendously increased both in the Empire and in France. The exception was Indochina where after WW2 the French colonial state could not resume its control; the last data point is for 1953 and shows a decrease in fiscal capacity and in public spending (as well as a collapse of rice exports). Revenue to GDP went from 8.6 to 14.7% and from 17.5 to 29.0% respectively (when Indochina is counted apart). Figure 2 depicts the evolution of this indicator across time in each colonial territory. It went down during the two world wars, and then dramatically peaked in the 1950s both in NA and WCA. Madagascar also stands as an exception with its rather stationary profile. Independence years (1956, 1960, 1962) create an air pocket due to administrative disorganization, yet fiscal revenue quickly recovers afterwards, back to the 1955 level. In 1955, colonial fiscal extraction is again half of metropolitan.

Strikingly enough, Latin American comparators are then lagging behind, between 7 and 10%, while in French colonies central government tax revenue reaches 11% of GDP. In France public expenditures have risen to almost 30% of GDP and in colonies they stand much above fiscal revenue, at 21%, thanks to large transfers from the metropolis (see section 5 below).[23]

In 2010, the states of the former French Empire are collecting as much revenue as 26% of their GDP, in which the oil and mining sectors bring a very significant fraction (Table 2, bottom panel). Yet fiscal extraction on the rest of the economy is also higher on average than in 1955, slightly above 20%. All the increase is driven by North African countries, while Madagascar has regressed and West and Central African countries have little progressed.

The right part of table 2 also informs about the heterogeneity within the colonial Empire. In terms of revenue to GDP, the variance is in fact rather limited, in 1925 and even more so in 1955. Perhaps surprisingly, Indochina[24] and Madagascar are the colonies where fiscal pressure is highest (above 10%) in 1925, while WCA more expectedly lags behind (5.8%), because of AEF (3.5%) and newly acquired Cameroon (3.1%); NA settler colonies stand in the middle with rates ranging from 7 (Algeria) to 9% (Morocco). Given this, higher expenditures per capita in NA mostly result from higher wealth, not higher taxation. In 1925, they are two to three times larger compared to Indochina or Madagascar, and fivefold compared to SSA.[25] In 1955, WCA has impressively caught up with NA and Madagascar in terms of fiscal extraction. Most territories then lie in a narrow enough interval from 12% of GDP (AEF) to 17% (Algeria), except small

[22] In 1925 NA, the figure (128) is impacted by the War of the Rif. The 1955 figure (159) is also affected by the beginning of the war in Algeria.

[23] The expenditure gap would of course look much wider if we were including welfare expenditures like pensions or health insurance, whose weight increased a lot after WW2 in the metropolis, and only marginally for settlers in NA; the metropolitan figure would then climb to 42% [check].

[24] Indochina is rather close to the figure provided by Booth (2007) for colonial Burma (11.3% of NDP in 1926-7).

[25] These results are broadly in line with those of Frankema (2010) on British colonies for 1911-1937. Tax incidence is much higher in the metropolis, be it UK or France, than in any colony, even including the dominions Canada, Australia or New-Zealand where European descent settlers form the majority of population. Likewise, all "partial settlement" colonies, North Africa, South Africa, Southern Rhodesia or Mauritius, levy more taxes on a per capita basis than non-settler colonies. We differ in the way we make a correction for income: we use (very coarse) GDP estimates, where Frankema uses reported average wage for urban unskilled male workers; urban wages can imperfectly correlate indigenous income if the level of wage dualism varies, depending in particular on settlers' presence. Yet, in both cases, differences are much reduced, and we find that Algeria did not tax more than French West Africa but more than French Central Africa, while Frankema finds that South Africa ranked below the richest non-settler colonies like Gold Coast or Kenya, but much above the very populated Nigeria.

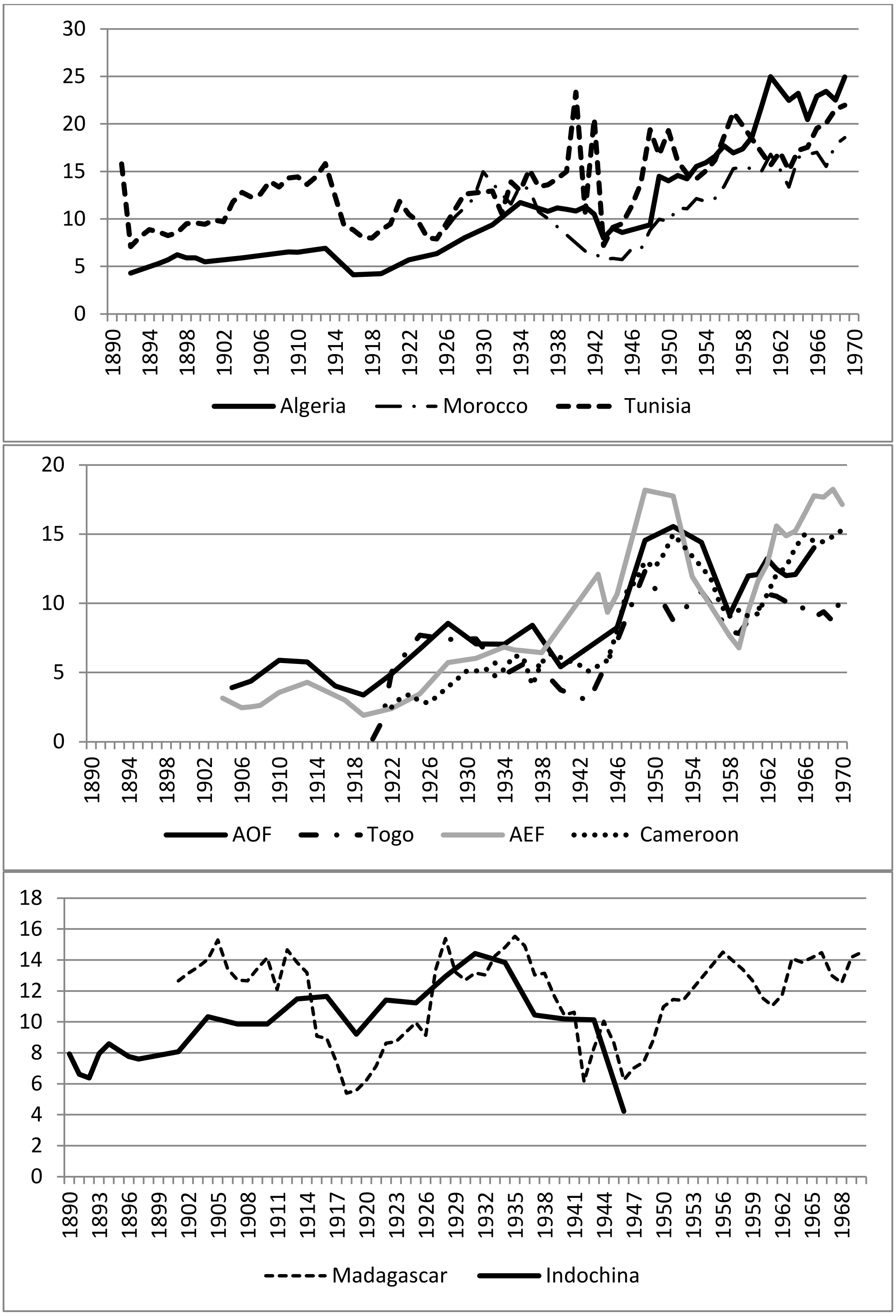
Togo at 10%. WCA also slightly converged in terms of income per capita, thanks to the post-war export commodities boom (Berthélemy 1980 on AOF and Togo).

Table 2 – Fiscal extraction and state size across the French Empire in 1925, 1955 and 2010

	Metropolis	Empire*	NA	Indoch.*	Madag.	WCA
Year 1925						
Population (millions)	40.61	64.51	13.67	26.06	3.57	21.27
GDP per capita (1937 FF)	7,765	828	1,876	632	693	552
Share of Europeans (%)		1.9	8.1	0.1	0.5	0.1
Imports/GDP (%)	20.4	24.6	32.4	15.4	32.4[a]	18.3
Exports/GDP (%)	21.1	20.7	21.8	21.6	29.3[a]	14.8
Revenue / GDP (%) w/o municipalities	17.5	8.6	7.5[b]	12.4	9.9	5.8
Central government Tax Revenue / GDP (%)	13.0	5.8	4.8[b]	7.6	8.4	5.2
Civilian Expenditures / GDP (%)	6.7	7.6	7.1[b]	10.8	8.3	4.6
Estimates with municipalities	10.1	8.2	8.1[b]	10.9	8.3	4.8
Civilian expenditures per capita (1937 FF)	524	63	133[b]	68	57	25
Estimate with municipalities	783	68	152[b]	69	57	26
Metropolitan military exp. per cap. (1937 FF)	373	34	128	11	13	6
Year 1955						
Population (millions)	43.43	61.26	22.36	*34.58*	4.92	34.01
GDP per capita (1937 FF)	11,938	1,476	2,399	*477*	1,118	922
Share of Europeans (%)		2.9	7.0	*0.15*	1.2	0.4
Imports/GDP (%)	11.9	25.4	28.3	*16.9*	18.6	18.9
Exports/GDP (%)	12.2	18.6	19.8	*4.1*	13.1	16.0
Revenue / GDP (%) w/o municipalities	29.0	14.7	15.2	*9.4*	14.6[c]	13.9[d]
Central government Tax Revenue / GDP (%)	25.0	10.9	10.5	*7.1*	6.8[c]	12.4[d]
Civilian expenditures / GDP (%)	25.7	18.8	19.9	*7.0*	18.8[c]	16.7[d]
Estimates with municipalities	29.8	20.9	23.5	*7.6*	18.8[c]	16.7[d]
Civilian expenditures per capita (1937 FF)	3,070	277	479	*33*	210[c]	154[d]
Estimate with municipalities	3,554	308	564	*36*	210[c]	154[d]
Metropolitan military exp. per cap. (1937 FF)	1 144	80	168	*123*	53	26
Year 2010						
Population (millions)	65.03	357.46	78.67	107.69	21.08	150.01
GDP per capita (1937 FF)	46,807	2,840	7,136	2,240	720	1,318
Revenue / GDP (%)	25.2	26.3	31.6	22.7	11.2	18.8
Revenue / GDP (%), non-mineral	25.2	20.6	22.1	21.7	11.2	15.3
Tax Revenue / GDP (%), non-mineral	25.2	18.0	19.6	19.3	9.2	13.8

Notes: *: 1955: Empire average is without Indochina. Data on Indochina is 1953 (except PMS region 1954); a: 1926; b: Morocco 1926; c: 1956; d: AEF =1954.

Figure 1 – Fiscal revenue to GDP from 1890 to 1970



Notes: Revenue to GDP with provincial and departmental revenue included, but not municipal revenue.

Colonial fiscal capacity was in most regions not too low since the beginning. Furthermore, colonial administrations managed to double fiscal extraction between 1925 and 1955, especially in the first decade after WW2. We now describe how they adapted the tax structure to contexts and historical periods.

Fiscal adaptation across space and time

Detailed data on public revenue allowed us to reliably categorize taxes from the most archaic to the most modern, i.e. from tools involving only light administrative management like head tax (*capitation*) or monopolies (salt, opium, tobacco, alcohol, post and telegraph, registration fees, land rents, etc.) to taxes demanding up-to-date registers and/or detailed observation like income, turnover or large spectrum transaction taxes, going through taxes on external trade and a whole range of intermediate tools like excise taxes. Unsurprisingly the tax structure of the metropolitan state is by far the most "modern". As early as in 1925, monopolies only provide 13.3% of total revenue, while direct and indirect "modern" taxes on income or production bring 31.5% (Table 3, column 1). In 1955, the metropolitan tax structure has further modernized, as the latter share reaches 53.5%.

Table 3 – Tax structure 1925 and 1955

	Metropolis	Empire*	NA	Indoch.*	Madag.	WCA
Year 1925						
Capitation	0.0	11.3	1.1	13.1	32.4	27.4
Monopolies	13.3	28.7	31.2	34.1	15.5	10.0
Intermediate & Other	49.7	35.1	34.8	39.5	26.7	26.4
Trade	5.5	17.9	16.7	12.0	25.4	36.1
Modern direct & indirect	31.5	7.1	16.3	1.3	0.0	0.1
	100.0	100.0	100.0	100.0	100.0	100.0
Year 1955						
Capitation	0.0	5.7	0.0	*0.4*	17.6[a]	14.2[b]
Monopolies	7.5	20.7	26.5	*21.0*	14.6[a]	10.8[b]
Intermediate & Other	30.8	37.7	31.1	*36.4*	18.3[a]	23.3[b]
Trade	8.2	21.5	9.6	*38.0*	37.2[a]	41.0[b]
Modern direct & indirect	53.5	24.3	32.7	*4.2*	12.3[a]	10.7[b]
	100.0	100.0	100.0	*100.0*	100.0	100.0

Notes: Capitation includes taxes on cattle. *: 1955: Empire average is without Indochina. Data on Indochina is 1953 (except PMS region 1954); a: 1956; b: AEF = 1954.

Within the Empire, the North-African tax structure is the closest to the metropolitan, relying for 16.3% on modern taxes in 1925. Algeria first, then Tunisia had gradually adopted a copy of taxes existing in metropolitan France, in particular direct taxes on wages, benefits, income from personal property, real estates, trading licenses, as well as a general income tax that came on top in 1919 Algeria and 1928 Tunisia. "Modernization" also meant suppressing or decreasing the weight of traditional taxes that were a legacy of the Ottoman period: the so-called "Arab taxes" disappeared in 1919 Algeria (Todd 2009), while in Tunisia the product of *ad valorem* taxes on income drawn from agricultural exports (olives, cereals, wine, etc.) gradually overcame the product of ancient taxes on palm or fruit trees, land for vegetable farming or cattle (Nicolai 1962, p.443). Morocco started this modernization process later, as it fell late under colonial rule, and did not receive as many settlers overall. The tax on agricultural income called "*tertib*", a reformation of disparate precolonial taxes initially introduced by sultan Moulay Abdelaziz in 1901 then withdrawn, made the bulk of direct tax revenue until the end of 1940s, after which its share gradually declined to one third in 1955. As for taxation of trade, Algeria, and Tunisia with a few exceptions, formed a custom union with metropolitan France, so that neither imports from France nor exports to France were taxed; only dock dues ("*octroi de mer*") applied as they applied to other origins. In contrast, because of treaties signed in 1911 regulating the protectorate, in Morocco French imports had to be taxed at the same rate as other nations; this impediment was gradually circumvented through excises on imported goods. As everywhere in the Empire, import tariffs were raised in Tunisia and Morocco during the Great Depression and WW2 then went down only slightly after 1946. Table 4 breaks down the 1925-1955 variation in revenue to GDP into tax types, and shows that "modern" taxes are responsible for half of the increase in fiscal extraction over the three decades (3.8 percentage points over a total variation of 7.7).

Table 4 – Fiscal modernization between 1925 and 1955

	NA	Madagascar	WCA
Variation in revenue to GDP 1925-1955[a]	+7.7	+4.6	+8.1
Capitation	-0.1	-0.7	+0.4
Monopolies	+1.7	+0.6	+0.9
Intermediate & Other Resources	+2.2	+0.0	+1.5
Import taxes	+0.2	+2.6	+2.2
Export taxes	+0.0	+0.3	+1.4
Modern direct & indirect	+3.8	+1.8	+1.5
Import taxes with constant import share[b]	+0.4	+4.7	+1.8
Export taxes with constant export share[b]	+0.0	+1.0	+1.4

a: in percentage points. Madagascar = 1925-1956; AEF = 1925-1954.

b: computed as $(\tau_{1955} - \tau_{1925})\left(\frac{S_{1925}+S_{1955}}{2}\right)$, where τ is the average tax rate on imports (resp. exports) and S is the share of imports (resp. exports) in GDP.

The other areas, Indochina, Madagascar and WCA, display rather similar structures in 1925, in that they relied more on *Ancien Régime* taxation, capitation and monopolies.

In Indochina monopolies of opium, imported alcohol and salt brought alone 25% of total revenue, while taxes on local alcohol, tobacco and mineral oil brought an additional 10%. Opium was 'deliberately a Chinese tax', as it was purchased mainly by wealthy ethnic Chinese, although it gradually extended to Indochinese urbanites (Bassino 2000 p. 281). Like in NA, taxation of trade was limited by the custom union prevailing with metropolitan France. Among local governments, the small but wealthy Cochinchina, where many of the French and Chinese were found, contributed more than other territories, to the benefit of poorer Tonkin and Annam as there was some resource pooling organized by the general government (Bassino 2000 pp. 279-80). Local governments drew the bulk of their resources from direct taxation, mainly the head tax on autochthons, the land tax on paddy fields which mainly weighted on them, and trading licenses more or less equally shared with settlers.[26] A minimal lump-sum tax based on twelve income brackets and a wage tax had been in place since 1920, then a general income tax was introduced between 1938 and 1941 and extended to Chinese and Indochinese, yet Europeans were not enough to generate large revenue. According to our estimates drawing from income tax data, the average European was five times richer than in NA, and Europeans earned around 9% of total national income while being not more than 0.12% of population (Appendix 1). The budget of Indochina could not afford relying on the taxation of this tiny European enclave, as wealthy as it was. This structural feature is the main explanation for the archaic taxes that were implemented.

Madagascar and WCA relied very much on capitation, a head tax that was paid for every individual except children (with varying minimum age thresholds), and oldsters and physically impaired; civil servants and military soldiers were also exempted. The lump-sum amount could vary across colonies and even districts. In 1925 WCA, capitation alone weighted 27% over 37% when adding revenue from state monopolies. In Madagascar, it brought 26% of total revenue; the tax on cattle brought another 6% and revenue from public monopolies and state-owned land counted for 16%, putting "old-style" taxes share at a very high 48%. Since the very beginning of 20th century, capitation rates had been set at much higher levels in Madagascar (Jacob 1987) compared to WCA (Cocquery-Vidrovitch 1968 & 1972). This, and secondarily the cattle tax and monopolies, explains why tax revenue in the former was almost twice the level raised in the latter.

Corvée labor from the so-called "*prestations*" system set in 1912/15 SSA represented an in-kind taxation, which came in addition to using conscription reservists in public works (Fall 1993). Our figures do not include monetary equivalents of these labor payments, except when they were rebought in cash. Marlous van Waijenburg translates *corvée* labor days into francs using unskilled labor minimum wages. She finds that in 1925 *corvée* labor meant a 9 to 71% addition to individual colonies' revenue; when weighted by colonies' budgets[27] the average increase is 20% for WCA, i.e. a lower amount than capitation (27%) (van Waijenburg 2018). Taking into account this upper bound estimate would raise our share of "capitation + corvée" to (.27+.20)/(1+.20)= 39% in WCA. In Madagascar, the colonizer had rather made the choice to set high capitation rates[28], so that *corvée* labor only brought an additional 11% of revenue, bringing the share of "capitation + corvée" to exactly the same level.[29]

Taxes on trade represented a quarter of tax revenue in Madagascar, and the highest share overall in SSA (36%). Madagascar had a custom union with metropolitan France, so that duties were limited, yet the consumption of a few imported goods was taxed, and exports were taxed. In the rest of SSA, import tariffs could be fixed according to domestic conditions and

[26] 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).

[27] From Frankema & van Waijenburg 2014, Table 2, p 383. For reasons explained thereafter we do not think that these individual colonies budgets are properly reconstituted, yet the federal average should fit.

[28] In order to break with the very unpopular intensive forced labor practices of the precolonial *Merina* kingdom, see Jacob 1987 and Campbell 2005. In counterpart, conscription reservists (the so-called SMOTIG, *Service de la Main-d'Œuvre des Travaux Publics d'Intérêt Général*) were used intensively between 1928 and 1945 (Fremigacci 2014 p. 50); they are not counted in Waijenburg's estimates.

[29] For 1913/15, the contribution of *corvée* labor was much higher, the SSA average figure from van Waijenburg being 43%. For 1934, one gets a figure close to the one of 1925. In 1946, forced labor was outlawed in French colonies.

circumstances, even if the general principle of favoring or exempting French imports also prevailed, except that treaties imposed limitations for Côte d'Ivoire and Dahomey in AOF, and for all colonies in AEF except Gabon (Congo River Basin) (Bernard 1913; Naudin 1929; Cornevin 1972 pp. 294-295). Trade taxes were most often raised at harbors whatever the final destination within the Federation, so that imports and exports of landlocked colonies, and revenue from them are strongly underestimated in administrative records.[30] Hence it is not straightforward to reallocate federal revenue to individual colonies and to assess federal redistribution. Although coastal colonies had most likely (but gradually) turned more buoyant than landlocked, granting them all custom duties collected in harbors leads to overstating their tax revenue and understating the share of head tax in this revenue, so that the negative correlation between the share of direct taxes and total public revenue should be smaller than the one found by Frankema and van Waijenburg (2014, pp. 384-386). Yet, within French SSA, it is still true that in 1925 AOF collected twice the tax revenue of AEF, whether in capita or in GDP terms, and at the same time depended less on capitation (or on monopolies); the same is true when comparing Togo to Cameroon.[31] Hence what is salient is a West/Central contrast, similar to the West/East one that Frankema (2011), and Frankema and van Waijenburg (2012 & 2014), reveal among British colonies, rather than a coastal vs. landlocked contrast. This contrast was most likely due to (i) a higher initial extraversion of West Africa dating perhaps from the time of 'legitimate commerce' (Law 1995); (ii) above mentioned differences in international trade agreements applying to each territory. This contrast actually vanished at the end of 1930s (see Figure 1, middle panel) and was no longer visible in 1955: all areas in SSA were then displaying the same fiscal revenue and very close tax structures; GDP estimates by the French administration in 1953 ranked AOF above AEF, but Cameroon much above Togo.[32]

Between 1925 and 1955, a significant modernization of the tax structure also occurred in Madagascar and WCA: the share of capitation and monopolies declined to 32% in the former, to 23% in the latter while the one of modern taxes shifted from 0 to 11-12%. In colonies like Senegal, which were wealthier than average and where French colonists were settled in larger numbers, the income tax introduced in the 1930s began to raise more revenue than capitation, and the turnover tax almost as much. Yet the extent of this modernization was more limited than in NA. At the same time the share of trade taxes increased dramatically. As shown in Table 4, in WCA (especially AOF and Cameroon), this was mainly the result of a rise in the average tax rate on imports (while the share on imports on GDP stayed roughly constant), combined with the rise in the tax rate on cash crop exports.

In 1953 Indochina, the French grip had gotten much weaker, the autonomous government of Vietnam had suppressed capitation and monopolies revenue had lost weight, yet modern taxes had little progressed. In a context where the colonial state was losing ground, trade taxation had become the dominant source of revenue, with a 38% share against (12% in 1925).

[30] As acknowledged in: Gouv. Gal de l'AOF, *Budget Général Année 1925*, Gorée : Imprimerie du G. Gal, p. xx-xxi.
[31] Figures not shown in the tables. Fiscal revenue in 1925 per capita (FF 1937 PPP)/per GDP (%): AOF = 37/6.7; Togo = 46/7.7; AEF = 18/3.5; Cameroon = 17/3.1. In 1955: AOF = 137/14.5; Togo = 84/10.0; AEF (1954) = 92/11.9; Cameroon = 134/13.4.
[32] GDP per capita in 1955 (FF 1937 PPP): AOF = 940; Togo = 835; AEF = 788; Cameroon = 1001. Immediate post-WW2 estimates for 1947 are closer to each other.

Increasing progressivity in taxation?

Our data do not allow conducting a precise incidence analysis. In settlement colonies of NA, Europeans and Jews for sure paid a large share of the tax bill, given their weight in total income. They paid a disproportionate share of the direct taxes in Algeria and in Tunisia[33]; less in Morocco, because of the agriculture tax mentioned above. They also paid quite a lot of the taxes on imported consumer goods, alcohols in particular. Generally speaking, most of the modernized taxation apparatus applied to a formal sector built around the settlers' enclave, so that Europeans also paid a large share of turnover taxes and of registration fees.[34] Anyway, as seen in Figure 1, it does not seem that tax collection collapsed after independence when the majority of Europeans left these countries. This was most likely obtained through a quick replacement of settlers by Autochthons in "formal" salaried and non-salaried positions, involving large recruitment in civil service and army and shifts in capital or land property, and through an increase in tax rates. In contrast to NA, in Indochina, Madagascar and WCA, Autochthons were bound to pay the majority of the tax bill. This however does not tell us how much each group was taxed in proportion of its own income.

Appendix 1 shows tentative estimates for the income shares of Europeans and Autochthons, using novel data from income tax tabulations (Alvaredo, Cogneau & Piketty 2017). We also tried to break down the autochthonous population into "urban and rural non-poor" and "rural poor", in order to simulate more easily the distribution of the tax burden. Specifically, the rural poor are assumed to be taxed mainly via capitation and agricultural exports, and in Morocco by the *tertib*; the non-poor are assumed to pay the same tax rate as Europeans in proportion of their income - with the only exception of capitation. Given this, the overall tax rate on income is bound to be higher for Europeans than for Autochthons.

Our estimate for 1925 NA is a 2.7 percentage points difference: 8.9 against 6.2%. Given the large gap in average income, taxation is very little progressive. Autochthons are estimated to pay at most 38% of the total tax bill. For Algeria only, Ageron (1990 p. 66) estimates this share to 47% before WW1, and to 27% after the suppression of Arab taxes in 1919; we find almost the same figure (28%) for 1925 Algeria. In other colonies, our estimates suggest that Europeans were taxed higher than in NA, from around 12% in Madagascar and WCA to 24% in Indochina; this could reflect that they had less political voice there. Yet this did not mean that Autochthons were less taxed, as their own tax rates range between 5 (WCA) and 11 % (Indochina); taking into account the *corvée* in WCA would put the autochthonous tax rate above the NA level. At the end of the day, Autochthons were probably less taxed in Algeria than in Morocco, slightly less taxed in NA settlers' colonies than in others, and more taxed in Indochina and Madagascar than everywhere else.

After WW2, the modernization of the tax system should have improved its progressivity along the racial line, as the formal sector increased its contribution. Yet, at the same time more Autochthons began to live in cities, got wage jobs, and consumed formal goods, so that the shift in progressivity could be more ambiguous. According to our estimates, in 1955 the respective contributions of Europeans and Autochthons had turned rather homogeneous across colonies:

[33] In 1955 Tunisia, Europeans represented 75% of income tax payers, and the remaining 25% were perhaps overwhelmingly paid by Jews (Alvaredo, Cogneau & Piketty 2017). See also Nicolai 1962 pp. 447-450.

[34] For 1956 Tunisia, Nicolai estimates that indirect taxes paid by Europeans could be more than 50% of total indirect tax revenue (Nicolai 1962, p. 453).

Europeans would have been taxed for 20-24% of their income, when Autochthons disbursed around 12%. The ratios of before tax to after tax income indicate a rather tenuous increase in progressivity along the racial line. However, modernization also implied more progressivity among Autochthons, as taxing more imports, incomes, and generally the formal sector meant that the richest Autochthons contributed more. This latter conclusion is much less ambiguous than the former.

In sum, the French colonial states managed from the start to extract significant fiscal resources, by taxing sometimes rather heavily the Autochthons. As time went, and especially after WW2, they succeeded in doubling extraction while shifting to more modern tax systems with better distributive properties.[35] However, this extractive efficiency of the colonial state did not come with productive efficiency, neither with fairness, as we are going to see in the next section by examining expenditures.

4. The true nature and legacy of the colonial state: bias and costs

The true limitation of the colonial State was its very colonial nature. It basically meant that expenditure was biased and costly.

Biased expenditures

On the biasedness side, it had to serve first the interests of French colonists and capitalists, by favoring costly investments in railways and harbors to connect mines and plantations, but also by providing settlers with urban public services at metropolitan standards (education, health assistance, electricity).

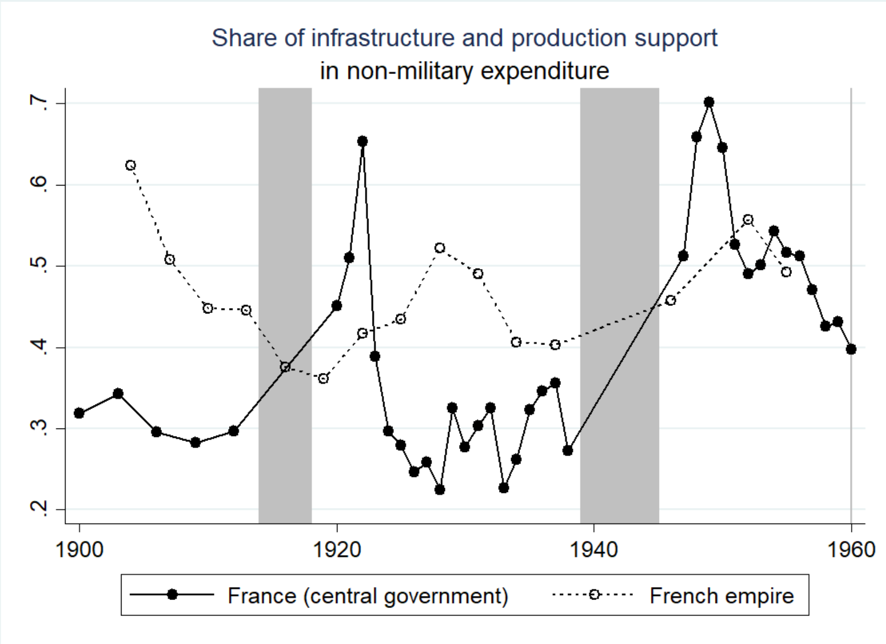
Tables 7 provide a few elements on the structure of expenditures by sector, for 1925 and 1955. Here again, budgets' data collection, homogenization and aggregation were organized in order to make expenditure headings comparable across space and time.

In all colonies, a large share (33 to 49%) of public expenditures went to infrastructure, in particular transportation, and to what we call support "production support", like post and telegraph or transfers to concessionary companies. A large fraction went in particular to railways, in the form of subsidies to private companies in the first place, in direct investment financed by loans or in buying back the private capital, then in subsidies to the operating national company. The only exception to this rule was post-1945 Indochina, where warfare prevented large scale infrastructure projects which were only reaching a 24% share in 1953.

As Figure 2 shows, the dates of 1925 and 1955 are not very representative of metropolitan spending, as reconstruction efforts after the two World Wars were then absorbing large public investments. Before WW1 or during the 1930s, the share of this type of expenditures was much higher in the colonies compared to metropolis. Yet, despite some catch-up between 1925 and 1955, the gap between the metropolis and the colonies remained huge in terms of electricity output, roads and railways. Indochina was particularly lagging behind (data for 1943).

[35] It seems that the consolidation of the fiscal apparatus also went with a strong decrease in the time volatility of tax revenue, see Andersson, 2018, paper II.

Figure 2



Railway companies were a favorite investment of colonial capitalists, as it was secured and subsidized by public money. The drawing of railways, main roads and harbors were meant to help the routing of mines' and plantations' outputs. Further, especially before WW2, public subsidies were also directed to the settlement of French farmers in NA, or to colonial societies in SSA or Indochina. Rural roads, small scale irrigation projects, input access and agricultural extension benefitting autochthonous smallholders were not prioritized. NA colonies received more electricity but did not end up better endowed than others with roads or railway lines, because settlers lived in cities.[36] Agricultural investments remained concentrated in regions with high potential and a significant presence of European farmers or traders, like the groundnut basin in Senegal, the Office du Niger for cotton and rice in Soudan, or the rice-producing Mekong delta in Cochinchina.[37] However biased they were, and despite high investment and operating costs, infrastructure investments were still transformative. In particular, railway lines and major roads stimulated autochthonous initiatives in cash crops, and spurred the growth of larger and wealthier cities (Jedwab & Moradi, 2016; Jedwab, Kerby & Moradi, 2017).

The shares of education in both expenditures and employment were higher in the metropolis, where they respectively reached 20 and 32% in 1925, then 14 and 35% in 1955[38]; corresponding figures in the Empire were 8 and 13%, then 11 and 18% (see Table 7 for shares in expenditures). According to aggregate figures, NA colonies seem to have exerted a larger educational effort than others, especially Algeria which spent 11-12% in both years and where

[36] The metropolitan average is perhaps not the best comparator, if only to assess the post-WW2 infrastructure effort. If we instead take one of the most disadvantaged departments in mainland France, *Creuse*, the density of electricity stood at par with Algeria in 1925, yet reached double (192.8 kWh per capita) the Algerian level in 1955. Even more impressively, *Corsica* island had almost no electricity in 1925 (1.3 kWh p.c.), then lied above Algeria (130 kWh p.c.) in 1955. From this standpoint, the *Corrèze* (another relatively poor department next to *Creuse*) was indeed preferred to *Zambèze*, as urged by the famous motto of the "Cartierist" political movement in the 1950s ("*La Corrèze plutôt que* [rather than] *le Zambèze!*").

[37] Dumont (1966) harshly criticizes this biasedness of post-WW2 investments under the FIDES.

[38] The drop in the share of education expenditures is mainly due to the temporary increase of the share of public works for post-WW2 reconstruction.

education personnel constituted 36-37% of the total of civil servants. Yet this effort was dramatically biased towards European settlers. In Algeria, a specific credit line is reported for the European sub-sector, and we could calculate that 78% of total educational expenditures actually went to it in 1925, 82% in 1955; the same figure was also 79% in 1925 Morocco. In terms of expenditures per pupil, European children in Algeria finally enjoyed the same level as metropolitans. In contrast, in 1955 Algerian children received no more than in other parts of the Empire.

Among Autochthons, primary school gross enrollment rates (6 to 13 year-old) were extremely low in 1925: 4% in NA, 5% in Indochina, and 2% in WCA. This is counting only recognized public and private schools, not unofficial koranic schools[39], or municipal schools in Indochina.[40] In 1955, enrollment had increased, yet only to 18 in NA and 12% in WCA; 13% in 1943 Indochina. Tunisia, Madagascar and Cameroon displayed the highest rates, around 30%, followed by Togo (23%). In the case of Tunisia, modernization attempts in the 19th century led to the foundation of the Sadiki high school in 1875 (Sraieb 1993); then under French rule, bilingual "Franco-Arab" and "modernized" koranic schools likely encouraged indigenous enrollment. In contrast, in Algeria schools only taught in French, and the local government of settlers explicitly rationed the provision of education to Autochthons until late (Ageron 1979, pp. 152-167 & 532-536); yet enrollment accelerated in the 1950s so that at country independence in 1962, the rate was double the level of 1955, i.e. 33%. In the highlands of Madagascar (*Imerina*), a few protestant missions proposed some schooling as early as in the 1820s, and then were placed under state control by king Radama I (Campbell 2005 pp.86-89). In Togo and Cameroon, mission schools came in under German rule, yet it is only after WW2 that the secularist stance of the French Republic was relaxed enough to authorize and subsidize a larger number of mission schools (Cogneau & Moradi 2014; Dupraz 2017). At secondary level, only Tunisia, followed by Madagascar and Cameroon, lie significantly above the average, although at very low levels (respectively 3.4, 1.8 and 0.8% of 11-18 year-old indigenous children, while at the same time this gross rate reached 19.2% in metropolis). At the end of the day, even with the Tunisian exception, the educational performance of settlement colonies is far from impressive.

[39] Koranic schools in Algeria gathered 36,000 pupils in 1932, 100,000 pupils in 1950, see Kateb 2004.

[40] In these estimates, Jewish children in Tunisia and Morocco are counted apart: in 1925 they already enjoyed universal primary schooling, like Europeans.

Table 7 – Public expenditures and development outcomes in 1925 and 1955

	Metropolis	Empire*	NA	Indoch.*	Madag.	WCA
Year 1925						
Infrastructure & support to production						
Share in expenditures (%)	41.8	43.5	49.6	37.6	32.5	46.1
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	1.10	n.a.	0.6	0.1	n.a.	0.2[b]
Education						
Share in expenditures (%)	20.3	7.4	9.3	6.7	6.4	3.6
Gross primary enrollment, autochthons (%)	135.3	3.5	4.1	4.7[c]	n.a.	1.7[d]
Government schools only (%)	108.4	n.a.	3.8	4.2	n.a.	n.a.
Health						
Share in expenditures (%)	5.9	5.8	6.6	4.3	11.5	5.8
Public health personnel per 1000 inhabitants	1.40	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[d]
Administration, Finance, Justice and Security						
Share in expenditures (%)	31.9	32.0	24.8	41.6	27.8	30.7
Share in employment (%)	25.0	56.0	46.1	63.5	55.1	58.4
Year 1955						
Infrastructure & support to production						
Share in expenditures (%)	54.9	49.2	47.3	*24.0*	45.9[e]	53.9[f]
kWh per inhabitant	1,148.0	39.5	91.0	*3.4*[h]	11.8	5.9
Roads meters per 1000 inhabitants	15.0	4.7	5.0	*1.0*[h]	5.9	4.4
Railroads meters per 1000 inhabitants	0.9	0.2	0.3	*0.1*[h]	0.2	0.1
Education						
Share in expenditures (%)	13.5	11.3	13.4	*10.9*	7.0[e]	7.7[f]
Gross primary enrollment, autochthons (%)	109.8	14.5	17.6	*13.1*[h]	32.2	12.4
Government schools only (%)	92.9	10.7	17.1	*11.4*[h]	20.9	6.4
Health						
Share in expenditures (%)	11.6	8.1	7.7	*6.5*	8.3	8.7
Public health personnel per 1000 inhabitants	n.a.	0.58	0.65[g]	*0.17*[h]	0.82	0.54
Medical staff per 1000 inhabitants	1.97	0.30	0.29	*0.04*[h]	0.50	0.27
Administration, Finance, Justice and Security						
Share in expenditures (%)	15.8	21.8	24.5	*42.2*	16.2[e]	17.2[f]
Share in employment (%)	25.9	42.1	47.4	*n.a.*	n.a.	38.5

Notes: *: 1955: Empire average is without Indochina. Data on Indochina is 1953 (except PMS region 1954), except when noted (see h); a: Algeria and Morocco only; b: AOF only; c: Autochthonous municipal schools not taken into account; d: AOF, Togo and Cameroon only; e: 1956; f: AEF = 1954; g: Tunisia only; h: 1943.

The same conclusion holds for health. In the metropolis, the provision of health assistance and medical services mainly relied on the private sector on the one hand and on lower administrative layers (*départements* or municipalities) on the other, and it is only under the Fifth Republic (after 1958) that a national and centralized public health system took off. This explains why health does not get a much higher share of expenditures compared to colonies. In colonies the private sector was less developed, yet the same kind of bias applies to settlement colonies of NA. Then, with this indicator colonies do not look too different from each other; the most favored is Madagascar in 1925, thanks to a specific effort there towards indigenous basic health assistance ("*Aide médicale indigene*"). The total number of health professionals (physicians, pharmacists, dentists and midwives) per inhabitant is easier to compare across areas. According to these estimates, the metropolitan health supply stands far above (1.27‰). In 1925, Algeria came second (0.23‰ in 1925 while Morocco is at 0.05), followed by Madagascar (0.08). Yet in 1955, all colonies had converged towards a narrower interval ranging between 0.18 (Morocco) and 0.50‰ (Madagascar, Algeria being at 0.40). Here again, 1943 Indochina is dramatically lagging behind (0.04‰).

In 1925, "sovereignty spending" i.e. general administration, financial services, justice and security, still represented one third of expenditures and gathered the majority of public employment, even more if including military spending funded by the metropolis (see Table 2). Security in particular meant many low-pay indigenous police force (59% of sovereignty employment), especially outside of NA colonies. In 1955, this kind of spending had lost its weight in Madagascar and WCA, both in budgets and in labor force. The number of police men had little increased in per capita terms, but they turned more professional, with wages in this sector being very significantly raised, especially after 1949. In NA, such a move was not observed, and sovereignty spending kept the same share in 1955 as it had in 1925. By all means, the ratio of education and health investments to "order" spending, considered by Frankema (2011 p. 144) for pre-WW2 British Africa, had everywhere increased after 1945, signaling a more developmental orientation, and non-settler colonies had caught up with NA in this respect.[41] Expenditures remained significantly biased, but bias had decreased, outside of the Indochinese wartime exception. Besides, this greater emphasis on development also came with increasing costs, as Autochthons were reclaiming equal access to high-standard public goods as well as equal pay in civil service.

High costs

The wage costs of the colonial states had always been high, firstly because of the high emoluments and bonuses paid to expatriate French civil servants (on West Africa, Huillery 2014).

Before WW2, three wage schedules were distinguished in colonial civil service: "European" or "metropolitan" / "federal" or "common / "local". They referred to the capacity to exert functions in all territories including metropolitan France / in a group of colonies (AOF for instance) / in a given colonial territory only. Before WW2, only French citizens could be found in the metropolitan schedule. For a given nominal position, the base wage could be 20 to 50% lower

[41] Circa 1925, the structure of expenditures in French West and Central Africa is very similar to the one observed by Frankema for British Africa. See Frankema 2011, p. 142, Table 3. Our own analysis in a companion paper suggests that in West Africa, British colonies went through the same evolutions as French colonies after WW2; see Cogneau, Dupraz & Mesplé-Somps, 2017.

in the local schedule compared to the metropolitan.[42] It is hard to evaluate what were the respective shares of racial discrimination on the one hand, of differences in training and skills on the other hand, in this wage gap; indeed positions carrying the same name (for ex., "teacher 2nd class") implied different exams and degrees in each schedule.

On top of the gap in base wages, bonuses meant to compensate for expatriation could be very high: from 25 to 70% of gross wage, depending on the territory and/or the period, to which a variety of allowances for remoteness, riskiness, housing, family charges and cost of living were added. In Algeria and after WW1 in Tunisia, French settlers hired on the spot also received a 30% wage bonus ("*tiers colonial*"), even when they were natives and did not suffer from homesickness.[43] Even if they were reserved to French citizens in the first place, in skilled occupations like teachers, some of these allowances could be extended to Autochthons, this pulling all the wage schedules upward.[44] Another example of this anchoring of Autochthons' wages to Europeans' wages is given below in the case of Indochina.

Budget accounts for Madagascar and Indochina in the 1920s and 1940s are the rare ones in our data that allow breaking down the workforce and the wages by citizenship.

As shown in Table 5 (first and second rows), French civil servants represent in 1925 Indochina 12% of total employment in central government, but 58% of the wage bill; corresponding figures for Madagascar are close: 11 and 56% respectively.[45] Similar data for 1943-1946 (Table 5, bottom panel) show that the Autochthons' share in public employment little moved over two decades, as if the French share was incompressible in high positions.[46]

Yet their average compensation is strikingly 2.52 times (+152%) higher in 1925 Indochina compared to 1945, and also compared to Madagascar at both dates.

At the top of the hierarchy, the general governor is paid 1937 PPP FF 406,000 in 1925 Indochina vs. 280,000 in Madagascar, hence a 45% difference only. The base nominal wage in current francs is in fact different by 25%: 50,000 vs. 40,000. They receive the same large bonuses, about 2.8 times the base wage (at the 1925 exchange rate of the piaster), comprising not only the so-called "colonial supplement" but also travel and entertainment expenses. The rest of the difference then stems from price levels which are 18% lower in Indochina, according to our estimates. However, in 1925 Indochina the same level of bonuses applies to all French civil servants, more than tripling the base wage in francs. In Madagascar, like in other SSA colonies, bonuses and allowances only reach 70% of base wages.

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42 One example is provided for teachers in Togo by Gbikpi-Benissan, 2011, vol. 2, p. 203.

43 Interestingly, this kind of bonuses were also applied to overseas territories that remained French after 1960, and are still applied today whatever the place of origin of the civil servant.

44 For instance West African teachers exerting outside of their colony of origin, i.e. in the intermediate "federal" schedule, benefitted from a remoteness allowance ("*indemnité de dépaysement*") equal to 4/10 of base wage. Further, from 1925 to 1935 all indigenous teachers in Togo were granted a special bonus ("*indemnité spéciale du Togo*"), first equal to 6/10, 7/10 in 1927, and then gradually diminished to 3/10 in 1933 before to be cancelled due to financial restrictions. Gbikpi-Benissan, 2011, vol. 2, p. 205.

45 In Madagascar, data on employment and wages by citizenship and administrative sector are for 1921 and 1929, yet total wage bill by sector is observed for 1925. We estimate employment by sector in 1925 as the average of the two former years, and deduct wage differences. In Madagascar, the average wage computed from definitive accounts is slightly higher than the one computed from provisional budgets, by 12%; in Indochina it is slightly lower, by 5%. This makes that figures from Table 5 and Table 6 are not perfectly consistent.

46 Data for 1912-13 Indochina suggest that the share of French was just a bit higher, at 13%. Whereas it had expanded quite quickly from 1913 to 1925, public employment little progressed between 1925 and 1937, and little again in wartime. It even seems to have been reduced by 25% in Indochina occupied by Japan, and this reduction could have affected more the Indochinese personnel than the French.

Table 5 – 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	11	89
Share in wage bill (%)	58	42	56	44
Average annual public wage (1937 FF)	71,315	7,086	28,344	2,752
in units of GDP per 15+ pop.	66.6	6.6	28.1	2.7
in units of GDP per 15+ of each group[a]	1.1	7.3	1.0	3.6
Years 1943-1946				
Share in total employment (%)	10	90	12	88
Share in wage bill (%)	41	59	49	51
Average annual public wage (1937 FF)	29,541	4,392	24,893	3,452
in units of GDP per 15+ pop.	47.7	6.8	20.5	2.6
in units of GDP per 15+ of each group[a]	0.9	8.4	1.1	3.5

Notes: In Madagascar, data on employment and wages by citizenship and administrative sector are for 1921 and 1929, yet total wage bill by sector is observed for 1925. We estimate employment by sector in 1925 as the average of the two former years, and deduct wage differences. 15 year-old population was estimated at 59% (resp. 61%) of total population for 1925 (resp. 1945) Indochina, 69% (resp. 59%) for Madagascar; 71% (resp. 64%) for the French in both cases. In the bottom panel (1943-1946), data for Indochina do not comprise the general government, only 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 the correction of this bias is innocuous. Data on Madagascar is for 1946.
a: using estimates of average income of French and Autochthons, see Appendix Table A.1.

The story of these very high Indochinese wages is the following. At the beginning of WW1, the convertibility of the French franc into gold had been suspended. Due to the war, France accumulated large budget deficits, financed by monetary expansion, and trade deficits, resulting in high inflation and large depreciation of the franc against the dollar, the sterling and also the Indochinese currency, the piaster. Indochina rather displayed trade surpluses, the piaster was silver based, and inflation remained low throughout the war and in the 1920s. From 2.5 francs for one piaster in 1913, the exchange rate went down to 17 in 1926, then stabilized around 12 under the Poincaré government, before to be pegged at 10 after 1930 (Brocheux & Hémery, pp. 134-135. Giacometti, 1998).

From 1913 to 1917 in metropolitan France, nominal wages of civil servants had not been changed, hence had lost purchasing power a lot. Then, from 1918 to the end-1930s, nominal wages gradually recovered, starting with the lowest wages of postmen or teachers. 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 expatriates, metropolitan schedules directly applied to all colonies.

As the franc was depreciating quickly, translating wages set in francs into piaster would have led to huge losses in purchasing power. The government of Indochina then decided to set a specific schedule making correspond to every base wage in franc a colonial supplement in piaster (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, in line with the metropolitan policy of gradual wages recovery. It was revised each year all along the 1920s. Therefore the Indochinese supplement fixed in piaster ended up representing the bulk of the pay: in 1925, it ranged between 2 to 4 times the base wages, when going down the scale from the top (governor) to the bottom. In contrast with the metropolis, not only the real wages of French civil servants were preserved in Indochina, but they even increased quite sharply between 1913 and 1925, from 1937 PPP FF 52,649 to 71,315 (i.e. by 36%).[47]

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.[48] 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 rather 3,990 piasters in Indochina, worth 31,290 francs at the 1925 exchange rate; when transported to Indochina, his wage rate was then 41,245 francs rather than 15,852, or in 1937 PPP francs 87,300 rather than 25,588. The figure in Indochina is higher than in Table 5 because the supplement in piaster had tapering rates. We conclude that the bulk of the gap in French average earnings can be attributed to the setting of this "colonial supplement" in 1920-1930s Indochina. While the two colonies were rather close in average income, this gap meant that in Indochina the average French civil servant earned 66.6 times the GDP per worker, against 28.1 in Madagascar (Table 5, fourth row).

Why is it that the colonial supplement was so generous in 1925 Indochina? Strikingly enough, our tentative estimates of the average income of Europeans (Table A.1 in Appendix) stand at par with average wages in the civil service in both colonies (Table 5, fifth row).[49] 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, as well as 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 turned small, at all base wages; nominal wages in francs had recovered, so that the special supplement schedule had gradually lost its motivation. Further the bankruptcies of the Great Depression had also diminished private benefits, hence the civil servants' reservation wage (Brocheux et Hémery 1994, pp. 260-269). WW2 finished pulling down the 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 being halved between 1940 and 1945, and would never entirely recover. Between 1937 and 1945, inflation was extremely high in both colonies: in Indochina prices were multiplied by 5.8, even 6.7

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[47] 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.

[48] 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.

[49] Recall that, at least for Indochina, these are rather precisely measured thanks to income tax data collected by Alvaredo, Cogneau & Piketty (2017).

in Madagascar; yet nominal wages were less adjusted in the former. French public wages kept up with Europeans' average earnings in each place, as the latter collapsed by almost 60% in Indochina whereas we estimate that they only fell by 25% in Madagascar, mostly because the number of French colonists doubled in the 1930s, new immigrants being less affluent than first comers.

The setting of French wages also influenced that of Autochthons. In 1925, the average French civil servant was paid 10 times what the average Autochthon received in both colonies (Table 5, third row). This also means that the latter was paid 2.6 times (+158%) more in Indochina. It is quite surprising, as indigenous civil servants were not paid the colonial supplement. Some "parallelism" was actually sought between the metropolitan and the local wage schedule, in order to be able to attract apt Autochthons who could substitute to Europeans. During the period of the depreciation of the franc (1918-1930), a generous and progressive exchange rate was then applied to translate the wages from francs into piasters. In 1926 for instance, when the actual exchange rate was near to 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.[50] The wages of subaltern personnel, which had no correspondence in francs, were presumably also pulled upward. In all, the real wages of autochthonous civil servants also went upward between 1913 and 1925, from 1937 PPP FF 4,219 to 7,086, that is by 68%.[51]

Here again most of the gap in earnings with Madagascar can be accounted by policy. 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 6.7 times the GDP per worker, while the same ratio only reached 2.7 in Madagascar (Table 5, fourth row). According to Jean-Pascal Bassino's estimates for Indochina's GDP and to our own extrapolation of Madagascar's GDP, the average Autochthon was equally poor in the two countries. Then, as the "parallelism" motive pulls wages upward, dualism is twice larger in Indochina among the Autochthons, with average wage in civil service reaching 7.3 times the average Autochthons' income against 3.6 in Madagascar.[52]

In 1943-46, the Autochthons' average also improved significantly in Madagascar, so that it was only seven times lower than the French one, against ten times before. In Indochina, the Autochthons' once generous schedule was shifted down drastically, in parallel with the French's, yet their average wage displays the same ratio to the French level as in Madagascar (7, against 10 again in 1925). If only due to skills' upgrading, some catching-up process was under way.[53] Yet in both colonies dualism indicators little moved. As for Autochthons, the ratios of public wages to GDP per worker are the same as in 1925; again, in Indochina the collapse of average earnings in the private sector is almost perfectly parallel to the fall of public wages.

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[50] 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].

[51] Employment increases more in administrative sectors paying initially higher wages, like education and health, yet the composition effect is limited. The Paasche index of wages increases by 54% and the Fisher by 63%.

[52] The data we collected also allow us to look at the lowest paid teachers; in 1925 Indochina, the lowest teacher wage was 3.8 times the average Autochthons' earnings, whereas in 1925 Madagascar, the same ratio only reached 2.1. This difference could be overstated if we underestimate GDP in Indochina, at least in Annam and Tonkin. If only in Cochinchina, the reservation wage would be binding as much as in Madagascar, as the GDP per worker is there estimated to be 2.3 times the Indochinese average.

[53] In 1913 Indochina, this wage ratio was 12.7.

As already said above, Autochthons represented around 90% of public employment in 1925/1945 Indochina and Madagascar. Scarcer evidence suggests that the same proportion applied to West and Central Africa.[54] In North Africa, the share of Muslim Autochthons was much lower, given the labor supply from French settlers. They made not more than 40% of civil servants, concentrated in low-skill and low-rank positions.[55] We estimate their share at 37% in 1925 NA. Among French civil servant in NA, the share of natives must have varied greatly depending on the territory and the date considered; we estimate that only 5% of French civil servants had been hired in the metropolis in 1925 Algeria, against 36% in Tunisia and 63% in Morocco (where the protectorate was recent and settlers were still few).

The combination of wage bonuses with the composition of employment in terms of citizenship and origin (expatriate / settler / autochthon) translates into differential relative costs of public employment. Let's assume that in 1925 expatriate French civil servants all received a 7/10 wage supplement, except in 1925 Indochina were they received 30/10 (see above), and that French settlers in North Africa all received a 3/10 supplement. Let's also assume that bonuses do not stimulate labor productivity (no efficiency wage mechanism). Then, in comparison to the metropolis, the impact of bonuses on wage costs would have been +8-9% in Madagascar and WCA, +22% in Indochina, and +32% in NA (from 22 in Algeria to 44% in Morocco).[56] These calculations disregard any "pull effect" on Autochthons' wages. The "parallelism" mentioned above for 1925 Indochina actually raised the wage costs in this colony by +82%.

Due to high wage costs and also to the transport costs of materials imported from the metropolis, monetary expenditures overstate the volume of public service and output. Especially in NA and Indochina, the reality of service provision by civil servants lies between wage expenditures per capita and employment per capita, yet closer to the former than to the latter.

After 1950, the official distinction between citizens and subjects was abolished. The pre-war three schedules mentioned above were renamed "general" / "superior" / "local", in order to withdraw references to race, citizenship status, origin or place of recruitment that were explicitly forbidden by law.[57] Wage bonuses were at the same time significantly decreased. After 1950, executives in the upper-tier, most often from the metropolis, only received a 40% bonus in WCA

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[54] In 1926 Togo, African primary school teachers and lower rank instructors made 88% of education personnel (68% if we restrict to teachers): Gbikpi-Benissan, 2011, pp. 217-218. In 1938 Cameroon, 595 French men are enumerated in public service, according to a census (Ministère de la France d'Outre-Mer, 1947. *Annuaire Statistique du Cameroun 1938-1945*, volume I. Paris : Imprimerie Nationale, Tableau VIII p. 33). In our data, total public employment is 5,097, so that Autochthons again make 88%.

[55] In 1921 Tunisia, more than 5,000 European civil servants were enumerated in the population census, while in our data for 1925 total public employment is around 10,000 (Régence de Tunis, *Statistique générale de la Tunisie 1925,* pp.8-9). In 1925 Tunisia, 35% of teachers are from the metropolis, 44% are French recruited on the spot, and only 21% are Autochthons (Min. des Aff. Etrangères. *Rapport au president de la République sur la situation de la Tunisie en 1925*, p. 47). In 1936 Algeria, according to population census Europeans make 62% of workers in public services and army (Gouv. Gal de l'Algérie,.*Annuaire Statistique de l'Algérie 1939-1947*, p.26).

[56] These calculations take into account the status composition of employment in each sector (general administration, security, justice, financial services, health, education, infrastructure, support to production), assuming in particular that the Madagascar composition applies to all WCA. In particular, police forces have everywhere a lower number of French, except at very high ranks (officers). For NA, status composition in education sector is known for 1925 Tunisia; we then assume that in other sectors the French civil servants are over/under represented (compared to education sector) like in 1925 Indochina.

[57] See for instance: République Française, « Loi n° 50-772 du 30 juin 1950 fixant les conditions d'attribution des soldes et indemnités des fonctionnaires civils et militaires relevant du ministère de la France d'outre-mer, les conditions de recrutement, de mise en congé ou à la retraite de ces mêmes fonctionnaires ». Of course in practice, even if not in law, these categories still correlated with race or origin.

and Madagascar, instead of 70% before.[58] For 1955, the decrease of wage bonuses should have mitigated their wage cost effect to 5% in SSA and 22% in NA. This adjustment was made easier because most of the top administration had been faithful to Vichy and was wiped out and replaced after 1944.[59] Public employment Africanized a bit in the late 1950s, but not much, even in NA where the room for progress was the largest. Africanization contributed to reduce the costs somewhat, but remained limited.[60]

Table 6 – Public Employment and Wages in 1925 and 1955

	Metropolis	Empire	NA	Indoch.	Madag.	WCA
Year 1925						
Civilian expend. per capita (1937 FF)	524	63	133	68	57	25
Public employment per 1.000 inhab.	11.8[a]	2.2	2.9[b]	1.7[c]	3.9	1.4[d]
Annual average public wage (1937 FF)	17,049[a]	11,702	12,902[b]	15,858[c]	5,327	6,504[d]
in units of GDP per 15+ pop.	1.7[a]	9.3	4.8[b]	14.8[c]	5.3	8.1[d]
Year 1955						
Civilian expend. per capita (1937 FF)	3,070	277	479	n.a.	209	153
Public employment per 1.000 inhab.	21.6	4.6	6.8	n.a.	4.8[e]	3.1
Annual average public wage (1937 FF)	30,389	20,087	22,791	n.a.	12,343	17,938
in units of GDP per 15+ pop.	1.9	8.0	5.5	n.a.	6.3	11.2

Notes: a: 1922 for employment, 1923 for wage bill; b: Tunisia = 1924; c: Cochinchina 1924; d: Soudan, Côte d'Ivoire and Togo = 1926. e: extrapolated under the assumption that provincial employment is paid the same average wage as central government employment. 15 year-old population was estimated using population censuses.

Like during WW1 although less sharply, in the metropolis civil servants wages had lost purchasing power during WW2 and the wage scale had been compressed, in particular through a lump-sum increase granted by the freed France first government in 1944. From 1948 to 1955, Metropolitan nominal wages recovered, more quickly than after WW1, and the wage scale widened again (Piketty 2018 pp. 191-194). Wartime inflation had been higher in NA colonies compared to the metropolis. As of 1955 compared to 1937, the differential with the metropolis was erased in Algeria, but preserved in Tunisia and Morocco, so that real wages remained more depressed in the two latter colonies, by 19 to 26% according to our (coarse) estimates.

In contrast, in WCA, 1937 to 1945 inflation had been much lower compared to metropolis. Madagascar made an exception in SSA, as 1937-45 inflation was the same as in metropolitan France. The AOF and AEF inflation patterns led to the creation of the CFA franc in December

[58] See for instance : République Française, « Décret n° 51-511 du 5 mai 1951 fixant, en application de la loi n° 50-772 du 30 juin 1950, les régimes de rémunération, des prestations familiales, des congés administratifs de certains cadres de fonctionnaires civils relevant du ministère de la France d'outre-mer. »

[59] On the Vichy period: Jennings 2001, and Cantier & Jennings 2004 (especially pp. 334-363 on the aftermath of Vichy). On the replacement of colonial governors, see Chambru & Viallet-Thévenin 2017.

[60] For 1955, Amin (1966) reports 64,000 non-Muslim civil servants out of 95,000 in Algeria (p.153), 18,000 over 30,000 in Tunisia (p. 161), and 41,000 over 68,000 in Morocco (p. 174), i.e. respectively 67, 60 and 60%, and 63% on average when our estimate for 1925 was 63%... (see above). In 1945 Morocco, 71% of primary school teachers are French, 59% in 1955 on the eve of independence (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 make 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).

1945; SSA colonies (then including Madagascar) got a new currency, with an appreciated fixed exchange rate of 1.7 (1946-47), then 2 in 1948.[61] The new exchange rate fitted with parity in price levels in 1948, with the exception of Madagascar; this was still true in 1955 AOF or Togo, less true in AEF in Cameroon who experienced more inflation in the years 1949 to 1955 and it was very much overvalued in Madagascar. As in WCA nominal wages formerly paid in francs were paid in CFA francs at the same level and were subject to the same proportional increases in nominal terms, 1937-1955 inflation differentials alone generated large gains in real wages, by around 57% in AOF and Togo, 25% in AEF and Cameroon, and not much in Madagascar. Further, the purchasing power of these wages in the metropolis, or in French imports, was preserved through the CFA franc appreciation.

At the end of the day, despite lowered bonuses, everywhere metropolitan level wages were still paid to the French civil servants, while Autochthons claimed and partially obtained equal treatment, so that wage dualism remained high.

Table 6 shows per capita figures for civilian expenditures and public employment, as well as average public wages for the years 1925 and 1955. We observe that due to wage costs, the gaps in public employment are narrower than the gaps in expenditures. In 1925 or 1955, the colonies where expenditures per capita are the highest (NA and Indochina), are also the ones where average wages are the highest. Wage dualism, again measured by the ratio of the average wage to GDP per working age population (15 year-old and over) is highest in the poorest colonies of SSA.

As expenditures per capita skyrocket after the war (Figure 3), the number of civil servants per inhabitant increases much less, because the average wage doubles and even triples in WCA. Wage dualism again increases slightly. In 1955, the average civil servant earns more than five times the GDP per worker in NA, six times in Madagascar, up to eleven times in WCA; this ratio hardly reaches two in the metropolis, as it already did in 1925.

In NA, between 1925 and 1955, the average wage more or less followed the increase in GDP per worker. In WCA, it widely overtook this increase. The main reason is the lower inflation and the CFA franc, as wages paid in the new currency follow the French schedules and apply the same nominal increases. Another factor is the structural change of indigenous employment from low-pay tasks like security to high-pay tasks like education and health; besides, police forces get professionalized and receive much higher wages than before. Such a structural change is not observed in NA colonies. Wages of the lowest and best paid teacher and of the lowest and best paid nurse were collected, for 1913, 1937, 1949 and 1955. Although particularly noisy, they do not reveal a very salient trend in the wage scales, and if anything a compression in WCA as more skilled autochthonous teachers and nurses are being recruited.[62] This kind of compression was already observed in 1945 Indochina and Madagascar (compared to 1925), between French wages and Autochthons' wages. Yet it did not mean a significant change in dualism.

[61] NA colonies stayed with the franc until their independence, like Indochina with the piaster. Guinea left the franc zone in 1960, Mali only for a while between 1962 and 1984, and Madagascar in 1973. The exchange rate of CFAF remained constant until the CFAF devaluation of 50% in 1994.

[62] In order to check robustness to noise, regional minima and maxima can be computed in different ways: either take the lowest and highest wage in each region, or else average the lowest and highest wages in each region. When judged from the comparison with the highest wage paid, the one of the governor, there is indeed an overall compression as governors' wages rather decrease in real terms while average wages are at least double in all groups of colonies.

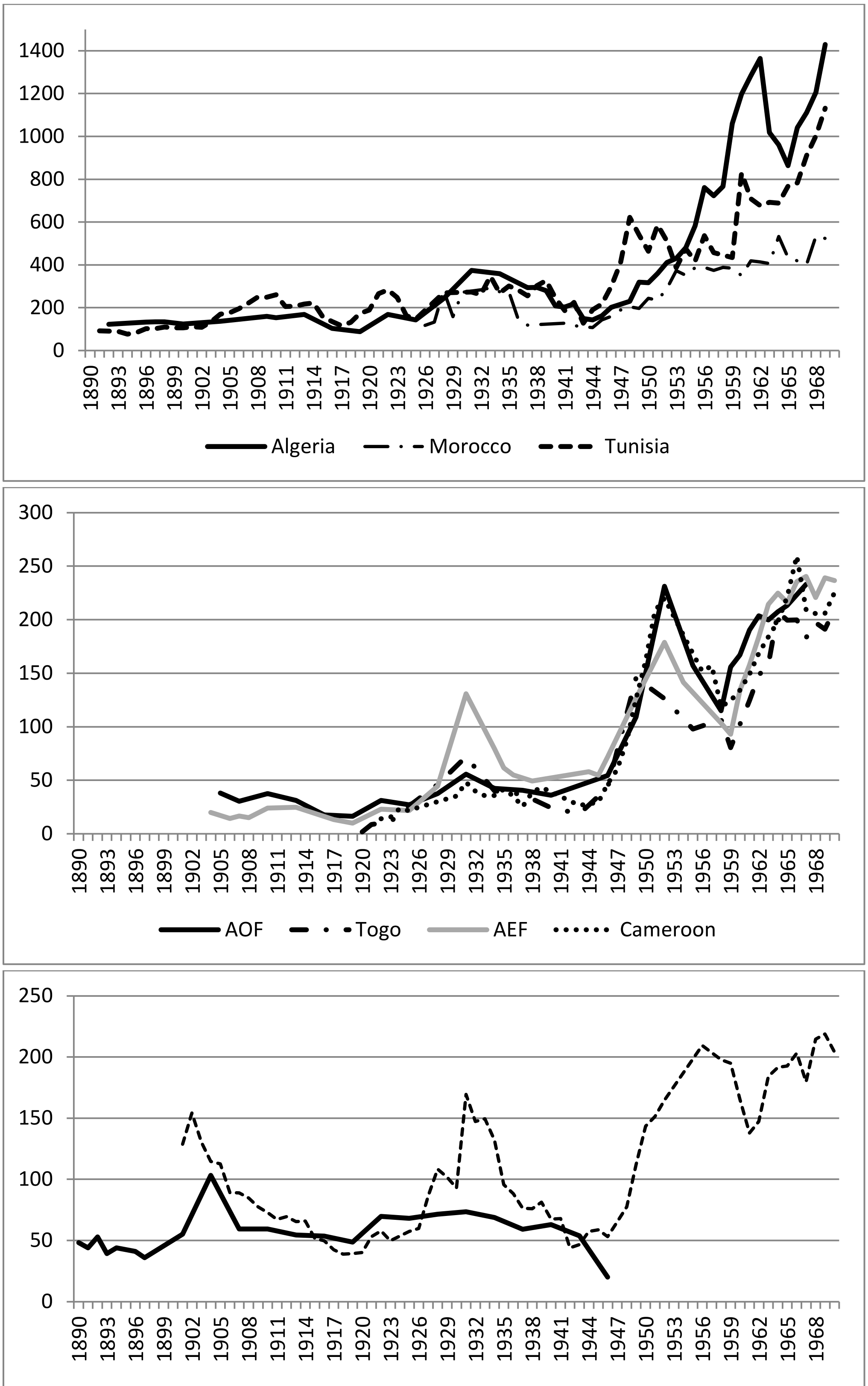
In sum, colonial public spending was very much biased in the first place and involved large costs, in particular a high wage bill, so that despite impressive increases in fiscal capacity the colonies remained under-administered. After WW2, at the same time as expenditures became less biased and more developmental, costs also increased. More skilled autochthonous civil servants were to be trained and hired, and equality in pay had to progress, under strong pressure of African trade unions (Cooper, 1996, pp. 277-322 and pp. 407-431).

In first approximation, the pre-WW2 colonial political economy could fit in the two-group model of Besley and Persson (2009), in the case they consider of an "autocracy ruled by the rich", here the colonizers. The ruling colonizer group displays strong biased preference towards the welfare of its members (p.1224). It taxes the colonized to redistribute income to the colonists and under-provides public goods (pp.1227-1228). Yet, as long as the colonizer expects to remain in power for a time (i.e. "political stability is high"), it invests in fiscal and legal capacity – that are complements, and even "over-invests" (p. 1231) compared to an utilitarian (unbiased) government, as the private gains from regressive redistribution outweighs the losses due to lower public goods provision. This will be even more the case in wealthier colonies. Settlers' colonies are (i) wealthier, (ii) there the colonizer group is larger in size and (iii) not richer (compared to Autochthons) than in the non-settler case; Besley and Persson model then expects them to invest more in fiscal capacity and legal capacity on the whole, which is what we found. In non-settler colonies, who are (i) poorer, (ii) where the colonizer group represents a tinier share of the population, and (iii) where wealth inequality between colonizers and colonized is higher, it predicts less public good provision and less fiscal capacity construction, and a focus on police and security in the first place. This is also what we found for the pre-WW2 period.

However, as the time horizon of colonial rule gets shorter (independence is expected), which is represented in the model by "political instability" and the risk of being ousted from power, investments in state capacity are also predicted to decrease. And in cross-section, the more colonizers will feel threatened to lose power the less they will invest. Here the model predictions fail because the causality ran the other way around. After WW2, French colonial governments accelerated their modernization project and turned more developmental in the hope of preserving their dominance. They extended the franchise not only in the political dimension, as described in section 1, but also along the fiscal dimension, by turning fiscal extraction more progressive (section 3), by decreasing the bias in public spending and by granting some wage equality claims (section 4).

To finance this developmental phase, transfers from the metropolis increased, inaugurating some form of aid dependency for WCA colonies, as we show in the following section.

Figure 3 – Expenditures per capita from 1890 to 1970



Notes: Expenditure per capita in PPP 1937 francs with provincial and departmental expenditure included, but not municipal.

Authors like Amin (1966) on NA and Dumont (1962) on SSA have very early pinpointed the high level of public wages in newly independent states. Both criticized in particular the replacement one-to-one of French civil servants at the same wage. In NA, according to figures reported by Amin, public employment went in Algeria from 175,000 (of which 100,000 in army) in 1955 to 300,000 in 1963 (of which 120,000 in army), in Tunisia from 67,000 (37,000) to 80,000 in 1960, in Morocco from around 122,000 (54,000) to 255,000 in 1964.[63] Of course these large increases over 5 to 9 years hide even higher growth among Muslim Autochthons, as they represented not more than 50% of total employment in 1955 and most likely more than 80% on average in the mid-1960s, except in some occupations like secondary teachers. According to our estimates using the wage bills reported by Amin, the ratio of public wages to (non-oil) GDP per worker went down to around from 5 to 3, as the new hired were still less skilled on average and the colonial supplement was most likely cancelled; using Algerian data, the same ratio (3) is still found for 1977 Algeria. On top of large wage costs, Amin raised fears about plethoric unproductive recruitments. Similar figures are more difficult to establish for post-independence SSA. Present-day estimates suggest that the wage ratio could lie above 4 in SSA, even after the CFA franc devaluation of 1994 (Bossuroy & Cogneau 2013). Like Amin, beyond wage costs in themselves Dumont denounced the discrepancy between wage paid and actual technical skills of the new recruits, something that we cannot measure with our data.

Then we do not argue that paying well civil servants was necessarily a bad thing, as we cannot analyze the correlation of wages with productivity.[64] Yet, we argue that the colonial legacy of dualism very much determined the features of socioeconomic and political inequalities in the young independent countries. In the first two decades of their existence, an administrative bourgeoisie emerged whose economic affluence and political influence combined 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, yet as dualist features persisted and development was not shared, its initial political capital depreciated and its authority was undermined.

Aid dependency

Figure 4 shows the transfers from the metropolitan budget to the colonial budgets, expressed in proportion of colonial civilian expenditure. Military expenditures paid by the metropolis are not counted as transfers, except the ones devoted to infrastructure (roads, bridges, hospitals) and health.

For some colonies, these grants could represent a significant share of expenditures in the beginnings, usually before WW1, at a time when the fiscal apparatus was still under construction. Of course, as expenditures were also at low levels, the cost to the metropolis was not high. We calculate that between 1870 and 1919, the cumulated net metropolitan grants represented 6.5% of cumulated expenditures in the Empire, yet only 0.05% of metropolitan France GDP.

Then between 1920 and 1944, the Empire is self-financed: the same figures fall respectively to 1.2% and 0.03%. The visible exception is Central Africa (AEF) whose expenditures are financed by grants up to 6.6%; yet the cost to the metropolis is negligible, and ten times compensated by the financing of the metropolitan budget by Indochina. Transfers to AEF peak

[63] These figures include lower-layers of government (departments or regions and municipalities). For military forces in 1955 NA, see Mahieu, 2001.

[64] On the case of East Africa, Simson (2017) shows that public jobs were allocated meritocratically.

when Albert Sarraut was minister of the Colonies, the one who first expressed the necessity of "adding value" ("*mise en valeur*" were his terms) to the poorest colonies, which was taken by some as the first "developmental" attempt (Cornevin 1972 pp. 281-290). A follower of Sarraut at the ministry of Colonies, André Maginot, then launches in 1929 the idea of big state-guaranteed loans that are finally voted in 1931 after he is out of office, and as the Great Depression begins to reach France and the Empire. All WCA countries, as well as Madagascar, contracted these loans. The 1931 loan was especially massive in AEF, where it was used for the completion of the "*Congo-Océan*" railway line linking Brazzaville on the Congo River to Pointe-Noire on the Atlantic coast; before the mechanization of the building process, it had cost many lives of forced African laborers between 1921 and 1930. At the same time, the "*Fianarantsoa-Côte Est*" railway line is built in Madagascar, linking the highlands to the Indian Ocean. The 1931 loans were still being reimbursed in the 1950s. However, thanks to the large inflation of the 1940s that multiplied prices by 14, resulting real interest rates were negative so that interwar loans actually represented a less visible subsidy from metropolitan bondholders.[65]

As can be seen again on the graphs of Figure 4, it is only after 1946, and the implementation of the Economic and Social Development Investment Fund (FIDES), that metropolitan grants take off for Sub-Saharan African colonies. In 1959, the FIDES is replaced by the Aid and Cooperation Fund (FAC). Although the colonial budgets also contribute to the FIDES, the contribution of the metropolis is major (about 70% of total).

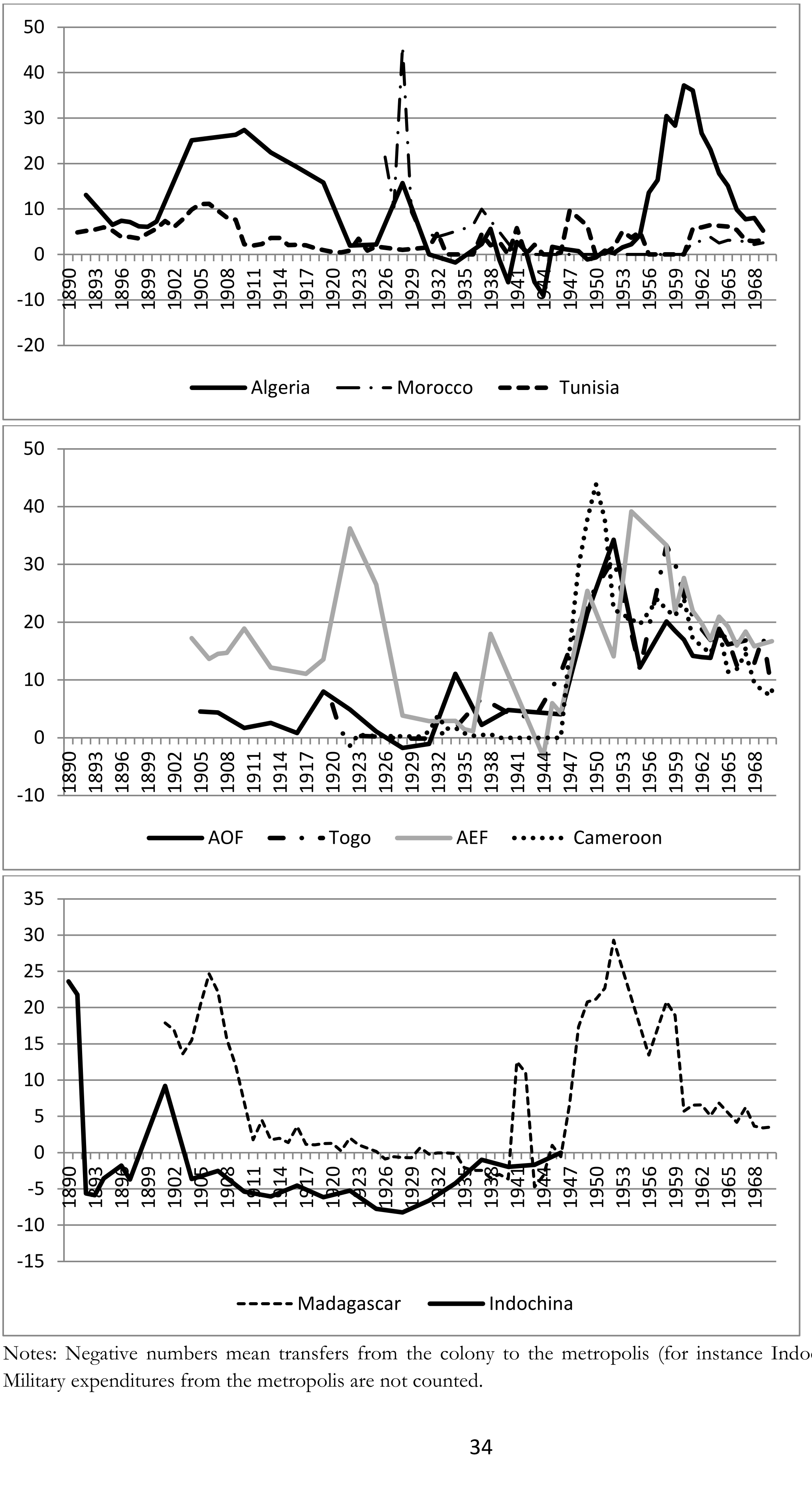
As for North Africa, Tunisia and Morocco are still mostly financed through loans under the Modernization and Equipment Fund (FME), renamed Economic and Social Development Fund (FDES) after 1955 (Saul 2016 p. 47). Algeria also borrows from the same Funds, yet, starting in 1956, also receives huge amounts of metropolitan aid, culminating in 1959-1962, under the "Constantine Plan", aimed at industrializing the country while the liberation war is raging.

Between 1945 and 1962, metropolitan grants then finance 17.1% of the Empire public expenditures: 23% in WCA colonies, 17% in Madagascar, 20% in Algeria, very little in Tunisia and Morocco. In total, these grants represent 0.40% of cumulated metropolitan GDP during the period, one half exactly going to Algeria.

After 1963 the amounts of French aid directed to Algeria decrease quickly, to represent only 5% of the country's expenditure in 1969, not too far from what Tunisia and Morocco also receive (3%). Madagascar also experiences a large downfall of French aid after 1960. In WCA, aid also drops after 1960, yet the share of French aid in expenditures stabilizes between 8 and 16%.

[65] To give just one example, AOF was in the 1950s still reimbursing annuities on loans contracted between 1903 and 1932, for a total debt amount of 3,526 million francs, in which the 1931 loan owned the lion share (3,120 million, disbursed in seven sections from 1931 to 1937). The total annuities reached 30 million of CFA francs, representing only 0.1% of the expenditures of the Federal budget.

Figure 4 – Metropolitan transfers in total expenditure 1890-1970 (net grants)



Notes: Negative numbers mean transfers from the colony to the metropolis (for instance Indochina 1905-1937). Military expenditures from the metropolis are not counted.

Table 7 summarizes the financing of colonial budgets over the whole colonial period from 1833 (first data point on colonial Algeria) to 1962 (last data point for colonial Algeria). It shows that only 10% of civilian expenditures were financed by metropolitan transfers overall. The cumulated cost was worth 0.15% of metropolitan cumulated GDP, more than half (0.9%) having gone to North Africa and mostly to Algeria. Net loans financed another 4% of expenditures, either through reimbursed loans on which negative real interest rates were paid (see above) or through loans that were still pending at the end of the colonial period, especially in Tunisia and Morocco. Indochina stands as an exception, as it accumulated budget surpluses and rather financed the metropolitan budgets; a large part of the use of this surplus is left unknown in our data, the "residual" being as high as the total deficit.

Table 7 – Financing of the colonial Empire by the metropolis 1833-1962

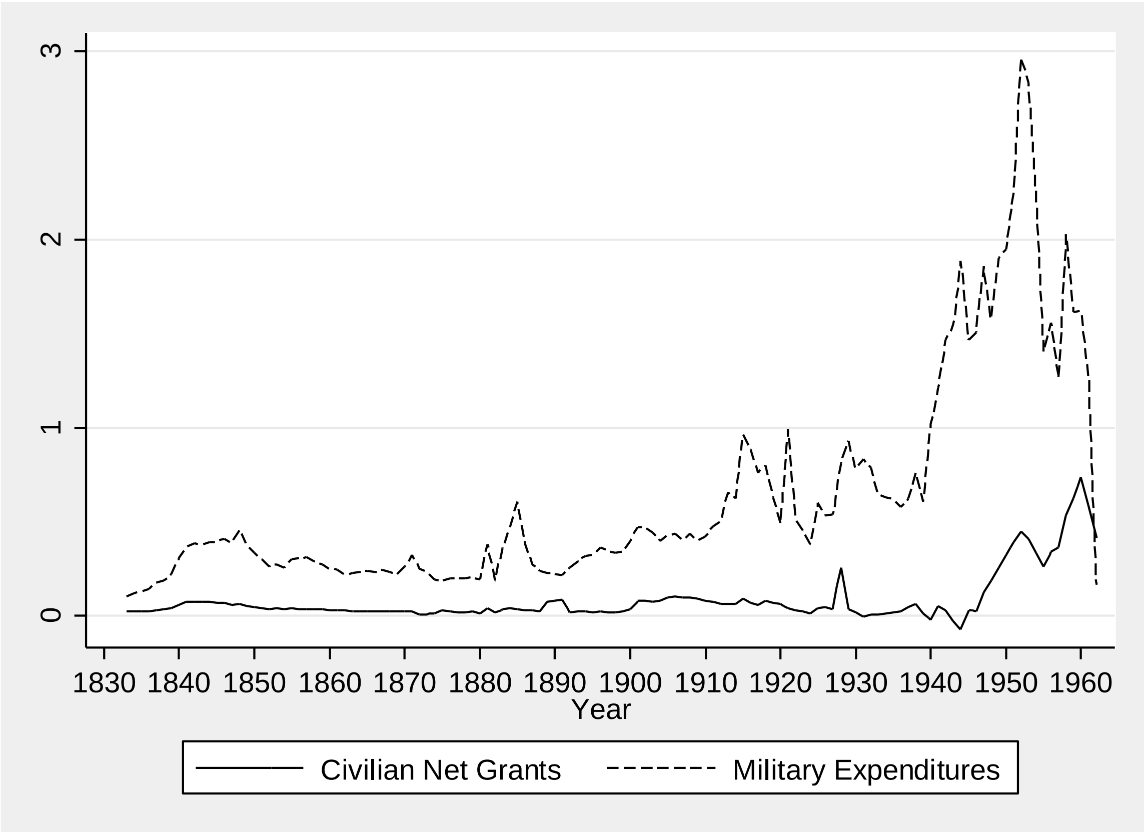
	Empire	NA	Indoch.	Madag.	WCA
In % of cumulated expenditures					
Cumulated deficit	15.1	21.6	-9.3	10.9	19.9
Cumulated net grants	10.2	11.9	-2.5	10.5	17.0
Cumulated net loans	4.3	5.2	4.4	2.6	2.3
Residual	0.6	4.6	-11.2	-2.2	0.6
In % of cumulated metropolitan GDP					
Cumulated deficit	.224	.168	-.014	.010	.061
Cumulated net grants	.147	.090	-.004	.009	.052
Cumulated net loans	.057	.043	.007	.002	.005
Residual	.020	.035	-.017	-.001	.004

Note: Net deficits, net grants and net loans are cumulated between 1833 and the year of independence of Algeria (1962). Cumulated deficit is the sum of the primary deficit (revenue-expenditure) of central and provincial administrations, expressed in real terms (1937 francs), over the period 1833-1962; a surplus has a negative sign (Indochina). Cumulated net grants are the sum of net transfers from the metropolis in real terms (see Figure 4). Military expenditures from the metropolis are not counted (except in infrastructure and health). Cumulated net loans are the sum of amounts borrowed or received as advances minus amounts reimbursed, and of reimbursements received of amounts lent or advanced to others minus amounts lent or advanced. Residual is just the difference between the cumulated deficit and the two identified sources of financing, i.e. grants and loans. It includes other sources of funding like private transfers, or saving gains. Missing data were annually and linearly interpolated in real terms between the following start and end dates for each colony: Algeria 1833-1962; Tunisia 1891-1956; Morocco 1915-1956; Indochina 1871-1946; Madagascar 1901-1960; AOF 1905-1960; Togo 1920-1960; AEF 1904-1960; Cameroon 1922-1960. We are missing a few dates at the beginning (1830-33 in Algeria, 1881-1890 in Tunisia, etc.) and only the end of colonial period in Indochina (1947-1954).

Figure 5 shows the time evolution of metropolitan transfers both for civilian and military.

Even at its apex in the post-WW2 period, the financial contribution of the metropolis to civilian expenditures averaged at 0.5% of its own GDP, below the target fixed today by OECD for its members (0.7%) that is reached briefly on the year 1960.

Figure 5 – Metropolitan transfers, in % of metropolitan France GDP



Note: Civilian net grants include military expenditures in infrastructure and health. Military expenditures include personnel and operating expenses of troops, and other expenditures than infrastructure and health. Expenditures during the Indochinese and the Algerian liberation wars are rough estimates, likely to be underestimated in the case of Algeria. Missing data were annually and linearly interpolated in real terms between the following start and end dates for each colony (in parenthesis start data for civilian grants): Algeria 1833-1962; Tunisia 1881(1891)-1956; Morocco 1911(1915)-1956; Indochina 1870(1871)-1955(1946); Madagascar 1861(1901)-1960; AOF 1833(1905)-1960; Togo 1915(1920)-1960; AEF 1861(1904)-1960; Cameroon 1915(1922)-1960. For civilian grants, we are missing a few dates at the beginning, and only the end of colonial period in Indochina (1947-1955).

Military expenditures in the colonies are recorded in the metropolitan budgets of the two ministries of Navy/Colonies/Overseas (SSA and Indochina) and of War/Defense (NA and Indochina War). Expenditures linked to the war of Algeria (1954-1962) had to be estimated for they are not distinguished in the ministry of Defense accounts; they could be understated.[66] Figure 5 shows that military costs always lied much above civilian subsidies; they weighted on average 0.85% (vs. 0.15%) of metropolitan GDP over the 1833-1962 period, represented around half of civilian expenditures of colonies, and 6% of their own GDP. Of course these costs peaked in times of conquest wars (1830-50 in Algeria, 1880-1886 in Tunisia, Indochina, and Madagascar, 1920s and 1930s in Morocco) and during WW1 and WW2 due to indigenous conscription. Yet it is only after 1940 that they dramatically boom to levels much above 1% of

[66] We relied on Samir Amin's (1966) figures for metropolitan military expenditures in 1953, 1957 and 1960 Algeria, and interpolated other years based on the annual figures of army men (including conscripts) present in Algeria; expenditures in 1953 Tunisia are also from Amin and are kept constant in real terms until 1956, while in Morocco (until 1956) they are taken from balance of payments data, assuming that 90% of public expenditures paid by metropolis are for the military.

metropolitan GDP, reaching a first local maximum between 1951 and 1954 during war in Indochina (Tertrais 2002), then in 1958-1960 during war in Algeria but also in Cameroon.

However, the post-WW2 increase in military expenditure is not only driven by liberation wars. France also very much increased its military presence in Sub-Saharan Africa and after 1946 military spending also very much increases in Madagascar, AOF and AEF. The preservation of the Empire was not only turning costly in terms of subsidies to developmental or social expenditures, it was turning even more costly in terms of military. After the independences, France kept a few permanent military bases in former colonies, until 1961 in Morocco and Tunisia, and until today in Senegal and Gabon, yet withdrawal saved a lot of money on the military side.

The succession of conquest and pacification wars make it difficult to define a true "peacetime" in the colonial context; yet if we exclude WW1 (1914-1918) and all years after 1939 we still get military costs as high as 0.43% of metropolitan GDP, much higher than civilian transfers. In post-independence Morocco, after 1957, military expenditures appear in the domestic budget and weight 13% of total expenditures, or 25% in real terms of what was spent by the metropolis before the start of the Algerian war in 1953, or 1.5% of domestic GDP.[67] If we adopt the latter ratio to GDP (1.5%) to define a counterfactual military spending (absent colonialism), then the financing of military forces by the metropolis would have only represented a 0.21% transfer in terms of metropolitan GDP, bringing total metropolitan aid to 0.15+0.21=0.36% over the 1833-1962 period. Overall, metropolitan transfers were definitely modest.

5. Conclusion

A novel data collection provides comparative evidence on colonial states of the 'second' French colonial Empire, since their foundation to their devolution in the 1960s. Colonial states were neither omnipotent Leviathans nor casual night watchmen. On the one hand, we emphasize the extractive efficiency and capacity of adaptation of colonial states to varied socioeconomic contexts and to varying historical conditions. On the other hand, we put forward dualism as the main common feature and legacy. For sure, apart from their biasedness and costliness, another characteristic was that colonial states were authoritarian and lacked legitimacy. Just after independence, legitimacy was greatly increased, yet their dualist features and international dependence persisted and gradually depreciated this initial capital and undermined authority. Some postcolonial states turned even more authoritarian to compensate (Algeria), others quickly faced political instability (Madagascar, Chad), while some managed their way more peacefully (Senegal), yet most of them were sooner or later contested in their capacity to generate shared development, that is to break with the dualistic structure, whatever the ideological orientation they claimed, pro-western or socialist.

Further works will make advances in two directions.

First, additional data collected on British colonies with the same methodology allow us to examine to which extent the same features held with a different colonizer. For West African colonies, it seems that common features dominate, in terms of size, tax and spending structure,

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

time sequence and metropolitan transfers. Colonizers' idiosyncrasies are only of second order, like higher spending on education on the British side. However, the tradeoff between wage levels and public employment seems to have been solved differently in each case, resulting in lower dualism and inequality in British colonies. To further our understanding, the Africanization of high rank administrative positions around independence will have to be analyzed more thoroughly.

Second, ongoing data collection will allow us to extend the analysis after the year 1970, until present times. Beyond the transition to independent countries, the critical junctures of socialist experiences then of structural adjustment policies will be studied, both from the taxation side and the spending side, together with the impact of the commodity boom and bust (1975-1985).

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Appendix – Estimates of the fiscal burden on Europeans and Autochthons

Income shares

Using income tax data from Alvaredo, Cogneau and Piketty (2017), we first devise estimates of the respective income shares of Europeans and of Autochthons, in 1925 and 1955. Jews in North Africa, Indian and Chinese minorities in Madagascar are merged with Europeans. Chinese in Indochina are treated as (urban) Autochthons, for they are many more than Europeans.

For NA in 1955, we adopt Samir Amin's (1966) estimates for the income shares of Europeans: 47% in Algeria, 43% in Tunisia and 37% in Morocco. These figures mean that the ratios of European average income to national average income are similar, respectively 7.8, 8.4 and 8.2. Data for 1956 (resp. 1946) Tunisia provide the income distribution of the top 33% (resp. 20%) Europeans. Data for 1945 Cameroon provide the income distribution of all Europeans. These data are used throughout to extrapolate the income earned by Europeans in all colonies.

For Algeria in 1925, we use income tax data for 1932. The top 3% income earners are estimated to earn 52% of total income, i.e. 17 times average income, and we consider they are all Europeans (or Jews) so that they represent the 20% richest Europeans. Combining Samir Amin's estimate for the average income of Europeans in 1955 Tunisia with the income of the 20% richest, we learn that the latter earn 1.76 the Europeans' average. To get at the Algeria figure, we then compute that Europeans in Algeria earn 9.6 (=17/1.76) times the average income, hence 62% of total income. We assume that the same ratio (9.6) holds for 1925 Tunisia and Morocco. Income tabulation tables for Indochina in 1925 provide us with the income earned by Europeans. They earn 80 times the average income hence get a 9% share of total income while being only 0.13% of total population. In 1945 Cameroon, Europeans make 0.1% of tax units and earn 73 times the average income. They represent the same population share in 1925 AOF hence we import this ratio of 73 and get a 6% income share. For 1925 Togo, AEF, Cameroon, and Madagascar, we also start from the 1945 Cameroon figure and use the 1946 Tunisian data and Pareto interpolation to estimate the income ratios to respectively 105. 87. 105 and 36. Last, for 1955 SSA, we apply the same Pareto interpolations using Tunisian data.[68]

Next, we break down the autochthonous population in two social classes: "urban + rural non-poor" and "rural poor". Urban and rural non-poor Autochthons will pay a significant share of direct and indirect taxes, of import tariffs, as well as buy a significant share of state-provided services and goods. Rural poor will be mostly subsistence farmers paying the capitation, a tiny share of imports and excise taxes, and export taxes on agricultural commodities.

For 1955 NA, Samir Amin (1966. pp. 114-119) provides population and income shares for urban and rural Muslims in each NA colony. Furthermore, he distinguishes (p. 185) a fraction of rich farmers who make 7% of rural population and earn one third of total rural income; we aggregate them to the urban population. For 1925 NA, the urbanization rate of Muslims is drawn from the 1926 population census in Algeria, and is also adjusted for the (assumed equal to 1955) 7% share of non-poor farmers in rural areas. The average income of rural poor is extrapolated backward to 1925 using the Autochthons' income per capita growth rate (hence assuming that income distribution did not change among Autochthons); the average income of the non-poor Autochthons is then computed as a residual.

[68] We tried an alternative simpler estimation procedure where we disregard Cameroon income tax data and use only the Tunisian distribution, assuming that Europeans earn the same income everywhere. Results were very similar, one exception being Togo.

For SSA countries in 1925, we use 1945 Cameroon tax data and infer that indigenous personal income tax and trade licenses' payers are 15 times as many as Europeans, meaning only 1.4% of Autochthons; we adopt twice this figure to account for unregistered rural non-poor. In Indochina all Chinese are considered to be urban, on top of 4.3% of urban Indochinese, so that our estimate is doubled to 5.5%. The same figure is applied to Madagascar. For 1955, a 10% urbanization rate is assumed, which is roughly consistent with World Bank data for 1960.

In all colonies outside of NA, we assume that the rural poor earn a fixed subsistence income per capita, that we estimate for the year 1925 as the price of a yearly ration of 1.600 kcal of rice in 1938 Madagascar (or Indochina. the two figures being almost the same). For the year 1955 we increase this figure by the growth rate of average autochthonous income (i.e. slightly above 50%) to reflect agricultural productivity gains linked to the take-off of cash export crops. In both years, the average income of the non-poor class is then computed as a residual.

Table A.1 summarizes the results of this tentative estimation procedure.

Table A.1 - Income distribution estimates for the years 1925 and 1955

	NA	Indoch.	Madag.	WCA
Year 1925				
Europeans: Population share (%)	9.2	0.1	0.8	0.1
Income share (%)	50.0	9.1	22.8	5.9
Average income (FF 1937 PPP)	10,193	46,083	19,433	40,299
Urban & Rural Non-Poor: Pop. (%)	16.9	5.5	5.5	2.8
Income share (%)	26.3	30.7	22.7	23.1
Average income (FF 1937 PPP)	2,912	3,517	2,870	4,501
Rural Poor: Population (%)	73.9	94.4	93.7	97.1
Income share (%)	23.7	60.2	54.6	71.0
Average income (FF 1937 PPP)	603	404	404	404
Year 1955				
Europeans: Population share (%)	8.1		1.5	0.4
Income share (%)	41.1		24.4	13.1
Average income (FF 1937 PPP)	12.232		18.149	33.204
Urban & Rural Non-Poor: Pop. (%)	22.0		9.8	10.0
Income share (%)	32.7		24.7	26.2
Average income (FF 1937 PPP)	3.566		2.804	2.422
Rural Poor: Population (%)	69.9		88.6	89.7
Income share (%)	26.1		50.8	60.7
Average income (FF 1937 PPP)	896		641	624

Source: Income tax tabulation data from Alvaredo. Cogneau & Piketty (2017). See text for other sources.
Notes: Europeans include Jews in NA. and Indians and Chinese in Madagascar. Chinese in Indochina are in urban autochthons.

We then make additional assumptions to get at estimates of the fiscal burden endured by each of the three groups

Tax rates

We make "conservative" assumptions in order not to underestimate the fiscal burden of the Autochthons. We believe the assumptions made provide an upper bound for the taxes paid by this group. We are aware that tax incidence analysis is difficult, in particular for indirect taxes (e.g. Atkinson & Stiglitz. 1982); we acknowledge that we lack the statistical basis (social accounting matrixes) and a well-founded equilibrium model to perform a proper one. For capitation, we consider that each group pays proportionally to its population share. Hence in proportion of income, the burden of capitation will overwhelmingly weight on rural poor Autochthons. For imports, we assume that the latter only "consume" 2.5% of their income in imported goods in 1925, 5% in 1955 to reflect the increased openness of economies. The residual imports are "consumed" by the two other groups. We make the extreme assumption that non-poor Autochthons consume the same share of their income in imports as Europeans. Then we apply to both groups the colony's average tax rate on imports. For export taxes, we make the extreme assumptions that the rural poor pay them all, when they produce coffee, groundnuts or cocoa in West or Central Africa, or when they collect rubber in Indochina or vanilla in Madagascar. For monopolies and intermediate taxes, we assume that the rural poor have a propensity to consume taxed goods that is one twentieth of non-poor in 1925, one tenth in 1955 (these proportions are meant to be similar to the assumption on imports); non-poor autochthons are taxed at the same rate as Europeans. Last, for modern taxes, we assume that the rural poor pay none, excepting the *tertib* in Morocco, and that Europeans and non-poor Autochthons endure the same rates.

Table A.2 - Estimates of tax rates on income

	NA	Indoch.	Madag.	WCA
Year 1925				
Europeans	8.9	23.6	12.8	12.2
Autochthons	6.2	11.2	9.1	5.4
Urban or Rural Non-poor	10.1	23.9	13.5	12.2
Rural poor	1.9	4.8	7.3	3.1
All	7.5	12.4	9.9	5.8
Year 1955				
Europeans	20.4		21.1	23.8
Autochthons	11.6		12.5	12.3
Urban or Rural Non-poor	19.1		21.9	24.5
Rural poor	2.2		7.9	7.1
All	15.2		14.6	13.8

Source: See text.
Notes: Europeans include Jews in NA. and Indians and Chinese in Madagascar. Chinese in Indochina are in urban autochthons.