The fruits of the boom: real wages and housing costs in Dakar, Senegal (1914-1960)

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Abstract

The incomes of unskilled workers in Dakar under colonial rule was comparable to those of their counterparts elsewhere in West Africa. Real urban wages grew during the Great Depression and the 'developmental decade' following World War II, though accounting properly for housing costs results in substantial downward revision to both the level and growth of real wages. This paper argues that a similar revision is likely necessary for real wage estimates in other colonies in Africa. The magnitude of this correction suggests that much of the fruits of the economic boom of the first half of the twentieth century were 'soaked up' by urban landlords, pointing to an important driver of inequality in urban colonial Africa.[1]

JEL Codes: N17, N37, N57

1 Introduction

In the past decade, our knowledge of comparative living standards in colonial Africa has made great strides, thanks to real wage studies using the now standard methodology of Robert Allen (Frankema and van Waijenburg, 2012; Frankema and Juif, 2016; Bolt and Hillbom, 2015; De Zwart, 2011). To date, however, none have been constructed for cities in French Africa. In this paper, I offer new estimates of real wages for Dakar, the capital of the Republic of Senegal. During the period of French rule, it was the capital of Afrique occidentale française (AOF), a federation of seven French colonies in West Africa, stretching from the Saharan sands of Mauritania in the northwest to the lagoons of Benin in the southwest. I show that the standard of living in Dakar was comparable to the cities of British West Africa for which we have estimates. Incomes grew especially— and on the face of it, paradoxically—during the Great Depression; as well as in the final fifteen years or so of French rule, the long 'developmental decade' that preceded independence in 1960, when French investment was at its peak (Huillery, 2014). But I add an important qualification. If we attempt to measure actual housing costs, rather than merely adding on an additional 5% to the cost of the consumption basket as in other studies, the real wage is substantially depressed, as is its growth. This points to an important fact about African economic development in the twentieth century: aggregate urban income increased but accrued largely to urban landlords. The argument proceeds as follows. I first give a brief overview of the economic history of Dakar and Senegal in the colonial period. I then discuss previous attempts at compiling a real wage series for Dakar, before laying out the method and sources I have used to construct my own series, which I present and compare to other cities in West Africa. Finally, I discuss the role of housing costs in African real wage series, and provide some data to show why a proper investigation of their role is essential for understanding the development of not only the living standards of urban workers, but also of the trajectory of urban inequality in Africa.

2 Historical background

What became the colonial city of Dakar was built on Lebu land; the name 'Dakar' itself could already been seen on French maps a hundred years before the French claimed the land. Dakar—then N'Dakarou—was the capital of what has come to be known as the Lebu Republic, an independent Islamic state which split from Kajoor in the eighteenth century and which the French colonial settlement on Gorée treated as a fully-established polity. (Sylla, 1955) In 1857, the navy admiral Auguste-Léopold Protêt had the tricolour planted on the peninsular, claiming it in the name of France, and established Dakar as a French colonial town. In its early days the new town was not well-favoured: Gorée had been settled longer and was much easier to defend (though had reached critical population density) and nearby Rufisque had a much longer commercial history, a strong connection with the booming groundnut sector through its port, its mercantile community and the fiscal preference of the local Lebu tribes, who directed trading caravans there (Dubresson, 1978). Dakar, on the other hand, had only the favour of the Administration to commend it,

and for a long time it was Rufisque's poor and empty cousin. Pierre Loti, in his classic novel of 19th century Senegal, wrote evocatively of the new city: "Dakar, a kind of colonial town sketched on sand and red rocks, a place for boats to rest on this western point of Africa called the Green Cape. Tall baobabs planted here and there upon desolate dunes. Clouds of ospreys and vultures hovering over the countryside". (Loti, 1896) Several decades later, a visitor, Léon d'Anfreville de la Salle, wrote that it was still 'a garrison town. Soldiers and officers swarm about, thus giving to the town something of its character'. (de La Salle, 1912)

The first factor in Dakar's ascendancy was the completion of the Dakar–Saint Louis railway line, which began operations in 1885. The railway opened up the first 'groundnut basin', roughly corresponding to the old precolonial kingdom of Kajoor. The line did serve Rufisque also, but without the need to pay caravan tolls to local authorities, the town's fiscal preference was eroded to Dakar's advantage. A more substantial line, the Thiès–Kayes (that would eventually become the Dakar–Niger) was built over the course of the first few decades of the 20th century; it too, however, served Rufisque. It also served Kaolack, the dominant port of the increasingly prosperous Sine-Saloum,which was the second groundnut basin of Senegal. Rufisque continued to serve as a major marketing centre in the groundnut trade, alongside Dakar and Kaolack.

Groundnuts were the foundation of Senegalese export agriculture. From the 1840s, cultivation of the crop expanded rapidly, reflecting a growing demand in the industrial core for fats and oils to use not just in cooking but also for the production of manufactures like soap and candles. As elsewhere in French West Africa, cash crops like groundnuts also served another purpose: the cash they earned could be used to pay poll taxes, which the French believed would force Africans whom they considered "lazy" to work harder (Idrissa, 1993). (The groundnut season coincided with the growing seasons of most native food crops, so the extent to which the poll tax increased aggregate labour inputs in a colony like Senegal is at the very least debatable). Exports rose from less than a ton in 1840 to nearly 300,000 tonnes a year by the start of the First World War, and around 700,000 tonnes a year by the time Senegal won its independence from France in 1960. The boom resulted in a switch from food crops like millet and sorghum to groundnuts, though this substitution was more pronounced in some areas; it also brought vast swathes of previously uncultivated land into production. The demand for labour was acute at various points in the production cycle, and Senegalese labour was insufficient to meet it. A pattern of annual circular migration that brought migrant farmers, the *nawetaan* supplied the shortfall. Around 56,000 came to Senegal in 1939, of which 19,924 of them were from Soudan français, but also a substantial number from Guinée française (18,133), Guinea Bissau (8343) and Gambia (6,553). Most went to the *cercle* of Kaolack, in the Sine-Saloum.[2]

It was not until the Great Depression that Dakar began to definitely supplant Rufisque as a groundnut export port. In the 1929-30 trading season, Dakar received 87,617 tonnes of groundnuts to Rufisque's 83,134 tonnes, while Kaolack took 113,364 tonnes. The following year, at the beginning of the Great Depression, Dakar received 86,692 tonnes, only slightly less than in 1929-30. Rufisque's

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[2]'Sénégal : nombre des navétanes', ANS 21 G 36.

trade collapsed: that year it took only 33,560 tonnes. Kaolack suffered a modest decline, to 90,757 tonnes (Seck, 1970). From then on, Rufisque would fade while Dakar's deepwater port allowed even greater volumes of groundnuts to be exported.

Important though the import-export trade was, and the ancillary logistical and financial services that grew in its wake, Dakar had an even greater economic asset: the federal government of the federation of Afrique occidentale française, which grouped Senegal, Mauritania, Guinea, Soudan (now Mali), Côte d'Ivoire, Dahomey (now Benin), Haute-Volta (now Burkina Faso) and Niger together with a *gouvernement général* to administer matters of interest to all the colonies. After a decade in the capital of the colony of Senegal, Saint Louis, the government was established in 1905 in Dakar, which later was detached from Senegal and made its own federally administered capital district. With power came money, and people. In 1916, Dakar had a population of about 20,000; ten years later, this had doubled. Dakar's population grew throughout the Great Depression, despite unfavourable economic headwinds. From a town of 69,000 residents in 1930, it grew to 125,000 residents in 1943, and by 1950 had over a quarter of million people. Though in population it was no match for Ibadan, the largest city of Nigera in 1950 at nearly half a million residents, it was comparable in scale to Lagos (288,895) and overshadowed Accra in the Gold Coast (158,196). The goal of this paper is to understand what impact this prodigious growth had on Dakar's citizens, and their standard of living.

3   Previous studies

There have been three previous attempts to construct real wage indices for Dakar. Ibrahima Thioub's is the most comprehensively documented (Thioub, 1994). Thioub gathered individual price series for imported rice, oil, sugar, bread, percale cotton fabric, meat, fish and millet, and calculated index numbers. He also calculated index numbers for the unskilled nominal wage, and combined the price series to calculate a composite price index based on the consumption basket posited by the minimum vital, the colonial attempt at drawing up a consumption basket for African workers (Cooper, 1990). We are then given a number of charts in which the nominal wage is deflated first by each of the individual price indexes (producing, for example, the nominal wage deflated by the price of imported sugar, then of imported cloth, then of millet, and so on). Thioub then finally produced two composite series, one in which the nominal wage was deflated by an index of import prices covering the years 1931, 1932, 1934, and then all years between 1936 and 1954; then one in which the nominal wage was deflated by the index of the minimum vital, what might be thought of as the colonial 'subsistence basket', covering the sixteen years from 1938 to 1954. Though there is a great deal of useful information in these calculations, they are difficult to compare across years, let alone across countries. Furthermore, the reliance on import prices may bias the composite price index in either direction. Commercial margins were frequently high in French West Africa and retail prices could diverge substantially from CIF or wholesale prices. On the other hand, French colonial trade statistics were compiled using official values (the valeurs mercuriales) which were largely drawn up based on

the recommendations of large merchant firms, who presumably would have had an incentive to understate market prices, resulting in lower official prices and thus lower unit import tariffs (d'Almeida-Topor, 1976).

The two other attempts are less easy to assess. Monique Lakroum gathered nominal wages for a variety of different workers in the Port of Dakar in the Great Depression. However, her deflator was relatively crude: she simply used the INSEE retail and wholesale index for France for that time period; this probably tracked reasonably closely with Dakar import prices, but is unlikely to have reflected local food prices (Lakroum, 1976). In a more detailed study, Lakroum analysed the terms of trade between agricultural and urban sectors, though her indices still used the INSEE price series for France (Lakroum, 1982). Finally, Elliot Berg's real wage index for Dakar from 1939 to 1960 was presumably constructed with reasonably good data, but his scanty documentation make verification difficult (Berg, 1964). Importantly, none of these three studies examines the 1910s and 1920s; nor do they use a methodology that allows for easy comparison of living standards with other cities across the world. Though Francophone researchers were pioneers in many aspects of the study of labour relations in Africa, the recent wave of historical real wage studies has not produced a single study of French Africa, a lacuna this article aims to rectify.

4   The urban real wage

The standard methodology in the recent economic historiography follows Robert Allen's 'subsistence ratio' methodology, by which the cost of a fixed basket of goods designed to meet only the bare minimum human needs for food, shelter, clothing and fuel is compared with the nominal unskilled male wage (Allen, 2001). Because of the standardised basket, this methodology offers, or appears to offer, the possibility of comparing welfare across both time and space: not just to compare incomes in York in 1300 and in 1900, nor just to compare incomes in Kigali and San Francisco in 2015, but to compare the wage of an unskilled worker in 1300 in Paris with that of an unskilled worker in 1960 in Dakar. This method has been adopted for several countries in colonial African contexts, all but one of them former British colonies, for which the collection of data is greatly facilitated by the existence of the annual Blue Books, a set of statistical compendia which typically include a section on wages and another on retail prices. No such document exists for French Africa. Consequently, my own estimates rely on archival documents from the Archives nationales du Sénégal as well as published sources (see Appendix for full details). The real wage requires two kinds of data: a nominal wage series, and the Allen price index to deflate it.

4.1   The nominal wage

Though we lack official published statistics on prices and wages for much of this period, government budget data are plentiful and easily accessible, and have been extensively drawn upon to estimate wage rates across French colonies by van Waijenburg (2018) in order to estimate the shadow price of forced

labour. The budget documents are an ideal source for the purposes to which van Waijenburg puts them: they give wages for many locations across colonies, and they represent the rates at which colonial administrations obtained labour when they were obliged to pay for it. For this reason, they make an excellent resource for estimating the shadow price of forced labour, much of which took place outside capital cities, and for government purposes, like road-building. Though I too draw on budget documents, there are two reasons why I have chosen not to use her figures in this exercise. The first is simply that we need the wage rate in Dakar, rather than an average across the colony of Senegal, which is what van Waijenburg's method requires. The second is that the use of government wages carries with it the implicit assumption of perfectly competitive labour markets, with a single market-clearing price applying to both private employers and the State. We have some evidence to suggest that this assumption did not always hold true. In 1934 François Dunand, who traded in car, motorbike and bicycle parts, wrote to the President of the Dakar Chamber of Commerce to complain that the administration, though it requested confidential information about wages paid to indigenous employees in Dakar businesses, did not seem to make use of such information in order to set its own wage rates:

> labourers employed by the Public Works Department, the Water Department, etc., are paid 7 francs to 7.50 francs for a day's work of eight hours, and sometimes receive rations as well, whereas private businesses do not pay more than 4 francs per day, even as they require higher productivity.[3]

Someone at the Chamber of Commerce, however, wrote in pencil the words '*a voir : travail specialisé*' at this point, suggesting that whoever read the letter believed that the labourers employed by the administration, despite the title '*manoeuvre*', may have been more skilled than those employed in commerce, and hence commanded a commensurate wage premium.

Cheeseparing colonial administrations did not like to overpay for labour if they could help it. Additionally, officials in Dakar were often worried about the phenomena of *surenchère* and *débauchage*—in other words, private firms bidding up wages, and hiring workers away from other firms, practices which would discourage capitalists from investing in the skills of their workers (Cooper, 1996). In order to ensure that the government of the circonscription de Dakar et dépendences was not paying above market rates for unskilled workers, its officials gathered reports from private sector firms. In the 1930s and 1940s, the Chamber of Commerce seems to have been responsible for collating wage records from a number of its members; at any rate, it is in the archives of the Chamber that the original records have been preserved. A standardised form allowed employers to note the average wages paid to employees in different categories. I have compiled a large database of private sector wages from these forms. The complete dataset records over 1400 wage observations, at the firm-level during the 1930s. The wage observations are for a 'trimester' (i.e. a three-month period). The subset of unskilled labourer wages comprises

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[3]Letter from Francois Dunand to President of the Chamber of Commerce of Dakar, 16 August 1934, Archives nationales du Senegal, Fonds de la Chambre de Commerce de Dakar, 366.

Table 1: Public sector wage premium, unskilled labourers. Source: ANS Fonds Chambre de Commerce de Dakar, various; Budgets generaux de l'AOF, various editions

	Public sector	Private sector	Public sector premium
1931	2920	2310	26%
1932	2928	2367	24%
1933	2555	2037	25%
1934	2555	2022	26%

173 observations. In Table 1, I present the trimmed (25%) mean of these observations for unskilled labourers (*manoeuvres*) from 1931-1934, and compare it to the public sector *manoeuvre* wage taken from Dakar budgets. There appears to be a fairly consistent public sector premium of around 25%. For this reason, I have used the private sector wage *levels* for 1931-1934 and projected them backwards with the *index* of the public sector wage series. I then rely on Elliot Berg's Dakar nominal wage series to construct the rest of the series up to 1960.

The evolution of the nominal wage itself is of little interest, except in comparative perspective. In Figure 1, I compare the Dakar nominal unskilled wage to its equivalent in Accra, probably the richest city per head in British West Africa, both converted to US dollars at prevailing market exchange rates. Expressed in this form, the nominal wage in both cities were broadly stable across the first half of the century. Substantial inflation in the postwar period, as well as economic growth, led to a nominal wage increase in both cities, though the increase was far more substantial in Dakar than in Accra. As we shall see in Section 4.2, however, this pattern is *not* reflected in the two cities' relative real wages. Dakar lagged Accra in real terms even as it shot ahead in nominal terms. The reason for this was the substantial overvaluation of the CFA franc, which had been pegged to the metropolitan franc at CFA 1.7 = FF 1 from 1945, and then at CFA 2 = FF 1 from 1948. The French franc was itself relatively overvalued. The combined effect was to increase the price level in Senegal relative to the France and the rest of the world. Pigeaud and Sylla (2018) argue that this nominal overvaluation was an explicitly political tool designed to reinforce French control over their colonies by making them dependent on French imports. Regardless of the motive, the overvaluation ensured that Senegalese labour was dear compared to counterparts elsewhere in West Africa.

Wage seasonality

The size of Dakar's labouring population swelled and ebbed with the seasons. This is evidenced by a partial survey of employers in Dakar in 1939. The survey was sent only to firms or government departments employing more than fifty people, so we cannot assume that it is representative of the Dakarois economy as a whole. Nonetheless, it suggests very strong seasonality in labour demand. The survey asked for the total number of permanent workers in various categories, as well as for the maximum, minimum and average number of 'temporary workers'. Not all firms hired temporary workers: the brewing company Brasseries de l'Ouest africain, for example, employed 75 unskilled labourers, but all were permanent employees. On the other hand, the lighterage service

Nominal wages in Dakar and Accra

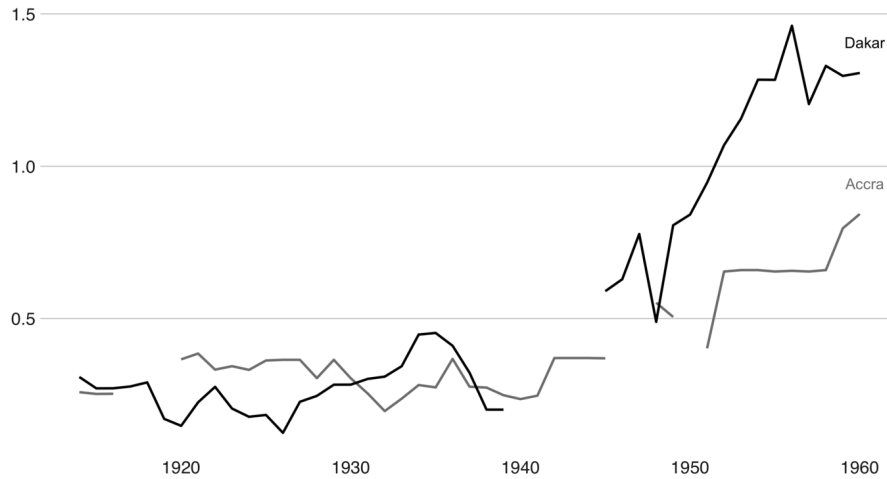Current USD, converted at market exchange rates

Figure 1: Nominal wages at market exchange rates in Accra and Dakar, 1914-1960.

run by the Dakar Chamber of Commerce at the port of Rufisque employed around 150 day labourers in peak season, but only around half that in the slack season. The median ratio of minimum to maximum temporary employment for large firms that did employ temporary workers was about 0.44: that is, in the median firm the number of temporary employees halved from seasonal peak to seasonal trough.[4]

The seasonality of the size of the labour force was unsurprisingly closely linked to the annual agricultural cycle. This is particularly evident when we examine the month of death for unskilled labourers in Dakar: workers whose death certificates were listed as *de passage* in Dakar were much more likely to have died during the agricultural slack season than workers who were born in Dakar or had moved there permanently. More specifically, the distributions of death by month for unskilled labourers shows a peak around April that is much higher for seasonal migrants than for permanent residents of Dakar (see Figure 2). Though we should be cautious about reading too much into results obtained from a small sample—the largest number of relevant deaths in any month was 15, in April, the lowest 6, in December and January—the overall pattern we obtain is fairly telling. It can be readily mapped onto the traditional Wolof division of the agricultural year into the *navet*, roughly from June to September; *lolly*, from September to December; *nor*, from December to March; and *thioron*, from March to June. The pattern of deaths suggests a rough equality between migrants and residents during *nor*, the 'season of rest', while migrants represent a minority of deaths from *thioron* to the end of *lolly*. If we believe the relative magnitudes of deaths was the same as the relative size of the respective seasonal

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[4]'Enquête au sujet de la main d'œuvre à Dakar, 1939', ANS K 257, versement 26.

Month of death by migration status
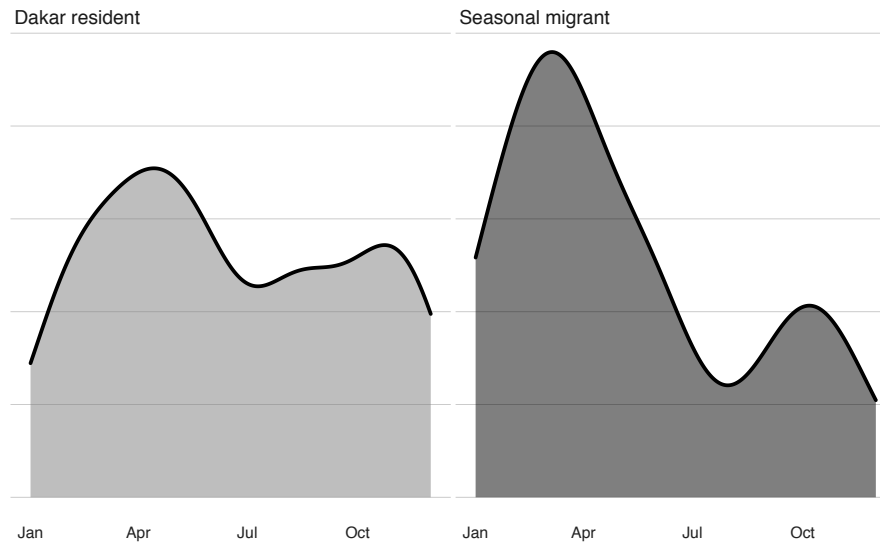
Dakar resident · Seasonal migrant

Figure 2: Patterns of seasonal labour migration for unskilled labourers in Dakar, 1910-11. Deaths by migration status (*manoeuvres* only) taken from death registers in FR ANOM 1 DPPC 6557 and FR ANOM 1 DPPC 6594.

and permanent populations, we could conclude that in 1910-11 the unskilled labouring population of Dakar roughly doubled during the latter part of the dry season as compared with the peak agricultural season. (This assumes that migrants and locals had an equal probability of dying in any given year, an assumption which may not hold.) Such an increase would be consistent with anecdotal evidence from one of the other major groundnut export ports, Kaolack: one estimate in 1935 suggested that the city doubled in size during the peak trading season, from 21,973 residents in the slack season to 44,904.[5]

Did this pattern imply that wages were seasonal as well? In theory, not necessarily. If the demand for labour increases in the face of unchanging supply, its price will of course rise, just as it will decline if labour supply increases while labour demand stays constant. But if labour demand and labour supply jointly increase, then the impact on the wage is indeterminate, and possibly zero. Evidence of seasonal patterns in the nominal wage, therefore, would help us understand whether the increase in employment at seasonal peaks was driven more by the demand for labour at a given wage or by an increase in supply.

The limited evidence we possess suggests that the seasonality of the labour force was a supply- rather than a demand-driven phenomenon. The data, though scanty, comes from the monthly *Bulletin mensuel des renseignements économiques*, compiled by officials in Dakar. The bulletin was neither published officially nor systematically preserved in archives, so we must be content with a selection. The issues that exist do suggest strong seasonal fluctuations in some unskilled

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[5]'La population de Kaolack', in Gouvernement général de l'Afrique occidentale française, *Bulletin hébdomaire d'information et de renseignements* 25 March 1935, Dakar, p.6.

labourer wages. Economic reports from 1927 tell a clear story of seasonality in unskilled labourer's wages: in April, labour was 'abundant' and wages at 'normal levels'; for jobs that did not require onerous exertion, this level was 'just under 10 francs' per day. The next month, as the rainy season drew closer and the opportunity cost of urban work began to rise, workers unloading groundnuts abandoned their posts, 'demanding a wage of 20 francs' per day. Whether they were successful or not was not recorded, but by June 'labour [was] becoming less abundant' and the cost of labour varied 'between 15 and 17.50 to 20 francs' per day. This patterns repeated itself in later years, to the point that the official filling in the form in June 1929 suggested that the fluctuations pointed to a need to invest in handling machines in the Port of Dakar to avoid costly wage bills during the peak agricultural season.[6] Unfortunately, we do not possess a long series from the *Bulletins mensuels* to construct a seasonal index of nominal (or real) wages. But the evidence in these reports, quantitative and qualitative, does suggest that the constrained side of the market was labour supply and not labour demand. The implications of this fact are discussed further in Section 5.1.

4.2   Price index

In order to deflate my nominal wage series, a consumer price index is required. Perhaps the most important innovation of the 'welfare ratio' methodology is to impose a more-or-less uniform consumption basket. This is what makes Allen ratios comparable across space and time. Comparability comes at a conceptually high cost. A 'universal' consumption basket cannot be adapted to historical context, except in the most basic form (the substitution of local grains for use of rye or wheat in the European baskets, for example). We can make the assumption that preferences for the various elements of the subsistence basket were identical *at subsistence levels*—in other words, that a family at a barebones subsistence level of consumption living in medieval Paris had the same preferences over consumer goods as one living in twentieth-century Bamako. This assumption is not too onerous because the composition of the basket is designed to meet physiological needs, not social or cultural ones. But the index number problem cannot be so lightly brushed aside whenever incomes are not at subsistence. There is no reason to suppose a family with an income sufficient to purchase *two* subsistence baskets in sixteenth-century Prague had the same standard of living as a similar family living in Belle Epoque Argentina, for the simple reason that preferences are not homothetic. This limits the kinds of contexts in which an Allen-style 'welfare ratio' is economically meaningful (it is precisely for this reason that Allen also used a 'respectability basket', which, relevant as it may be to early modern Europe, is almost impossible to generalize elsewhere and maintain comparability across space). The barebones subsistence basket is at its most useful as a deflator when incomes are close to barebones subsistence, as they were in Dakar in the first half of the twentieth century.

This caveat aside, the construction of the contents of the basket is relatively straightforward. As Frankema and van Waijenburg (2012) argue, the optimal

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[6]'Bulletin de renseignements économiques'. April 1927, May 1927, June 1927, June 1929, ANS 1 Q 60, versement 19.

Table 2: Contents of the Dakar subsistence basket used in this study

Rice	184 kg
or millet	222 kg
Fish or beef	3 kg
Groundnut oil	3 litres
Sugar	2 kg
Cloth	3 metres
Soap	1.3 kg
Petrol	1.3 litres
Charcoal	58 kg
Candles	Additional 2.5%
Rent	Additional 5%

contents of the subsistence basket may change depending on the relative prices of goods. The problem can be formally stated as a constrained maximation problem, with the objective function being a cost function to be minimised, and the constraints describing minimal nutritional requirements: a minimum number of calories, of protein, and perhaps of fat and other nutrients like B12 and Vitamin C. This can be solved analytically or algorithmically, using linear programming techniques (Allen, 2017).

The subsistence basket used in the Dakar series is described in Table 2. In the first stage, I calculated the required quantities of millet, rice and cassava that would be necessary to obtain the same number of calories (1825) from grains as in F&W. It should be noted that the design of the original Allen basket, designed to supply 1940 calories per person per day, has been criticised by Humphries (2013) because it does not supply sufficient calories to feed a family of five; Allen has therefore constructed a new version of the subsistence basket on the basis of 2100 calories per person per day (Allen, 2015). I have, however, kept the 1940 calorie basket because of its use in Frankema and van Waijenburg's estimates; the Dakar real wage estimated herein is therefore directly comparable to their series, which would not be the case had I used the updated basket. The impact of changing to a 2100-standard basket are not very large for Dakar in any case and would not change any of the conclusions herein; the subsistence basket costs and real wages using the 2100-calorie basket are available from the author on request.

After calculating the required quantities of millet or rice in each year, I then calculated how much protein this would supply, given that grains also contain protein. In the case of millet and cassava, which are relatively rich in protein, there was no need for further protein. A rice or maize based diet, however, would require additional sources of protein. I therefore calculated the cheapest form of protein (in Dakar, this was fresh fish in all years, probably Nile perch or tuna). I then added the requisite amount to each basket. As Frankema and van Waijenburg do, I then add 2kg of sugar and 3 litres of oil to the basket. The consumer choice as to which grain and meat they will buy are independently assessed in each year.

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The choice between millet and rice was freighted with macroeconomic meaning. Though some was imported from neighbouring Soudan français, millet was overwhelmingly produced and marketed domestically. Despite the rice-growing potential of the Casamance and even the floodplains of the Senegal River, most Senegalese rice came from elsewhere in the Empire. Indochina sent her best rice to Europe or elsewhere in Asia, but cheap broken rice (*brisures*) was exported to Africa, and particularly to Senegal, which became reliant on it (Ndao, 2009). On a macroeconomic level, the advantage of rice was that it freed farmers to plant more groundnuts, a more lucrative crop. For an urban worker,imported rice had another advantage: it did not need to be processed. The outer hull of millet grains is indigestible to humans; the grain must be pounded or otherwise hulled to make the grain edible.[7] In Senegambian societies, as in much of the 'millet belt' of the Sahel, the pounding of millet is a traditionally female occupation; indeed, in occupational data in the Dakar births and deaths registries in the early twentieth century, the overwhelming majority of women are described as '*pileuses de mil*', millet pounders, though it is unclear whether, in the case of any individual woman, she pounded millet for customers who paid her or the occupational label was simply a description of the largest part of her domestic duties. Pounding millet is arduous work (Oyeyemi et al., 2017). Even if it had not been traditionally a female task, it is doubtful whether single men who had spent all day at a factory or commercial employment would have had the energy or time to pound enough millet for a daily meal; thus, in a city filled with unmarried men, the need for commercial millet-pounding services.

Thus at least some Dakaroise did pound millet for payment. How much might they have charged? Unable to locate any archival evidence on this question, I make some educated guesses based on productivity and unskilled wages. One woman in Dakar testified that she could pound ten kilos of millet a day (Lecarme, 1999). In Niger, apparently, pounding sorghum could take between twenty minutes and an hour and a half, depending on the fineness of flour desired; assuming a reasonably average fineness and a normal working day, the ten kilogram per day estimate seems to be plausible (Droy, 1990). If we assume that ten kilos per woman per day is a reasonably estimate of millet-grinding potential, we can add the value of her labour to the market price of millet. Unfortunately, we have vanishingly little quantitative information on the remuneration of female labour in colonial Senegal: we must be content with scraps. A colonial budget in 1929 from French Sudan lists a *pileuse de mil* employed by a hospital, who was paid 80 francs per month, compared to a male unskilled labourer who was paid 90 francs per month. Another colonial budget, this time from Senegal in 1890, suggested similarly that a *pileuse* was paid about 80% of the wage paid to unskilled males. I therefore assume that the 'wages'—or average daily income—of a professional *pileuse* were 80% of male unskilled wages. Thus, the cost of a kilogram of millet will be increased by $0.08w$, where w is the unskilled nominal male wage, to obtain an estimate of the cost of processed millet couscous or flour.

The price of millet calculated in this way is considerably higher. On average, about a quarter of the price of a kilogram of processed millet was the labour re-

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[7]Rice must also be hulled after it is has been harvested, of course; but it arrived in the port of Dakar having already been processed, and the price reflected this.

quired to pound it. This mark-up was often, though not always, enough to make rice a more economical choice for any worker who had to take his millet to a professional *pileuse* for milling. The most obvious exceptions to the general rule that of rice's price advantage are during the two world wars—in other words, when supplies of Indochinese broken rice were most compromised. This is shown graphically in Figure 3, in which a value above zero indicates that rice was more expensive than millet, and a value below zero that it was cheaper.

Rice or millet?

The price premium on rice in Dakar, 1912-1960
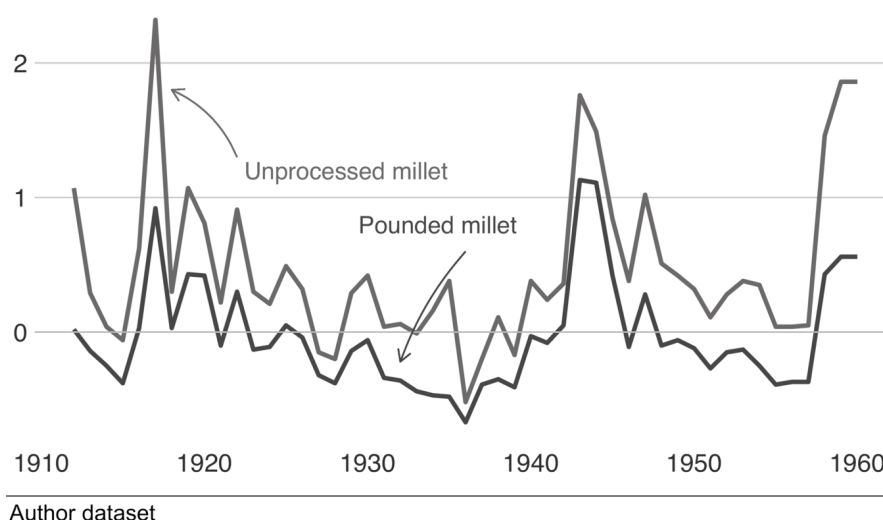

Author dataset

Figure 3: Price premium on rice, calculated as the ratio of rice prices to millet prices, minus 1. A value of 0 indicates that millet and rice are equal in price. Pounded millet prices are equal to raw minflated by 0.08 times the daily male unskilled wage. See text for method and appendix for data sources.

The price of rice is compared to both the unprocessed millet series and my estimated pounded millet price series; in both cases, the estimates account for the fact that rice provides more calories, gram for gram, than millet does. Of course, whether millet was a cheaper option depends on the valuation of female labour, and from the point of view of a married male unskilled worker, the value of the labour of his wife—or wives—measured in terms of opportunity cost may have been very low. Even if we ignore the strong arguments from feminist economis about the need to account for the value of unpaid female labour (see e.g. Folbre and Wagman, 1993), the sheer weight of unmarried men in Dakar at the time suggests that an adjustment for pounding costs is necessary. Moreover, the preference for rice over millet appears to have been very real; in a sample of household budgets across three Senegalese cities in the mid-1950s (Mersadier, 1957), even the poorest household spent about three-quarters of their 'grain' budget on rice; richer families spent about nine-tenths (see Table 3).

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Table 3: Millet and rice purchases by household income in Dakar, Thiès and Saint-Louis, 1954-5. Source: Yves Mersadier, *Budgets familiaux africains*, p.72; author calculations.

Income (f)	**Grain purchases** (f)	**% rice**
1000-1500	333	78%
1500-2000	345	83%
2000-2500	440	80%
2500-3000	401	89%
3000-4000	487	93%
4000-5000	503	88%
5000-7000	477	91%
7000+	464	88%

4.3 Dakar urban wage in comparative perspective

Real wages in Dakar were low by global standards in the first half of the twentieth century (see Figure 4). The welfare ratio was mostly between 1 and 2 until the onset of the Great Depression. The spike in the urban real wage during the early years of the Great Depression, caused by sticky nominal wages and collapsing retail prices for both millet and rice, was likely enjoyed only by a lucky few; unemployment increased, and many Dakarois workers left for the countryside (d'Almeida-Topor, 1976). This phenomenon was not unique to Dakar: in British African cities, the first few years of the Depression saw an increase in real urban living standards (at least for those who remained employed) due to rigid nominal wages and falling prices. The hardest years were, as elsewhere, those marked by conflict: the real wage in Dakar collapsed during the Second World War, as Allied forces first attempted an invasion of Dakar then a blockade. It was at the time that import substitution began in earnest in Senegal: not as industrial policy, but at necessity to replace imports of basic consumer goods that had been cut off by Allied warships. The end of World War II marked the beginning of a season of relative prosperity. The real wage tripled between 1945 and 1960, when Senegal gained independence. For a brief moment, French money poured into West Africa, and as the federal capital, Dakar soaked up much of it. As Babacar Fall argues, the end of the Second World War marked a change in the guiding economic philosophy of French colonial rule: from the idea that colonies must be financially self-sufficient—with all shortfalls covered by loans rather than grants from the metropole—to one in which money would flow from Paris to the colonies to finance development (Fall, 2010).

The rapid increase in real wages in the postwar period can also be seen as a consequence two developments: firstly, the increasingly militant labour movement in Senegal, and secondly, the abolition of forced labour with the Loi Houphouët-Boigny. Strikes were not by any means a postwar novelty (Thiam, 1993). But the arrival of the Popular Front government in Paris in 1936 signalled the beginning of an era more friendly to organised labour: a number of new unions were formed, and a wave of strikes hit the Senegalese labour market. After the repression of the Vichy years, union activity struck up again in earnest

at the end of the war and after it: consider the Thiaroye massacre, the French response to a strike in which Senegalese soldiers protested the refusal of the French army to award them promised pensions, or the railway strike of 1947-8, which formed the basis of *Les bouts de bois de Dieu*, one of the great novels of postwar Senegal (Sembène, 1960). According to Guèye (2011), the efforts of the Labour Inspectorate helped to tamp down more militancy; the majority of the matters it dealt with were related to wages.

Though much forced labour was devoted to public works, and as such served as an implicit tax (van Waijenburg, 2018), it was also sometimes used for private enteprises. Most famously, African farmers were coerced into working at sisal plantations and processing factories in eastern Senegal (Touré, 1984; Rodet and Tiquet, 2016). The institution was abolished, officially, with the loi Houphouet-Boigny in 1946. Though the legislation did not entirely abolish the use of coerced labour—the Société des Salins de Kaolack still used penal labour in its saltworks up until 1956 (Fall, 1993)—it almost certainly led to an increase in wage labour demand on the part of the colonial government that could not longer rely on free labour to undertake arduous tasks on public works, and this probably resulted in a positive shock to the real wage.
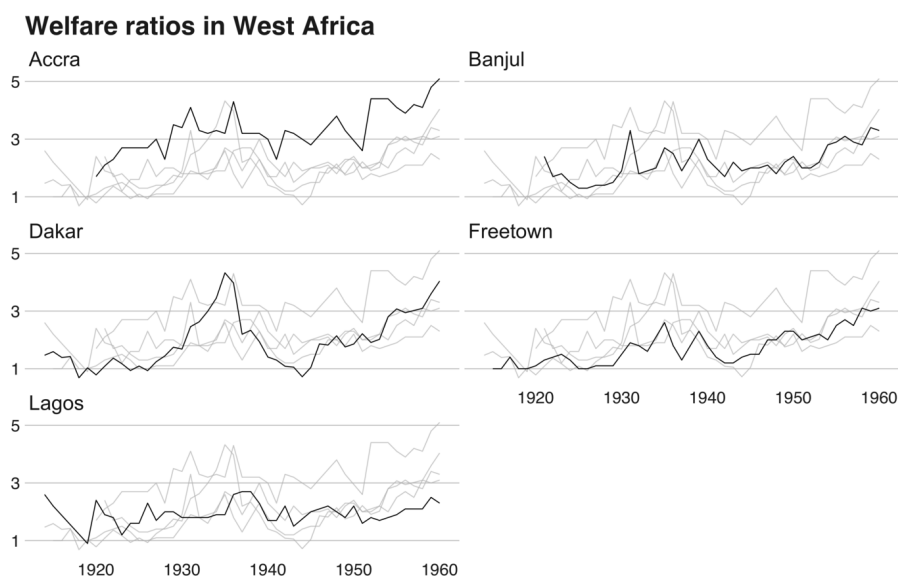
Figure 4: Welfare ratios across West African capitals, 1914-1960. Source: for Dakar, this paper; for other cities, F&vW.

As we can see in Figure 4 Dakarois workers were not as well-off as their counterparts in Accra, by some distance the richest city in the region, judging by unskilled labourer wages. Interestingly, the two cities closest to Dakar, Freetown and Banjul/Bathurst, showed very similar real wage patterns to the Senegalese capital in the 1950s, in both levels and rates of change, which may be evidence of an increasingly integrated market for labour in the Senegambian-Guinean zone.

Table 4: Growth rates of welfare ratios in various West African cities. Source: This study for Dakar; Frankema and van Waijenburg (2012) for all others

	1918-1929	1930-1938	1939-45	1946-1960
Dakar	5.2%	3.6%	−12%	5.7%
Banjul	-5.2%	0.2%	−5.9%	4.1%
Freetown	0%	0.1%	−6.9%	3.9%
Accra	5.1%	−0.8%	0.2%	2.9%
Lagos	3%	6%	−1.5%	0.9%

The growth of real wages in Dakar showed something of a distinctive historical pattern when compared with other West African cities. In Table 4, I compute least-squares growth rates by regressing the log wage on a time trend and taking the estimated coefficient on the time trend. Banjul/Bathurst and Freetown, the two cities closest to Dakar, show very similar real wage patterns: zero or negative growth in the 1920s, very slow growth in the 1930s, a substantial collapse during World War II and reasonably strong growth performance in the period between 1946 and 1960. Lagos and Accra are somewhat different, showing reasonably strong growth in the 1920s. The Lagosian real wage shows a very strong upward trend during the Great Depression, while Accra lagged behind. Both cities struggled during the Second World War but did not see the large negative growth trends of Banjul and Freetown. Wages in both cities increased after the War, though slower than in the 1920s. Dakar was somewhat different again: as in Lagos and Accra, the real wage boomed after World War One; unlike in Ghana, growth slowed but did not stall during the Great Depression, with Dakar posting a respectable 3.6% average annual least-squares growth rate; there was no wage growth acceleration as in Lagos. Unsurprisingly, given the Allied blocade, wages during World War 2 fell further in Dakar than in any of the other West African cities. This was largely a consequence of Dakar's reliance on rice imports to feed itself. Prior to the outbreak of war, Senegalese imports of Indochinese rice came to around 30 kg per person per year. In 1944, this had fallen to a mere 1.27 kg per person. Though some of the caloric deficit was made up by increased production of millet in French West Africa, grain prices did rise substantially. The collapse in the real wage was made good after the end of hostilities, as Dakar's real wage grew faster than in any of the capitals of British Africa.

The evolution of the real wage in Dakar, as elsewhere, was a phenomenon with multiple causes. Alongside the growth of the federal government, one of the most important factors driving growth in the real wage was the fortunates of the groundnut sector. As Choy and Sugimoto (2018) argue, real income growth in tropical port cities like Singapore (or Dakar) can be explained by the growth of forward, backward and final demand linkages from the export sector, concentrated in one or two staples. For Singapore, this was the rubber and tin produced in the hinterlands of Malaya; for Dakar, the groundnuts grown in Senegal and French Soudan. As the first scholar to apply staple theory to West Africa argued, broadly speaking the forward and backward linkages were circumscribed by the physical nature of the staple (Hopkins, 1973). There were few economies of scale in production in groundnuts, or indeed in any of

the crops grown to produce vegetable fats. There were some possibilities for processing, and indeed groundnut oil factories had existed in Senegal since the 1920s, though their viability was threatened by French restrictions designed to product the processing industries of Marseilles. More important were the various services associated with an export industry: bagging groundnuts and loading them onto ships, merchant and financial services, and so on. The final demand linkage was also an important one: as the groundnut boom lead to increased peasant purchasing power, farmers in rural Senegal could begin to purchase a (narrow) range goods produced in Dakar. The precise link between urban incomes and the groundnut boom is a topic left for another paper. In Figure 5, though, I plot per-worker groundnut exports, taken from Vanhaeverbeke (1970) against the real wage as calculated above. It shows a strong and positive correlation between incomes in Dakar and the fortunes of the groundnut sector, as measured by per worker production.

Per worker groundnut exports vs. real wage

Figure 5: Groundnut exports per agricultural worker (x-axis, kg) and Dakar real wage, 1914-1960. Per worker figures derived from the urbanisation ratio.

5   Housing & the nature of urban inequality

The evidence from Section 4 suggests that—with the idiosyncratic exception of the early years of the Great Depression, as prices fell and nominal wages remained relatively stable—real wages in Dakar largely stagnated until the end of the Second World War, but increased rapidly thereafter.

In many historical contexts, we have very little information on the cost of

housing at all. Robert Allen's initial article proposing the idea of a barebones subsistence basket chose to bridge this lacuna by assuming that the *subsistence* cost of housing was equal to 5 per cent of the cost of the rest of the basket, an addition Allen described as 'minimal' and an assumption to which he recommended scholars turn their attention in future work (Allen, 2001). By and large, however, they have largely accepted the practice of adding a fixed constant, usually 5 per cent, to the cost of the subsistence basket to represent housing costs. Frankema and van Waijenburg (2012) adopt this solution in their pathbreaking study of real wages in British Africa.

The historical evidence, though fragmentary, suggests that this may be a substantial underestimate, particularly in the final decades of colonial rule. One particularly colourful description of African housing in Dakar in this period comes from Maurice Voisin, the populist (and racist) journalist and editor of the Dakar newspaper *Echos d'Afrique noire*. Voisin wrote an article in 1952 attacking the Credit foncier de l'Ouest Africain, a real estate lending institution that owned many buildings in the capital, including several in the suburb of Colobane, of which Voisin had the following to say:

> The bedrooms—if one can call them that—are exactly 4 by 3.25m. Of course, there is neither electricity nor water. No windows, either: just wooden shutters, so that at night one suffocates from the heat....Next to the bedroom, there is a miserable little storage closet, without air or light. While the housing crisis rages, this little nook might house six or seven people. How sanitary! They were paying 600 francs per room, per month, and, based on the quality of construction and the amenities, they hoped for a reduction. They had heard of a law on rents. On May 18, they received a letter from the head of the Credit foncier...1660 francs per room per month.[8]

If the Credit foncier's dwellings were inhabited by average unskilled labourers, these rents would have consumed a considerable portion of the monthly wage: 12% of the unskilled nominal wage at the old rate, and 33% at the increased rate. Measured as a percentage of the rest of the subsistence basket, the rents would have been even higher: 25% of the subsistence basket at the old rate, and 68% at the increased rate. In practice, not all African workers were exposed to high rents: some were provided with free housing. This was particularly the case for public sector employees, mining workers, and—in Cote d'Ivoire particularly—agricultural employees on plantations (see Table 5). Those who worked in construction, industry and transport, on the other hand, usually had to fend for themselves. Of the roughly 100,000 formal sector employees in Senegal in the late 1950s, about one in five enjoyed free housing from their employer. The figure was noticeably high in the transport sector compared to all other colonies in the Federation, and can probably be attributed to the importance of the Dakar-Niger and the broader railway sector in Senegal. Overall, however, the vast majority of workers in Dakar would have been responsible for finding—and paying—for their own housing.

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[8]Maurice Voisin, 'J'accuse le Crédit foncier de saboter la bonne entente entre blancs et noirs en Union française', extract in FR ANOM AFFPOL1 2163.

Table 5: Share of waged employees provided with free housing by sector and colony, AOF, 1956. Source: *Annuaire statistique de l'AOF*, vol. 6, tome 1.

Sector	CIV	BEN	GIN	BFA	MRT	NER	SEN	MLI
Public sector	19%	2%	17%	1%	19%	25%	22%	2%
Agriculture	99%	29%	11%	2%	23%	100%	11%	9%
Mining	45%	13%	48%	84%	74%	97%	51%	
Industry & construction	6%	7%	22%	2%	6%	4%	13%	4%
Transport	7%	5%	1%	3%	26%	15%	30%	4%
Commerce	11%	4%	1%	6%	37%	23%	16%	14%
Housekeeping	35%	10%	1%	6%	37%	35%	20%	1%

5.1 Housing and the development process

The importance of housing costs in workers' budgets, and its role in driving urban inequality, points to one interesting aspect of the welfare ratio methodology, one that has rarely been remarked on. The idea of a 'barebones subsistence' level of income is quite close to a feature of the most famous model in development economics: the Lewis (1954) model of economic growth with unlimited supplies of labour. In Lewis's model, there is a large population working in a traditional sector, where the marginal product of labour is very low or even zero; workers, however, are paid the average product of labour, equal to a barebones subsistence income. Because there are unlimited supplies of labour in the traditional sector, capitalists in a 'modern' sector can therefore obtain as much labour as they need without any increase in the real wage (perhaps, as Lewis argued, at a slight premium over subsistence to account for living costs). One testable implication of the Lewis model would therefore be that the real urban wage stagnated around subsistence levels (at a welfare ratio of around one, in the Allen framework).

In the Lewis model, the difference between the marginal product of labour in the modern sector (for example, manufacturing) and the nominal wage—set by the average product of labour in the traditional sector, and constant because of unlimited supplies of labour—yields a surplus that accrues entirely to capitalists. If this surplus is reinvested, the capital stock grows, and poorly-paid workers essentially finance industrial—and economic—growth. However, suppose that the supply of housing near the modern sector (which we can think of an an urban sector) is completely fixed. We can think of this economy as being composed of three kinds of agents: the migrant worker, the capitalist and the landlord. The migrant worker faces an agricultural income at subsistence level s. The capitalist knows that she can hire the worker at any wage $p > w - r > s$, where p denotes the marginal product of labour in the capitalist sector, w denotes the nominal wage, and r denotes the house rent that the worker must pay to live near the capitalist's factory (for the purposes of this thought exercise, assume without loss of generality that housing rent is the only element of the cost of living).

First, consider the case in which rent is zero. The capitalist will want to maximise profit, which is given by $p - w$. She does this by setting w only slightly above the rural income s. But what happens when we let the landlord charge a

rent for housing? His income is simply an increasing function of r. He knows that the worker will still choose to migrate from the countryside as long as $w - r > s$. If the nominal wage in the capitalist sector were fixed, at say w^*, the optimal rent would simply be $w^* - s$. However, the capitalist is earning supernormal profits. If the landlord is aware of this, he also knows that, even if he sets the rent at a rate such that $w^* - r < s$, which would choke off all migration from the countryside, it would be profitable for the capitalist to raise the nominal wage, to restore migration, so long as $p > w$. A sufficiently ruthless landlord could therefore force the capitalist to set wages at the level $w = p$; the rent would then be set at $r = p - s$. In other words, the landlord could extract all of the surplus between the fixed subsistence wage and the labour demand curve that ordinarily would have accrued to the capitalist. Economic growth would then depend on the investment behaviour of the urban landlord, not the capitalist. The degree to which these dynamics may be present will depend on the relative market power of landlord and capitalist (note that the capitalist could also set w such that $w - r^* < s$, hoping to squeeze out the landlord). For our purposes, though, it is enough to merely point out that there is an economically interesting relationship between housing costs, real wages and economic development that could be revealed by real wage indexes that properly account for rents.

Senegal was not a labour-abundant economy in the same way that China and India were in the twentieth centuries. The groundnut boom would not have been as significant or sustained had Senegalese farmers not been able to bring significant amounts of new farmland into cultivation. However, as Austin (2008) has argued, the strongly seasonal nature agricultural work generates seasonal factor ratios as well: Senegal may have been a land-abundant economy in the rainy season, but it was effectively labour-abundant during the (in Senegal relatively long) dry season. Arthur Lewis was famously sceptical of the applicability of his model of development with unlimited supplies of labour to Ghana, and since Hopkins (1973), a suitably modified version of the Myint (1958) model of 'vent-for-surplus' has been seen as a more appropriate than Lewis's to West African conditions. If agricultural labour was abundant throughout a large part of the year in Senegal, though, and could easily move to Dakar for seasonal work, then the Lewis model may be a reasonable enough approximation, and the model sketched above could be a useful way of describing the trajectory of housing costs in cities like Dakar.

5.2 Housing costs in Dakar and Senegal

Operationalising the idea of a rent-inclusive subsistence basket in a context such as colonial Dakar is easier said than done, however. Given that retail prices were not systematically documented, we cannot expect the kind of information on the evolution of housing costs contained in contemporary consumer price indices. I have collected around 20 observations of working class rents in Dakar from archival across the period 1914-1960, and have interpolated between them to arrive at a rough estimate of a rent price series. Some of these observations were collected by French officials inquiring into the standard of living in Senegal; others came from sources like budget documents that provided information on prices charged for rent in temporary accomodation for migrant workers and accommodation allowances to unskilled workers employed by the French

administration.

In Figure 6, I plot the Dakar welfare ratio with Allen-style housing costs and with my own rental price index. The results are fairly dramatic. The spike during the Great Depression is attenuated, and the substantial growth in the period between the end of World War II and independence in 1960 is much more modest. Skyrocketing rents ate up part of the nominal wage growth in this period. We can assume that this also led to a growth in urban inequality in Senegal, as landlords enjoyed a high rate of return on their property assets.
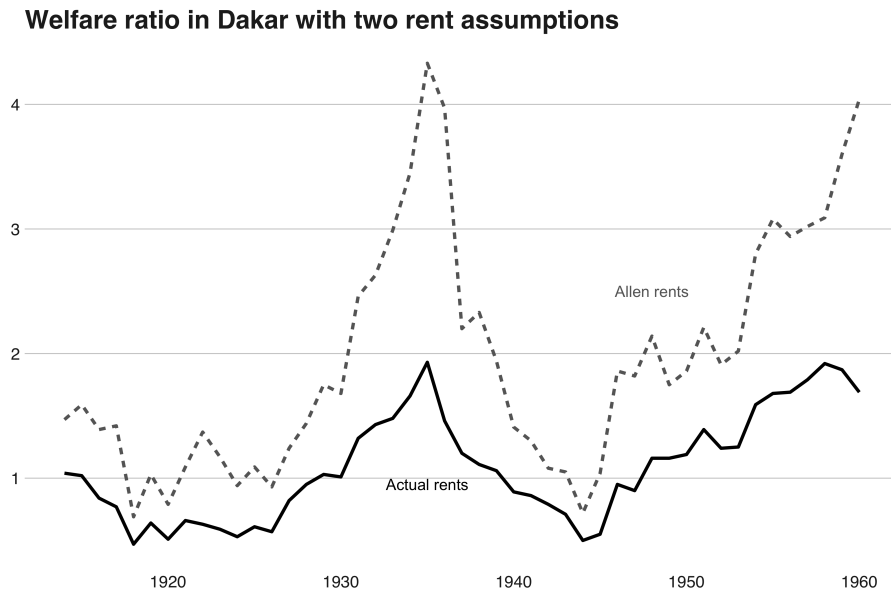
Welfare ratio in Dakar with two rent assumptions

Figure 6: Welfare ratios in and Dakar, with the traditional "Allen"-style rents (5% of the cost of the rest of the subsistence basket) and with actual working class rents.

5.3 Housing costs across West Africa in the developmental decade

Dakar was by no means an exception. Across colonial Africa, large cities experiences major housing crises, particularly in the final decades of imperial rule (Brennan, 2007). Compiling a full rental series for all of West Africa for the purposes of comparison is beyond the scope of this paper; however, as an indication, in Table 6, I present a range of estimates of rental costs for unskilled labourers in various African cities from 1940 to 1960. In the third column, I calculate the rental amount as a proportion of the cost of the subsistence basket, either from archival sources or from Frankema and van Waijenburg (2012). These estimates suggest that the 5% standard is a considerable underestimate, and that for certain periods and certain cities—consider Ouagadougou, Freetown, or Niamey—housing costs might be the single most important determinant of the real wage of unskilled labourers.

Table 6: Working class rents as a share of subsistence basket costs across West
Africa. Sources: 'Essai de recapitulation des éléments connus à Dakar pour
servir à un calcul du revenu national de l'A.O.F.', FR ANOM BIB SOM 314723.
Freetown, Bathurst, Lagos and Accra: J. Orde Browne, Labour conditions in
West Africa, May 1941, London. Kampala: Colonial Office, The British Territo-
ries in East and Central Africa, 1945-1950, June 1950, London, p.128. Subsistence
basket costs taken from Sources: Senegal ANS 22G 136, Haute Volta ANS 22G
223, Guinee ANS 22G 222, Soudan ANS 22G 227, Niger ANS 22G 225 and from
Frankema and van Waijenburg (2012) for British colonies.

| Location	Description	Rent as % of basket
Kampala, 1950	"Dwellings built of stabilised earth...rents range from Sh. 13 per month, plus Sh 2 water rate to..[Sh 75]"	70%
Bathurst/Banjul, 1940	"For the unskilled labourers...4s for the rent of a room [monthly]"	20%
Accra, 1940	"Zongo accomodation for casual labourers, range of single rooms..Rent 5s 6d per room"	53%
Lagos, 1960	"House rent ...in Lagos between £3 and £4."	95%
Freetown, 1940	"rent, amounting to at least four to six shillings monthly, and even this entails sharing a room"	96%
Dakar, 1951	"case en paille, loyer mensuel de 800 francs"	47%
Bamako, 1951	"pièce en banco...400-500 francs"	80%
Abidjan, 1951	"le simple droit de déposer sa natte, avec plusieurs autres, dans une 'baraque' est payée à 5 à 600 frs par un manœuvre"	50%
Cotonou, 1951	"loyer mensuel pour une pièce en banco ou en chaume varient de 800 à 1000 francs"	139%
Niamey, 1951	"une pièce en banco...750-1000 francs à Niamey"	86%
Ouagadougou, 1951	"pièce en banco...1000 francs à Ouagadougou"	150%
Conakry, 1951	"loyer mensuel d'un simple-abri variant entre 1000 et 2000 francs"	84%
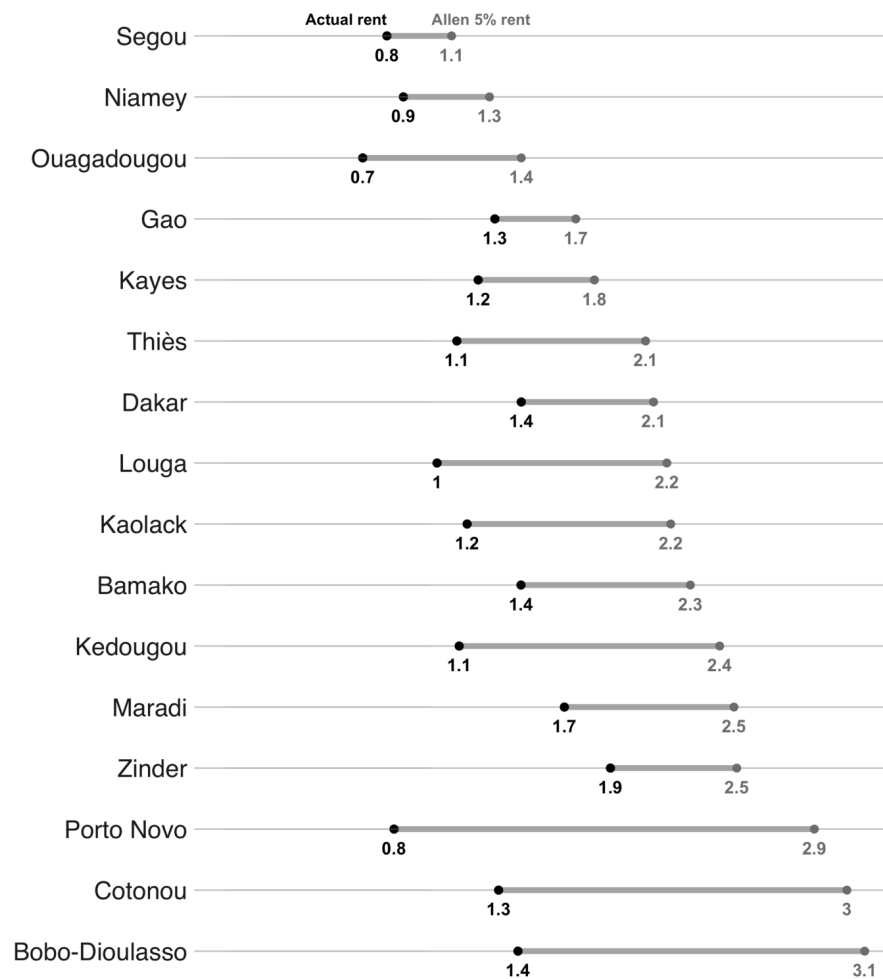
Figure 7: Welfare ratios in French West Africa, 1951, using the Allen-style assumption that rent is equal to 5% of the cost of the rest of the subsistence basket, and actual rents. Sources: Senegal ANS 22G 136, Haute Volta ANS 22G 223, Guinee ANS 22G 222, Soudan ANS 22G 227, Niger ANS 22G 225. Rents from FR ANOM BIB SOM 314723. Wages from same source as prices or from Annuaire statistique de l'AOF.

These estimates point to a pessimistic revision of recent attempts to quantify African unskilled workers' living standards, particularly in the last decade or two of colonial rule. What workers won from employers in wages, they lost to landlords in rent. In the case of Kampala, to take one example, the traditional methodology yields a welfare ratio of 1.5 in 1950—that is to say, the urban unskilled male wage was sufficient to purchase the essentials required to feed one and half families of 4 at a barebones subsistence level of income. If we instead calculate the cost of the barebones basket using the rent for a stabilised earth house given in Table 10, the welfare ratio declines to just over 1. More

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drastically still, the Lagosian real wage declines from 2.3 in 1960 to 1.1 if we take into account house rent. In Figure 7, I show the decline in the estimated real wage for various cities in urban centres in Afrique occidentale française when adjusting for actual rents. Two facts are immediately striking. One is, as above, the large impact that accounting for rents has on estimates of urban living standards: the welfare ratio in Porto-Novo, to take an extreme example, declines from nearly 3 to under 1 if housing costs are properly accounted for. This suggests that the results of recent work on living standards in late colonial Africa may be too optimistic: not because aggregate urban income was low, but because it was unequally shared between labourers and their landlords. More broadly, it points to an important future research agenda on historical housing costs in urban Africa in order to make more precise estimates of the evolution of living standards over time, a process that has begun for other parts of the world (Drelichman and Agudo, 2014; Zegarra, 2020).

The other fact is the correlation between the 'traditional' welfare ratio and the size of the adjustment, demonstrated in Figure 8. Three interpretations are possible, and indeed are not mutually exclusive. The first is that this correlation reflects a difference in housing quality: as workers earned higher incomes they rented better properties, and this was reflected in the values gathered by the French officials responsible for drawing up the 1950 national accounts. Indeed, there is some variation in the description of the various dwellings (a 'case en paille', or straw hut, in Dakar; a 'pièce en banco', a mud-walled room, in various other cities). This seems unlikely to account for the entire relationship. Another possibility is that causality ran from rents to wages: workers were explicitly compensated for high rental costs in boom cities with higher nominal wages. This suggests a departure from market-clearing in the labour market. A third possibility is that, as in Dakar, higher wages were swallowed up by landlords.

Why might housing have been expensive in countries with an abundance of land? Part of the reason is the land *in general* may be abundant; but what matters is the quantity of land available within walking distance of employment. In economies without widespread means of mechanical transport, unskilled labourers often walk to work. In 1959-60, in Abidjan, a survey suggested that roughly two in five workers in Adjamé-Centre and Adjamé-Ebrié and Treichville walked to their place of employment. Over half of those living in Adjamé "Obligatoire" walked. These figures were even higher for those who rented: 64% of those who rented at Treichville walked to work (Bernus, 1962). Walking distance is of course not a fixed concept, but if we suppose that a worker will be willing to walk a maximum of fifteen kilometers to work each day (about three hours' walk each way), then the 'possibility' circle defined by the worker's willingess to walk, and in which a job must be located, is about 700 square kilometres in area, about the current footprint of Austin, Texas. The distance of 15km is roughly the distance between Guédiawaye or Pikine, two of the major outer-urban low-income settlements of Dakar, and the centre of the Senegalese capital. If jobs are concentrated geographically, then the If jobs are concentrated geographically, then land rents will naturally capitalise the value of proximity to those jobs. The price of urban land may be further driven up by unclear property rights; returns to construction must be high enough to compensate for the possibility of expropriation, for example (see more generally (Bah et al.,

Rents were much higher in higher wage towns in A.O.F

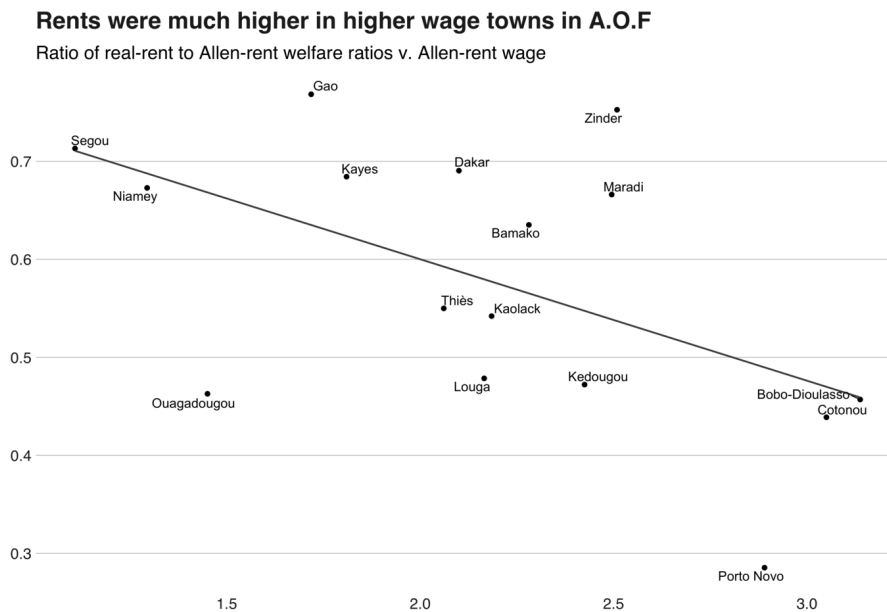Ratio of real-rent to Allen-rent welfare ratios v. Allen-rent wage

Figure 8: Relationship between the traditional welfare ratio, using a 5%-rent assumption (x-axis) and the ratio of the actual-rent welfare ratio to the 5%-rent welfare ratio (y-axis). Sources: as in Fig 7.

2018).

Of course, supernormal profits ought to encourage entry, driving the price back down: however, housing is no ordinary market. Urban land is fixed in supply, legal and de facto ownership are often murkey, and without well-functioning credit and/or land markets, even those who possess clearly-defined rights to land may not be able to borrow to build. All of these constraints were probably present in early twentieth century Dakar. Furthermore, government regulation could often have unintended consequences on the pace and nature of construction. One particularly strong preoccupation of colonial urban regimes was "hygiène", or sanitation, a haunting obsession that frequently structured official policy towards indigenous African practices and dwellings (Swanson, 1977; Curtin, 1985). Frequent epidemics in urban Senegal led to distinctive regimes of urban planning, designed to protect European settlers and officials by separating them, as much as physically possible, from insalubrious African dwellings (Bigon, 2015; Ngalamulume, 2004). The outbreak of bubonic plague in 1914 was a catalysing factor in the construction of the Médina, north of Plateau, as a segregated area for African dwellings (M'bokolo, 1982). Concerns about sanitation could result in an official preference for low-quality dwellings for Africans: one solution to epidemics was to completely burn the houses of those who had been infected, which was certainly cost-effective from the point of view of the Administration; once it began requiring property-owners to use more expensive building materials than the typical mud and straw, it was required to compensate homeowners when their houses were burned for

sanitary reasons (Sinou, 1985). This could even be a justification for banning durable constructions in the 'African' suburbs of colonial towns, like Guet N'Dar in Saint-Louis.

Moreover, well-meaning government regulations, like the 1928 decree that imposed minimum standards for rental housing, including a requirement for at least 15 square metres per lodger, may, if they were adhered to, have constricted supply (Bouche, 1978). Similarly, a series of restrictions on the amount of rent chargeable by landlords, imposed from the 1930s onwards, were alleged to have stifled new investment in housing construction by reducing the rate of expected return: "in certain agglomerations of the Federation," one report asserted, "the limiting of annual rents to 8% of the real value of the property has not allowed owners to draw a sufficient income from their invested capital; thus we risk seeing capital flow out of the construction sector."[9]. A letter from Pierre Chichet of the Syndicat des entrepreneurs et industriels de la Côte d'Ivoire to the Minister of Overseas France was explicit on this point for Abidjan:

> for African dwellings in Treicheville and Adjamé, it is the case that a [maximum] income of 8% a year would result in rents at most one fifth of those currently practised; [imposing this limit] would result in a total halt to all construction in Treichville.[10]

The question of housing costs has, as suggested above, broader implications for the process of economic development. Consider again the discussion of the Lewis model above. If landlords appropriated a large portion of the above-subsistence incomes of urban workers, then growth depends therefore on the investment strategies of landlords, not capitalists. If they re-invest rents in high-productivity industries, for example, then the unequal distribution of urban income growth can result in growth dynamics very similar to the Lewis model. However, if landowners dissipate their rents in consumption or reinvest in housing (a sector, let us assume, without substantial potential for increasing returns) then Lewis-like rapid growth may be unlikely. A priority for future research in this case ought to be to more historical studies of landlords and their investment strategies in West African urban centres (Fourchard, 2003; Tall, 1994; Mann, 1991)

6 Conclusion

The aim of this paper has been to investigate the comparative standard of living in rural and urban Senegal from 1914 to 1960, drawing on a range of published and archival sources. Two main real income series were constructed: the first, a real wage series for Dakar, closely follows the 'subsistence basket' methodology widely employed in studies across time and space. The second measure is a qualification of the first measure, drawing on a series of observations of working class rents to relax the usual assumption in the subsistence-basket-based real wage literature that housing accounts for 5% of the cost of the rest of the subsistence basket. I argue that this assumption is flawed for 20th century

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[9]Report to President of France, FR ANOM 1AFFPOL 2163

[10]Letter from Pierre Chichet to Ministre de la France d'Outre Mer, 13 March 1953, FR ANOM 1AFFPOL 2163.

Senegal, and I collect observations from across colonial Africa in the 1940s and 1950s to suggest that it is probably flawed elsewhere. That housing costs appear to have been very high across the continent in the 1940s and 1950s points to a new agenda in African economic history, examining the relationship between tenants and landlords in major cities and of the role of unequal access to land and housing as one of the key historical motors of inequality in African urban centres.

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A   Time series

A.1   Data sources

Private sector nominal wages

1914-1934: Index of manoeuvre wage taken from the Budgets généraux de l'Afrique occidentale française, Hôpital indigène. Projected backwards from private sector manoeuvre wage from ANS FCCD, various (trimmed 251935-6: Responsibility for the hôpital indigène was transferred to the budgets of Dakar et dépendences; index of wages taken from that source. Projected backwards as above. 1938-1960. Private sector wage taken from Berg, 'Trends in Real Incomes'

Retail prices

Prices for years not mentioned were estimated by linear interpolation.

Rice: ANS 6Q 39 (1914, 1919-1925, 1929, 1931), 'Valeurs mercuriales' in Journal officiel (1915-1917), Bulletin mensuel de l'Agence économique de l'Afrique occidentale française (1926, 1935, 1936), Bulletin mensuel des renseignements économiques in ANS 1 Q 60 (19) (1928, 1930, 1933), Import prices marked up 22

Millet: ANS 6Q 39 (1914, 1919-1925, 1929, 1931), 'Valeurs mercuriales' in Journal officiel (1917), ANS FCCD 368 (1938-1944), Bulletin mensuel de l'Agence économique de l'Afrique occidentale française (1926, 1935, 1936), Bulletin mensuel des renseignements économiques in ANS 1 Q 60 (19) (1928, 1930, 1933, 1934), ANS K 273 (1937-1944), Annuaire statistique de l'Afrique occidentale française (1945-1954), ANS 11D1/500 (1956) others interpolated or extrapolated from rice prices.

Fish: ANS 6Q 39 (1914, 1919-1925, 1929, 1931), 'Valeurs mercuriales' in Journal officiel (1917), Bulletin mensuel des renseignements économiques in ANS 1 Q 60 (19) (1928, 1933), ANS 1 Q 161 (1934-1936), ANS K 273 (1937-1944), Annuaire statistique de l'Afrique occidentale française (1945-1954), Bulletin statistique de l'Outre-mer (1955), ANS 11D1/500 (1956), ANS 22G 316 (1958, 1959), ILO October Inquiry 1960 (1960)

Beef: ANS 6Q 39 (1914, 1919-1925, 1929, 1931), Bulletin mensuel des renseignements économiques in ANS 1 Q 60 (19) (1928, 1933), ANS 1Q 161 (1934-1944) Annuaire statistique de l'Afrique occidentale française (1945-1954), Bulletin statistique de l'Outre mer (1955), ANS 11D1/500 (1956), ANS 22G 316 (1958, 1959), ILO October Inquiry 1960 (1960)

Sugar: ANS 6Q 39 (1914, 1919-1925, 1929, 1931), Import prices, marked up 22% (1926, 1930, 1933) ANS Q 161 (1934-1944), Annuaire statistique de l'Afrique occidentale française (1945-1954), Bulletin statistique de l'Outre mer, (1955-1957) ANS 22G 316 (1958, 1959), ILO October Inquiry 1960 (1960)

Soap ANS 6Q 39 (1914, 1919-1925, 1929, 1931), Import prices marked up by 22% (1915-1918, 1924-25, 1930, 1932), Bulletin mensuel des renseignements économiques in ANS 1 Q 60 (1928, 1934, 1935) Annuaire statistique de l'Afrique

occidentale française (1945-1954), Bulletin statistique de l'Outre mer, (1955-1957), ANS 22G 316 (1958, 1959), ILO October Inquiry 1960 (1960)

Groundnut oil: Extrapolated backwards from 1929 (from ANS 1 Q 19) using unit price of groundnut exports (1914-1929); Import prices marked up 22%, (1930, 1932); ANS 1Q 161 (1934-1944); Annuaire statistique de l'Afrique occidentale française (1945-1954); Bulletin statistique de l'Outre mer, (1955-1957); ANS 22G 316 (1958, 1959), ILO October Inquiry 1960 (1960)

Cotton cloth ANS 6Q 39 (1914, 1919-1925, 1929, 1931), Import prices marked up 22%, (1930, 1932) Bulletin mensuel de l'Agence économique de l'Afrique occidentale française (1935), Annuaire statistique de l'Afrique occidentale française (1945-1954), ANS 11D1/500 (1956), ANS 22G 316 (1958, 1959)

Petrol Projected backwards from 1929 (ANS 1 Q 60) using the index price of huiles lourdes imports (1914-1929); ANS 1 QD (1929, 1931), ANS FCCD 382 (1934), ANS 1Q 161 (1934-1944), Annuaire statistique de l'Afrique occidentale française (1945-1954), ANS 11D1/500 (1956), ANS 22G 316 (1958, 1959), ILO October Inquiry 1960 (1960)

Charcoal: Projected forward and backward from 1925 prices from coal import price index. (1914-1930), Bulletin mensuel de l'Afrique occidentale française (1931-1933), ANS 1 Q 161 (1934-1944), ANS Annuaire statistique de l'Afrique occidentale française (1945-1954), Annuaire statistique de l'Afrique occidentale française (1945-1954), 11D1/500 (1956), Bulletin statistique de l'Outre mer, (1955-1957), ANS 22G 316 (1958, 1959)

Room rent: 'chambre pour indigène', ANS 6Q 39 (1914, 1919-1925), Indemnité de logement pour matelot, Budget du Port de Dakar (1928-1930), ANS 4G 107 (1935), Total price for rent of room in caravanserail for itinerant workers in Dakar, Budget de la circonscription de Dakar et dépendences (1936-8), ANS K 273 (1942), ANS FCCD 368 (1944), FR ANOM BIB SOM 314723 (1951), FR ANOM 1 AFFPOL 2163 (1953), 'loyer mensuel' in ANS 22G 316, 'Rapport de l'inspection de travail' (1958), extrapolated forward to 1962 using UNECA briefing note E/CU,14/HCUPA/3 'Housing problems and policies'

A.2   Series in data table

I: Family subsistence basket cost, Allen-style housing costs (i.e., rent is 5% of the cost of the rest of the subsistence basket).

II: Family subsistence basket cost, actual rents.

III: Nominal urban wage.

IV: Welfare ratio, Dakar, Allen-style rents (III ÷ I)

V: Welfare ratio, Dakar, actual rents (III ÷ II)

Series:	I	II	III	IV	V
Unit	*Francs*	*Francs*	*Francs*	*Welfare ratio*	*Welfare ratio*
1914	324	458	475	1.56	1.16
1915	298	464	475	1.74	1.29
1916	341	565	475	1.44	1.20
1917	334	618	475	0.87	0.81
1918	692	1019	475	1.41	1.16
1919	538	872	554	1.19	1.04
1920	806	1247	633	1.22	1.05
1921	875	1433	949	1.94	1.52
1922	739	1604	1011	1.80	1.53
1923	861	1720	1010	2.33	1.84
1924	1088	1936	1019	2.05	1.61
1925	1058	1907	1155	1.79	1.46
1926	1238	2024	1155	1.60	1.32
1927	1394	2112	1733	1.79	1.28
1928	1306	1975	1882	1.82	1.27
1929	1240	2093	2166	1.99	1.53
1930	1289	2140	2166	1.97	1.54
1931	939	1747	2310	2.32	1.64
1932	901	1650	2367	2.22	1.60
1933	681	1380	2037	2.55	1.74
1934	586	1218	2022	2.84	1.93
1935	473	1062	2046	3.39	2.22
1936	516	1406	2049	4.12	2.17
1937	1098	2018	2412	2.40	1.61
1938	900	1889	2100	3.11	2.19
1939	1236	2269	2400	2.53	1.72
1940	1836	2901	2580	1.95	1.53
1941	2169	3266	2820	1.82	1.41
1942	2965	4059	3216	1.51	1.21
1943	3370	5028	3552	0.85	0.78
1944	4992	7154	3600	0.81	0.74
1945	5069	9628	5280	1.60	1.37
1946	7093	13955	13200	2.31	1.79
1947	8967	18140	16320	1.78	1.49
1948	12442	23045	26640	2.14	1.65
1949	22855	34558	40080	1.74	1.35
1950	23779	37046	44160	1.77	1.36
1951	22447	35778	49680	1.86	1.36
1952	29394	45154	56160	1.77	1.34
1953	30058	48547	60720	1.86	1.43
1954	24061	42451	67440	2.04	1.50
1955	21928	40036	67440	2.18	1.51
1956	23889	41520	70320	2.03	1.42
1957	25208	42391	76080	1.96	1.36
1958	27145	43828	84000	1.89	1.32
1959	26677	51422	96000	2.28	1.55
1960	23760	56684	96000	2.90	1.93