

Agriculture and industry in the process of
economic growth and inequality in Senegal,
c.1848-1979

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This thesis is submitted for the degree of Doctor of Philosophy.

October 2021

ABSTRACT

This thesis describes and analyses the path of structural change in the Senegalese economy from around the abolition of slavery in French-ruled insular Senegal in 1848 to the time of structural adjustment in 1979. A study of the economics of urban slavery in mid nineteenth-century Senegal uses the structure of slave prices to argue that urban growth in nineteenth century West Africa was constrained and conditioned by the existence of land abundance in the countryside and a highly seasonal potential labour force. I argue that urban inequality in these economies is driven by the accumulation of rents to those who can command scarce and inelastically supplied resources, like urban land, permanent and skilled labour, and credit. As Dakar—Senegal’s most important city—grew, it drew upon reserves of low-skilled labour in the countryside. Many migrants moved to Dakar seasonally, taking advantage of the possibilities of the urban economy during the long dry season. Male workers born in Dakar were much more likely to obtain well-paid, skilled work than migrants; upward social mobility was also relatively low by contemporary standards. This urban growth was rapid, but costly: a large share of national capital formation was devoted to providing the social overhead infrastructure necessary for growth. This created stark inequalities within the Dakar economy. Workers’ wages in Dakar often grew faster than agricultural incomes using standard methods of measurement; however, if housing costs are adequately accounted for then urban unskilled wages never outpaced rural incomes by much. The fruits of the groundnut boom accrued mainly to urban landlords, not workers. The unequal distribution of agricultural growth placed severe constraints on industrialisation. An import-substituting strategy was always a risky proposition, but the failure of the attempts at postcolonial federalism in West Africa definitively doomed it: the size of the domestic Senegalese market and the structure of demand for industrial output was unlikely to allow import-substituting industries to achieve competitive efficiency.

PREFACE

This thesis is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared here in the preface and specified in the text.

It is not substantially the same as any work that has already been submitted before for any degree or other qualification. An earlier version of Chapter IV appeared as African Economic History Network Working Paper #60.

It does not exceed the prescribed word limit for the History Degree Committee.

All translations from French are my own.

ACKNOWLEDGMENTS

Without the extraordinary financial generosity of the Cambridge Trust, and more particularly of Dr Wong and Dr Calthorpe who funded the Wong-Calthorpe scholarship, I would not have been able to start, let alone finish, this project. I am extremely grateful to them for their kindness, and hope that in the future I be able to pay forward to future scholars some of what I have received. I also warmly acknowledge financial assistance from the Ellen Macarthur Fund at Cambridge.

A condition of the scholarship was membership at the youngest of the old colleges. At Sidney Sussex I put a lot of effort into trying not to stick out amongst the crowd of Americanists: Lewis DeFrates, Jeanine Quené, Rhys Jones and Yaz Dualeh did their best to ignore the fact that I usually had no idea what they were talking about. Taushif Kara was an inexhaustible source of the only two good things in life (wine and gossip). Elsewhere at Cambridge, in the global economic history group, I found a very pleasant academic home alongside Damilola Adebayo, Mostafa Abdelaal, Laura Channing, and especially Emiliano Travieso, from whom I learnt everything I have ever known about Uruguay, among other things. The pandemic cut short my conversations about African industrial policy with Georges Quist, but I learnt a lot from him all the same. My housemates in Dakar—Ky Nadine, Jessica, and Magalie—helped me find my feet in what was for me a very new and at times bewildering city. Archival work is lonely work without friendly faces: Na’ama Morag-Zamonski, Arfan Sarr and Idriss Fofana were great research companions in the Dakar archives, as were Diego Alves and Cherif El Heide Baldé in the various libraries and archives I worked in during my stay in Paris. In other time zones, Liam Gammon, Emily Millane, Elouise Fowler and Leah Ginnivan were infallible sources of solidarity.

I am exceedingly grateful for the dedication and professionalism of archivists in the Archives nationales d’outre mer in Aix-en-Provence, the Archives nationales and the Service d’archives économiques et financières in Paris, the Archives municipales in Mulhouse, and the Archives nationales in Dakar. In addition, I would like to thank Jenni Skinner, the manager of the Centre for African Studies library at Cambridge, who is not only an invariably friendly face in the library but who also went above and beyond to track down items she (correctly) thought might be of interest in the centre’s basement archival collections: whatever the university is paying her, it isn’t enough.

My advisor, Dr Bronwen Everill, was instrumental in helping my rethink the scope of the thesis during the first-year examination. While working on the PhD, I was also part of a major project led by Dr Isabella Weber and Dr Gregor Semeniuk, now at the University of Massachusetts, Amherst. The project was very challenging and rewarding, and I am extremely grateful to Isabella and Gregor for allowing me to be part of it, for their help, and their hospitality in Northampton. As my PhD was coming to an end, I was fortunate to be invited to return to (more or less) my old job at the Asian Bureau of Economic Research in Canberra, in the orbit of which I entered around 2013, and the directors of which, Shiro Armstrong and Peter Drysdale, have been mentors and friends ever since.

My family, of course, deserve far more credit than I can possibly give them here, but it would be remiss of me not to mention that as the pandemic erupted and I very suddenly found myself without accommodation in Cambridge, I had little choice but to return to Australia, and to live at home until I completed the dissertation. I am very grateful to my mother and my father for letting me stay so long.

The final acknowledgment is also the most substantial: to Professor Gareth Austin, who introduced me to the study of African economic history—indeed, really, to economic history in general. Ever since the first broken Skype conversation, sitting in my kitchen in Istanbul, where I outlined a very sketchy plan to work on Senegalese industrialisation, he has been supportive, generous with his time, and liberal with his wine stocks. Gareth, Pip, Becca, Lily and Maddy invited Emiliano and I to their family Christmas three years in a row, and I hope it is not too mawkish to say that they became my Northern Hemisphere family.

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INTRODUCTION. *Structural change
in the land-abundant tropics: theories and models*

Upon independence in 1960, Senegal stood out in West Africa: one the oldest of Europe's colonies in the region, by some distance the most urbanized, and the most industrialized (see Table 1). More broadly in Africa, when we consider the share of manufacturing in GDP only the settler colonies outpaced it south of the Sahara. Two decades into the twenty-first century, the picture looks less rosy. On independence, per capita GDP in Senegal was around \$1445 in Geary-Khamis dollars; by 2010 it was \$1507.¹ The share of manufacturing output to total output was around 13% in 1960; today it is only slightly higher, at about 15%. The question this thesis asks is simple: what led to Senegal's precocious economic development, and why has this development seemingly stalled? This thesis offers a broad economic history of Senegal from the 1830s to the early decades of independence, bringing to bear a large quantity of newly collected macroeconomic data. It is organised around an old question in economic history, and in development economics: by what means does an agrarian society transform into an industrial one; from a rural to an urban one; from a 'traditional' to a 'modern' one? What determines the pace and intensity of these transformations?

TABLE 1: Manufacturing share of GDP at the end of colonial rule in Africa.

Country and year of estimate	Manufacturing share of GDP	Country and year of estimate	Manufacturing share of GDP
Central African Republic (1961)	6.9%	Malawi (1960)	6.2%
Chad (1956)	6.0%**	Mauritania (1959)	0.8%
Congo-Brazzaville (1956)	8.2%**	Niger (1959)	4.2%
Congo-Léopoldville (1958)	7.6%	Nigeria (1959)	5.1%
Dahomey (1959)	4.9%	Senegal (1960)	12.7%

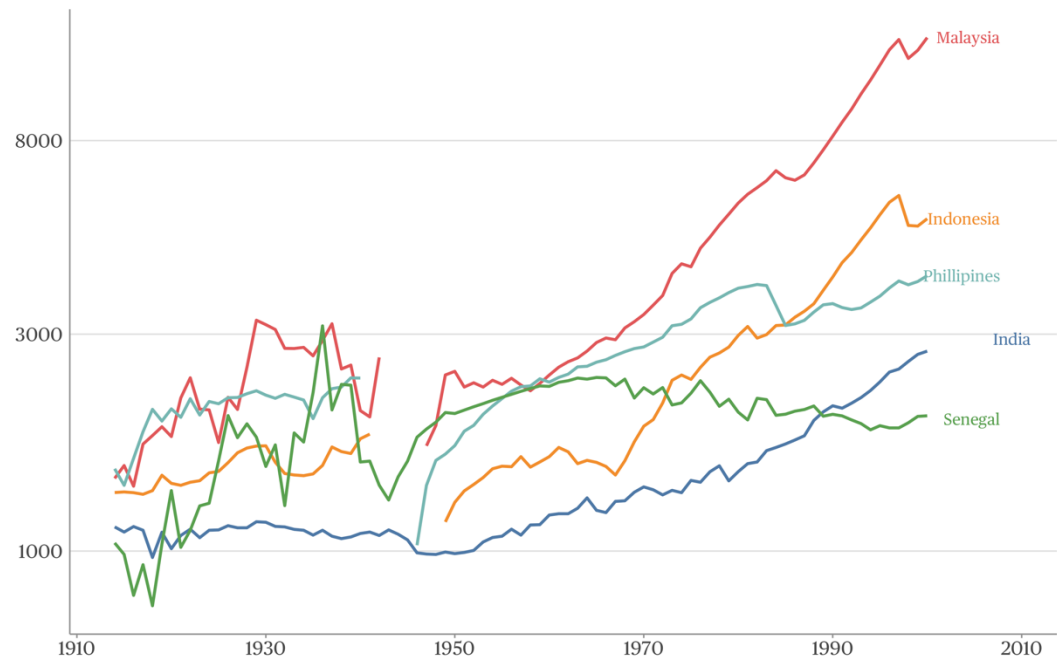
¹ Jutta Bolt and Jan Luiten van Zanden, "The Maddison Project: Collaborative Research on Historical National Accounts," *The Economic History Review*, 2014, doi:10.1111/1468-0289.12032.

Ethiopia (1957)	4.7%	South Africa (1960)	25.9%
Gabon (1960)	9.1%	Sudan (1960)	4.8%
Guinea (1956)	6.5%**	Tanganyika (1960)	3.0%
Ghana (1960)	6.3%	Togo (1957)	7.7%**
Ivory Coast (1960)	6.2%	Uganda (1960)	6.5%
Kenya (1960)	9.5%	Upper Volta (1956)	9.5%**
Madagascar (1960)	8.1%*	Zambia (1960)	4.0%

Notes: *Of which 3% is estimated artisanal output. **Many of the mid-1950s French colonial estimates appear to have implausibly low agricultural output; the share of manufacturing in the economy for these countries is therefore probably an overestimate. Source: Calculated from figures in UNECA, 'Statistical bulletin for Africa', November 1965.

Another question that motivates the thesis is a comparative one: why has industrial growth, and indeed income growth, been so disappointing in West Africa when compared to, for example, land-abundant Southeast Asia? The latter is a region with which West Africa shares a fair number of similarities, including the seasonal rhythms of tropical agriculture, long histories of European colonial rule, and participation in one of the less well-appreciated economic revolutions of the past century: the tropical cash-crop boom. In Figure 1 I plot series for national income per capita for three Southeast Asian countries, as well as India, and compare it to a series for Senegal constructed from data collected and presented in the rest of this thesis. The results are striking: Senegalese national income was broadly comparable to those of Malaysia, Thailand, and Indonesia, and with the exception of the period of the First World War (for which data is of questionable quality in any event) it exceeded Indian GDP per capita consistently until the 1990s.

FIGURE 1: GDP per capita in Southeast Asia and Senegal, 1914-2000, log scale.



Sources: Malaysia: Sultan Nazrin Shah, *Charting the Economy: Early 20th Century Malaya and Contemporary Malaysian Contrasts* (Oxford University Press, 2017). Indonesia: Pierre van der Eng, “The Sources of Long-Term Economic Growth in Indonesia, 1880–2008,” *Explorations in Economic History* 47, no. 3 (2010): 294–309. Philippines and India: Maddison Update 2020. Senegal 1914–1950 derived from agricultural production series presented in Chapter 4 and urbanisation data from Chapter 3 using the method of Malanima²; after 1950 from the Maddison database.

Though the subject is historical and the method is that of historical inquiry, the argument has obvious relevance for a number of contemporary policy questions. Senegal, like many countries in Africa south of the Sahara, is no wealthier today (on a per-head basis) than when it first gained independence from France, and, contrary to the dreams of optimistic planners in the 1960s, it has not become an industrialised society. Senegalese President Macky Sall’s third Prime Minister was Mohammed Boun Abdallah Dionne, previously an official at the UN Industrial Development Organization. In declaring his government’s priorities in 2014,

² Paolo Malanima, “The Long Decline of a Leading Economy: GDP in Central and Northern Italy, 1300–1913,” *European Review of Economic History* 15, no. 2 (2011): 169–219.

Dionne emphasised first the need for structural transformation. He noted ‘the paradox of the evolution of the Senegalese economy’, which was ‘the relative stagnation of the past five decades, which can be seen in the weak structural transformation that coexists with the dynamic potential of a young society, capable of inventiveness, effort and success’. Dionne’s vision for structural change emphasised productivity growth in agriculture, the development of new ventures in agro-industrial manufacturing in order to maximise domestic value-added and to develop intersectoral linkages, as well as a relaunching of modern textile manufacturing.³ The *Plan Sénégal Émergent*, President Sall’s signature policy framework, envisaged real aggregate economic growth of 8.3% per year by the end of the planning period, with industrial production essentially doubling between 2011 and 2018. The GDP growth goal was only slightly too bold: the growth rate in 2018 was an impressive 7.4%.⁴ But the industrialisation objective was wildly over-optimistic: instead of increasing by 76% from 2011 to 2017 (the latest year for which the West African Central Bank gives data) industrial production increased by only 5%.⁵

This thesis aims to put this experience into historical perspective. Its major theme is the relationship between agriculture and manufacturing in a land-abundant economy where natural comparative advantage might be thought to reside with export agriculture. This is a hardy perennial in scholarship on economic development in the non-industrialised world. And, for that matter, in the industrialised world itself: indeed, a very long line of scholars have claimed that the Agricultural Revolution was a precondition for the Industrial one. Perhaps most

³ Mohammed Boun Abdallah Dionne, ‘Déclaration de politique générale’, Dakar, 11 November 2014, 10.

⁴ République du Sénégal, *Plan Sénégal Émergent*, Dakar, February 2014.

⁵ Banque centrale des États de l’Afrique de l’Ouest, ‘Entrepôt de données économiques et financières’, <<https://edenpub.bceao.int/>> Accessed June 2021.

famously, the Estonian economist Ragnar Nurske summarised what he felt was a scholarly consensus that the introduction of the turnip into English agriculture had contributed to an increase in productivity that released English workers from the fields and allowed them to go to work in factories.⁶ Subsequent research cast some doubt on the centrality of the humble turnip,⁷ but the connection between the Agricultural Revolution and the beginning of sustained industrial take-off in England is still a live theme in British economic history.⁸

STRUCTURAL CHANGE IN ECONOMIC HISTORY

The long-run trajectory of economies is often described by a set of ‘stylised facts’ known collectively as ‘Kaldor’s facts’. There are six of them: first, the shares of labour and capital in economic output remain more or less stable over time; second, the rate of growth of capital per worker is relatively stable over time; third, the growth of labour productivity is roughly stable over time; fourth, the ratio of the capital stock to output is roughly stable over time; fifth, the rate of return on capital is roughly stable over time; and sixth, while labour productivity and output growth tend to grow at stable rates in any given country, these rates are quite different

⁶ Ragnar Nurkse, *Problems of Capital Formation in Underdeveloped Countries* (London, England: Blackwell, 1953), 52–53.

⁷ See the discussion in C. Peter Timmer, “The Turnip, The New Husbandry, and The English Agricultural Revolution,” *The Quarterly Journal of Economics* 83, no. 3 (1969): 375–95.

⁸ For example: Gregory Clark, “Too Much Revolution: Agriculture in the Industrial Revolution, 1700–1860,” in *The British Industrial Revolution: An Economic Perspective*, ed. Joel Mokyr (Boulder, Colorado: Westview Press, 2018), 206–40; Jacob L. Weisdorf, “From Domestic Manufacture to Industrial Revolution: Long-Run Growth and Agricultural Development,” *Oxford Economic Papers* 58, no. 2 (2006): 264–87; Eona Karakacili, “English Agrarian Labor Productivity Rates Before the Black Death: A Case Study,” *The Journal of Economic History* 64, no. 1 (2004): 24–60.

between countries.⁹ To the extent that they hold at all¹⁰, these stylised facts are more applicable to advanced countries than to developing ones: the third Kaldor fact of stable labour productivity growth, for example, is clearly violated in ‘catch-up’ economies like Taiwan, South Korea and China. Noticeably, none of these facts concerns the sectoral distribution of output: the Kaldor facts can easily be reproduced in a one-sector model that makes no allowance for structural change.¹¹ To address the question of structural change, a set of ‘Kuznets facts’—named after the pathbreaking work on structural change conducted by the Russian–American economist Simon Kuznets¹²— have been proposed: as economies grow, the share of agriculture in employment declines and that of the services sector rises, while manufacturing employment tends to remain stable; the same occurs for each sector’s share of total consumption.¹³ But these are simply stylised facts: they do not tell us *why* economies develop in this way.

Most work on causal relationships between growth in agriculture and growth in other sectors tends to fall somewhere along a spectrum that has the ‘comparative advantage’ view at one end and the ‘useful surplus’ view at the other. The first kind of argument suggests that countries that possess a comparative advantage in

⁹ Nicholas Kaldor, “A Model of Economic Growth,” *The Economic Journal* 67, no. 268 (1957): 591–624.

¹⁰ See e.g., David H. Papell and Ruxandra Prodan, “Long Run Time Series Tests of Constant Steady-State Growth,” *Economic Modelling* 42 (2014): 464–74; Loukas Karabarbounis and Brent Neiman, “The Global Decline of the Labor Share,” *The Quarterly Journal of Economics* 129, no. 1 (2014): 61–103.

¹¹ The derivation of the Kaldor facts from one-sector neoclassic growth models is a common exercise in graduate students in macroeconomics. See for example the exercises on balanced growth paths in Daron Acemoglu, *Introduction to Modern Economic Growth* (Princeton, New Jersey: Princeton University Press, 2008).

¹² Simon Kuznets, *Modern Economic Growth*, Study in Comparative Economics (New Haven, CT: Yale University Press, 1967).

¹³ Piyabha Kongsamut, Sergio Rebelo, and Danyang Xie, “Beyond Balanced Growth,” *The Review of Economic Studies* 68, no. 4 (2001): 869–82. Compare this with Petty’s Law, which states that agriculture’s share of employment first declines in favour of manufacturing, then afterwards both decline in favour of services: formulated first in modern economics in Colin Clark, *The Conditions of Economic Progress* (Macmillan, 1957), 492.

agriculture will specialise in it, to the detriment of industrial development.¹⁴ At the other end, growth in agricultural output beyond that which would merely sustain the population is seen as generating rising incomes that, in Walt Rostow's words, 'may be an important stimulus to new modern industrial sectors essential to the takeoff' of economic growth.¹⁵ Matsuyama produced a synthesis by pointing out that the crucial distinction was between open and closed economies: in a closed economy, high agricultural output leads, via demand and non-homothetic preferences, to a growing industrial sector; in an open economy, agriculturally-inclined societies will specialise according to comparative advantage and fail to industrialise.¹⁶ Recent research has reinforced the importance of the important linkages between the two sectors. These linkages make it difficult if not impossible to study industry, or the factor markets that sustain it, in partial equilibrium alone.¹⁷ And yet many of the models used to understand developing countries today are one-sector models: that is to say, they assume that the entire country can be represented by a single representative agent.¹⁸

¹⁴ Joel Mokyr, "The Industrial Revolution in the Low Countries in the First Half of the Nineteenth Century: A Comparative Case Study," *The Journal of Economic History* 34, no. 2 (1974): 365–91.

¹⁵ W. W. Rostow, *The Stages of Economic Growth*, 3rd ed. (Cambridge, England: Cambridge University Press, 2012), 23.

¹⁶ Kiminori Matsuyama, "Agricultural Productivity, Comparative Advantage, and Economic Growth," *Journal of Economic Theory* 58, no. 2 (1992): 317–34. See also Mukesh Eswaran and Ashok Kotwal, "The Role of the Service Sector in the Process of Industrialization," *Journal of Development Economics* 68, no. 2 (2002): 401–20.

¹⁷ For an overview, see David Henley, "The Agrarian Roots of Industrial Growth: Rural Development in South-East Asia and Sub-Saharan Africa," *Development Policy Review* 30 (2012): s25–47; Michael T. Rock, "Exploring the Impact of Selective Interventions in Agriculture on the Growth of Manufactures in Indonesia, Malaysia, and Thailand," *Journal of International Development* 14, no. 4 (2002): 485–510.

¹⁸ Jonathan Temple, "Dual Economy Models: A Primer for Growth Economists," *Manchester School* 73, no. 4 (2005): 435–78.

DUAL ECONOMIES AND DUAL SECTOR MODELS

For this reason, it is worth returning to another tradition within economics: that of the dual-sector models. In these models there are, as the name implies, two sectors. One is usually backward, traditional, or unproductive; the other is progressive, capitalist, and productive. The third distinction is the most important: it points to the fact that intersectoral gaps in labour productivity in developing countries are usually very large.¹⁹ This is especially true in twentieth-century Africa, and of Senegal in particular: of the ten countries documented in the Africa Sector Database, Senegal had the highest agricultural productivity gap—that is to say, the ratio of labour productivity outside agriculture to labour productivity within it—in 1960, and had the second highest gap in 2010 (see Figure 2).²⁰ Reallocating resources from one sector to another therefore suggests a promising path to rapid economic growth, and it is this reallocation process that most dual sector models focus on.²¹

¹⁹ Douglas Gollin, David Lagakos, and Michael E. Waugh, “The Agricultural Productivity Gap,” *The Quarterly Journal of Economics* 129, no. 2 (2014): 939–93; Ellen B. McCullough, “Labor Productivity and Employment Gaps in Sub-Saharan Africa,” *Food Policy* 67 (2017): 133–52.

²⁰ Emmanuel Buadi Mensah and Adam Szirmai, “Africa Sector Database (ASD): Expansion and Update,” *UNU-MERIT Working Paper*, no. 2018–020 (2018).

²¹ Though note that selection effects play a role in productivity gaps: workers in agriculture may be less skilled or less educated than workers in other sectors, meaning that when they move to non-agricultural employment their labour productivity would be substantially below prevailing productivity rates: see Joan Hamory et al., “Reevaluating Agricultural Productivity Gaps with Longitudinal Microdata,” *Journal of the European Economic Association* 19, no. 3 (2020): 1522–55.

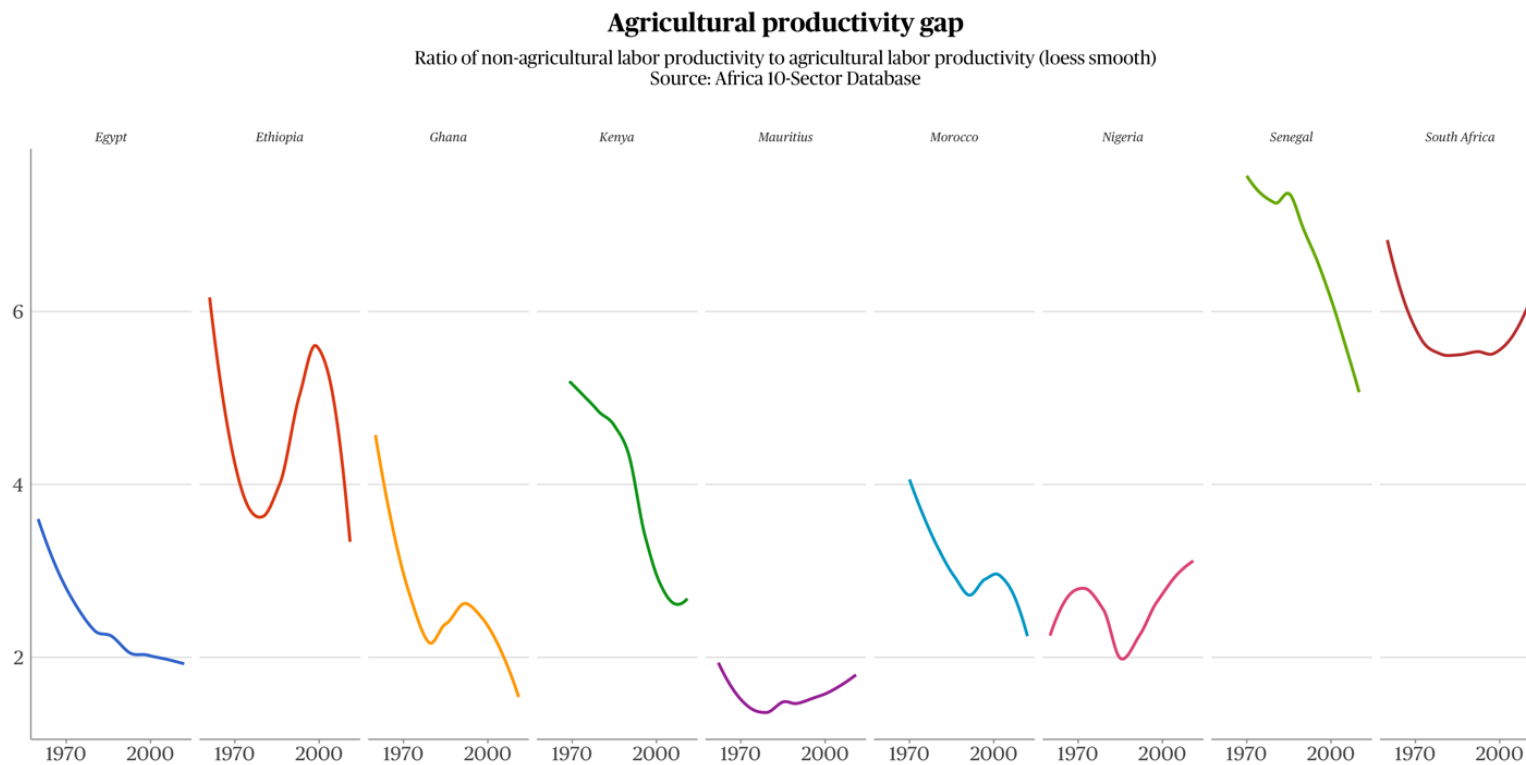


Figure 2: Productivity gaps in African countries, 1960-2010.
Source: Groningen Africa Sector Database. Raw data was smoothed with a local regression (LOESS) curve.

Perhaps the most famous model in all development economics is the Lewis model—specifically, a single model out of several described verbally in his now-famous 1954 paper.²² In formulating this model, Lewis was influenced not only by the conditions he observed in the peripheral developing countries of his day, particularly in the Caribbean, but also by classical political economists, all of whom, Lewis contended, had assumed that there was an essentially unlimited supply of labour in a ‘subsistence’ sector (*not*, as he was anxious to clarify, necessarily synonymous with a rural or an agricultural sector) upon which a ‘capitalist’ sector could draw. Having made this crucial assumption, Lewis sketched out several implications. Firstly, he analysed the effect of this assumption on incomes in the non-capitalist sector: they would be constant and low. He further assumed that incomes would be equal to the average product of labour, rather than the marginal product. Most importantly, he observed that the unlimited supplies of labour would pin down the real wage in the capitalist sector at the same (or perhaps slightly above) the unchanging, low income levels of the non-capitalist sector, even though the marginal product of labour in the modern sector was likely to be quite high. The gap between the marginal product of labour and its reward would accrue to capitalists, who would reinvest in the capitalist sector, drawing even more workers from the non-capitalist sector. As long as unlimited supplies of labour guaranteed supernormal profits for capitalists, this process would continue, yielding fast growth and (if we elide Lewis’s distinction between capitalist, urban and industrial) urbanization and industrialization.

Lewis’s paper is rich, but as it has been distilled for successive generations of economics undergraduates the richness has often been lost. The ‘unlimited supplies

²² W. Arthur Lewis, “Economic Development with Unlimited Supplies of Labour,” *Manchester School* 22, no. 2 (1954): 139–91; W. Arthur Lewis, “Unlimited Labour: Further Notes,” *Manchester School* 26, no. 1 (1958): 1–32; Gary S. Fields, “Dualism in the Labor Market: A Perspective on the Lewis Model after Half a Century,” *Manchester School* 72, no. 6 (2004): 724–35; Douglas Gollin, “The Lewis Model: A 60-Year Retrospective,” *The Journal of Economic Perspectives* 28, no. 3 (2014): 71–88.

of labour in a closed economy’ model most usually referred to as the ‘Lewis model’ is but one of several models presented in the paper. A more general problem of the paper is that exposition is entirely verbal, and as a result many of the general equilibrium effects of unlimited labour supplies were not dealt with in much detail, requiring further elaboration later on. A number of influential papers helped to express Lewis’s basic intuition in mathematics, but pointed out several complications. Amartya Sen, for example, pointed out that for the concept of unlimited labour supplies to be operational, the marginal utility of income and disutility of effort schedules for a family in the subsistence sector must be flat, a condition that might be rarely met in practice.²³ Fei and Ranis showed that the impact of duality in labour markets would also be felt in the product market. The Fei-Ranis model demonstrates that—at least in a closed economy—per worker output would have to rise in the agricultural sector (considered to be coterminous with Lewis’s subsistence sector) in order to feed non-agricultural workers; wages in both industry and agriculture would also rise, meaning that the ‘Lewis turning point’, when unlimited supplies of cheap labour were no longer available, would come much sooner than Lewis thought.²⁴ Wang and Piesse, however, point out that such a mechanism might be counteracted by a Malthusian population response in the subsistence sector, thus restoring the constancy of the real wage.²⁵ Harris and Todaro, inspired by the experience of Kenya, entered another objection: unemployment in the city meant that the process of absorbing surplus labour would be governed not only by the wage differential but also by the expectation of unemployment in the cities.²⁶ For Harris and Todaro, the urban wage was

²³ Amartya K. Sen, “Peasants and Dualism with or without Surplus Labor,” *The Journal of Political Economy* 74, no. 5 (1966): 425–50.

²⁴ John C. H. Fei and Gustav Ranis, “Unlimited Supply of Labour and the Concept of Balanced Growth,” *Pakistan Development Review* 1, no. 3 (1961): 29–58.

²⁵ Xiaobing Wang and Jenifer Piesse, “The Micro-Foundations of Dual Economy Models,” *Manchester School* 81, no. 1 (2013): 89.

²⁶ John R. Harris and Michael P. Todaro, “Migration, Unemployment and Development: A Two-Sector Analysis,” *The American Economic Review* 60, no. 1 (1970): 126–42.

determined not by market forces but by labour market interventions like statutory minimum wages and union bargaining, and for this reason the Harris-Todaro intuition is usually used to answer the question: ‘why does rural-urban migration persist in the face of urban unemployment’? However, the model can also be looked at from another angle: if unemployment in cities arises for reasons unconnected to wage policies (high search costs, for example), then it follows that the urban wage must exceed rural incomes by an even greater proportion than Lewis anticipated in order for Lewisian dynamics to be at play.

Harris and Todaro’s investigation of rural–urban migration dynamics, which emphasises the expected utility of migration, fits neatly within a broader literature that focuses on utility differences across space that drive urbanisation. Generally speaking, the forces driving rural-urban migration are usually grouped in two categories: *rural push* factors and *urban pull* factors.²⁷ As the name suggests, the first category describes phenomena occurring in rural economies that might induce or allow farmers to migrate to the city. For example, an increase in agricultural productivity allows a society to meet its food requirements with less labour, allowing farms to ‘release’ workers to the cities (though rising labour productivity in agriculture probably leads to rising incomes in the countryside, so the net effect may be a wash). A more unhappy ‘rural push’ factor, particularly salient in Sahelian/savanna economies, might be desertification, which lowers agricultural incomes and leads people to move to the city. It is noteworthy that both lower and higher labour productivity in agriculture might be considered ‘rural push’ factors. What determines which of the two will push workers out of the countryside is essentially the feasibility of food imports. If a country experiences a negative shock to agricultural food productivity and it *cannot* import food, then labour will

²⁷ Somik V. Lall and Harris Selod, “Rural-Urban Migration in Developing Countries: A Survey of Theoretical Predictions and Empirical Findings,” *World Bank Working Paper*, no. 3915 (2006).

probably flow out of the urban sector back into agriculture to make good the deficit. But if it can import food, then it is quite likely that prolonged droughts and desertification will lead some farmers to leave the country for towns and cities. Urban pull factors, on the other hand, refer to phenomena which entice rural workers to the city: a manufacturing boom that promises high wages to unskilled workers, better consumption possibilities, better healthcare and education, and so on. Empirical evidence on the very long-run relative importance of these two kinds of forces is limited mostly to now-rich economies, but suggests that the pull factors dominated push factors early in the process of industrialisation.²⁸ There is also the question of what Jedwab, Christiaensen and Gindelsky call *urban push*—that is to say, the relative growth in the urban population of a country due to high urban birth rates.²⁹ This is a question to which we will return in Chapter Three, when I discuss the growth of Dakar, the role of rural-urban migration and the path of structural change in Senegal.

Broadly speaking, the Lewisian framework has enjoyed great and enduring success in development economics as well as, to some extent, economic history,³⁰ though, especially after Arrighi's thorough criticism of Barber's application of the model to Southern Rhodesia, not so widely in African economic history.³¹ However, all of the

²⁸ Francisco Alvarez-Cuadrado and Markus Poschke, "Structural Change Out of Agriculture: Labor Push versus Labor Pull," *American Economic Journal: Macroeconomics* 3, no. 3 (2011): 127–58.

²⁹ Remi Jedwab, Luc Christiaensen, and Marina Gindelsky, "Demography, Urbanization and Development: Rural Push, Urban Pull and ... Urban Push?," *Journal of Urban Economics* 98 (2017): 6–16.

³⁰ For example: Oliver Grant, *Migration and Inequality in Germany, 1870-1913* (Oxford: Oxford University Press, 2005); Peter Temin, *The Vanishing Middle Class: Prejudice and Power in a Dual Economy* (Cambridge, Massachusetts: MIT Press, 2017); Jeffrey G. Williamson, "Factor Market Distortions, Applied General Equilibrium and History," *Australian Economic History Review* 29, no. 1 (1989): 3–20.

³¹ Giovanni Arrighi, "Labour Supplies in Historical Perspective: A Study of the Proletarianization of the African Peasantry in Rhodesia," *The Journal of Development Studies* 6, no. 3 (1970): 197–234. William J. Barber, *The Economy of British Central Africa* (Stanford: Stanford University Press, 1961). For a recent though not entirely convincing application to South Africa, see John Knight, "A Tale

variations on a Lewisian theme depend on the idea of an unlimited supply of labour. What is meant by this phrase? Lewis's followers have not always agreed. Ranis thought surplus labour was that portion of the subsistence-sector workforce that was paid an income greater than its marginal product, while for others surplus labour meant more precisely labour whose marginal product was zero or negative, such that its removal from the subsistence sector would result in an increase in output.³² These conditions are most likely to be met at low land-labour ratios, where the marginal contribution of additional labour inputs is likely to be low. In Senegal, and West Africa more broadly, the land-labour ratio has historically been high, with wages reasonably high by regional standards, as Chapter Four documents. There *was* a kind of surplus labour, but, as elsewhere in West Africa, it was a seasonal surplus only. Millet is planted usually from April onwards and harvested from July to September. Cassava tends to be planted from June through to October, but can be harvested more or less when required. Rice, grown only in southern Senegal, is also planted from April onwards but the harvesting season was longer, stretching through into January. The groundnut planting season begins, usually, in June and July, and is harvested in October and November. This left a substantial portion of the year—from about November in the areas where millet was the subsistence crop, and from about January where rice played that role— with much less than full-time work for most people in the agricultural sector. At groundnut harvest time, the whole of the agricultural labour force was fully employed; and, indeed, often required the assistance of the *navétane* migrant workers from Mali, who received land for their own use in return and hence allowing them to pocket of the cash proceeds from the year's harvest.³³ In the dry season, much of this labour—at least,

of Two Countries and Two Stages: South Africa, China and the Lewis Model," *The South African Journal of Economics*. 89, no. 2 (2021): 143–72.

³² Wang and Piesse, "Micro-Foundations," 85.

³³ Philippe David, "Fraternité d'hivernage : le contrat de navétanat," *Présence africaine*, no. 3 (1960): 45a–57a.

the native Senegalese portion of it, since the *navétanes* would return home—was underemployed.

Assume though that effective use could be made of the seasonal stock of surplus labour. The existence of surplus *land* in addition to surplus labour is the premise of another well-known developmental model from the 1950s, first described by a Burmese economist, Hla Myint.³⁴ Burma itself is perhaps the canonical example: the rapid expansion of rice growing for export from the 1850s onwards was facilitated by the vast supply of uncultivated land in Lower Burma in the Irrawaddy delta suitable for rice cultivation, and by a ready supply of cheap labour both domestically and from more labour-abundant parts of South Asia. A similar phenomenon occurred in other parts of Southeast Asia, particularly in the Mekong delta of southern Vietnam and the Chao Phraya delta of Thailand.³⁵ To neoclassical ears, Myint's classical argument sounds even odder than Lewis's. The latter theory is by comparison relatively easy to assimilate into neoclassical models: all that is required is the relative shortage of other factors (land and capital) to explain how surplus labour could exist without being soaked up by entrepreneurs (assuming relatively rigid production functions with low substitutability of inputs, like a Leontief function). But *two* surplus factors is harder to accept: why would farmers not simply increase their incomes by combining surplus labour and surplus land? Myint's answer involved two main arguments: first, he suggested, there was an

³⁴ Hla Myint, "The 'Classical Theory' of International Trade and the Underdeveloped Countries," *Economic Journal* 68, no. 270 (1958): 317–37.

³⁵ Keith Owen Fuglie, "'Vent-for-Surplus' as a Source of Agricultural Growth in Northeast Thailand, 1958–1980," *Journal Of Developing Areas*, 1991, 331–46; Peter A. Coclanis, "Metamorphosis: The Rice Boom, Environmental Transformation, and the Problem of Truncation in Colonial Lower Burma, 1850–1940," *Agricultural History* 93, no. 1 (2019): 35–67; Montserrat Lopez Jerez, "Deltas Apart: Factor Endowments, Colonial Extraction and Pathways of Agricultural Development in Vietnam" (Lund University, 2014). On the existence of unlimited labour supplies: Gregg Huff and Giovanni Caggiano, "Globalization, Immigration, and Lewisian Elastic Labor in Pre-World War II Southeast Asia," *The Journal of Economic History* 67, no. 1 (2007): 33–68.

‘inelastic domestic demand for the exportable commodity’, and a ‘considerable degree of internal immobility and specificity of resource’.³⁶ To put it in more concrete terms, imagine a millet farmer in precolonial Kédougou, in eastern Senegal, producing enough food in a year for a household to eat comfortably. Suppose this farmer has access to both spare land and spare household labour with which the millet harvest could be doubled. Myint argues that the household itself is unlikely to want twice as much millet—demand for grain, indeed for food in general, is relatively income-inelastic, as Engel’s law states, and as my own analysis of colonial household budgets in Chapter 5 shows for rural West African in particular. And if this household does not demand substantially more millet than it is producing, then there is little reason to suppose that any household close enough to trade with would demand more millet either.³⁷ In relatively integrated economies, a deficit in the harvest in one region—due to a drought, for example—can be made good with a surplus from a non-affected region. In Myint’s vent-for-surplus economy, on the other hand, which is poorly integrated, such trade is unlikely due to very high transportation costs. The only households to which farmers who have experienced a poor harvest due to a drought can theoretically turn to purchase extra grain are therefore precisely households that have suffered from the drought as well, and are unlikely to have grain to sell. A rational farmer in such circumstances will plan to produce enough grain to satisfy household needs—

³⁶ Myint, “International Trade,” 322.

³⁷ An old and related idea is that agricultural innovation in precolonial West Africa was hampered by the ease with which a peasant household could reach a subsistence level of income. This proposition was at the heart of an interesting debate in *Past & Present*: the Polish historian Marian Małowist claimed that relative prosperity in the old Mali empire compared with Eastern Europe explained why agriculture developed more quickly in the latter. Hopkins’s rejoinder pointed out both empirical and theoretical problems with the position. See Marian Małowist, “The Social and Economic Stability of the Western Sudan in the Middle Ages,” *Past & Present*, no. 33 (1966): 3–15; A. G. Hopkins, “The Western Sudan in the Middle Ages. Underdevelopment in the Empires of the Western Sudan,” *Past & Present*, no. 37 (1967): 149–56.

plus, possibly, a small surplus as insurance against a bad year—but no more.³⁸ The crucial event in a ‘vent-for-surplus’ episode is therefore the arrival of a new market opportunity, as backward areas are opened up to international trade. “The most important contribution of the colonial governments”, as Myint put it “[is] in their basic services, such as the establishment of law and order and the introduction of modern transport, which enabled the pre-existing surplus productive capacity of the colonies to be tapped by the world market demand”.³⁹ The implication of vent-for-surplus is that an expansion in agricultural exports comes without opportunity cost: no resources must be diverted from other uses in order to produce an extra ton of groundnuts, cocoa or rice for export.

One of the most important differences between the export booms of West Africa and those of Southeast Asia were the specific crops involved. Though some Asian export economies specialised in crops for which there was only limited regional demand (Malayan rubber being a particularly salient case), the most striking cases of ‘vent for surplus’ were the land-abundant rice economies of Thailand, Southern Vietnam and Burma, and in these economies Myint’s observation that export growth essentially involved a scaling up of existing patterns of grain production was probably roughly true. But it was not true of almost all of the economies of West Africa, though some maize was produced for export in southern Dahomey, and several export crops, like palm oil, cotton and indeed groundnuts, had been produced in relatively small quantities for domestic use before they became major export crops.⁴⁰ An implication of this divergence between the two regions has not been widely addressed in the literature on vent-for-surplus, or on the comparative

³⁸ For an especially lucid exposition of the logic of agricultural production in unintegrated markets see the first two chapters in Karl Gunnar Persson, *Grain Markets in Europe, 1500–1900: Integration and Deregulation* (Cambridge University Press, 1999), 1–47.

³⁹ Myint, “International Trade,” 335.

⁴⁰ For a more thorough description see Patrick Manning, *Slavery, Colonialism and Economic Growth in Dahomey, 1640–1960* (Cambridge: Cambridge University Press, 1982), 91–97.

economic history of tropical economies: the impact on grain market integration. In the 'rice bowl' economies of Southeast Asia, every grain producer was both a potential exporter and a potential supplier to urban markets. Rice exports increasingly served regional rather than European markets. The share of Burma's rice exports going to Western countries declined from around 75% in 1875 to 21% by 1935⁴¹; more broadly, in 1920-4 only 16.6% of Southeast Asian rice exports in general were to other Asian countries; by the early 1960s that figure had risen to 48.7%.⁴² This intraregional trade ensured a steady and relatively cheap supply of the staple grain to growing urban centres across Asia,⁴³ but also served to integrate domestic markets for grains, lowering volatility in prices and ensuring a steady supply of staple foodstuffs to urban centres within the vent-for-surplus economy. In contrast, almost all of the export crops in West Africa were either non-staple food crops that could make only a limited contribution to calorific requirements (groundnuts, cocoa, palm oil) or non-food crops (cotton, sisal, rubber). Households that produce these kinds of crops need to plan to ensure adequate food supplies, and this often results in less-than-complete specialisation in export crops.⁴⁴ Senegal offers a striking exception: unlike in Northern Nigeria, the other major groundnut exporter of West Africa, many groundnut farmers in Senegal specialised completely, growing little or no millet and surviving either on millet purchased on the market or on imported rice. A more complete discussion of this history is in Chapter Four. The upshot for structural change is that market integration was likely

⁴¹ Aye Hlaing, "Trends of Economic Growth and Income Distribution in Burma, 1870-1940," *Journal of the Burma Research Society* 47, no. 1 (1964): 90.

⁴² Pierre van der Eng, "Productivity and Comparative Advantage in Rice Agriculture in South-East Asia since 1870," *Asian Economic Journal* 18, no. 4 (2004): 348.

⁴³ A. J. H. Latham and Larry Neal, "The International Market in Rice and Wheat, 1868-1914," *The Economic History Review* 36, no. 2 (1983): 260-80. A very interesting study of the integration of the Japanese rice market with 'Monsoon' Asia is Loren Brandt, "Interwar Japanese Agriculture: Revisionist Views on the Impact of the Colonial Rice Policy and the Labor-Surplus Hypothesis," *Explorations in Economic History* 30, no. 3 (1993): 259-93.

⁴⁴ Marcel Fafchamps, "Cash Crop Production, Food Price Volatility, and Rural Market Integration in the Third World," *American Journal of Agricultural Economics* 74, no. 1 (1992): 90-99.

a bifurcated phenomenon in West Africa. Where export crops could be grown efficiently it was profitable to build new transportation networks in order to evacuate them, and within the penumbra of the railways and roads staple consumption crops like millet and maize could be marketed as well, potentially resulting in market integration in grains as well as in the export crops. But this would usually be a very limited form of integration, since households engaged in production of cash crops like cotton or groundnuts for export were unlikely to have large surpluses of grain to trade. In areas which were distant from the railway or were served by low-quality roads, market integration almost certainly remained weak. For this reason, as I argue in Chapter Four, food prices in West African urban centres were comparatively higher than in land abundant Southeast Asia, which in turn lead to higher nominal wages for a given real wage.

The discrepancies between Myint's model and history—particularly West African history—go further than this.⁴⁵ Many subsequent glosses have relaxed Myint's assumption of deficient demand, preferring to base their models on the idea that the opening to international trade does come with an opportunity cost—in the form of leisure, perhaps, the relative price of which increases as the possibilities for export agriculture expand, or in the form of reduced handicraft production.⁴⁶ Other authors have pointed to historical deviations from the Myint model's assumptions.

⁴⁵ A useful overview is Gareth Austin, "Explaining and Evaluating the Cash Crop Revolution in the 'peasant' Colonies of Tropical Africa, ca. 1890-ca. 1930: Beyond 'Vent for Surplus,'" in *Africa's Development in Historical Perspective*, ed. Emmanuel Akyeampong et al. (books.google.com, 2014), 295–320.

⁴⁶ Robert Szereszewski, *Structural Changes in the Economy of Ghana, 1891–1911* (London: Weidenfield and Nicolson, 1965); Jan S. Hogendorn, "The Vent-for-Surplus Model and African Cash Agriculture to 1914," *Savanna: A Journal of the Environmental and Social Sciences* 5, no. 1 (1976): 15–28; Barbara Ingham, "Vent for Surplus Reconsidered with Ghanaian Evidence," *The Journal of Development Studies* 15, no. 3 (1979): 19–37; Carl K. Eicher, "The Dynamics of Long-Term Agricultural Development in Nigeria," *Journal of Farm Economics* 49, no. 5 (1967): 1158–70; Gustav Ranis and Frances Stewart, "Rural Nonagricultural Activities in Development: Theory and Application," *Journal of Development Economics* 40, no. 1 (1993): 75–101.

Some have pointed to the dynamism of precolonial, pre-cash crop African agricultural markets, for example, where ‘cash’—or perhaps more accurately ‘commercial’—crops were grown and traded locally.⁴⁷ Others, writing particularly on economies where tree crops like cocoa and palm were the dominant export specialisations, have noted that the shift from annual grain crops to slower-growing perennials involves a fundamental shift in the underlying production function of the agricultural sector.⁴⁸ The same problems that other authors have identified with vent-for-surplus theory in other West African contexts can be raised in the our case: the same dry season/wet season distinction applies quite clearly across the ecological zones of Senegal. It is also clear that the massive expansion in groundnut production came with an opportunity cost: in the Wolof zones especially, groundnuts were planted in fields previously devoted to millet, while in the more arid parts of S n gal oriental, the Sufi *seri n*⁴⁹ and their followers pushed Ful be pastoralists off land they had previously used to graze their herds, with the tacit approval of the French administration.⁵⁰ Equally, just as the Ghanaian cocoa boom involved a great deal of entrepreneurship on the part of the ‘rural capitalists’ (to use Polly Hill’s term), so did expansion of Senegalese groundnut production involve a good deal of inventiveness from the *seri n*, who had to organise supply lines to their followers in largely inhospitable terrain. Studies of the social and economic organisation of the groundnut industry in Senegal similarly put the entrepreneurialism of the Sufi brotherhoods in sharp focus. The brotherhoods anticipated the extension of French-built railways through previously pastoral land

⁴⁷ John Tosh, “Lango Agriculture during the Early Colonial Period: Land and Labour in a Cash-Crop Economy,” *Journal of African History* 19, no. 3 (1978): 415–39.

⁴⁸ Gareth Austin, *Labour, Land and Capital in Ghana* (Rochester: University of Rochester Press, 2005), 78–79; Gareth Austin, “Vent for Surplus or Productivity Breakthrough? The Ghanaian Cocoa Take-off, c. 1890–1936,” *The Economic History Review* 67, no. 4 (2014): 1035–64.

⁴⁹ This is the Wolof term, which I use interchangeably with the more widely used (in English as in French) term *marabout*, a Gallicised version of the Arabic *mur bi t*.

⁵⁰ Donal B. Cruise O’Brien, *Saints and Politicians: Essays in the Organization of a Senegalese Peasant Society* (Cambridge: Cambridge University Press, 1976), 67–69.

and set up groundnut farms nearby, building quite complex networks of suppliers to be able to provide food and water to labourers in often very inhospitable rural areas.⁵¹

LAND ABUNDANCE, COERCION AND SLAVERY

Another feature of the West African cash crop booms on which Myint's model is silent is the role of slavery and labour coercion in the expansion of exports. Implicit in his paper is the idea of a relatively homogenous group of free smallholders who can easily expand their production of an existing crop using spare land and labour. But as we have seen, labour was scarce, and the main Senegalese export crop was one that was only cultivated in relatively small amounts prior to the beginning of the export boom. Importantly, slave labour was commonly used in groundnut production in many parts of greater Senegambia.⁵² Moreover, even when slavery was banned and its prohibition enforced, coercion in other forms remained a regular feature of economic life. In particular, much of the infrastructure that enabled the efflorescence of the cash crop boom across French West Africa was

⁵¹ Elisabeth N'doye, "Migration des pionniers Mourid wolof vers les terres neuves : rôle de l'économique et du religieux," in *Modern migrations in western Africa*, ed. Samir Amin (London: Routledge, 1974), 371–83; Cheikh Guèye, *Touba : la capitale des mourides* (Paris: Karthala, 2002), 70; Sakho Papa, "Evolution des escales ferroviaires du bassin arachidier oriental jusqu'à la fin des années 1980" (Université Cheikh Anta Diop de Dakar, 1991).

⁵² Martin A. Klein, *Slavery and Colonial Rule in French West Africa* (Cambridge: Cambridge University Press, 1998), 68; Olga F. Linares, "Deferring to Trade in Slaves: The Jola of Casamance, Senegal in Historical Perspective," *History in Africa* 14 (1987): 113–39; Andrew F. Clark, "Slavery and Its Demise in the Upper Senegal Valley, West Africa, 1890–1920," *Slavery & Abolition* 15, no. 1 (1994): 63; Ken Swindell, "Serawoollies, Tillibunkas and Strange Farmers: The Development of Migrant Groundnut Farming along the Gambia River, 1848–95," *Journal of African History* 21, no. 1 (1980): 93–104; George E. Brooks, "Peanuts and Colonialism: Consequences of the Commercialization of Peanuts in West Africa, 1830–701," *Journal of African History* 16, no. 1 (1975): 49–50; Joye L. Bowman, "'Legitimate Commerce' and Peanut Production in Portuguese Guinea, 1840s--1880s," *Journal of African History* 28, no. 1 (1987): 90.

built with substantial amount of *corvée* labour.⁵³ But on the other hand, the expansion of cash cropping and the attendant increase in farming incomes provided the means by which many could purchase their freedom, and supplied an economic incentive for slaves to move away from masters.⁵⁴

In the historiography of West African slavery, the existence of property rights in humans has often been explained by the relative abundance of the factors of production: more specifically, by the general surplus of cultivable land and the deficiency of labour (and capital) with which to exploit it.⁵⁵ Taken together, these two facts imply that land will be cheap or free to acquire and labour expensive to hire. More specifically, in order to procure a supply of wage labour the African landowner had to offer a wage higher than the income that could reasonably have been expected from the individual cultivation of a farm on free land. Landowners could only reasonably hope to do so if their land was more productive (per unit of labour expended on cultivation) than the marginal acre available to others; this difference in labour productivity owing to the different quality of land could then be shared jointly between owner and worker, making both better off.⁵⁶ In certain economic circumstances, as Domar hypothesised, there may be no combination of wages and production functions such that the wage that can be offered to workers

⁵³ Marlous van Waijenburg, "Financing the African Colonial State: The Revenue Imperative and Forced Labor," *The Journal of Economic History* 78, no. 1 (2018): 40–80.

⁵⁴ Bernard Moitt, "Slavery and Emancipation in Senegal's Peanut Basin: The Nineteenth and Twentieth Centuries," *The International Journal of African Historical Studies* 22, no. 1 (1989): 27–50; more generally see Gareth Austin, "Cash Crops and Freedom: Export Agriculture and the Decline of Slavery in Colonial West Africa," *International Review of Social History* 54, no. 1 (2009): 1–37.

⁵⁵ The classic exposition is in A. G. Hopkins, *An Economic History of West Africa* (London: Longmans, 1973). Hopkins reasserts this view in the lengthy introduction to the second edition, 2019.

⁵⁶ For example, in Northern Nigeria, where '*fadama*' floodplain land was valuable and scarce, migrant wage workers would be employed during the long dry season to grow rice: Kenneth Swindell, 'Farmers, Traders, and Labourers: Dry Season Migration from North-West Nigeria, 1900–33', *Africa* 54, no. 1 (1984): 3–19, p.9

exceeds their reservation wage. In such conditions, extra-household labour can only be procured through coercion.⁵⁷ Influential though it has been, the Domar hypothesis has been controversial; indeed, the fact that the demographic collapse (and consequent increase in the land-labour ratio) of the Black Death was followed in some parts of Europe by the *decline* of feudal relations and in other parts by a 'second serfdom' indicates that the ratio cannot by itself explain the evolution of coercive labour institutions.⁵⁸

Another substantial revision to be made to the Domar hypothesis that is particularly salient in semi-arid tropical economies like Senegal is that land is abundant only when use can be made of it: if land is devoted to crops, the effective agricultural season is a function of climate and the requirements of the plants themselves. This seasonality introduces a bias towards inputs (labour and capital) that can be rented or hired, since there is no need to maintain them during periods in which they cannot usefully be put to work.⁵⁹ In this case of slaves, this may mean that crops with short growing seasons lend themselves more to wage labour rather than slave labour, as Earle argues was the case with wheat in the antebellum United States.⁶⁰ Alternatively, it may mean that landowners who planted crops such as

⁵⁷ Evsey D. Domar, "The Causes of Slavery or Serfdom: A Hypothesis," *The Journal of Economic History* 30, no. 1 (1970): 18–32. See also Gareth Austin, "Factor Markets in Nieboer Conditions: Pre-Colonial West Africa, c.1500–c.1900," *Continuity and Change* 24, no. 1 (2009): 23–53. The applicability of the Domar hypothesis to slavery at the Cape has recently been partially challenged: see Erik Green, 'The Economics of Slavery in the Eighteenth-Century Cape Colony: Revising the Nieboer-Domar Hypothesis', *International Review of Social History* 59, no. 1 (2014): 39–70. Green argues that while low labour-land ratios did make labour expensive early in the life of the colony, there was no real demand for slaves: the low requirements for labour were largely met by Khoisan waged labourers. Only when a substantial wealthy agricultural elite developed did slavery become viable.

⁵⁸ Robert Brenner, "Agrarian Class Structure and Economic Development in Pre-Industrial Europe: The Agrarian Roots of European Capitalism," *Past & Present* 97, no. 1 (1982): 16–113.

⁵⁹ Jean-Pierre Bompard, Thierry Magnac, and Gilles Postel-Vinay, "Emploi, mobilité et chômage en France au XIXe siècle: migrations saisonnières entre industrie et agriculture," *Annales. Histoire, Sciences Sociales* 45, no. 1 (1990): 55–76.

⁶⁰ Carville V. Earle, "A Staple Interpretation of Slavery and Free Labor," *Geographical Review* 68, no. 1 (1978): 51.

wheat tried to increase the annual productivity of their slaves by putting them to work in other kinds of economic activity during the agricultural low season.⁶¹ Domar conditions, however, cannot really be used to explain slavery in colonial port cities, where land was scarce (Gorée and Saint-Louis are both small islands) and where functioning wage labour markets also existed for more or less the same occupations as those practiced by slaves.⁶²

While the structure of economic output may encourage slavery, slavery need not affect the structure of economic output. Slaveowners may expropriate all or part of the factor payments to labour, and they remove any occupational choice from the slave, but in determining the occupation of slaves themselves, they may respond to a very similar set of relative *sectoral* prices as a liberated slave would. If the marginal revenue value of an hour spent in cotton production exceeds the marginal revenue value of an hour in indigo production, and these are the only two possibilities, both a slaveowner and a free smallholder will probably choose to direct the labour they control into cotton production. In practice, the fact that a slaveowner places less value on the leisure, comfort and consumption of their slaves than the slaves themselves do could mean that the structure of output will differ from that prevailing in a 'free' equilibrium. This is particularly worth considering in light of the long dry season in the West African savannah, in which the opportunity cost of labour in agriculture declines more or less to zero: a free worker might choose to consume some of the dry season in leisure, while a slaveowner, indifferent to his or

⁶¹ Johan Fourie, "Slaves as Capital Investment in the Dutch Cape Colony, 1652-1795," in *Agricultural Transformations in a Global History Perspective*, ed. Ellen Hillbom and Patrick Svensson (core.ac.uk, 2013), 136–59.

⁶² Ousmane Sané, « La vie économique et sociale des goréens entre 1817 et 1848 » (PhD thesis, Université de Dakar, 1978).

her slave's welfare, may feel more acutely the incentive to engage slaves in artisanal production or small-scale mining.⁶³

The same relative prices that encouraged the use of enslaved labour in production in rural West Africa faced those who lived in the (usually relatively small) urban settlements in the region, whether on the edge of the Sahara⁶⁴ or on the shores of the Atlantic.⁶⁵ The archives are particularly rich on the phenomenon of urban slavery in two of Senegal's towns: Gorée, just off the Atlantic coast near Dakar, and Saint-Louis, the old colonial capital in the mouth of the Senegal River. These two towns were occupied, mostly by the French, for centuries, growing wealthy first on the slave trade and then on the export of gum arabic, an industrial stiffening agent that was highly prized by European textile manufacturers, among others. A rich literature has documented the social and economic evolution of the twin trading towns of Saint-Louis and Gorée, and, unsurprisingly, there is a good deal of work on both the slave trade and slavery.⁶⁶ But as Klein has noted, we still have a very weak understanding of why slavery was so widespread in urban centres in West and West Central Africa, why the institution endured as long as it did, whether it increased economic output and encouraged urbanization or whether it decreased output and retarded urbanization.⁶⁷ Because the archival sources on slavery in

⁶³ Gareth Austin, "Resources, techniques, and strategies south of the Sahara: revising the factor endowments perspective on African economic development, 1500–2000," *Economic History Review* 61, no. 3 (2008): 587–624.

⁶⁴ Paul E. Lovejoy and Stephen Baier, "The Desert-Side Economy of the Central Sudan," *The International Journal of African Historical Studies* 8, no. 4 (1975): 551–81; Richard Roberts, "Long Distance Trade and Production: Sinsani in the Nineteenth Century," *Journal of African History* 21, no. 2 (1980): 169–88.

⁶⁵ Martin A. Klein, "Urban Slavery in West and West Central Africa during the Transatlantic Slave Trade," *Journal of African Diaspora Archaeology and Heritage*, 2020, 1–20.

⁶⁶ Roger Pasquier, "Fortune, race et pouvoir. La crise de 1837–1838 au Sénégal," *Publications de la Société française d'histoire des outre-mers* 5, no. 2 (1981): 941–60; Klein, *Slavery and Colonial Rule*; James F. Searing, *West African Slavery and Atlantic Commerce: The Senegal River Valley, 1700–1860* (Cambridge, England: Cambridge University Press, 2011); Bronwen Everill, "Industriousness and Slavery," *Early American Studies An Interdisciplinary Journal* 15, no. 4 (2017): 714–39.

⁶⁷ Klein, "Urban Slavery."

Saint-Louis and Gorée become exceedingly rich in the years leading up to abolition in 1848, they provide a unique insight into how coerced non-agricultural labour was recruited and rewarded in nineteenth century Africa. For this reason, I devote the first two chapters to a detailed study of this phenomenon, taking up Klein's invitation to develop a model of African urban slavery, and in so doing relate it to broader economic forces that shaped African economic development in the nineteenth and indeed twentieth centuries.

SEASONALITY, PROTOINDUSTRY AND INDUSTRY

One of the major themes of this dissertation is the effects of seasonality on economic structure and economic change. Seasonality within agriculture is intimately connected to several major questions in the history of industrialisation: how does manufacturing begin? What are the linkages between a manufacturing sector and traditional—or even 'modern' capitalist—agriculture in a land-abundant economy? Manufacturing in West Africa predates colonial rule by a long way. The production of textiles and metalworking were probably the two most important industries, though a wide range of other manufactured goods were also produced.⁶⁸ According to Colleen Kriger, the earliest account of cotton textile production in West Africa, that of the eleventh-century Spanish geographer al-Bakri, describes a site in modern-day Senegal.⁶⁹ Though some precolonial industry became impressively large—especially in the city of Kano in the Sokoto

⁶⁸ An old but still worthwhile overview is in A. G. Hopkins, *An Economic History of West Africa*, 2nd ed. (London, England: Routledge, 2019), 44–50. A more recent survey is Gareth Austin, Ewout Frankema, and Morten Jerven, "Manufacturing Growth," in *The Spread of Modern Industry to the Periphery since 1871* (Oxford: Oxford University Press, 2017).

⁶⁹ Colleen E. Kriger, "Mapping the History of Cotton Textile Production in Precolonial West Africa," *African Economic History*, no. 33 (2005): 87–116.

Caliphate⁷⁰—the usual pattern of production was small-scale. Often, artisanal production was organised around the agricultural calendar: during the dry season, which is of considerable length in the savannah region to which Senegal belongs, there was little use for agricultural labour outside the traditional millet and groundnut seasons, allowing people, if they wished, to devote labour time to the production of handicrafts. In this sense, Senegal as with much of Western Africa can be considered ‘wet-season land-abundant, dry season labour-abundant’; a combination that implies a possible comparative advantage in both agricultural goods like groundnuts and manufactured goods for which the most efficient production function is relatively heavy on labour and relatively light on capital. Certain kinds of textiles fit these requirements, and this can help to explain the resilience of many West African textile manufacturers in the face of more mechanised foreign competition.⁷¹ Opportunities for increased productivity through capital investment, however, are limited by the temporal structure of labour costs, the capitalist being forced to hire dear labour during the wet season or perhaps even leave her capital asset idle for a large part of the year.

A famous paper by Hymer and Resnick suggested that in an open economy under colonial rule cottage industries would begin to die out.⁷² They construct a dual sector model in which the production of ‘Z-goods’—that is to say, essentially non-internationally-traded services and goods like artisanal textiles, jewellery and so on—takes place alongside the production of an exportable agricultural good, called

⁷⁰ See Chapter 4 of Paul E. Lovejoy, *Jihad in West Africa during the Age of Revolutions* (Athens, GA: Ohio University Press, 2016).

⁷¹ This argument is made at greater length and in greater detail in Gareth Austin, ‘Labour-Intensity and Manufacturing in West Africa, c. 1450-c. 2000’, in *Labour-Intensive Industrialization in Global History*, ed. Gareth Austin and Kaoru Sugihara (London: Routledge, 2013), 201. Austin points out that some kinds of agricultural goods, like cocoa, created employment opportunities outside the traditional agricultural slack season, thereby reducing labour supply in the handicrafts sector.

⁷² Stephen Hymer and Stephen Resnick, “A Model of an Agrarian Economy with Nonagricultural Activities,” *The American Economic Review* 59, no. 4 (1969): 493–506.

food, though in translating the model to African historical reality we could think of it as a compound agricultural good (millet and groundnuts, for example). Additionally, ‘M-goods’—imported manufactures—are a possible substitute in consumption for Z-goods. As the price of the agricultural good rises,⁷³ incomes rise, and this leads to a higher consumption of Z-goods, but a substitution away from inferior domestic to superior M-goods. This kind of model has particular resonance in Senegal, where imported cloth, particularly the *guinée* cloth produced in French India, began to displace handicraft weaving relatively early.⁷⁴ This pattern of deindustrialisation was not universal: in other parts of West Africa, particularly Northern Nigeria, the quality of local textile production and the shape of consumer preference ensured that the industry survived the increasing penetration of Manchester for quite a long time.⁷⁵

Hymer and Resnick’s argument assumes that agricultural goods and Z-goods can be produced more or less in any proportions: if the price for food rises, then a peasant can simply produce more food and fewer Z-goods. Invoking Ester Boserup’s work on agricultural intensification, they argue that a ‘wide range of techniques exist’ that could allow for agriculture to be expanded past its usual seasonal limits even in ‘the most primitive societies’, with a steady increase in labour inputs as agrarian economies move from forest to ‘bush’ fallow, to short

⁷³ This is salient, as the terms of trade for African agriculture did during the nineteenth and early twentieth centuries: see Ewout Frankema, Jeffrey Williamson, and Pieter Woltjer, “An Economic Rationale for the West African Scramble? The Commercial Transition and the Commodity Price Boom of 1835–1885,” *The Journal of Economic History* 78, no. 1 (2018): 231–67.

⁷⁴ Richard Roberts, “Guinée Cloth: Linked Transformations within France’s Empire in the Nineteenth Century,” *Cahiers d’études Africaines*, 1992, 597–627; Toyomu Masaki, “The Export of Indian Guinée to Senegal via France: Inter-Colonial Trade in the Long Nineteenth Century,” in *Modern Global Trade and the Asian Regional Economy*, ed. Tomoko Shiroshima (Singapore: Springer Singapore, 2018), 87–115.

⁷⁵ Philip Shea, “The Development of Export-Oriented Dyed Cloth Industry in Kano Emirate in the Nineteenth Century” (University of Wisconsin, 1975).

fallow and then to annual cropping and finally multi-cropping.⁷⁶ But their engagement with Boserup's work is somewhat superficial: Boserup does indeed argue that labour inputs increase through all stages of this progression, but crucially, she also argued that in dry farming environments, like those of southern India and the West African savanna, this intensification occurs almost entirely *within* the short rainy season.⁷⁷ Intercropping can, under the right circumstances, extend the agricultural season, though there are limits.⁷⁸ When groundnuts and millet are grown together, however, the agricultural season remains short, and very careful planning is required to ensure that labour is available when needed.⁷⁹ In very arid climates like those that predominate Senegal, particularly north of the Gambia, only irrigation or the introduction of pasture in the field rotation system can do much to smooth labour inputs across the year. Thus an increase in agricultural production—say, from a groundnut boom—need not lead to a reduction in Z-good production, since the opportunity cost of labour remains low during large parts of the year.⁸⁰

Seasonal labour can be absorbed more easily when the elasticity of substitution of labour for capital is higher, and in the presence of regulatory barriers in the labour market—for example, laws that make it difficult to fire permanent workers—

⁷⁶ Hymer and Resnick, "Agrarian Economy," 494.

⁷⁷ Ester Boserup, *Conditions of Agricultural Growth*, Unwin University Books (St Leonards, NSW, Australia: Allen & Unwin, 1972), 94.

⁷⁸ Glenn Davis Stone, Robert Netting, and Priscilla Stone, "Seasonality, Labor Scheduling, and Agricultural Intensification in the Nigerian Savanna," *American Anthropologist* 92, no. 1 (1990): 7–23.

⁷⁹ Paul Péliissier, *Les paysans du Sénégal : les civilisation agraires du Cayor à la Casamance* (Paris: Imprimerie Fabrègue Saint Yrieux, 1966), 94.

⁸⁰ See particularly Gareth Austin, "Labour-Intensity and Manufacturing in West Africa, c. 1450-c. 2000," in *Labour Abundant Industrialization in Global History*, ed. Gareth Austin and Kaoru Sugihara (Abingdon: Routledge, 2013).

employing more seasonal workers can be efficient.⁸¹ But manufacturing firms that have grown to rely on cheap seasonal labour may be less willing to invest in capital and techniques that must be used year-round in order to recoup their cost.⁸² This may lead to technological backwardness in manufacturing firms in economies with highly seasonal labour supply, as Sokoloff and Tchakerian argue was the case for wheat-growing counties in the antebellum American south.⁸³ Sokoloff and Dollar argue that specialisation in grain agriculture in England, with its high seasonal labour peaks, led to more cottage manufacturing than in the United States. Land abundance in the latter country resulted, at least outside the South, in specialisation in agricultural goods that had less seasonal labour demand requirements; thus early American industrialisation was more heavily based around centralised plants.⁸⁴ In Chapter Five, I examine the effects of seasonal surplus labour on manufacturing in colonial French West Africa, showing that firms did absorb more labour in parts of the federation where labour supply peaks were likely to be more pronounced during the dry season.

AFRICAN INDUSTRIAL GROWTH

Senegal's failure to industrialise in the period following independence from France may be viewed as a subset or instance of a more popular question: why has Africa

⁸¹ See e.g. Michael J. Ferrantino, Gary D. Ferrier, and Carl B. Linvill, "Organizational Form and Efficiency: Evidence from Indian Sugar Manufacturing," *Journal of Comparative Economics* 21, no. 1 (1995): 29–53.

⁸² Bompard, Magnac, and Postel-Vinay, "Emploi, mobilité et chômage."

⁸³ Kenneth L. Sokoloff and Viken Tchakerian, "Manufacturing Where Agriculture Predominates: Evidence from the South and Midwest in 1860," *Explorations in Economic History* 34, no. 3 (1997): 243–64.

⁸⁴ Kenneth L. Sokoloff and David Dollar, "Agricultural Seasonality and the Organization of Manufacturing in Early Industrial Economies: The Contrast Between England and the United States," *The Journal of Economic History* 57, no. 2 (1997): 288–321.

stayed so poor while other parts of the twentieth century's 'developing' world, particularly in Eastern Europe and in Asia, have achieved reasonably rapid growth? Morten Jerven has called this the 'quest for the Africa dummy', in reference to the fact that in cross-country growth regressions, a 'sub-Saharan Africa' variable still usually holds explanatory power even when taking account the other variables on the left-hand side of the estimating equations; a sign that something about the African experience, yet to be quantified, has doomed it to low growth.⁸⁵ Jerven argues—and I concur—that the quest is a misguided one: African countries have seen periods of reasonably fast growth as well as of stagnation, so the idea of some kind of general African 'growth disease' is ahistorical.

Few, if any, of the grand questions of African economic history have received as much recent attention as the long-run impact of colonial rule on modern economies. It is almost a scholarly ritual to cite, in this respect, the work of Acemoglu, Robinson and Johnson.⁸⁶ Their 'Reversal of Fortunes' paper in particular places an emphasis on industrialisation as one link in the chain of causality that leads from colonial rule to economic prosperity today: the authors claim that countries with less 'extractive' institutions were able to take advantage of the opportunity to industrialise during the nineteenth century, the century in which the 'reversal' of their paper's title took place. Aside from some dubious specific historical assertions, the problems with this kind of argument are theoretical and

⁸⁵ Morten Jerven, "The Quest for the African Dummy: Explaining African Post-Colonial Economic Performance Revisited," *Journal of International Development* 23, no. 2 (2011): 288–307.

⁸⁶ Daron Acemoglu, Simon Johnson, and James A. Robinson, "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review* 91, no. 5 (2001): 1369–1401; Daron Acemoglu, Simon Johnson, and James A. Robinson, "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution," *The Quarterly Journal of Economics* 117, no. 4 (2002): 1231–94. However, telling criticisms have been levelled at this body of work, on both empirical and methodological grounds. See, respectively, David Y. Albouy, "The Colonial Origins of Comparative Development: An Empirical Investigation: Comment," *American Economic Review* 102, no. 6 (2012): 3059–76; Gareth Austin, "The 'Reversal of Fortune' Thesis and the Compression of History: Perspectives from African and Comparative Economic History," *Journal of International Development* 20, no. 8 (2008): 996–1027.

empirical. The posited econometric relationship is not necessarily watertight. AJR's story runs as follows: settler mortality can be considered an exogenous variable, areas with low settler mortality 'received' more inclusive institutions from their colonial rulers, these institutions were durable, and explain why some countries were able to industrialise in the nineteenth century and others were not. However, the identification strategy of the instrumental variable approach requires that the exclusion restriction—that the only channel by which settler mortality can be causally related to industrial output in the 19th century is institutions, with any other possible channels explicitly controlled for—be satisfied. For one thing, the set of geographical controls is not exhaustive: they include latitude, temperature, humidity, and a very aggregated definition of soil quality; however, this neglects other variables that have an enormous influence over agricultural productivity, such as rainfall, ruggedness and altitude. If these variables are independently correlated with industrial output (for example, and germane to the topic of this thesis, this might be because they are correlated with agricultural productivity, which might be a precondition for industrial growth) then the estimates of the importance of institutional quality may be biased.

The quality of the industrialisation variable itself is also open to question. Acemoglu et al. use the most quoted long-run figures on manufacturing's share of economic output, which are still Paul Bairoch's rather fuzzy and—it must be said—poorly documented estimates. These provide almost no illumination for historians of any economy lying between the Sahara and the Limpopo River.⁸⁷ The lack of detail about the ways in which the data have been constructed is concerning, because it leaves open the possibility of measurement error. Classical measurement error (that is, with mean zero and uncorrelated with the regressors) in the dependent variable

⁸⁷ P. Bairoch, "International Industrialization Levels from 1750 to 1980," *Journal of European Economic History* 11, no. 2 (1982): 269–334.

would pose little problem: OLS estimates in the presence of measurement error of this kind are inefficient but not biased or inconsistent. But problems emerge if the error is not classical, with a zero mean and uncorrelated with the regressors. Bairoch's data is likely to be more accurate for countries with higher industrial output, which means that measurement error is correlated with the dependent variable, potentially rendering OLS estimates inconsistent and biased; if it is also correlated with their explanatory variables then the potential for bias in parameter estimates is significant.⁸⁸ It is not hard to imagine how different kinds of institutions may have a systematic impact on the quality of industrial data; in which case, the interpretation of the coefficient on the institutional variable (or its instrument) is ambiguous. The data on urbanisation and arable land might be equally problematic.⁸⁹

More broadly, though, the aspect of the Reversal of Fortunes scholarship that focuses on the institutional capacity of countries to grasp the industrial possibilities open to them (which are presumed to be the same for all countries—industrialisation is considered a homogeneous technology), is open to the kind of critique made by Gareth Austin: it neglects the rich and varying histories of countries between the two points chosen for the purposes of the comparative statics.⁹⁰ The idea that 'the opportunity to industrialise' can be considered like a technology that can be taken down off a shelf and dusted, ready for use in any geographical or temporal circumstance, with political economy constraints the only obstacle, is more or less to ignore every feature of interest in the process of industrialisation, and offers little explanation for those cases, in the nineteenth

⁸⁸ Dean R. Hyslop and Guido W. Imbens, "Bias from Classical and Other Forms of Measurement Error," *Journal of Business & Economic Statistics* 19, no. 4 (2001): 475–81.

⁸⁹ Sanghamitra Bandyopadhyay and Elliott Green, "The Reversal of Fortune Thesis Reconsidered," *The Journal of Development Studies* 48, no. 7 (2012): 817–31.

⁹⁰ Austin, "Compression of History."

century as in the twentieth, in which powerful political leaders really did desire industrial growth in their countries and were unable to conjure it.

It also ignores any other impacts—that is to say, apart from making the actual ‘technology’ available—that the British Industrial Revolution may have had on the possibilities available to other economies, and, perhaps more damning, it abstracts from the possibility that later industrialisations may look very different from earlier ones: they may be quicker, for example. In any discussion of the problems of ‘late’ development, the work of Alexander Gerschenkron is bound to be invoked as a tonic to the all-too-frequent assumption that poorer countries were merely richer countries with a few hundred years subtracted.⁹¹ This teleological assumption of a universal economic pattern to which all countries would conform at different points of time (‘The history of the world goes from East to West: Europe is absolutely the end of History, while Asia is the beginning,’ as Hegel put it⁹²) has formed the basis of some very influential accounts of the economic history of the ‘developing’ world—Rostow’s theory, for example, that economic development progresses linearly in stages, with certain prerequisites to be collected before a country can graduate from one stage to the next.⁹³ Gerschenkron argued that the industrialisation of one country changed the possibilities for all other countries: hence, one industrialisation would not necessarily resemble another. Germany was not England, and South Korea would not be Germany.

Gerschenkron hypothesised that the ‘relative backwardness’ of a country determined the shape its eventual industrialisation took: the elite in more backward

⁹¹ Alexander Gerschenkron, *Economic Backwardness in Historical Perspective* (London, England: Harvard University Press, 1962).

⁹² Georg Wilhelm Friedrich Hegel, *The Philosophy of History*, trans. J. Sibree (Mineola, New York: Dover Philosophical Classics, 2012), 103.

⁹³ Rostow, *The Stages of Economic Growth*.

countries would feel more obliged to act deliberately to stoke industrial growth, thus making ‘late’ industrialisation more state-driven. The more backward the country, the more forceful the state’s interventions were likely to be, and the more likely that industrial growth would focus on capital rather than consumer good production, the more likely production techniques would be capital- rather than labour-intensive, and the more likely that manufacturing firms would be large rather than small. It was also likely that more backward countries would experience more ‘unbalanced’ growth: manufacturing and agriculture would not grow in tandem, and manufacturers would not be able to rely on rising agricultural incomes to supply a market for their output. This latter proposition was the subject of dispute between some of the most famous development: Ragnar Nurske and Paul Rosenstein-Rodan famously advocated ‘balanced growth’, in which all parts of the economy would be developed simultaneously,⁹⁴ requiring a ‘big push’ of capital investment; Hirschman, meanwhile, argued that unbalanced growth would likely be faster and easier to obtain than balanced growth.⁹⁵ Similarly, the industrialisation of one country may change the economic value of another country’s factor endowments. Even if, as Robert Allen has argued, the English Industrial Revolution was provoked in large measure by high wages⁹⁶—thus making the substitution of labour for capital economically desirable—it does not follow that all future industrialisation must be the consequence of high wages; indeed, as many

⁹⁴ Nurske, *Capital Formation*; Paul N. Rosenstein-Rodan, “The International Development of Economically Backward Areas,” *International Affairs* 20, no. 2 (1944): 157–65.

⁹⁵ Albert O. Hirschman, *The Strategy of Economic Development* (New Haven: Yale University Press, 1958).

⁹⁶ See generally Robert C. Allen, *The British Industrial Revolution in Global Perspective*, New Approaches to Economic and Social History (Cambridge: Cambridge University Press, 2009); Robert C. Allen, “The High Wage Economy and the Industrial Revolution: A Restatement,” *The Economic History Review* 68, no. 1 (2015): 1–22.

have argued, low wages are of great benefit to ‘late’ industrialisation, since they render low value-added exports more competitive.⁹⁷

The kinds of policies pursued can generally be grouped together under the rubric of ‘import substituting industrialisation’. Generally, this involves a staged process, beginning with the domestic production of very simple manufactured importables and progressing gradually into the production of more complex goods. Non-durable consumer goods like clothes, soap, and foodstuffs tend to feature in the initial stages of ISI, as they did in Senegal; this is generally followed by durable goods like cars, then by capital goods.⁹⁸ The case for infant industry protection is one with a long history,⁹⁹ and liberals like J.S. Mill could be found to endorse it, with important qualifications, notably that the protection should be strictly (as the name implied) temporary. The role of protection (and, in particular, of the Calico Acts) in the English industrial revolution is hotly contested. Joseph Inikori bluntly describes the rise of English textile manufacturing as a case of successful import substitution industrialisation: first woolens, then linens, then finally cottons in the eighteenth century.¹⁰⁰ Other authors, however, have cast doubt on the effectiveness of English protection for cotton.¹⁰¹ Alice Amsden argued that in South Korea, even

⁹⁷ C.f. Gregory J. Kasza, “Gerschenkron, Amsden, and Japan: The State in Late Development,” *Japanese Journal of Political Science* 19, no. 2 (2018): 146–72.

⁹⁸ High barriers to international trade in a country with comparative advantage in agriculture are usually assumed to promote the development of manufacturing and the relative decline of agriculture. K. Madhu Panikkar argued that in the West Africa it was *agriculture* that had suffered from the ‘open economy’: unlike in the author’s native India, which he considered ‘closed’, government revenues could be obtained from commerce (especially in slaves) and therefore there was no pressing need for West African states to make productive investment in public goods like irrigation to benefit the agricultural sector. Kavalam Madhusudan Pannikar, *The Serpent and the Crescent: A History of the Negro Empires of Western Africa* (Bombay: Asia Publishing House, 1963), 283. While

⁹⁹ Dating back at least to the seventeenth century in England: see Jacob Viner, *Studies in the Theory of International Trade* (London, England: Allen and Unwin, 1937), 71–72.

¹⁰⁰ See in particular Chapter 2 (‘The English economy in the *longue durée*’) in Joseph E. Inikori, *Africans and the Industrial Revolution in England* (Cambridge, England: Cambridge University Press, 2011), 19–89.

¹⁰¹ Stephen N. Broadberry and Bishnupriya Gupta, “Cotton Textiles and the Great Divergence: Lancashire, India and Shifting Competitive Advantage, 1600–1850” (LSE Working Paper, 2005).

low wages were not sufficient for the cotton textile sector (usually seen as the epitome of a labour-intensive industry) to produce at the prevailing world price; hence the need for widespread subsidies to infant industries.¹⁰² If this was the case in a country with a natural advantage in the ‘early’, low-wage varieties of manufacturing, then surely the need for government intervention in sub-Saharan Africa (where higher urban wages were the norm¹⁰³) was clear-cut.

Though sub-Saharan Africa has a reasonably long history of import-substituting industrialisation,¹⁰⁴ the historiography is still rather slim.¹⁰⁵ Most of the analysis of ISI in Africa has been carried out by economists, and for them, assessment of the effectiveness of ISI remains mostly negative. Though the consensus is far from total, the arguments made in a series of international case studies conducted in the 1970s and 1980s have been influential. Perhaps the best known of these is a series of NBER studies, together entitled ‘Foreign trade regimes and economic development’, undertaken under the direction of Anne Krueger and Jagdish Bhagwati. These case studies covered a number of developing and semi-industrialised economies, including one on Ghana by J. Clark Leith.¹⁰⁶ In this study, Leith blamed the ‘restrictive system’ (referring to controls on external movements of goods and

¹⁰² Alice H. Amsden, “Diffusion of Development: The Late-Industrializing Model and Greater East Asia,” *The American Economic Review* 81, no. 2 (1991): 284.

¹⁰³ Ewout Frankema and Marlous van Waijenburg, “Structural Impediments to African Growth? New Evidence from Real Wages in British Africa, 1880-1965,” *The Journal of Economic History* 72, no. 4 (2012): 895–926.

¹⁰⁴ Probably the earliest example of modern ISI in sub-Saharan Africa was the deliberate use of protective tariffs in South Africa, starting in 1914 with the Customs Tariff Act and more seriously from 1924 with the government of General Hertzog, which introduced much more serious tariff barriers in the hope of stimulating the domestic manufacturing sector (and white employment within it) and established government electricity and steel enterprises: Charles H. Feinstein, *An Economic History of South Africa* (Cambridge, England: Cambridge University Press, 2012), 117–20.

¹⁰⁵ Though for Senegal see particularly Catherine Boone, *Merchant Capital and the Roots of State Power in Senegal: 1930-1985* (Cambridge, England: Cambridge University Press, 1992).

¹⁰⁶ J. Clark Keith, *Foreign Trade Regimes and Economic Development: Ghana*, vol. 2, Special NBER Conference Series on Foreign Trade Regimes and Economic Development (New York: National Bureau of Economic Research Columbia University Press, 1974).

capital) prevailing under the Nkrumah and Busia regimes for Ghanaian economic stagnation. Leith argued that ‘the broad objective of industrialization was almost completely obscured in the indiscriminate distribution of protection’.¹⁰⁷ Despite a huge increase in the investment-to-GDP ratio, thanks to the public sector, there was very little effect on incomes. A later project, of similar character, discussed the links between trade policy and employment; one chapter, by Terry Monson, was devoted to Côte d’Ivoire, and especially to the effects of the tariff reform of 1973, which imposed cascading tariffs to encourage domestic processing of raw material exports.¹⁰⁸ The general approach in the project was heavily influenced by the textbook Heckscher-Ohlin-Samuelson model of trade, which Anne Krueger had restated in a more general form in order to encompass the wide range of economic structures in the countries under study.¹⁰⁹ Monson’s analysis of Côte d’Ivoire, while noting that protection in Côte d’Ivoire was much less extensive than in many other countries in West Africa, argued that distortions had arisen because protection in the exportables sector had been more extensive in less labour-intensive goods than for labour-intensive goods (Monson considers the latter to be goods that conformed to Côte d’Ivoire’s comparative advantage).

These are problems that essentially involve being on the wrong part of a production possibilities frontier. The other problem, as Peter Kilby argued in the case of the Nigerian manufacturing sector, was being inside the PPF. Kilby argued that one of the main problems of Nigerian manufacturing was an inefficient conversion of inputs to outputs; many of the import-substituting firms were so inefficient, he

¹⁰⁷ Ibid., 2:164.

¹⁰⁸ Terry Monson, “Trade Strategies and Employment in the Ivory Coast,” in *Trade and Employment in Developing Countries*, ed. Anne O. Krueger et al., vol. 1 (Chicago: University of Chicago Press, 1980), 239–90.

¹⁰⁹ Anne O. Krueger, “The Framework of the Country Studies,” in *Trade and Employment in Developing Countries*, ed. Anne O. Krueger et al., vol. 1 (Chicago: University of Chicago Press, 1980), 1–28.

argued, that their costs were so far above those prevailing in the rest of the world that they would go out of business even in the presence of the ‘natural protection’ of transportation costs and the justifiable protection of infant-industry tariffs. Though in many ways Peter Kilby’s account of Nigerian industrialisation could be described as conventionally liberal, he did acknowledge that the classic argument made by Amartya Sen in favour of capital-intensive industrialisation—that profits were more likely to be reinvested than were wages, so a choice of technique that maximised reinvestment could be justified in a dynamic sense even if it were statically inefficient¹¹⁰—had to be revised in the context of large-scale foreign investment. Profits may be more likely to be reinvested than wages, true, but this was irrelevant if the profits of a foreign-owned cement factory in Lagos were repatriated to England and reinvested in a plant in London. In this way, Kilby argued, in certain circumstances it may make more sense to encourage the development of small-scale indigenous firms that employed labour-intensive production techniques, in the hope that they would be more likely to reinvest in Nigeria itself.¹¹¹

The attitude of economists towards state intervention in industry in order to promote structural change has become somewhat rosier in the last two decades or so. Pioneers like Alice Amsden and Robert Wade have pointed to the crucial role played by states in the East Asian miracle economies: these governments may not have operated command economies, but they did direct resources into priority sectors (even as individual firms were often forced to obey hard budget constraints)

¹¹⁰ Amartya Kumar Sen, “Some Notes on the Choice of Capital-Intensity in Development Planning,” *The Quarterly Journal of Economics* 71, no. 4 (1957): 561–84.

¹¹¹ Peter Kilby, *Industrialization in an Open Economy* (Cambridge, England: Cambridge University Press, 1967), 261.

and manipulate prices of goods and factors in order to promote structural change.¹¹² Neither Amsden nor Wade are pure statisticians, and both recognise the power of markets to discipline economic agents and to allocate resources, but they argue that governments must superintend markets if they are to lead to structural change.

A line of research has focused on the other insight salvaged from the wreck of *dependencismo*. Echoing the argument of the Latin American structuralists that some specialisations were intrinsically more worthwhile than others, some economists have begun to trace the ways in which an economic specialisation is path-dependent. The capabilities required to produce some kinds of goods and services, they argue, are more easily transferrable than others. For this reason, some countries can be ‘trapped’ by their comparative advantage.¹¹³ Recently, my co-authors and I have shown that the path-dependency of export specialization extends back to the turn of the twentieth century at least.¹¹⁴ Finally, a recent econometric literature has begun to explore, at a micro-level, the impact of industrial policy on growth, especially in successful industrialisers like South Korea and Japan. Nathan Lane produces a rigorous econometric update to the structuralism of Albert Hirschmann, which focused on ‘backward’ and ‘forward’ linkages between different firms or different sectors.¹¹⁵ Lane uses a Leontief matrix,

¹¹² Alice H. Amsden, *The Rise of the Rest* (New York, NY: Oxford University Press, 2001); Robert Wade, *Governing the Market* (Princeton, NJ: Princeton University Press, 2018), doi:10.2307/j.ctv346sp7.

¹¹³ César Hidalgo et al., “The Product Space Conditions the Development of Nations,” *Science* 317, no. 5837 (2007): 482–87; Ricardo Hausmann, Jason Hwang, and Dani Rodrik, “What You Export Matters,” *Journal of Economic Growth* 12, no. 1 (2007): 1–25; Dani Rodrik, “What’s so Special about China’s Exports?,” *China & World Economy* 14, no. 5 (2006): 1–19.

¹¹⁴ Isabella Weber et al., “What You Exported Matters: Persistence in Productive Capabilities Across Two Eras of Globalisation,” Rebuilding Macroeconomics Working Paper Series 2021.

¹¹⁵ Albert O. Hirschman, “A Generalized Linkage Approach to Development, with Special Reference to Staples,” in *The Essential Hirschman* (Princeton University Press, 2013); Leroy P. Jones, “The Measurement of Hirschmanian Linkages,” *The Quarterly Journal of Economics* 90, no. 2 (1976): 323; Guido Cella, “The Input-Output Measurement of Interindustry Linkages,” *Oxford Bulletin of Economics and Statistics* 46, no. 1 (2009): 73–84.

derived from South Korean input-output tables, to determine the impact of South Korea's Heavy Chemical and Industry program, showing that the policy had positive long-lasting impacts on the directly targeted industries as well as 'downstream' industries that used the targeted industries' outputs as inputs. Conversely, it had a negative impact on 'upstream' industries' output, presumably because part of the policy involved loosening restrictions on the ability of the targeted industries to import intermediate goods.¹¹⁶ In Chapter 5, I document—for the first time in a standardised form—the strength of interindustry linkages at the time of independence for a number of sub-Saharan African countries, as well as over the first twenty years of independence for Senegal. I show that linkages were in general weak, and that industrial policy in Senegal had only middling success in fostering greater domestic linkages.

One of the difficulties in devising suitable industrial policy faced by Senegal that was less salient in the Korean or Japanese cases was the size of domestic demand. Samir Amin's analysis of Senegalese industry places at its centre an argument that will be tested somewhat more rigorously later in this dissertation: that the domestic supply of manufactures was brought about by the demand supplied the French civil service and the rest of *Afrique occidentale française* in the colonial period, the collapse of which doomed Senegal's industrial prospects without more radical change.¹¹⁷ The mere collapse of a formal legal market, however, need not have led to the collapse in trade and the reversal of country-level specialisations. In general, the end of other customs unions has often been followed by a reasonably high degree of persistence in trade flows initially, followed by a waning in intra-union

¹¹⁶ Nathan Lane, 'Manufacturing revolutions', 2016.

¹¹⁷ Samir Amin, *L'Afrique de l'Ouest bloquée : l'économie politique de la colonisation, 1880-1970* (Paris: Éditions de Minuit, 1972).

trade intensity.¹¹⁸ But regional interactions in West Africa were characterised not by the open regionalism that prevailed in East Asia¹¹⁹ but rather by piecemeal integration, still heavily conditioned by the existence of an old colonial bloc—the CFA franc zone—under a new name.¹²⁰

SCOPE, METHODOLOGY AND STRUCTURE

Histories of the nation are invariably entangled with histories of the broader world.¹²¹ Though this thesis is not consciously a work of ‘global history’, as it has come to be understood in the past two decades especially, it does emphasise imperial and regional connections, stressing for example the role of Soudan français as a broad hinterland for an urbanising and industrialising Senegal, and the economic consequences of Dakar’s role as a federal bureaucratic capital for France’s West African territories. Drawing on the pathbreaking work of Kenneth Pomeranz on the economic divergence between England and the Yangtze Delta of China,¹²²

¹¹⁸ This effect has been examined in studies of other customs unions, largely in Europe east of the Elbe: see for example on the former Yugoslavia: Jan Fidrmuc and Jarko Fidrmuc, ‘Disintegration and Trade’, *Review of International Economics* 11, no. 5 (2003): 811–29, Jose De Sousa and Olivier Lamotte, ‘Does Political Disintegration Lead to Trade Disintegration? Evidence from Transition Countries’, *Economics of Transition* 15, no. 4 (2007): 825–43; for central Europe after the First World War, see Georges De Ménénil and Mathilde Maurel, ‘Breaking up a Customs Union: The Case of the Austro-Hungarian Empire in 1919’, *Review of World Economics* 130, no. 3 (1994): 553–75 and Hans Christian Heinemeyer, ‘The Treatment Effect of Borders on Trade. the Great War and the Disintegration of Central Europe’, *Cliometrica* 1, no. 3 (2007): 177–210

¹¹⁹ Peter Drysdale, *International Economic Pluralism: Economic Policy in East Asia and the Pacific* (Canberra: Allen & Unwin, 1988).

¹²⁰ Percy S. Mistry, ‘Africa’s Record of Regional Co-Operation and Integration,’ *African Affairs* 99, no. 397 (2000): 553–73.

¹²¹ Bruce Mazlish, ‘Comparing Global History to World History,’ *The Journal of Interdisciplinary History* 28, no. 3 (1998): 385–95; Patrick O’Brien, ‘Historiographical Traditions and Modern Imperatives for the Restoration of Global History,’ *Journal of Global History* 1, no. 1 (2006): 3–39; Sebastian Conrad, *What Is Global History?* (Princeton: Princeton University Press, 2017).

¹²² Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000).

Gareth Austin has proposed the pursuit of ‘reciprocal comparisons’ in African economic history—that is to say, histories that, in comparing two countries or two regions, do not take either as the ‘natural’ case to which a ‘deviant’ case can be compared.¹²³ A broader ambition, of which this thesis forms only a very preliminary first step, is to conduct such a reciprocal comparison for the land-abundant countries of West Africa and Southeast Asia in the twentieth century. The specific reasons for such a comparison are suggested above: both West Africa and Southeast Asia have tropical climates, land surpluses, a varied regional history of coerced labour and European colonial rule, and extensive participation in the cash crop boom of the nineteenth and twentieth centuries. Some of the comparisons have been developed more recently by Anne Booth, though—unsurprisingly, given the variation observed even within regions—only as yet in fairly summary form.¹²⁴ Though this dissertation aims to give a coherent economic history of the relationship between agriculture and industry in Senegal, I also hope it can serve as material for the writing of a broader comparative history that can help us to understand the ‘Late Divergence’ in the global tropics.

The first two chapters of this thesis are concerned with slavery and the division of labour in urban Senegal prior to the legal abolition of slavery in 1848. The major historical contribution is a detailed study of the economics of the institution of slavery, drawing on rich quantitative evidence collected by French administrators in the two colonial ports of Saint-Louis and Gorée. The chapters offer an interpretation of urban slavery that emphasises the functional role of slavery in overcoming some of the obstacles to urbanisation in precolonial Africa. The central theme of the first chapter is about how African societies have marshalled and

¹²³ Gareth Austin, “Reciprocal Comparison and African History: Tackling Conceptual Eurocentrism in the Study of Africa’s Economic Past,” *African Studies Review* 50, no. 3 (2007): 1–28.

¹²⁴ Anne Booth, “West Africa in the Southeast Asian Mirror: The Historical Origins of the Post-1960 Divergence,” *Itinerario* 32, no. 3 (2008): 61–90.

governed a scarce resource: skill. Drawing on a new dataset of slave prices, I document a very high return to enslaved skilled labour and a very high premium paid by slaves purchasing their own freedom. In Chapter 2, I conduct an exercise that to my knowledge has never been conducted for any slave society on the eastern side of the Atlantic: I calculate the profitability of slavery in urban Senegal. I show that owning slaves was highly lucrative to urban slaveowners, even when compared with other kinds of investments. I compare the dynamism of the trade-based economy to a well-known attempt by French colonial authorities to establish a plantation-based system of colonial agriculture in the Senegal River Valley in the 1810s and 1820s. I come to somewhat different conclusions to a recent analysis of the scheme:¹²⁵ I argue that the statistics that the French left behind are very unreliable, due to the massive incentives for fraud in the scheme, and that while this points to very real *political* difficulties that any imperial scheme for plantation-based agriculture in the valley would face, the estimates of land and labour productivity in agriculture the Senegal River plantations should not really be accepted on face value. Rather, labour productivity in agriculture was likely still high enough that the recruitment and retention of a permanent labour force in urban centres was constrained by the attractiveness of agriculture, explaining both the desirability of slavery for slaveowners when compared to a wage labour system, and pointing to constraints that would be faced by the urban economy throughout the next hundred and fifty years of Senegalese economic history.

In Chapter 3, I analyse the growth of Senegalese cities after the abolition of slavery. I draw up a balance sheet for Senegalese urbanisation in the nineteenth and twentieth century. Drawing on a number of previously unexploited data sources

¹²⁵ Klas Rönnbäck and Dimitrios Theodoridis, “African Agricultural Productivity and the Transatlantic Slave Trade: Evidence from Senegambia in the Nineteenth Century,” *The Economic History Review* 72, no. 1 (2019): 209–32.

from archives, I explore the occupational attainment of migrants from rural Senegal to Dakar and Kaolack, two of the most important cities in the country. I argue that cities serve a vital role in developing skills. It is not just that urban-born workers are more likely to work in skilled occupations than are rural-urban migrants, which might be expected given historically unequal access to education across Senegal: even when accounting for literacy and years of schooling, urban-born workers are more likely to hold skilled positions. This lends weight to Frankema and van Waijenburg's argument that the full dividend of the expansion of African schooling has yet to be harvested.¹²⁶ The results in Chapter 3 suggest that education and 'urban experience' are complements in production, and therefore massive urbanisation may result in growth, but with a generational lag. But urbanisation also comes with its costs: cities are capital-intensive, and Senegal, like other colonies in West Africa, was historically short of capital. Investment in urban roads and buildings consumed resources that might otherwise have been spent on productive capital. The chapter shows that investments in Dakar in particular were very large, to a considerable degree offsetting the economic benefits of structural change.

The fourth chapter investigates one of the core features of the dual sector models described above: the divergence in income between city and country. Based on extensive archival research, the chapter presents a real wage series for Dakar between 1914 and 1960, the first using now-standard 'Allen basket' methodology for any country in French Africa.¹²⁷ It also presents a novel method for estimating farmer incomes in an agricultural economy in which labour and land were divided

¹²⁶ Ewout Frankema and Marlous Van Waijenburg, "The Great Convergence. Skill Accumulation and Mass Education in Africa and Asia, 1870-2010" 2019.

¹²⁷ Previous studies have focused on British Africa and the Congo: Frankema and van Waijenburg, "Structural Impediments"; Dacil Juif and Ewout Frankema, "From Coercion to Compensation: Institutional Responses to Labour Scarcity in the Central African Copperbelt," *Journal of Institutional Economics*, 2018; Jutta Bolt and Ellen Hillbom, "Potential for Diversification? The Role of the Formal Sector in Bechuanaland Protectorate's Economy, 1900-65," *Economic History of Developing Regions* 30, no. 2 (2015): 95-124.

between export crops and subsistence crops, but only the production of the former was measured with any accuracy. Put together, these two series suggest a major divergence between rural and urban incomes, which might suggest that ‘urban pull’ factors predominated in driving urbanisation. But I then complicate the story by adding in a new element in African real wage studies: a measure of housing costs. I show that unskilled labourers paid very dearly for accommodation, particularly in the final two decades of colonial rule, and properly accounting for this lowers the estimated urban real wage such that its divergence from estimated rural incomes is only minimal. Landlords, in other words, swallowed up the gains that might otherwise have accrued to ordinary workers. As well as providing a pessimistic revision of the recent literature on living standards in colonial Africa, this fact suggests that rural push factors may have played some role in driving rural-urban migration in the twentieth century. Finally, I assemble some tentative evidence in favour of the hypothesis on food prices mentioned above: that the integration of domestic markets for consumption staples like millet and rice was more advanced in Southeast Asia than in Senegal, leading to higher food prices in Dakar and consequently a higher nominal wage. This may have played some part in rendering Senegalese labour uncompetitive with workers in Thailand, Indonesia, the Philippines and Malaysia.

Chapter Five connects Senegal’s agriculture growth in the twentieth century with its nascent industrial sector. The analysis is inspired by staple theory, a theoretical framework that, though now in rather low water, enjoyed considerable success in explaining the economic development of land-abundant temperate economies like Canada (where the theory originated) and Australia. The experience of tropical ‘peasant export’ colonies in West Africa was very different from those of the settler economies, but I argue that the staples framework is still flexible enough to generate interesting insights into the fitful industrialisation of West African economies in

the twentieth century. The chapter draws together a large amount of new quantitative evidence on rural and urban demand, manufacturing in French West Africa, and—in order to evaluate the strength of linkages between agriculture and manufacturing—input output tables, which I have digitised and standardised.

I conclude by reflecting on the continuing relevance of the classic models of development economics for understanding the economic history of structural change in the land-abundant tropics, and particularly Senegal. The Lewis model has only limited relevance for economies with high land-labour ratios, though it may help to elucidate the ‘dry season economics’ of economies with very short growing seasons. Myint, on the other hand, is more or less silent on the growth of industry in the ‘vent-for-surplus’ economies. What is needed is a model of structural change that explains why industrialisation does or does not occur in the presence of land abundance, high real urban consumption (even if unequally distributed between landlords and tenants), relatively high nominal wages, and seasonal swings in factor ratios. The thesis argues that industrialisation in the face of these constraints is difficult, and in that sense Senegal’s failure to achieve the industrial growth that its post-independence leaders sought is probably not surprising. But since Senegal shared many of these features with countries elsewhere in the global tropics that *have* succeeded in attaining significant economic growth and structural change in the past sixty years or so, these constraints were probably not completely binding. How Senegal might have escaped them is a question that can only be answered comparatively, and is a project that lies outside the scope of this thesis; however, I hope that analysis presented in the chapters that follow might form part of the material necessary for such an undertaking.

CHAPTER I. *The economics of slavery and
the mastery of skill*

Many of the West African towns that grew in the shade of the transatlantic slave trade—Lagos, Porto Novo, Luanda—have been the capital or dominant city of independent nations. Coastal trading towns may have been partly a European imposition on the West African urban system, but port cities did not just face outward across the ocean: their development depended on their integration with hinterland economies, from which they obtained provisions¹ and, crucially, labour. In several crucial economic aspects they resembled the ‘port cities’ of the desert edge that serviced the trans-Saharan trade. And in common with many port cities on both sides of the Atlantic², their social and economic development was conditioned by slavery and its afterlives.³ Many of them grew to dominate larger colonies both politically and culturally.⁴ Recently, Martin Klein has urged historians to look again at the phenomenon of urban slavery in Africa.⁵ Neither the plantation nor the kinship model—upon which scholars of African slavery have so frequently

¹ James Anderson and Walter Vorster, “In Search of Melaka’s Hinterland: On Provisioning the Emporium in the Fifteenth–Nineteenth Centuries,” *The Rise and Growth of the Colonial Port Cities in Asia*, 1985, 1–8; Philip Misevich, “The Sierra Leone Hinterland and the Provisioning of Early Freetown, 1792–1803,” *Journal of Colonialism & Colonial History* 9, no. 3 (2008).

² The literature is vast, and growing; see especially: Jessica Choppin Roney, “Introduction: Distinguishing Port Cities, 1500–1800,” *Early American Studies: An Interdisciplinary Journal* 15, no. 4 (2017): 649–59; Pepijn Brandon, Niklas Frykman, and Pernille Røge, “Free and Unfree Labor in Atlantic and Indian Ocean Port Cities (Seventeenth–Nineteenth Centuries),” *International Review of Social History / Internationaal Instituut Voor Sociale Geschiedenis, Amsterdam* 64, no. S27 (2019): 1–18; Filipa Ribeiro da Silva, “The Slave Trade and the Development of the Atlantic Africa Port System, 1400s–1800s,” *International Journal of Maritime History* 29, no. 1 (2017): 138–54; Jorge Canizares-Esguerra, Matt D. Childs, and James Sidbury, *The Black Urban Atlantic in the Age of the Slave Trade* (University of Pennsylvania Press, 2013).

³ Kristin Mann, *Slavery and the Birth of an African City* (Bloomington: Indiana University Press, 2010); Robin Law, *Ouidah: The Social History of A West African Slaving Port*, Western African Studies (Athens, GA: Ohio University Press, 2004).

⁴ In Senegal, the port cities became special political enclaves whose African citizens enjoyed rights denied to their counterparts elsewhere in the colony; the Wolof dialect spoken in Saint-Louis also became a kind of urban lingua franca. Mamadou Diouf, “The French Colonial Policy of Assimilation and the Civility of the Originaires of the Four Communes (Senegal): A Nineteenth Century Globalization Project,” *Development and Change* 29, no. 4 (1998): 671–96; Fiona McLaughlin, “On the Origins of Urban Wolof: Evidence from Louis Descemet’s 1864 Phrase Book,” *Language In Society* 37, no. 5 (2008): 713–35.

⁵ Klein, “Urban Slavery.” Klein’s broader work on slavery in French West Africa provides a useful frame of reference for more detailed studies of particular sectors: Klein, *Slavery and Colonial Rule*.

drawn—are of much help in understanding the phenomenon of urban slavery in Africa, Klein argues.⁶ To this we can add that an examination of urban slavery tells us as much about the nature of African cities as it does about slavery. Though it may be objected that the Eurafrican port cities of the West African coast were only slightly representative of the societies on the edges of which they grew, or of the African towns of the interior or the Saharan desert edge, they nonetheless faced a common set of economic constraints, including scarce labour, thin credit markets, and strong seasonal fluctuations in relative prices, including for labour.

This chapter builds on Klein's own observations to advance a model of urban slavery in Africa based on a detailed examination of manumission records and[?] the structure of slave prices in Saint-Louis and Gorée, two French colonial settlements on the coast of what is now the Republic of Senegal. The sources upon which I have drawn for this chapter and the following one come from both French and Senegalese archives, and they mostly date from the very end of slavery, which was finally abolished following the 1848 revolution in France.⁷ The move to abolish

⁶ A detailed account of plantation slavery in West Africa is the case study of Fanisau in the Sokoto Caliphate given in Mohammed Bashir Salau, *The West African Slave Plantation* (Basingstoke: Palgrave Macmillan, 2011). An older but useful interpretation is Paul E. Lovejoy, "Plantations in the Economy of the Sokoto Caliphate," *Journal of African History* 19, no. 3 (1978): 341–68. See also Jan Hogendorn, "The Economics of Slave Use on Two 'Plantations' in the Zaria Emirate of the Sokoto Caliphate," *The International Journal of African Historical Studies* 10, no. 3 (1977): 369.. On the relationship between slavery and kinship, see especially the editor's introduction to Suzanne Miers and Igor Kopytoff, *Slavery in Africa: Historical and Anthropological Perspectives* (Univ of Wisconsin Press, 1979). Two of the best known English-language surveys of slavery in Africa take quite different approaches to the importance of market production versus assimilation and dependence relationships as best describing the functional role of slavery in African societies—and hence of the social and cultural meaning of abolition: Paul E. Lovejoy, *Transformations in Slavery: A History of Slavery in Africa*, African Studies Series (Cambridge: Cambridge University Press, 1983); Sean Stilwell, *Slavery and Slaving in African History* (Cambridge: Cambridge University Press, 2014). A useful synthesis of recent work is Rossi's review essay: Benedetta Rossi, "Dependence, Unfreedom and Slavery in Africa: Towards an Integrated Analysis," *Africa* 86, no. 3 (2016): 571–90..

⁷ The literature on emancipation in insular Senegal is extensive, beginning with M'baye Gueye, "La fin de l'esclavage à Saint-Louis et à Gorée en 1848," *Bulletin de l'Institut fondamental d'Afrique noire. Serie B: Sciences humaines* 28, no. 3–4 (1966): 637–56. See also Roger Pasquier, "A propos de

slavery led to the production of an unusually detailed set of quantitative sources by the French administration. In the archives of the Ministry of Commerce relating to Senegal, preserved in the Archives nationales d'outre-mer in Aix-en-Provence, a compilation of slave prices from 1836 to 1846 was found, and has been used to calculate the hedonic regressions of slave prices.⁸ Also in these archives was a detailed source of information about the functioning of the slave economy in Senegal: a report into the possibility of emancipation by a commission of inquiry in 1845. Over thirty questions were asked of free residents, African and métis or European, regarding the likely consequences of a general emancipation. Somewhat less detailed interviews were also conducted with a sample of slaves, both in the towns and at trading posts on the Senegal River. The use of the Commission of Inquiry's reports is, of course, complicated—especially difficult is the interpretation of the interviews with slaves, which almost certainly took place in the presence of masters, or at least in the presence of colonial officials who represented the authority which enforced the institution of slavery. Since the testimonials of Senegalese slaves speak of a burning desire for freedom, it seems that the slaves were not cowed by this presence, and so I have treated their accounts as basically accurate, though some possibility for both exaggeration or understatement (depending on if slaveowners were present) must be contemplated, though not assumed, when considering their description of the negative treatment afforded by their masters.⁹ The structure of the chapter is as follows: first, I give a brief description of the economies of Saint Louis and Gorée. I then discuss the problem of skilled labour in 'pre-modern' African economies, and argue that another coercive institution, caste, was responsible for managing the supply and demand

l'émancipation des esclaves au Sénégal en 1848," *Revue française d'histoire d'outre-mer* 54, no. 194 (1967): 188–208; Trevor R. Getz, *Slavery and Reform in West Africa* (Ohio University Press, 2004).

⁸ Specifically, the compilations from notarial sources held in FR ANOM COL K 3/3.

⁹ On the challenge of reconstructing slave life from documents produced by the slave society itself, see Nigel Worden, "Cape Slaves in the Paper Empire of the VOC," *Kronos* 40, no. 1 (2014): 23–44.

for skilled labour in the Western Sudan, where very short agricultural seasons produced bottlenecks for skilled labour, particularly blacksmiths.

THE SETTING: GORÉE AND SAINT-LOUIS

“Senegal is not a colony like the others”, counselled Jean-Elie Gautier, a Bordelais politician who briefly served as the French Minister of Finance in 1839. “Nothing there resembles what we find elsewhere: neither the social situation, nor the customs, nor the political situation, nor the constitution of interests.”¹⁰ At the time he wrote those sentences, the colony he was describing was a territorially modest affair, comprising in the main the two island entrepôt towns of Saint-Louis du Sénégal and Gorée, with a scattering of torpid agricultural plantations and traders’ factories along the Senegal River. Saint-Louis itself lay in the mouth of this river; Gorée a mile or so off the coast of the Cap Vert peninsular further south. European flags—mostly French, but also Dutch, Portuguese and British—had flown on both islands for centuries before General Faidherbe began the conquest of mainland Senegal. Through the towns there passed a small but growing flow of trade. First, and most notoriously, there were the human captives destined for the New World, the majority to France’s ‘empire of sugar’ in the Caribbean, though a significant portion were shipped to British and Spanish colonies, as well as to Brazil. More economically significant by the nineteenth century was gum arabic, a vital industrial stiffening agent harvested from Mauritanian acacias.¹¹ To adopt the

¹⁰ Jean-Elie Gautier, ‘Rapport fait au ministre de la marine et des colonies par M. Gautier au nom de la commission chargée d’examiner les questions relatives à la traite des gommés au Sénégal’, in *Annales maritimes et coloniales* (Paris, 1842), 184. All translations from French are my own unless otherwise indicated.

¹¹ Cheikh Sène, “From Slaves to Gum: Colonial Trade and French-British Rivalry in Eighteenth-Century Senegambia,” in *British and French Colonialism in Africa, Asia and the Middle East* (Cham: Springer International Publishing, 2019), 19–33.

terminology of staple theory, the gum trade was a ‘leading sector’; it produced a number of backward linkages into other sectors, like ship and boat construction.¹² Additionally, there was an important ‘final demand’ linkage, as part of the income of the traders—most of whom were Afro-European—was spent on domestically produced goods and services like textiles and housing. The small but important need for specialised workers generated by these sectors—weavers, masons and carpenters, among others—was met partly by free workers but mostly by skilled slaves. Saint-Louis in 1837 had a total population of around 13,112 (counting the suburb of Guet N’Dar on the sand spit known as the Langue de Barbarie). Just under half were enslaved. Only around 500 were European. Gorée was an even more unequal society: of its 4,994 residents in 1937, three-quarters were enslaved.¹³

Transportation for trade was by far the most important source of employment for free and unfree residents of the islands. In 1837, there were 2790 people employed as sailors in Saint-Louis and Gorée, representing about 40% of the male population of both islands. The proportion was higher in Saint-Louis than in Gorée. Another 20% or so had some kind of artisanal employment, with the remaining 40% of the male population either unskilled labourers, unemployed or too young to work.¹⁴ In order to trade along the river, especially during the rainy season, French companies required large numbers of sailors to pull boats against the current. The boat-hands (*laptots*) were also petty traders, who made good incomes by exchanging the salt they were given in lieu of cash wages by their masters for goods in the upper valley of the river, where salt was expensive.¹⁵ In the towns themselves, men worked in a

¹² Hirschman, “Linkage Approach”; Richard L. Roberts, “Linkages and Multiplier Effects in the Ecologically Specialized Trade of Precolonial West Africa,” *Cahiers d’études Africaines* 20, no. 77 (1980): 135–48.

¹³ Ministère de la Marine et des Colonies, *Notices statistiques sur les colonies françaises*, vol 3, Paris, 1839,

¹⁴ Calculated from figures given in Ministère des colonies, *Notices statistiques sur les colonies françaises*, (Paris: 1837), vol 3, 224–5.

¹⁵ Searing, *West African Slavery*, 102.

range of skilled and unskilled occupations; masons and carpenters worked on private and public buildings and built and repaired the boats for traders; weavers made cloth for local consumption, and so on. Women were of course expected to reproduce in order to grow the ‘capital’ stock owned by (predominantly female) free entrepreneurs, a point to which we will return later in this chapter.¹⁶ But female slaves also worked as spinners, laundrywomen, millet-grinders and servants; and the quantitative evidence presented below suggests that they were as highly valued as male slaves.

Saint-Louis and Gorée were slave-based urban economies oriented around long-distance trade. In this they were far from unique in West Africa: not only the Atlantic ports but also the Sudanic towns served a similar role. There were, of course, crucial differences that went beyond the fact that the Atlantic ports were mostly European-ruled. For example, the Sahara-facing ‘port cities’ tended to be more integrated economically into their hinterlands, since they could not rely on imported foodstuffs as the Atlantic ports could. Saint-Louis and Gorée did import large quantities of grain and meat from the mainland: 9,125 tonnes of millet, 136 tonnes of vegetables, 54 tonnes of rice, and 309 tonnes of meat in 1837, along with 250 tonnes of fish caught by residents of the two towns. But the colony also imported around 280 tonnes of flour from France, as well as a considerable quantity of meat and sugar.¹⁷ The Sudanic trading towns depended on local grain supplies, though the Niger river and other waterways ensured that the effective hinterland for towns like Timbuktu was quite large. Output as well as consumption was different, too: a maritime orientation generated a large boatbuilding and boat repair

¹⁶ Ndèye Sokhna Guèye, “Splendeurs et misères des Signares : du rôle des femmes dans la traite transatlantique et l’esclavage à Gorée (XVIIe-XIXe siècles),” in *Pratiques d’esclavage et d’asservissement des femmes en Afrique : le cas du Sénégal et de la République démocratique du Congo*, ed. Ndèye Sokhna Guèye (Dakar: CODESRIA, 2002), 21–39.

¹⁷ *Notices statistiques*, 3:271.

sector in the coastal towns that had no real equivalent in the Saharan-oriented towns. The kinds of skills that slaves could develop in a maritime economy were highly specific, and valuable.¹⁸

THE DIVISION OF LABOUR IN WEST AFRICAN HISTORY

In order to understand the function of slavery in African cities prior to the twentieth century, it is useful to revisit the economic role of cities. Perhaps the most important element is the division of labour. One of the phenomena that usually distinguishes the village from the town or city is that in the latter there are invariably people who do not perform any agricultural work. The size and concentration of urban populations facilitates this division for reasons of both supply and demand: the size of cities provide for economies of scale in production¹⁹, and also a larger market for output, which makes full economic specialisation possible—either directly, from the purchasing power of urban consumers itself, or indirectly, via the networks of long-distance trade facilitated by the existence of trading towns. The cities of the West African savannah were sites of specialisation, a division sometimes reflected even in the urban structure itself. Jenné-Jeno, in what is now Mali, was composed of a number of ‘clusters’; the work of Roderick McIntosh and Susan Keech McIntosh (in conjunction with collaborators, both in

¹⁸ See particularly Kevin Dawson’s work on Atlantic slave pilots and divers. Kevin Dawson, “Enslaved Ship Pilots in the Age of Revolutions: Challenging Notions of Race and Slavery between the Boundaries of Land and Sea,” *Journal of Social History* 47, no. 1 (2013): 71–100; Kevin Dawson, “The Cultural Geography of Enslaved Ship Pilots,” in *The Black Urban Atlantic in the Age of the Slave Trade*, ed. Matt D. Childs And James Sidbury Jorge-Cañizares-Esguerra (University of Pennsylvania Press, 2013), 163–84; Kevin Dawson, “History Below the Waterline: Enslaved Salvage Divers Harvesting Seaports’ Hinter-Seas in the Early Modern Atlantic,” *International Review of Social History* 64, no. S27 (2019): 43–70.

¹⁹ Philip J. Shea, “Big Is Sometimes Best: The Sokoto Caliphate and Economic Advantages of Size in the Textile Industry,” *African Economic History*, no. 34 (2006): 5–21.

Mali and elsewhere) has suggested that these clusters were formed on the basis of occupational specialisation.²⁰ A similar process of geographical occupational segregation within cities obtained in the *gari* of Hausaland.²¹

For the McIntoshes, the most useful definition of a city—one to which Jenné-Jeno conformed—was Trigger’s notion of a large and heterogenous settlement that provided services and manufactures to a broader hinterland.²² But the agricultural abundance of the inner Niger Delta floodplain did not necessarily resemble conditions elsewhere in Africa. Indeed, the Middle Senegal River floodplain, also excavated by the McIntoshes, is organised quite differently: the *leydi* system, by which the floodplain has historically been divided up into relatively narrow strips of land leading from the river inland, encouraged a division of labour facilitated by familial connections between fishers, herders, farmers and artisans that did not result in the formation of a large town serving the broader valley hinterland but rather, in Schmitz’s evocative terminology, ‘village republics’.²³

Before the twentieth century the division of labour in the regions of West Africa between the forest belt and the Sahara operated mostly at the level of villages rather

²⁰ Both authors have been jointly and individually prolific: see for example Roderick J. McIntosh and Susan Keech McIntosh, “The Inland Niger Delta before the Empire of Mali: Evidence from Jenne-Jeno,” *Journal of African History* 22, no. 1 (1981): 1–22; Roderick J. McIntosh, “The Pulse Model: Genesis and Accommodation of Specialization in the Middle Niger,” *Journal of African History* 34, no. 2 (1993): 181–220.

²¹ Patrick Edewor, “Residential Segregation in Nigerian Cities,” in *Globalizing Cities: Inequality and Segregation in Developing Countries*, ed. Ranvinder S. Sandhu and Jasmeet Sandhu (New Delhi: Rawat Publications, 2011), 29–43.

²² Bruce G. Trigger, “Determinants of Urban Growth in Pre-Industrial Societies,” in *Man, Settlement and Urbanism*, ed. Peter Ucko, Ruth Tringham, and G. W. Dimbleby (London: Duckworth, 1972), 575–99.

²³ Susan Keech McIntosh, “A Tale of Two Floodplains: Comparative Perspectives on the Emergence of Complex Societies and Urbanism in the Middle Niger and Senegal Valleys,” in *Proceedings of the Second World Archaeological Congress Intercongress*, ed. P. Sinclair, (1999); Jean Schmitz, “Cités noires: les républiques villageoises du Fuuta Tooro (vallée du fleuve Sénégal),” *Cahier d’études africaines* 34, no. 133/135 (1994): 419–60.

than cities like Jenne-Jeno. One of the most distinctive features of social organisation in this region is the existence of endogamous occupational groups—often described by scholars as castes, though the term’s association with the more elaborate social hierarchies of South Asia have seen it fall out of fashion among Africanists (I use it here for want of another succinct term).²⁴ This phenomenon is extremely common north of the West African forest belt and quite rare below or in it (see Figure 3). Usually, though not always, those who belong to an artisan caste are considered impure in relation to farmers; thus, while artisans may farm, free farmers will never take up an artisanal craft like iron smelting. The existence of castes almost certainly preceded the existence of any unitary state in Senegambia.²⁵ In nearly all of the major societies of precolonial Senegal, free people were either agriculturalists or belonged to an endogamous occupational caste. A full comparative analysis would be too lengthy here; consider the Wolof caste system as an example. Individuals without a caste (*géer*) were socially separated from caste people (*ñeeño*). The latter were further subdivided into three subcastes: griots (*sab-lekk*), courtiers and jesters (*ñoole*) and artisans (*jëf-lekk*). The *jëf-lekk* were even further divided into individual groupings based on specific occupations: blacksmiths, jewellers, and in some cases weavers formed individual social groups.²⁶

²⁴ Tal Tamari, “The Development of Caste Systems in West Africa,” *Journal of African History* 32, no. 2 (1991): 221–50.

²⁵ Abdoulaye Bara Diop, *La société wolof: tradition et changement : les systèmes d’inégalité et de domination* (Paris: Karthala Editions, 1981), 36.

²⁶ Diop, *La société wolof*; Penda Mbow, “Démocratie, droits humains et castes au Sénégal,” *Journal de la Société des africanistes* 70, no. 1 (2000): 71–91; Maria A. Leichtman, “Islamic and Caste Knowledge Practices among Haalpulaar’en in Senegal: Between Mosque and Termite Mound,” *The Journal of the Royal Anthropological Institute* 13 (2007): 252+.

Existence of occupational castes by society

Source: Murdock Ethnographic Atlas

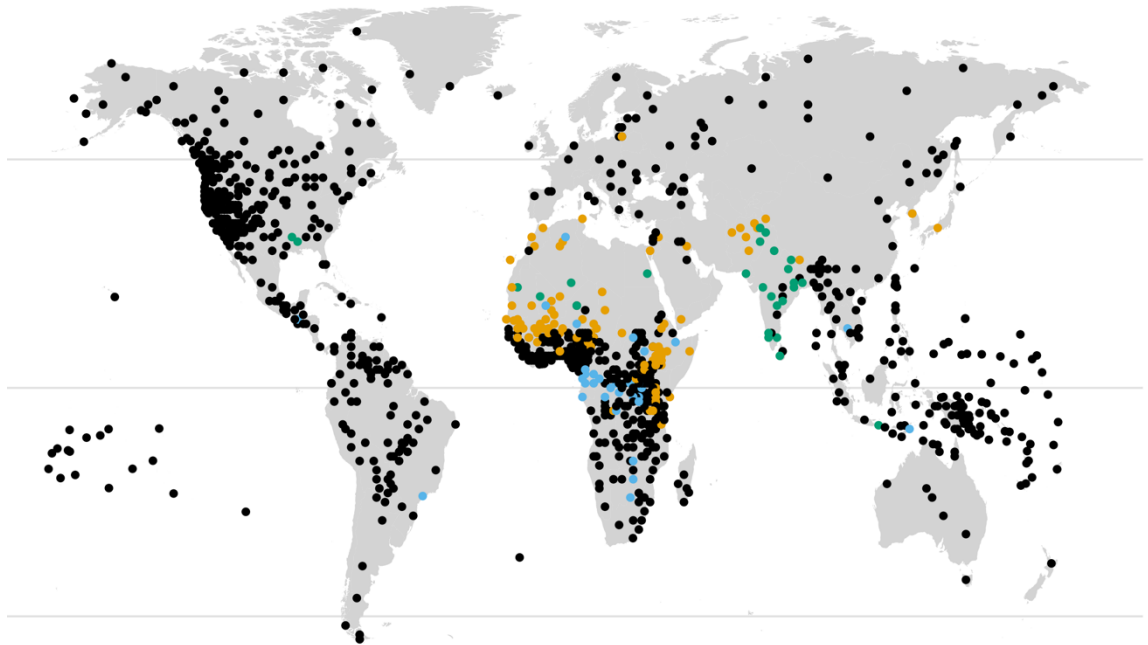


Figure 3: Occupational caste groups in ‘indigenous’ societies across the world.

Notes: Orange dots denote societies with caste stratification, with at least one despised occupational caste, green dots signify societies with complex caste stratification, and blue dots signify societies with ethnic stratification (i.e., the existence of a despised ethnic group, considered of foreign origin, that may or may not be associated with an occupation.) Black dots signify societies with no caste system or ethnic stratification.

A full economic functionalist explanation of Sudanic caste systems, if it is even attainable, lies well beyond the scope of this thesis. Nonetheless, several features of the system are worth exploring in some detail, since they illuminate how societies living close to subsistence levels managed one of the scarcest resources they had—skilled labour—in an ecological environment that generated pronounced labour market seasonality: that is to say, an abundance of labour at some parts of the year and an acute shortage at others. In his otherwise inconclusive study of the Ricardian nature of artisanal specialization in the Mandara highlands of Cameroon, Nicholas David mentions one possible reason for an institutionalised division of labour in

the tropics: labour bottlenecks during the wet season. “Because montagnards’ limited resources discourage them from obtaining equipment before it is needed”, David argues, the rainy season months are “also those in which there is the greatest call on smiths to forge new tools and repair old ones.”²⁷ In parts of West Africa with abundant forest resources, iron smelting could and did take place throughout the year, providing relatively ample opportunities for full-time employment. But in especially the northern parts of Senegambia, smelting disappeared relatively early as the forests were depleted.²⁸ The remaining demand was for smithing, and this was most needed during periods of cultivation. The demand for smiths’ labour thus had a sharp seasonal peak in the wet season—just as it did for agricultural labour. A description of this pattern of labour demand in Senegal can be found in the account of the French traveller François-Pierre Ricard:

As soon as the rains have made the ground wet enough for farming implements, the granaries are opened and the entire population is in the fields: village chief, marabouts, etc.; the hardworking from a sense of duty and the lazy from a sense of shame; *only the blacksmith remains in the village, but he still works in the fields in his own way: he repairs broken tools.*²⁹ [emphasis mine]

The economic problem this highlights can be appreciated in the light of what archaeologists call ‘bad year economics’: that is to say, the set of institutional and cultural norms that arise in a society in which production is in an average year just

²⁷ Nicholas David, “Ricardo in the Mandara Mountains: Iron, Comparative Advantage, and Specialization,” in *Metals in Mandara Mountains Society and Culture*, ed. Nicholas David (Trenton, NJ: Africa World Press, 2012), 165.

²⁸ Searing, *West African Slavery*, 5; Candice L. Goucher, “Iron Is Iron’til It Is Rust: Trade and Ecology in the Decline of West African Iron-Smelting,” *Journal of African History* 22, no. 2 (1981): 179–89. Doubts have been entered for West Africa more generally: see the recent discussion in Chris Evans and Göran Rydén, “Voyage Iron’: An Atlantic Slave Trade Currency, Its European Origins, and West African Impact,” *Past and Present* 239, no. 1 (2018): 41–70.

²⁹ François-Pierre Ricard, *Le Sénégal : étude intime* (Paris: Challamel aîné, 1865), 157.

enough to satisfy basic subsistence wants. In particular, the problem these societies must face is ensuring survival in *bad years*, when production falls short of subsistence requirements.³⁰ Here I advance a hypothesis that is not meant to explain the origins of caste in West Africa—an endeavour that others have pursued with only modest success and which lies well beyond the limited horizons of this thesis—but instead as a possibility to explain why the institution survived for so long in the savanna and Sahel. It is therefore not in conflict, for example, with theories that posit that the division of labour was the end result and not the origin of the existence of castes in West Africa.³¹ This institutional explanation does not fully account for every feature of the Sudanic caste systems, which in any case varied greatly from place to place and across time, but—given the universality of blacksmith castedness—it does offer an hypothesis that may help explain the economic aspect of an institution that accumulated many other features that were contributed nothing to this core economic logic.

Fundamentally, imposing a caste status on blacksmiths solves both a coordination problem and a credit market problem, both of which are particularly acute in bad years. The institution of caste imposes a certain degree of geographical labour immobility on the casted blacksmith, since it raises the cost of social integration anywhere he may choose to move. Additionally, it prevents the blacksmith from being recruited into the fields by a farmer during the rainy season, since his polluted status prevents him from working in the fields of others, even if he is technically allowed to cultivate his own crops.³² Since a single blacksmith would repair tools

³⁰ See particularly the editors' introduction in Paul Halstead and John O'Shea, eds., *Bad Year Economics: Cultural Responses to Risk and Uncertainty* (Cambridge, England: Cambridge University Press, 1989).

³¹ For example, Pascal Boyer, "Le status des forgerons et ses justifications symboliques : une hypothèse cognitive," *Africa* 53, no. 1 (1983): 44–63.

³² See the brief discussion of the interdependence of blacksmiths and farmers in Mande societies in David C. Conrad and Barbara E. Frank, "Introduction: Nyamakalaya: Contradiction and Ambiguity in Mande Society," in *Status and Identity in West Africa: Nyamakalaw of Mande*, ed. David C.

for many families, the institution that keeps him at the forge during the rainy months solves a collective action problem among *uncasted* farmers. No individual household can deprive the village of the blacksmith by bribing him into the fields, ensuring that even in bad seasons all families have access to a vital production input. At least in the case of the blacksmiths, caste is an institution that ensures that skilled labour is available when its value to farmers is greatest.

But the deal was not entirely one-sided. Membership of an occupational caste in West Africa is usually associated with sorcery: blacksmiths are as much feared as they are despised.³³ This kind of cultural association had the practical pay-off that blacksmiths could expect to be paid for their work once the harvest had been brought in, since cheating a member of a group with arcane knowledge of magic would be inadvisable. Caste in this particular instance therefore serves as the institutional substitute for an impersonal short-term credit market: since farmers cannot bribe the blacksmith to stay at his work during the rainy season with grain—they have not yet harvested the grain—they rely on the institution of caste to keep him at it, and since blacksmiths cannot enforce payment after the harvest (particularly in the case of a bad harvest, when farmers' temptation to stiff their creditors must be highest) they rely on their reputation as magic-wielders to procure payment.³⁴ This reputation was burnished by the accounts of powerful

Conrad and Barbara E. Frank (Indiana UP Bloomington, 1995), 1–23. In some societies, like the Hausa of Ader in what is now Niger, this interdependence gave birth to elaborate rituals to mark the exchange of tools for millet: Nicole Echard, “Note sur les forgerons de l’Ader (Pays Hausa, République du Niger),” *Journal de la Société des africanistes* 35, no. 2 (1965): 366–67.

³³ Patrick McNaughton, “The Semantics of Jugu: Blacksmiths, Lore and Who’s ‘Bad’ in Mande,” *Anthropological Linguistics* 30, no. 2 (1988): 150–65; Dona Richards, “The Nyama of the Blacksmith: The Metaphysical Significance of Metallurgy in Africa,” *Journal of Black Studies* 12, no. 2 (1981): 218–38.

³⁴ In Tuareg societies of the Sahara the magical powers of smiths are said to be activated involuntarily whenever there is a violation of the gift-exchange relationship with ‘noble’ families who are supposed to provide grain for attached smith families: see Susan J. Rasmussen, “Between Ritual, Theater, and Play: Blacksmith Praise at Tuareg Marriage,” *The Journal of American Folklore* 110, no. 435 (1997): 5.

blacksmiths in the great narratives of the Western Sudan, like the Epic of Sunjata, in which, in some retellings, blacksmiths furnish the iron rod that allows Sunjata to walk after a childhood spent lame, and supply the adult Sunjata with weapons that make him invincible; Sunjata triumphed over his greatest adversary, the Susu blacksmith-king Soumaoro Kanté, only when he had obtained the support of defecting smiths like the famous Fakoli.³⁵

The exact mechanisms that institutionalised the division of labour varied across societies and over time. For example, among the Yalunka of eastern Senegal, special fields were set aside to provide for the consumption of blacksmiths and cultivated by teenage boys as a form of collective work,³⁶ while in Kajoor, Mamadou Diouf argues that the relationship was more akin to a gift-exchange relationship in which the *ñeeño* gained more than the *géer*.³⁷ Regardless, the metaphysical equilibrium that existed between farmer and blacksmith in the Western Sudan was compatible with, and indeed supported, an economic equilibrium. The attraction of a supernatural credit enforcement system is particularly acute in land-abundant contexts, where land has no intrinsic economic value and therefore cannot be pledged as security for a loan, and where evasion of creditors is relatively simple.³⁸ This equilibrium was an imperfect one. If the castedness of blacksmiths was a necessary evil to manage labour supply in a highly seasonal ecological context, there

³⁵ George E. Brooks, *Landlords And Strangers: Ecology, Society, And Trade In Western Africa, 1000-1630* (Avalon Publishing, 1993), 100. In general see Patrick McNaughton, "The Smiths in Sunjata: What Epics and Oral Traditions Suggest about West African History," *Mande Studies* 13 (2011): 1–19; Patrick McNaughton, *The Mande Blacksmiths: Knowledge, Power, and Art in West Africa* (Indiana University Press, 1993).

³⁶ Danielle Fouchier, "Le déclin social du forgeron diallonké au Sénégal oriental," *Journal de la Société des africanistes* 53, no. 1 (1983): 190.

³⁷ Mamadou Diouf, *Le Kajoor au XIXe siècle* (Paris: Karthala Editions, 1990), 29. This argument is also made in Diop, *La société wolof*, 82–89.

³⁸ Compare with Weber's famous description of the role of Puritan sects in lubricating credit markets on the frontier in the United States of America: Max Weber, "'Churches' and 'Sects' in North America: An Ecclesiastical Socio-Political Sketch," trans. Colin Loader, *Sociological Theory* 3, no. 1 (1985): 7.

seems to be little justification for imposing caste on other occupations that are less time-sensitive, like weaving (which was not universally casted). Moreover, without outside sources of skilled labour, the system was inflexible: imposing barriers to occupational entry may have resulted in monopoly profits for casted blacksmiths, but it placed a barrier in the way of any change in occupational structure, temporary or permanent.

SKILLED SLAVERY IN RURAL AND URBAN WEST AFRICA

There was, however, an institutional solution to the latter problem: slavery. It is no longer thought that Western Sudanic occupational castes themselves were the product of a history of enslavement or coerced servility, as the forged nineteenth-century additions to the seventeenth-century *Tarīkh al-Fattāsh* had implied.³⁹ But it was certainly possible to use slaves as substitutes for casted artisans. Stripped of personal choice, an enslaved worker could be directed to whatever work his or her master felt was most pressing, even if they did not belong to the relevant caste group. Slaves of Halpulaar masters in Fuuta were, according to Yaya Wane, “farmers, woodcutters, stable-boys, bodyguards, masons, carpenters, servants, etc.”⁴⁰ In order to dispense with the need to contract with casted folk, a Fulbe slaveowner could place some of his slaves with free but casted blacksmiths in order

³⁹ As Letzcion pointed out, and has been elaborated by other authors, the additions to the manuscript were almost certainly made in order to justify the dominion of Seku Ahmadu, the founder of the *jihadi* Macina Empire, over all of the people in his territory, including the ‘zanj’ servile castes. Nehemia Levtzion, “A Seventeenth-Century Chronicle by Ibn al-Mukhtār: A Critical Study of *Tārīkh al-Fattāsh*,” *Bulletin of the School of Oriental and African Studies* 34, no. 3 (1971): 571–93; Mauro Nobili and Mohamed Shahid Mathee, “Towards a New Study of the So-Called *Tārīkh al-Fattāsh*,” *History in Africa* 42 (2015): 37–73.

⁴⁰ Yaya Wane, *Les Toucouleurs du Fouta Toro (Sénégal): stratification sociale et structure familiale* (Dakar: I.F.A.N., 1966), 69.

to learn the trade.⁴¹ In general, however, caste was almost certainly more efficient than slavery as a solution to the problem of skill scarcity in rural West Africa, for two reasons. Firstly, the labour of free caste workers could not be monopolised by slaveowners in periods of acute labour scarcity, as would be possible with a skilled slave. Secondly, within the caste system there were a variety of ‘carrots’ that could induce effort in skilled labour: blacksmiths, for example, could accumulate wealth independently of a master.

Skilled occupations, like blacksmithing, require specialised abilities acquired through training and, often, by repetition. Grain agriculture, obviously, involves skills in the sense that specialised knowledge of local conditions and agricultural techniques that are not innate in humans but are usually widespread within a given society.⁴² In what follows, therefore, ‘skill’ is taken to mean specialist knowledge, used in production, that is not generally held across a population.⁴³ The accumulation and use of technical skills is difficult to impose upon slaves without incurring large supervision costs. For this reason, skilled or ‘industrial’ slavery has often look very different to agricultural slavery. Fenoaltea hypothesised that slaveowners, having sticks and carrots at their disposal, would vary the relative use of each depending on the nature of the work to which they put their slaves. Work that required more effort than care could be encouraged by the stick: punishing

⁴¹ Oumar Kane, *La première hégémonie peule* (Paris: Editions Karthala, 2004), 308.

⁴² Ignorance of local conditions and techniques can, for example, explain the failure of European attempts at cocoa farming in the colonial Gold Coast: see Gareth Austin, “Mode of Production or Mode of Cultivation: Explaining the Failure of European Cocoa Planters in Competition with African Farmers in Colonial Ghana,” in *Cocoa Pioneer Fronts since 1800: The Role of Smallholders, Planters and Merchants*, ed. William Gervase Clarence-Smith (London: Palgrave Macmillan UK, 1996), 154–75.

⁴³ ‘Skill’ and the related concept of ‘human capital’ is a notoriously tricky concept to pin down : for an older but still useful discussion, see Paul Attewell, “What Is Skill?,” *Work and Occupations* 17, no. 4 (1990): 422–48. A useful concept of a skilled occupation that would be operational with data on individual labour productivity might be an occupation in which the labour productivity of workers with a certain amount of relevant education or experience is considerably higher than the productivity of workers with little or no relevant education or experience.

slaves to increase meant sacrificing quality of work for quantity. But work that required care, such as masonry or weaving or boatbuilding, required carrots, rather than sticks.⁴⁴ For this reason, urban slavery has generally been considered a less inhumane institution than plantation slavery; enslaved workers in cities have been thought to possess more agency.⁴⁵ Dari-Mattiacci has refined Fenoaltea's model using a game theoretic approach.⁴⁶ In his model, manumission is a tool which slaveholders can use to mitigate the impact of asymmetric information: that is to say, a situation in which a principal (the slaveholder) cannot perfectly observe something which an agent (an enslaved worker) can. An example might be a trading voyage from Gorée to the Senegalese coast further south to buy millet, overseen by an enslaved boat captain. If the voyage is a failure, the captain—but not the slaveowner—will know if this is due to some act of incompetence or laziness on the part of the captain or simply because the harvest was bad and therefore the price of millet was prohibitively high. If punishments are used rather than incentives, then 'innocent' slaves will sometimes be punished, and this can be costly to a slaveowner, because punishments like whipping and beating may further lower an enslaved worker's productivity. An incentive like manumission that is awarded only after the successful completing of a task (or, much more likely, many years of tasks) provides on the other hand a good reason for a slave not to exploit his or her asymmetric information.

The question of manumission is related to another question about labour relations in nineteenth-century urban Africa: why did free wage labour coexist with slave labour? For Dari-Mattiacci, the answer is simple: slavery allowed employers to

⁴⁴ Stefano Fenoaltea, "Slavery and Supervision in Comparative Perspective: A Model," *The Journal of Economic History* 44, no. 3 (1984): 635–68.

⁴⁵ Karwan Fatah-Black, "Introduction: Urban Slavery in the Age of Abolition," *International Review of Social History* 65, no. S28 (2020): 2.

⁴⁶ Giuseppe Dari-Mattiacci, "Slavery and Information," *The Journal of Economic History*, 2013, 79–116.

monopolise the use of a slave's skills, which were costly to acquire. Before abolition, slave apprenticeship was the main method for training skilled artisans in Saint-Louis and Gorée. A number of enslaved artisans were described as *apprentis*, and the prices they were sold for were somewhat lower than those paid for fully-fledged artisans of the same age and occupation. But an element of coercion appears to have endured even after 1848. Enslaved children were purchased on the mainland and 'freed' once in Gorée and Saint-Louis; they were then usually then placed with an artisan or merchant of good standing to meet a shortfall of skilled labour. The similarities with the old system of *engagement à temps*, usually seen as simply a fig leaf for the continuation of urban slavery, are obvious. The *Moniteur du Sénégal* frequently gives information about orphans and the men to whom they were entrusted. For example, in 1861, a boy called Oumar Hamadou, from Bundu, was given to a tailor called Moreau for four years; Moreau would 'feed him, take care of him in case of illness, and teach him his craft. After four years, the apprentice will be free without restrictions or reservations, and neither he nor his family will pay anything'.⁴⁷ The period of apprenticeship could be quite long. Usually, where the age of the orphan is indicated, the term of apprenticeship lasted until the orphan reached the age of 18; however, an eight-year old boy named Salif Bothié ('known also as Racine Kane') was apprenticed to a fitter named Lesse until the age of twenty-one.⁴⁸

We know very little about the apprenticeship system in Saint-Louis and Gorée, though we can assume that a slaveowner could instruct an adult skilled slave to train younger slaves in their craft. The specificity of manual skills in the two colonial towns precluded the possibility of obtaining skilled labour from the interior, though

⁴⁷ 'État des orphelins placés en apprentissage', *Feuille officielle du Sénégal et dépendances*, Tuesday 2 July 1861, vol 2 no 79, 185.

⁴⁸ Ibid.

of course unskilled slaves could be purchased and trained. Indeed, the possibility of using Saint-Louis as a ‘school’ in which slaves might gain valuable skills seems to have occurred to at least some of the Senegalese mainland elite, as we can see from a judicial proceeding in 1846. The affair concerned the legal status of a slave originally from Galam called Sidy, who had come to Saint-Louis at the age of about ten, and who had trained as a mason. Sidy took legal action against his ‘owner’, a *signare* called Coumba Samba, claiming that his arrival in Saint-Louis came after the abolition of slavery in 1823. Since Coumba Samba had not declared him as an *engagé à temps*, he was therefore legally under no obligation to remain with her. His supposed owner responded that Sidy was never her property, and in fact belonged to Samba Yacine, the ruler of Galam and her father, who had sent Sidy to Saint-Louis to acquire the skills of masonry.⁴⁹ Masonry was presumably a talent with some applications on the mainland, but it is much more likely that Samba Yacine intended Sidy to earn his keep in Saint-Louis.

I base my discussion on a set of manumission acts contained in the archives of the Justice of the Peace for Gorée and Saint-Louis, in the Archives nationales d’outre mer in Aix-en-Provence. This archival source is rich, but has been underused. Trevor Getz’s discussion of manumission was limited to the original documents in the Archives nationales du Sénégal, which appear much more limited in number than those in Aix.⁵⁰ Mbaye Guèye used the Aix records, but only sparingly.⁵¹ I have digitised and coded all available manumission acts between 1831 and 1838 for Saint-Louis and between 1832 and 1847 for Gorée. As Guèye argued, statistics are

⁴⁹ Case described in the 1846 registers of the état civil of Saint-Louis, FR ANOM 1 DPPC 4888.

⁵⁰ See Chapter 4 in Getz, *Slavery and Reform in West Africa*, 69–84. The Aix records are in fact the legally-required duplicates of those originally kept in Senegal; however, my assessment of the notarial archives in Dakar suggests that the French have preserved more of the manumission acts.

⁵¹ M’baye Guèye, “From Definitive Manumissions to the Emancipation of 1848,” in *The Abolitions of Slavery From Léger Félicité Sonthonax to Victor Schoelcher, 1793, 1794, 1848*, ed. Marcel Dorigny (New York: Bergbahn Books, 1995), 318–30.

likely to understate the number of manumissions that took place, since registration with the French notary was not always carried out. But this sample of records—169 manumissions for Saint-Louis, and 181 for Gorée—gives a reasonably strong quantitative basis upon which to construct some theories, albeit tentative, about the nature of urban manumission in Senegal and in West and West Central Africa more broadly.

The population figures given in the 1837 compendium *Notices statistiques sur les colonies françaises* suggest that, if the manumission records kept in Aix-en-Provence are complete, between 0.6% and 1% of the slave population in insular Senegal were manumitted in 1837. This compares to around 0.09% in Baltimore from 1790-1830,⁵² while slightly higher figures than for Senegal have been suggested for in parts of urban Latin America.⁵³ The year for which we have census estimates of population may bias our estimates upwards: 1837 had the highest number of manumissions for Gorée and the second-highest for Saint-Louis in our dataset. But the bias could be in the other direction if Guèye was right and manumission was sometimes not formalised with notaries—an intuition given further credibility by some of the manumission deeds in the dataset, which state that legal manumission was only confirming *de jure* a state of affairs that had existed *de facto* for some time.

Manumission was thus a major ‘carrot’ in the Senegalese urban slave system, particularly for slaves who were hired out regularly, and who generally kept half of their pay as a reward. Both the institution of half pay and manumission served as an incentive for skilled workers to exert effort and gain a reputation as hard and competent workers, while still allowing for a considerable rate of expropriation for

⁵² Stephen Whitman, “Diverse Good Causes: Manumission and the Transformation of Urban Slavery,” *Social Science History* 19, no. 3 (1995): 391.

⁵³ Lyman L. Johnson, “Manumission in Colonial Buenos Aires, 1776-1810,” *The Hispanic American Historical Review* 59, no. 2 (1979): 258–79.

the master, and lowering supervision costs. If a slaveowner earned a reputation as someone who liberally granted manumission, entrepreneurs looking to hire labour would tend to assume that the owners' slaves were facing a set of incentives likely to result in hard work. Conversely, few 'sticks' were employed: in only one of the manumission records was ill-treatment of a slave mentioned.

TABLE 2: Descriptive statistics of manumitted slaves in Gorée & Saint-Louis

	Saint Louis	Gorée
Type of manumission		
All manumissions	169	181
Freedom paid for by someone else	40	61
(of which by a family member)	21	35
Self-purchased	22	73
Non-pecuniary manumission	107	48
Unclear by whom freed	8	8
Median age at time of manumission		
All manumissions	24	30
Freedom paid for by someone else	25	25
(of which family member)		
Self-purchased	36	35
Non-pecuniary manumission	20	23
Proportion male		
All manumissions	46%	46%
Freedom paid for by someone else	45%	42%
(of which family member)	29%	31%
Self-purchased	68%	63%
Non-pecuniary manumission	33%	25%

Source: Author dataset elaborated from all manumission records in AOM 6 DPPC 2669.

Manumission could take several forms. Self-financed manumission was reasonably common, considering the large sums required. In addition, free black men and women were able to work to purchase their family members (or indeed non-related slaves) from slaveowners. Often fathers and husbands paid to free their children and wives. For example, in 1838, Urbain Borel freed a slave named Mariame and two of her small children for six hundred francs. Mariame's liberty was purchased by the father of the children, a free African trader called Mamady.⁵⁴ But it was not invariably men who purchased the freedom of children: for example, in July 1936, Dorine Galo, a free African woman, paid 750 francs to the *signare* Caty Valantin in order to free her fifteen year-old son.⁵⁵ A particularly poignant case is that of the young enslaved boy Fara, who was freed in 1835 when his parents, a carpenter by the name of Tioye Mbaye and a woman named Anna Gakou, paid five hundred francs to Fara's master, Edouard Chara. Both Tioye Mbaye and Anna Gakou were themselves still enslaved at the time they purchased their son's freedom.⁵⁶ Sometimes an employer could be a benefactor. Manel Faye was born somewhere in the kingdom of Kajoor but had from his childhood lived as a slave in Gorée in the household of Marguerite Hamilton and her husband Jean Dupuy. Faye was captain of the schooner *Alexandre*, owned by the famous trading firm Maurel et Prom. In June 1836, Faye was freed after Maurel and Prom paid 1000 francs to Hamilton on

⁵⁴ Double minute, 'Dépôt d'acte de liberation definitive de la nommée Mariame & de ses deux enfans par le Sieur Urbain Borel', 31 October 1838, no.14. AOM 6 DPPC 2669

⁵⁵ Double minute, 'Affranchissement définitif du nommé Vilcot Dimisse par Madame Caty Valantin', no. 55. AOM 6 DPPC 2669

⁵⁶ Double minute, 'Affranchissement définitif du nommé Fara, par le sieur E. Chara'. 18 December 1835, AOM 6 DPPC 2669. Trevor Getz discusses this case more briefly from marginalia in the Senegalese archives in Getz, *Slavery and Reform*, 72.

his behalf, though it is unclear whether Faye had to repay them.⁵⁷ Several months later Maurel et Prom also paid 600 francs to Yandé Sène, who owned Faye's enslaved wife Oury Dembé, to free her. The deed explicitly states that Faye was to repay the debt. Thus the slave manumission system provided work incentives not only to slaves but to free African workers as well.

But a considerable number of slaves were also freed *gratis*. In some cases this may have been a demonstration of Islamic (or Christian) piety. But the line between slavery and freedom was blurred. In the Islamic tradition, the emancipation of a slave was an act of generosity that generated expectations of behaviour: specifically, ex-slaves were supposed to demonstrate loyalty and deference to their former owners.⁵⁸ The transformation of a slave-master relationship into a client-patron relationship meant that former slaves could not necessarily expect to pass on property to their children: masters could lay claim to it.⁵⁹ In insular Senegal, this expectation was explicitly stated in the notarial documents themselves as a condition of emancipation. The *signare* Magdeleine Thévenot, for example, freed two slaves *gratis* in 1836—Fassale Madiope, a 42 year old woman, and Marie Koudia N'Diaye, a 45 year old woman—but only on the condition that if either of them died before Thévenot, their former mistress would inherit their property.⁶⁰ Though we have very little textual evidence on the social relations between manumitted skilled slaves and their former owners, it seems very likely that patron-client

⁵⁷ 'Affranchissement définitif du nommé Manel Faye par la nommée Marguerite Hamilton, AOM 6 DPPC 2669

⁵⁸ Paul G. Forand, "The Relation of the Slave and the Client to the Master or Patron in Medieval Islam," *International Journal of Middle East Studies* 2, no. 1 (1971): 59–66; Monique Bernards and John Abdallah Nawas, *Patronage And Patronage in Early And Classical Islam* (BRILL, 2005).

⁵⁹ McMahon argues that on the Swahili coast this practice continued into the 1920s: Elisabeth McMahon, *Slavery and Emancipation in Islamic East Africa: From Honor to Respectability* (Cambridge University Press, 2013), 138.

⁶⁰ 13 October 1836, 'Affranchissement définitif des nommées Fassale Madiope & Marie Koudia Ndiaye par Mme Magdeleine Thévenot', no. 96, AOM 6 DPPC 2669.

relationships were maintained, such that slaveowners could still exercise some kind of control over the labour of the workers that had trained.

There was another major carrot, in Dari-Mattiaci's sense, that facilitated a market in skilled labour: the slave hire market, and its custom of slaveowners leaving their slaves half of the wages earned while hired out. Given the structure of wages, this was an incentive that was far more relevant to skilled slaves than to unskilled ones. The skill premium for wages—measuring the difference between skilled and unskilled labour—was very high in Senegal, and particularly in Saint-Louis (see Table 3). Carpenters, for example, earned over seven times as much for a day's work than unskilled labourers. Compare this to another French colony at the same time, Martinique, where the premium was less than half the Saint-Louisian premium. This difference almost certainly reflected supply constraints: unlike Martinique, there were few French settlers in Senegal and none were craftsmen. A comparison of the skill premiums prevailing in Gorée to those of Saint Louis suggests that skilled labour was less well remunerated in the former town. Given the ease of movement between the two towns, this gap is likely to reflect comparatively lower demand for skilled labour in Gorée rather than comparatively restricted supply in Saint-Louis.

TABLE 3: Occupational skill premium for wages in Senegal and Martinique

	Nominal wage, daily			Skill premium (ratio skilled/unskilled)		
	Martinique (1837)	Saint Louis (1837)	Gorée (1845)	Martinique (1837)	Saint Louis (1837)	Gorée (1845)
Caulker	5.3	4.0	—	2.94	6.67	—
Carpenter	6.1	4.4	2.8	3.38	7.33	2.8
Blacksmith	—	3.5	—	—	5.83	—
Master mason	6.1	-	3.55	3.38	—	3.55

Mason	3.3	3.7	2.4	1.83	6.17	2.4
Fitter	3.3	3.7	2.4	1.83	6.17	2.4
Weaver	—	1.7	2.7	—	3.05	2.7
Goldsmith	—	5.5	—	—	8.17	—
Sailor	—	1.4	—	—	2.33	—
Labourer	1.8	0.6	1	—	—	—

Source: 'Notices statistiques'

As Everill has argued, slaves themselves were responsible for a large part of total consumption in the insular economies. Presumably the wage incentive allowed many skilled slaves to accumulate material possessions. Many of the testimonies of free métis or European traders in the 1845 commission of inquiry accused slaves of having developed a taste for luxury and dissipating their earnings rather than saving: 'unfortunately, the taste for luxury has progressed among slaves and their needs grow day by day. As for the pleasures of life, being naturally lazy and pleasure-seeking (*sensuel*) like all those who live in hot countries, the slaves have a pronounced inclination for them.'⁶¹ However manumission was for those who could afford it probably a more attractive option: as the merchant Chaize testified to the Commission of Inquiry, 'some slaves have bought land and built homes in brick and straw, but these have been rare cases because some masters have let their slaves buy their own slaves, build houses and then once the slaves are settled in, [the masters] briskly come and reclaim everything their slaves possess'; for this reason, Chaize estimated that 'what slaves put aside is mostly to purchase their own freedom'.⁶² Thanks to their greater earning power in the labour market (hired slaves kept half of their pay, giving half to their owner), enslaved men were much more likely than women to purchase their own freedom, while women were more likely

⁶¹ Testimony of Joseph Crespin, merchant, to Commission of Inquiry into Emancipation, 1845. FR ANOM SEN XIV/13.

⁶² Testimony of M Chaize, merchant, to Commission of Inquiry into Emancipation, 1845. FR ANOM SEN XIV/13.

to be manumitted for free, or to have their freedom purchased by a family member. Overall there were more freed female slaves than male slaves; though because the enslaved population's sex ratio skewed nearly 3:2 in favour of women and girls, in fact any given enslaved woman or girl was about 20% less likely to be freed than a given enslaved man or boy.

This, of course, raises a broader point: about the role of women in the urban slave system in Senegal. The economic role of female slaves in Gorée and Saint-Louis is less well understood than the role of female slaveowners, about whom a great deal has been written. Everill argues that the preference for female slaves in the two towns was largely due to their value as *producers* of goods and services, as Meillassoux argues was the case for female slaves in rural Africa.⁶³ But as Martin Klein has argued recently, drawing on a tradition of scholarship on slave concubinage,⁶⁴ Western Sudanic slave systems tended to prize female slaves as potential sex partners as much or perhaps even more so than for their potential to produce goods and services.⁶⁵ Though Klein does not discuss coastal urban centres like Saint-Louis and Gorée, the records of the 'liberation' of enslaved women lend weight to historians who have suggested widespread slave concubinage and sexual coercion in insular Senegal.⁶⁶

⁶³ Everill, "Industriousness and Slavery"; Claude Meillassoux, "Female Slavery," in *Women and Slavery in Africa*, ed. Martin A. Klein and Claire Robertson (Madison: University of Wisconsin Press, 1983), 49–66.

⁶⁴ See especially Paul E. Lovejoy, "Concubinage in the Sokoto Caliphate (1804–1903)," *Slavery & Abolition* 11, no. 2 (1990): 159–89.

⁶⁵ Martin A. Klein, "Sexuality and Slavery in the Western Sudan," in *Sex, Power and Slavery*, ed. Gwynn Campbell and Elizabeth Elbourne (Athens, Ohio: Ohio University Press, 2014), 61–83.

⁶⁶ Ndèye Sokhna Guèye, "Splendeurs et misères des Signares : du rôle des femmes dans la traite transatlantique et l'esclavage à Gorée (XVIIe-XIXe siècles)," in *Pratiques d'esclavage et d'asservissement des femmes en Afrique : les cas du Sénégal et de la République démocratique du Congo*, ed. Ndèye Sokhna Guèye (Dakar: CODESRIA, 2002), 22–39; Jessica Marie Johnson, *Wicked Flesh: Black Women, Intimacy and Freedom in the Atlantic World* (University of Pennsylvania Press, 2020).

It is difficult to be definitive in any one case, given the inherent ambiguity of the sources, which are drafted in the language of French civil law and not Islamic law that recognised and regulated the practice of concubinage.⁶⁷ But the context usually gives strong clues. On 3 November 1838, for example, Nicolas D’Erneville freed one of his slaves, a young Bambara woman called Fatouma Demba. For this he was paid 345 francs by a Maure, Mohammed Amar. His visit to Saint Louis came just a few years after the end of the Franco-Trârza war of 1834-6. Amar was described as ‘minister of the king of the Trârzas’: that is to say, he was of Mauritanian origin, and he was capable of signing his name in Arabic script on the *état civil*. Why would he have purchased the freedom of Fatouma? No reason is given in the emancipation document itself, but given Fatouma’s age (only 18), the financing party’s position as a major dignitary in the Trârza emirate, and the rather modest sum, it seems likely that she was effectively purchased as a concubine, rather than freed.

In other cases, the context of the emancipation strongly implies concubinage. Consider the case of the slave Coumbel, freed in 1831. Her master, a free African trader called Samba Laobé, had been returning from the up-river post of Bakel by boat and fallen mortally ill. Laobé asked to see the lieutenant in charge of the boat, as well as the river captain and quartermaster, in order to dictate his last wishes. One of these was to free Coumbel, ‘in recompense for the good care she took of me during my long sickness’. Laobé’s generosity went further: he gave her ‘everything that I possess as well as anything I might be owed’.⁶⁸ While it is possible, of course, that Laobé was simply displaying Islamic virtue on his deathbed, freeing a slave who had been faithful to him—or indeed that he was simply just an unusually generous master with no other kin—it is more likely that Coumbel was his concubine. In the

⁶⁷ Double minute, ‘Affranchissement définitif de la nommée Fatouma Demba par M. Nicolas D’Erneville’, 3 Novembre 1838, no 28. AOM 6 DPPC 2669

⁶⁸ Double minute, “Affranchissement définitif de la nommée Coumbel, captive du nommé Samba Laobé”. AOM 6 DPPC 2669

Maliki school of Islamic jurisprudence, which prevailed in the Western Sudan, concubines who have had children by their master become free upon the latter's death, and Laobé's wishes would have given effect to this religious requirement.⁶⁹ Moreover, the children of slave concubines inherit their father's freedom, and the inheritance that Laobé bestowed on Coumbel may well have been to provide for any children by her (though no mention of children is made). Consider again the case of Anne Baylene, an enslaved 16-year old girl freed by her master, a certain M. Déon, in January 1936. Déon had purchased Baylene from Marie Diouf and François Newton for 500 francs in January 1835. Why did he purchase Baylene only to free her a year later? The manumission document offers a clue: it states that the only condition of Baylene's freedom, otherwise granted to her *gratis*, was that she look after her daughter Émilie 'as a mother would': Émilie must have been conceived shortly after Déon had purchased her mother, and it is quite likely that she was the product of a coerced sexual relationship between Déon, or someone in his household, and Anne Beylene.

A MODEL OF URBAN SLAVERY IN WEST AFRICA

The above discussion helps trace the outlines of a model of urban slavery in Senegal. Slavery is usually thought of as a response to scarcity of labour. I suggested that the system of caste was one institutional response to the challenges of recruiting and making available skilled craftspeople in conditions of acute pressure on labour supplies during part of the year. The urban labour market had a similar problem,

⁶⁹ Lovejoy, "Concubinage," 170–71; Matthew S. Gordon and Kathryn A. Hain, eds., *Concubines and Courtesans: Women and Slavery in Islamic History* (Oxford: Oxford University Press, 2017); Elke E. Stockreiter, "British Perceptions of Concubinage and the Patriarchal Arab Household: The Reluctant Abolition of Slavery in Zanzibar, 1890s–1900s," *Slavery & Abolition* 36, no. 4 (2015): 721–37.

particularly in Saint Louis, where the most lucrative part of the year for a worker was the trading trip on the Senegal River. Several of the merchants interviewed during the Commission of Inquiry believed that if slavery was abolished much of the urban skilled labour supply would vanish: Chaize, for example, believed that “those Africans who have no skilled occupation will generally prefer to be *laptots*, and there will even be those who leave a skilled occupation in which they have been employed in order to become *laptots*, too”.⁷⁰ Slavery, as elsewhere in the world, effectively served to lower skilled wages in the face of scarcity. The system of manumission mitigated against information asymmetry for unskilled slaves, and, by allowing the redemption by purchase of other slaves, gave an incentive particularly to manumitted skilled slaves to continue to work hard after their own freedom had been obtained. We would expect, therefore, prices of skilled slaves to be high. Moreover we would expect the *manumission price premium*—that is to say, the ratio of the price of a given slave being manumitted and the market price of that slave—to be higher for skilled slaves. In rural West Africa, women often did much of the work; the situation was probably more even in urban Senegal. Enslaved women were by no means idle: they spun cotton, cooked meals and cleaned, among other things. But any price premium over male slaves was probably due more to their reproductive potential and their potential role as sex partners for slaveowners. For this reason, we would probably expect a steeper relationship between age and price for female slaves than for male slaves.

In Table 2 I carry out a series of regressions to examine the structure of slave prices in Senegal in the 1830s and 1840s, in order to test these three hypotheses (a high skill premium, a high manumission premium, and a steeper age-price profile for female slaves). The first two regressions use a dummy variable to account for a slave

⁷⁰ Testimony of M. Chaize to the Commission of Inquiry, AOM SEN XIV/13.

holding a skilled occupation like blacksmithing or carpentry; in the other four regressions, I use individual dummy variables for each occupational category. Regressions 2 and 4 also add year dummies to control for temporal variation in the overall slave price level. Finally, regressions 5 and 6 are restricted samples: regression 5 is restricted to only manumission acts, and regression 6 to all of the other acts. I use the latter two regressions to derive estimates of the ‘sales-equivalent’ price of manumitted slaves, allowing me to calculate individual-level manumission premiums.

The negative quadratic relationship between price and age, plotted in Figure 4 from regression 2, is more or less a universal feature of slave price series. By adding interaction terms for sex, I estimate age-price correlations separately for men and women, which can then be plotted as predicted values to form age-price profiles in Figure 4. As expected, the price peak for enslaved women was higher and was reached earlier in life than for enslaved men. This suggests that at least in urban Senegal, enslaved women’s value was tied as much to reproduction as to production.⁷¹ Between the ages of 15 and 26, enslaved women were around 20% more expensive than men; however, after this the gap began to close, and by the age of 40 men were slightly more expensive than women of the same age. If a female slave reached the age of 60, her market price would be nearly half that of an enslaved man of 60.

Skilled slaves were on average 37% more expensive than their unskilled counterparts. Apprentices to skilled artisans, on the other hand, were priced around the same as unskilled workers of a similar age. The skill premium implied by the

⁷¹ Compare with Paul E. Lovejoy and David Richardson, “Competing Markets for Male and Female Slaves: Prices in the Interior of West Africa, 1780-1850,” *The International Journal of African Historical Studies* 28, no. 2 (1995): 261–93; David C. Tambo, “The Sokoto Caliphate Slave Trade in the Nineteenth Century,” *The International Journal of African Historical Studies* 9, no. 2 (1976): 187.

regression results falls somewhere from the middle to the high end of the range of estimates in the literature on slave prices, summarised in Table 4. The Senegalese price premium on skilled slaves is comparable to the high end of Kotlikoff's estimates for skilled slaves in New Orleans in the first half of the nineteenth century, and lies somewhat above the estimates for La Plata, Santiago de Chile and Mauritius. Without a laborious investigation of the occupational data underlying these estimates it is difficult to form a strong opinion on the possible reasons for this variation; the definition of 'skilled' labour itself is by no means settled, and even then there are many possible explanations for difference in price premiums. Among skilled slaves, the highest prices were paid for the enslaved *traitants* who led trading voyages on the Senegal River; the predicted price for a 25-year-old *traitant* (1079 francs) was more than twice that of an unskilled slave (388 francs). Blacksmiths, who as we have seen held a despised and feared caste occupation, were also more than twice as expensive (836 francs) as unskilled slaves. Carpenters (647 francs), caulkers (656 francs) and joiners (598 francs) were also comparatively expensive.

TABLE 4: Skill premiums for enslaved workers, various authors⁷²

	Period	Premium	Source
La Plata, all	1767-1794	27.8%	Newland and San Segundo
New Orleans	1804-1862	23.6%-48.8%	Kotlikoff
Mauritius	1825-1827	14%-17%	Chenny, St-Amour and Vencatachellum

⁷² Carlos Newland and María Jesús San Segundo, "Human Capital and Other Determinants of the Price Life Cycle of a Slave: Peru and La Plata in the Eighteenth Century," *The Journal of Economic History* 56, no. 3 (1996): 694–701; Laurence J. Kotlikoff, "The Structure of Slave Prices in New Orleans, 1804 to 1862," *Economic Inquiry* 17, no. 4 (1979): 496–518; Shirley Chenny, Pascal St-Amour, and Désiré Vencatachellum, "Slave Prices from Succession and Bankruptcy Sales in Mauritius, 1825–1827," *Explorations in Economic History* 40, no. 4 (2003): 419–42; Celia Cussen, Manuel Llorca-Jaña, and Federico Droller, "The Dynamics and Determinants of Slave Prices in an Urban Setting: Santiago de Chile, c. 1773-1822," *Revista de Historia Económica* 34, no. 3 (2016): 449–77.

Santiago de Chile	1773-1822	21-26%	Cussen, Llorca-Jaña and Droller
Senegal	1836-1846	37%	This study

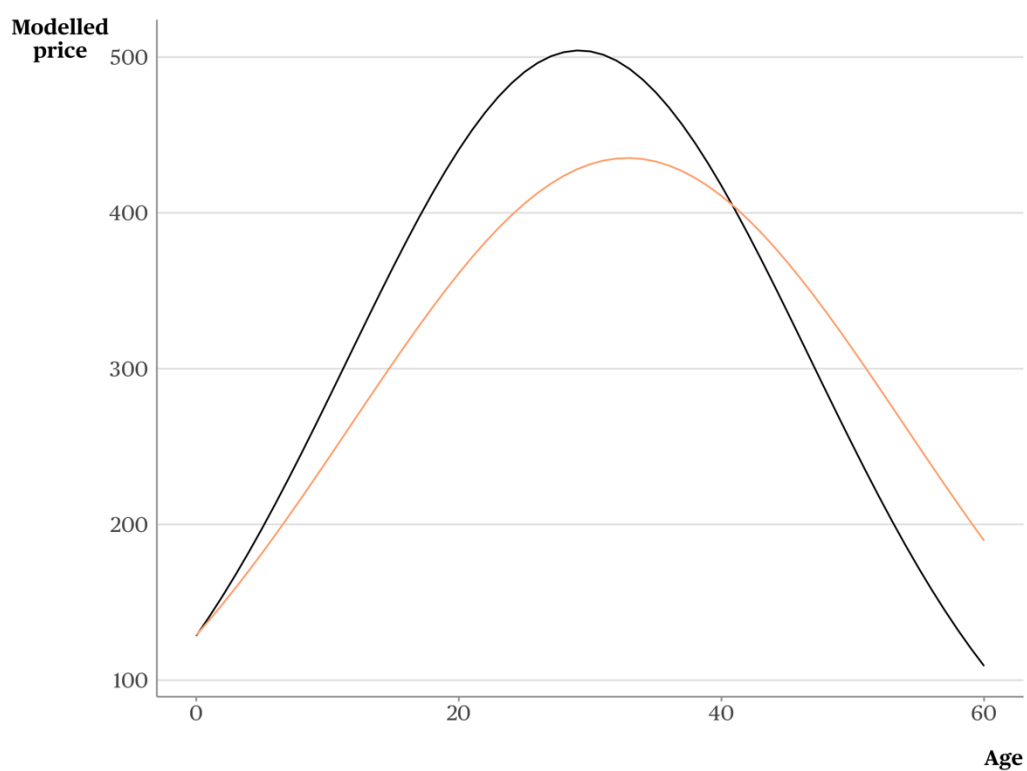
FIGURE 4: Age-price profiles by sex in Saint Louis and Gorée

TABLE 5: Structure of slave prices in urban Senegal, 1831-1848.

Dependent variable: log of slave prices. OLS.						
	(1)	(2)	(3)	(4)	(5)	(6)
Sample: (M=manumission)	Full	Full	Full	Full	Only M	Non-M
Age	0.092*** (0.008)	0.092*** (0.008)	0.089*** (0.008)	0.090*** (0.008)	0.095*** (0.017)	0.092*** (0.009)
—, squared	-0.002*** (0.0001)	-0.002*** (0.0001)	-0.002*** (0.0001)	-0.002*** (0.0001)	-0.002*** (0.0003)	-0.002*** (0.0002)
Male	0.024 (0.157)	-0.005 (0.155)	-0.266 (0.195)	-0.381* (0.195)	0.179 (0.324)	-0.544** (0.218)
Skilled	0.323*** (0.076)	0.318*** (0.075)				
Manumission × Male	0.181** (0.098)	0.205** (0.098)	0.151 (0.098)	0.169* (0.098)		
Sale contract						-0.172*** (0.065)
Gorée	-0.075* (0.046)	-0.063 (0.061)	-0.132*** (0.050)	-0.114* (0.064)	-0.202** (0.096)	-0.118** (0.058)
Apprentice	-0.205 (0.133)	-0.232* (0.133)	-0.298** (0.145)	-0.327** (0.147)	-0.399 (0.722)	-0.331** (0.151)
Manumission	0.210** (0.086)	0.211** (0.096)	0.243*** (0.086)	0.227** (0.095)		
Marriage	0.246*** (0.070)	0.330*** (0.080)	0.243*** (0.069)	0.305*** (0.081)		
Donation	-0.108 (0.546)	0.032 (0.535)	-0.123 (0.537)	-0.016 (0.528)		
Post 1844					0.240** (0.117)	0.315*** (0.068)
Age × male	-0.019 (0.012)	-0.017 (0.011)	-0.021* (0.012)	-0.017 (0.012)	-0.024 (0.022)	0.009 (0.017)
Age squared × male	0.001*** (0.0002)	0.0005** (0.0002)	0.001*** (0.0002)	0.0004** (0.0002)	0.001 (0.0003)	-0.0002 (0.0003)
Constant	4.916*** (0.126)	3.843*** (0.334)	5.244*** (0.185)	4.329*** (0.381)	5.052*** (0.240)	5.490*** (0.179)
Year fixed effects?	NO	YES	NO	YES	NO	NO

Occupation fixed effects?	NO	NO	YES	YES	YES	YES
Observations	617	617	617	617	199	418
R ²	0.315	0.372	0.358	0.408	0.380	0.419
Adjusted R ²	0.301	0.341	0.328	0.363	0.310	0.384
<i>Note:</i>	* p ** p *** p<0.01					

By predicting sales values of manumitted slaves from regression 5, I can calculate manumission price premiums. In both towns, these were high. The median manumission premium was 24% in both Gorée and Saint Louis. (By comparison, in Louisiana the manumission premium was around 19%.⁷³) But this masks heterogeneity among the sample: enslaved women generally did not pay much above market rates (8% premium) while enslaved men paid a considerable 40% premium. That said, the premium was lower than in at least some parts of rural Senegal, where the cost of redemption of a single slave was two slaves.⁷⁴ The difference between the sexes no doubt reflected the higher earning potential of men in the slave labour hire market. As predicted above skilled slaves paid a higher manumission premium (33%) than their unskilled counterparts (21%), though this comparison is complicated by the fact that we do not know if the manumission deeds always record a relevant occupation. Though we ought to be careful about extrapolating from scarce data, the occupations for which we have a reasonable sample suggest that highly skilled slaves paid well over the odds for freedom. The manumission premium for weavers was 57%, for carpenters 68%, and for skilled sailors (*matelots*) an astonishing 225% above market rates. In some cases, the price for freedom must have been intolerably high. In 1841, a slave on Gorée named Hira

⁷³ Shawn Cole, "Capitalism and Freedom: Manumissions and the Slave Market in Louisiana, 1725–1820," *The Journal of Economic History* 65, no. 4 (2005): 1021.

⁷⁴ François Manchuelle, *Willing Migrants: Soninke Labor Diasporas, 1848–1960* (Athens, GA: Ohio University Press, 1997), 36.

purchased his freedom for 220 francs. According to the pricing question above, the market value for Hira would have been less than 10 francs. He was 77 years old, already well above average male life expectancy in early nineteenth century Senegal, and must have struggled to earn any income from his labour after he was freed.

The slave system in urban Senegal was one solution to an institutional problem: how to induce effort among slaves while extracting the maximum amount of economic value from them. The structure of slave prices in Gorée and Saint-Louis suggests that the system of manumission helped slaveowners achieve this end. Free manumission was something of a lottery: good and faithful service could be rewarded with freedom, though this was more readily granted to female slaves, whose earning potential was lower and who were therefore less likely to be able to pay for their own freedom, especially if they earned only half of their market wage. Self-purchased manumission was more likely for skilled male slaves, who could earn considerable amounts of money on the market. The prospect of manumission would have supplied an effective incentive against shirking, while the higher-than-market cost of manumission for skilled slaves helped ensure that slaveowners could extract large amounts from their investment. Of course, the fact that the urban slave system was efficient at extraction did not make it any less cruel for the enslaved men, women and children from whom the surplus was extracted—especially, as we have seen, for some women and girls, who were almost certainly subjected to sexual coercion and possibly violence. But this analysis does point to a key constraint facing capitalists in African cities in this period: the high cost of labour, and especially skilled labour. In this following chapter, I consider the profitability of slave-owning—an almost purely extractive enterprise—from the point of view of the slaveowners of Saint-Louis and Gorée, in comparison with two of the other possible sectors in which they could invest: the gum arabic trade, and plantation agriculture.

CHAPTER II. *The profits of coercion and
the origins of urban inequality*

The French presence was, like most European colonies in the tropics, financed—and to some extent, justified—by control over the export trade in raw commodities. France, as an industrialising economy, required raw materials it could not grow at all or at sufficient scale in the metropole. Three hundred years or so of colonial Senegalese history was largely shaped by those needs. In the seventeenth and eighteenth centuries, this meant both the export of enslaved human beings to France’s ‘empire of sugar’ in the Caribbean as well as by the export—after it was gathered by slaves held by the Mauritanian ‘Maures’—of gum arabic, an all-purpose stiffening agent that was used in both food and textile manufacturing in France. Later, in the second half of the nineteenth and twentieth centuries, Senegal was incorporated into a French ‘empire of fat’ that produced oils for industrial uses, like soapmaking, as well as consumption; the groundnut revolution is considered in more detail in Part 3 of this thesis. The urban economy of nineteenth century Senegal was therefore centred on the trade in gum arabic and later in groundnuts, and for those who possessed the requisite capital, it could be extremely lucrative. It was also explicit French policy to encourage the cultivation of two industrial inputs, cotton and indigo, to replace imports from elsewhere in the world, and the Senegal River valley was identified as a prime location.²⁰² In this chapter I explore three sectors of the Senegalese colonial economy in the mid-nineteenth century: the gum trading sector, the slave labour hire sector, and the agricultural plantation sector.

²⁰² Though there are many accounts of the 19th century plantations, the version that best situates them in the context of growing French demand for cotton is Richard L. Roberts, *Two Worlds of Cotton: Colonialism and the Regional Economy in the French Soudan, 1800-1946* (Stanford: Stanford University Press, 1996), 63–65. French demand for indigo as a textile dye was extremely strong over the course of the eighteenth century, and the loss of Saint-Domingue hit the metropole hard, leading to a search for new possible sources. See Marguerite Martin, “Teindre en bleu après 1789,” *Hypothèses* 17, no. 1 (2014): 101.

The first two were, I argue, highly profitable; the third entirely unprofitable without government subsidies—but profits in plantation agriculture was unlikely to have been representative of the broader agriculture sector in Senegal at the time.

THE GUM TRADING VOYAGES

The most important part of the colonial economy of urban Senegal was the annual gum arabic trading voyages along the Senegal River, departing from Saint Louis from early in the new year, and continuing for much of the dry season.²⁰³ The single most important trade good exported from Saint Louis and exchanged for gum arabic was the Indian *guinée* cloth, produced in French Pondicherry and imported into Senegal.²⁰⁴ In the 1852-3 trading season, *guinée* accounted for 1,199,445 francs of the 1,799,946 francs' worth of trade goods sent on the Galam voyages.²⁰⁵ Not only was *guinée* valuable as a commodity, it also served as the main medium of exchange in the Senegal River valley, and further afield. For this reason, it tended to command high prices in terms of gum, which could be produced at reasonably low cost due to the use of labour coercion.²⁰⁶

²⁰³ On the details of gum trading, see James L. A. Webb Jr, "The Trade in Gum Arabic: Prelude to French Conquest in Senegal," *Journal of African History* 26, no. 2-3 (1985): 149-68; Anna Pondopoulo, "Les compagnies de commerce face à la crise de la traite des esclaves : les récits sur les peuples du fleuve Sénégal à la fin du 19 siècle," *Publications de la Société française d'histoire des outre-mers* 2, no. 1 (2001): 289-308; Tamba M'bayo, *Muslim Interpreters in Colonial Senegal, 1850-1920* (Lanham, MD: Lexington Books, 2019); Searing, *West African Slavery*.

²⁰⁴ Masaki, "Indian Guinée."

²⁰⁵ 'Etat des marchandises exportées pour Galam pendant la Campagne de 1852 à 1853', AOM SEN XIII/27.

²⁰⁶ De Longeville described gum harvesting as « une rude corvée imposée aux captifs par la faim ou par la peur des châtiments, corvée qui n'amène ni habitudes régulières de travail, ni efforts d'intelligence, ni appropriation soit du sol, soit de l'arbre ». A. de Longeville, *Les colonies françaises : géographie, histoire, statistique*. Rouen : Mégard et Cie, 1869, 12.

TABLE 6: Quantity & price of gum arabic exported from Senegal, 1837-1843.

	Quantity exported (kg)	Francs per kg
1837	4,437,163	1.4
1838	3,496,819	1.4
1839	4,093,134	1.4
1840	3,100,377	1.0
1841	1,727,828	1.2
1842	1,391,578	1.22
1843	1,067,661	1.4

Source: 'Notes annexées à l'État de commerce de Saint Louis (Sénégal) pour l'année 1843', FR ANOM XIII/27

Indeed the price of cloth had—according to Jean-Pierre Duchon-Doris, a Bordelais *courtier des marchandises* who specialised in the gum/guinée trade—been increasing ever since France regained control over its Senegalese possessions in 1818. From a rate of exchange of somewhere between 50 and 100 kilograms per piece of guinée cloth in 1817-19, the relative price of cloth had fallen to a mere 10-20 kilograms of gum per piece in 1839-41.²⁰⁷ The French government had even introduced price floors for guinée cloth so as to try to prevent the *traitants* from purchasing gum at too high a price. At the same time, though, the franc-denominated price of guinée imports was also declining. Profit for the *traitants*, given in francs, was a function of the price paid for cloth in gum to the *négociants* and the price of gum paid in cloth to the indigenous gum-harvesters. Since we have only the franc price paid by the *négociants* for cloth and the gum price paid by the

²⁰⁷ Jean-Pierre Duchon-Doris, *Commerce des toiles bleues dites guinées de l'industrie française de Pondichéry et de la métropole dans ses rapports avec le Sénégal, l'île de Bourbon et l'étranger*. Paris: Imprimerie de Wittersheim, (1842).

maures for cloth from the *traitants*, we cannot directly observe the relative profits or losses enjoyed by French *négociants* and métis *traitants*. Observing the relative declines of each commodity from 1817 prices, however, gives an idea of the scope for profits to be shared between the two groups, since a decline in the nominal price of acquiring cloth abroad should increase joint profits, while a decrease in the amount of gum obtained for each piece of cloth should reduce profits. The data we have suggests a relative decline in the gum price relative to cloth in the early 1820s, though by the middle of the decade the cloth price had fallen such that its overall price decline was relatively similar to that of gum.

TABLE 7: Franc price of guinée and guinée-price of gum arabic, Senegal, 1817-1842.

	Guinée		Gum
	francs/piece		Kg gum/guinée
1817	40-45	1817	50-100
1822	35-30	1819	35-45
1826	25-28	1825	30-35
1830	15-18	1830	22-30
1831	12-15	1831	22-30
1838	15-18	1838	22-30
1842	8-11	1842	10-20

Source: Jean-Pierre Duchon-Doris, 'Commerce des toiles bleues'.

Further problems began to emerge in the late 1830s, when an enormous increase in the quantity of guinée cloth into the colony—an effective increase in the monetary supply—led to enormous stockpiles of unsold cloth and a predictable increase in the guinée-price of gum. Prior to 1837, only about 100,000 pieces of cloth were imported each year; in 1837 this rose to 138,000 pieces, and, in 1838, to 240,000 pieces.²⁰⁸ While the supply of gum was not totally fixed, it was certainly much less elastic than was the supply of guinée cloths, and so its price in terms of guinée cloth

²⁰⁸ Edouard Bouët-Willaumez, *Commerce et traite des noirs aux côtes occidentales d'Afrique* (Paris: Imprimerie nationale, 1848), 14.

rose dramatically. According to Édouard Bouët-Willaumez, governor of Senegal, this meant that the *traitants*, who were often unaware of the size of the guinée cloth stock in the Saint Louis and Gorée stores, would buy cloth at the ‘normal’ guinée-gum prices, and then, on travelling upriver, would discover that European sellers (sometimes the same *négociants* from whom they had bought the cloth) were themselves selling cloth for gum. In this way, the *traitants* paid the price for the inflation induced by the increase in guinée cloth imports. Bouët-Willaumez suggests that the *traitants* received in 1838 between 4 and 6 pieces of gum per piece of guinée cloth less than they had paid for the cloth to *négociants* back in the coastal towns. Something similar happened again in 1839 and 1840. The *négociants*, who possessed superior information from French ports, knew that there was an oversupply of cloth in France. They sold stockpiled guinée cloth to the *traitants* and then supplied themselves with the cheaper French cloth, allowing them to undercut the *traitants* when purchasing gum upriver. Many of the *traitants* returned to the coast in considerable debt; in fact, the total *traitant* debt owed to the *négociants* (the only supplier of credit in a colony without any formal financial institutions at that stage) was about 2.5 million francs.²⁰⁹

In response to this situation, King Louis-Philippe’s government first proposed in April 1842 the establishment of a company with a monopoly over the gum trade. This was met with considerable opposition on the part of French merchants in the ports that traded most with Senegal, who suspected that a company with market power in the gum and guinée trades would squeeze their own profits. The government therefore formed a commission, headed by Jean-Élie Gautier, comprising a number of merchants from the colonial ports. After several months of deliberation, the commission proposed reserving the upriver trade for the

²⁰⁹ AOM SEN XIII/27.

traitants, forbidding the European *négociants* from competing with indigenous and creole merchants; introducing a ‘fonds commun pour les traitans’ by imposing a 5 per cent tax on gum entering into the coastal towns; and imposing a minimum rate of exchange between Indian guinée cloth and gum.²¹⁰ A royal decree, issued on 15 November 1842, established the power of the governor of Senegal to keep a list of authorised *traitants* upon which no European merchant, nor any employee of such a merchant, could be inscribed. It also established the *fonds commun* and the gubernatorial price-fixing power, as suggested by the commission.²¹¹ Not only was this thought to be necessary for the economic health of the colony, as Bouët-Willaumez wrote, it was a prudent one from the point of view of the French expansion— commercial, religious and territorial—in the Western Sudan, since it precisely the mixed-race or African *traitants* who could serve as the vectors of Western civilisation in a climate most inhospitable to Frenchmen.²¹²

A racial division of labour was thus enshrined in the laws governing the gum trade, a division that had informally been respected up until the influx of guinée cloth in 1836: European *négociants* took care of the gum trade between the metropole and Senegal, as well as the sourcing of the guinée cloths from Pondichéry via France, while the indigenous *traitants* sourced the gum arabic from suppliers on the Senegal River. It is interesting to note that this decree coincided more or less with the slight uptick in prices observed in Chapter 1; it may have been that the imposition of the *traitant* monopoly increased expected profits and hence the price of the labour used to produce those profits. The exclusion of European merchants from the gum trade was not to the liking of the *négociants*, who tried to convince

²¹⁰ Amirel Duperré, « Rapport au Roi », in P. Henrichs and F. Colombel, eds., *Nouvelles archives du commerce et de l'industrie agricole et manufacturière*, vol. 9 (Paris: Imprimerie de Bruneau, 1842), 483.

²¹¹ Ordonnance of Louis-Philippe on 15 November 1842 at Saint-Cloud, reprinted in *ibid.*, 483-89.

²¹² Bouët-Willaumez, *Commerce et traite des noirs aux côtes occidentales d'Afrique*, 38.

the metropolitan government to open up the gum trade to free competition once more. One of the loudest voices in favour of free trade on the Senegal River was Marc Maurel, of the Maurel et Prom *maison de commerce*. On the other hand, it did allow for some of the debt owed by the *traitants* to be repaid, although, despite a bumper gum crop in 1845, by no means all of it was retired.²¹³

Thanks to unusually detailed book-keeping after the royal decree of 1842, we can assess the profitability of individual gum-trading trips taken in 1845. Preserved in French archives is a list of all of the gum boats that took part in that year's trade, with the name of the merchant who financed and organised the trip, the value of merchandise upon leaving Saint Louis, the value of merchandise on the return trip, and the amount paid in wages and equipment rental, allowing us to calculate the net profit rate for each trader (TABLE 8).²¹⁴

TABLE 8: Profit rates of gum-trading trips on the Senegal River, 1845.

	Total profit (francs)	Profit rate
Mean	14,045	37%
Median	11,738	35%
Minimum	1,379	4.9%
Maximum	65,820	85%
25th percentile	6,445	26%
75th percentile	65,820	46%

The range in both aggregate profits and net profits was enormous; the least profitable voyage made only a 4.9% return on investment, while the most profitable made an 85% return. Without data from other years it is hard to know whether to interpret this as an indication that some traders were regularly able to make higher

²¹³ Ghislaine Lydon, "Les péripéties d'une institution financière: la Banque du Sénégal, 1844-1901," in *AOF : réalités et héritages. Sociétés ouest-africaines et ordre colonial*, ed. Charles Becker, Saliou Mbaye, and Thioub Ibrahima (Dakar: Archives nationales du Sénégal, 1997), 475–91.

²¹⁴ AOM SEN XIII/27.

profits than their competitors, or whether—and I suspect this is more likely to be the case—the profitability of gum trading trips was highly variable and expected returns were necessarily large to account for a high risk premium. Though analysis must be cautious, there is a strong bivariate relationship between the absolute ‘size’ of an expedition, measured in terms of merchandise traded, and the profit rate itself: an increase of 1% in the amount of goods traded was associated with an increase of 0.2 percentage points in the rate of profit. This suggests positive returns to scale in the gum-trading sector, and therefore a possible driver of wealth inequality, in conditions of credit scarcity: those who could afford to equip large trading expeditions were likely to earn not just higher profits, but a higher *return* on their capital.

If we assume that Senegalese entrepreneurs were credit-constrained, then the barriers to entry in the gum-trading sector might be thought to be considerable. If we consider the initial costs of an expedition to be the price of the goods shipped up the Senegal River plus the wages and rental costs associated with a voyage, then the *lowest* cost of any trip in 1845 was 10,241 francs: about 26 times the cost of an unskilled slave in Saint Louis. The median upfront cost was 37,383 francs, a sum well outside the means of most residents of Saint Louis who did not have access to credit. Of course, a trader could expect to at least recoup the cost of the trade goods, and he could probably have secured the latter on credit from a *négociant* in Saint Louis. If we consider the cost of wages and rental only, then the median cost of a trading voyage was still high, at 2,875 francs. Of course, the *négociants* may well have extended credit to finance wages and rental as well, but would almost certainly have required collateral, which may have been a prohibitive barrier to entry for small-time slaveowners, and even more so for free African workers seeking to invest their savings.

THE PROFITABILITY OF SLAVE LABOUR HIRE

We have seen that investing in gum trading was, on average, a profitable endeavour. But gum traders did not necessarily own the slaves who performed the arduous task of hauling boats up the Senegal River against the current. They were also hired from slaveowners in Saint Louis. In this section, I calculate whether or not holding slaves in order to hire them out (either for gum trading voyages or for other work in insular Senegal) was profitable. This section is a conscious echo of the very famous cliometric debates on the nature of American plantation slavery which did much to reinvigorate economic history as a quantitative discipline in the middle of the twentieth century.²¹⁵ Though space prevents a thorough treatment of this literature, one of the—in hindsight perhaps obvious—conclusions of this debate was that the price mechanism *did* operate to ensure profitability: if the present value of slave output were to increase, then the windfall gain to slaveholders would quickly be capitalised in the price paid for slaves; conversely, a negative shock to expected future productivity would result in slave prices declining in order to maintain a

²¹⁵ To my knowledge the only comparable studies in an African context have been the examinations of slavery in the South African Cape: the pioneering study is Nigel Worden, *Slavery in Dutch South Africa* (Cambridge: Cambridge University Press, 1985). Worden used aggregate data to conclude that slavery was profitable; the same conclusion was reached using microdata in a more recent study: Sophia Du Plessis, Ada Jansen, and Dieter von Fintel, “Slave Prices and Productivity at the Cape of Good Hope from 1700 to 1725: Did Everyone Win from the Trade?,” *Cliometrica* 9, no. 3 (2015): 289–330. Even to summarise the original cliometric debates would require a thesis of its own; the first shots were fired in Alfred H. Conrad and John R. Meyer, “The Economics of Slavery in the Antebellum South,” *The Journal of Political Economy* 66, no. 2 (1958): 95–130. The profitability calculations of that paper closely resemble the ones undertaken in this chapter. The most famous offensive was Robert William Fogel and Stanley L. Engerman, *Time on the Cross* (Boston: Little, Brown, 1974). Two particularly devastating counterattacks were the joint volume Paul A. David, *Reckoning with Slavery: A Critical Study in the Quantitative History of American Negro Slavery* (Oxford: Oxford University Press, 1976); Herbert George Gutman, *Slavery and the Numbers Game: A Critique of Time on the Cross* (Chicago: University of Illinois Press, 1975). An excellent albeit partisan retrospective can be found in a recent working paper: Richard C. Sutch, “The Economics of African American Slavery: The Cliometrics Debate,” Working Paper Series (National Bureau of Economic Research, 2018), doi:10.3386/w25197.

normal rate of profitability.²¹⁶ In this sense, an analysis of the profitability of Senegalese slavery might seem superfluous: an analysis of the structure of slave prices surely suffices. However, the study of profitability is useful. For one thing, it enables us to determine to which (an admittedly special case of) African slavery obeyed market principles. A body of research from the 1970s onwards, culminating with Robin Law's famous rebuttal of Karl Polanyi's assertions about the irrelevance of supply and demand to the formation of African prices²¹⁷, has more or less vindicated the 'formalist' position—and rejected the opposing 'substantivist' one²¹⁸—that African consumption and production can best be understood by the neoclassical theory of price. For another, an analysis of the profitability of the Senegalese slave labour system serves to illuminate the set of implicit relative prices that determined economic development.

In this section, I attempt to calculate the rate of profit on various categories of slaves held in urban Senegal in the 1830s and 1840s, incorporating newly collected information on life expectancy/mortality, slave revenue productivity and interest rates, as well as the hedonic models of slave prices presented in the previous section. The results confirm in more detail what has already been suggested in the effort-prices presented above: that slavery paid handsomely for slaveowners, and that skilled slaves were a more profitable investment than unskilled slaves. The simplest

²¹⁶ See for an empirical demonstration the reaction in the US slave market to Lincoln's election and the prospect of war Charles W. Calomiris and Jonathan Pritchett, "Betting on Secession: Quantifying Political Events Surrounding Slavery and the Civil War," *American Economic Review* 106, no. 1 (2016): 1–23.

²¹⁷ Robin Law, 'Posthumous Questions for Karl Polanyi: Price Inflation in Pre-Colonial Dahomey', *Journal of African History* 33, no. 3 (1992): 387–420; Robin Law, 'Computing Domestic Prices in Precolonial West Africa: A Methodological Exercise from the Slave Coast', *History in Africa* 18 (1991): 239–57.

²¹⁸ The two most representative works are, for the formalist position, Hopkins, *Economic History* and for the substantivist position, Paul Bohannon and George Dalton, *Markets in Africa* (Evanston: Northwestern University Press, 1962).

way of determining whether slavery ‘paid’ for slaveowners is to estimate a version of the standard capital asset pricing model: an equation that compares the total summed value of the flow of slave labour’s output—the benefits—with its various costs.²¹⁹

$$P_s = \sum_{A_p}^{E(L|A)} \frac{(\alpha w_s - c_s)}{(1 + r)^t}$$

where P_s is the price of a slave, α is the proportion of a slave’s wage appropriated by his or her owner, w the nominal wage, c_s the cost of maintenance, r the internal rate of return, t indexes years, A_p the age of the slave at purchase, and $E(L | A)$ is life expectancy at age A (or until the slave is too old or sick to work at a profit). Solving Equation 4 for r numerically, we can compare it to the interest rate i . If $r > i$ then we can conclude that purchasing a slave was profitable; if $r < i$ then it would be unprofitable. Almost every one of these constituent components can only be imprecisely measured for Senegal, due to the thinness of the archives dating from this period. In the following paragraphs, I assess the available evidence and try to judge its reliability.

Marginal product of slave labour

Measuring labour productivity in artisanal or commercial occupations would be difficult in any historical circumstance. To document *physical* output in mid-nineteenth century Senegal would be next to impossible given the scarcity of archival material. The existence of a slave labour hire market largely compensates for this scarcity, since we have the wage rates from the *Notices statistiques*. The usual assumption about the relationship between wages and productivity—that the

²¹⁹ Following Conrad and Meyer, “Economics of Slavery.”

wage reflects the marginal product of labour in competitive markets—may seem questionable, especially given the possibility for monopsony, given the large weight of the colonial administration in the economies of Saint Louis and Gorée. However, from the point of view of the slaveowner, what matters is precisely the marginal *revenue* product of the hired slave, and the wage does reflect this. What is not mentioned in the wage reports in the *Notices statistiques* is the number of days worked, a perennially tricky question. A report on Gorée weaving by Rondot offers an indication that weavers at least worked full weeks of long days: “weavers are, like spinners, slaves who work for their masters the entire week, 10 hours a day, and on their own account on Sundays. No wage is given to them”. We can therefore assume that slaveowners attempted to maximise the amount of time slaves worked for them.²²⁰ Assumptions for most skilled occupations in Senegal must necessarily be bold. But we can work backwards from monthly estimates of earnings, which, combined with the daily wages presented in Chapter 1, will give an estimate of the number of days worked in each month hired. A number of *signare* women were interviewed by the Commission of Inquiry into Emancipation, and they gave evidence on the amount a slave could earn for his or her mistress in a month’s hired work:

A gum arabic trader is hired out for 150 francs per month, plus 20 francs for each *millier* of gum he has traded; since the trading season lasts for seven months, this implies a profit of 1050 francs, and if he trades 40 *milliers* of gum, one must add 800 francs, making 1850 francs in total. Other slaves who do similar work, but only trade in millet, salt and other mainland commodities, are hired out at 100 francs a month. The slave who practices an occupation such as carpentry, joinery, caulking or masonry is hired out at 70 or 60 francs a month, depending on whether they are of the first or second rank.²²¹

²²⁰ Natalis Rondot, « Fabrications des pagnes de coton à Gorée » in *Séances et travaux de l'Académie de Reims*, vol 5, 1846, 17-24.

²²¹ Testimony of Marie Escal, resident of Saint Louis, to the Commission of Inquiry into Emancipation, AOM SEN XIV/13.

In TABLE 9 these indications are used to derived implied days per month worked. These calculations suggest that skilled workers like carpenters, masons and fitters worked fewer days per month than did unskilled labourers, which might suggest that there was less demand for their work.

TABLE 9: Implied working year of slaves from monthly & daily wages.

Occupation	Nominal wage	Nominal wage	Working days	Working days
	Daily	Monthly	Month	Year
Carpenter	4.4	70	16	190
Mason, fitter	3.7	70	19	228
Labourer	0.6	15	25	300

It is quite possible that slaves undertook more than one kind of work during the year, and the descriptions of slaves interviewed by the Commission of Inquiry suggest that many did. Providence, for example, was a slave who belonged to Louis Alsace, having been brought from the Sahara as a child to Saint Louis; he was described as ‘sometimes a boathand and sometimes a joiner’, and he said that he ‘found himself as much work as he could.’ Boathands would apparently find work in Saint Louis outside the trading season: Demba N’Diaye, a slave belonging to the trader Mambaye N’Digue, said that after the trading season ‘I find work as a labourer’, since his master gave him ‘nothing’. Charles Moussa, also a boathand, was a carpenter as well.

Interest rate

Conceptually, the interest rate in the asset pricing equation is a measure of the opportunity cost of slave-ownership: if a slaveowner could no longer purchase

slaves, what would the return on the next most profitable use of her funds be? Answering this question in any historically meaningful sense is enormously complicated. One option would be to lend the money to other people at interest, and in this sense the rate on commercial lending is a useful proxy for the opportunity cost of slave capital. It is clear that, as elsewhere in Muslim Africa, religious prohibitions on the taking of interest did not mean that there was no market for credit in Saint Louis and Gorée.²²² Indeed, one of the questions asked of free residents of Saint Louis by the Commission of Inquiry related to the establishment of a kind of debtor's refuge, at Mbéraye, a nearby settlement.²²³

Probably the simplest rate to use would be the rate on a French government bond: in the 1840s, the average yield on a 5% *rente* was 4.59% and the average yield on a 3% *rente* 4.14%.²²⁴ But this would really only be relevant to French investors, and there would have been few if any of these in Senegal. Unfortunately we have limited information about the—understandably thin—capital markets in Senegal in the mid-nineteenth century. The *Notices statistiques* mentions a legal limit on interest of 6% per annum for commercial loans, but noted that in practice rates were usually twice this.²²⁵ However, using either of these rates as a measure of opportunity cost would be problematic, since they reflect the possibilities of investing in an economy in which the structure of relative prices is determined by the possibility of slave labour.

²²² Bruce S. Hall, "Saharan Commerce and Islamic Law: The Question of Usury (Ribā) in the Nawāzil Literature of Mali and Mauritania, 1700-1929," *African Economic History* 41, no. 1 (2013): 1–18; Ghislaine Lydon, *On Trans-Saharan Trails: Islamic Law, Trade Networks, and Cross-Cultural Exchange in Nineteenth-Century Western Africa* (Cambridge: Cambridge University Press, 2009), 288.

²²³ Questionnaire in AOM SEN XIV/13.

²²⁴ Sidney Homer and Richard Sylla, *A History of Interest Rates*, 4th ed. (1963; repr., New Brunswick: Rutgers University Press, 2011), 217.

²²⁵ 'légalement de 5% en matière civil, et de 6% en matière de commerce ; mais, en fait, il est ordinairement de 12% dans le commerce': *Notices statistiques*, 3:305.

Profit rates also give an indication of the opportunity cost of capital. Probably the most profitable sector of the economy was the gum trading sector, as we have seen. Using the 1845 data as representative of profit rates might be unwise, though the median profit rate of around 30% is probably characteristic of the sector. But using profit rates from a sector that was heavily reliant on slave labour is in some senses begging the question: the relevant opportunity cost is one in which slavery does not exist. Perhaps a more historically faithful argument can be made from a source intimately connected historically with the abolition of slavery in Senegal: the *Banque du Sénégal*, which was set up with a part of the capital intended as compensation paid to slaveholders (paid out as shares in the Bank).²²⁶ In 1858, the first year for which I could find data, dividends in the bank yielded 5.8% annually, while the bank paid 8% interest on deposits of gold or silver.²²⁷ In order to make profits on taking deposits, the bank would have had to have lent commercially at higher rates. The assumption herein therefore is that the 12% figure suggested in the *Notices statistiques* held more or less true after emancipation as well, though further investigation in notarial archives may lead this to be revised. In the calculations of the net present value, I have also considered using a rate of 6% and a rate of 30%, a conservative figure based on the trading profits calculated in the previous section.

Expected number of years to live

As a capital asset, slaves (and their skills) were exploited over a long period of time. It is therefore necessary to estimate the period over which slaveowners expected to be able to extract labour services from their slaves: in other words, to calculate life expectancy curves. In order to construct age-specific life expectancy for slaves in

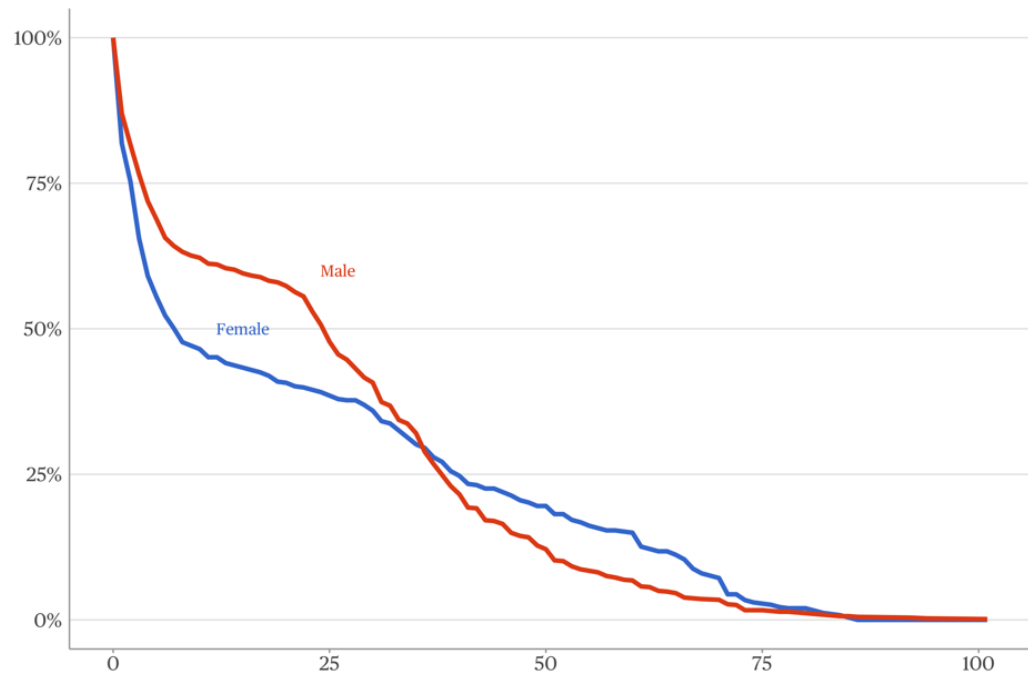
²²⁶ Lydon, “Les péripéties d’une institution financière: la Banque du Sénégal, 1844-1901.”

²²⁷ ‘Banque du Sénégal’ in the *Moniteur du Sénégal et dépendances*, 18 May 1858.

Gorée and Saint Louis, I assume a stationary population and no migration. The number of births in a year is taken as the size of the cohort $x = 0$. The size of cohort $x = 1$ is then given by the cohort at $x = 0$ minus the number of deaths of children between the ages of 0 and 1, and so forth. However, since births were probably underreported, and were considerably lower than deaths, I arbitrarily set the number of births equal to the number of deaths. From the number of births and the ages of people at death, an ‘instantaneous’ reading of the age structure of the population may be obtained. This is combined with the data on age at death to give age-specific mortality rates, which can then be used to construct a life expectancy curve. The data on age at death is obtained from death records I have transcribed from Saint Louis in 1860-61. Though this is, obviously, from a period after the end of slavery in 1848, the death records in prior periods are not sufficiently complete for an accurate measurement of life expectancy, since inclusion is more likely for French and *métis* inhabitants. I contend that life expectancy for adults was unlikely to have changed very greatly in the twelve years since abolition. Rates are calculated for males and females separately.

Infant mortality was, unsurprisingly for a town in 19th century West Africa, very high. If we assume that there were enough births to replace the population (births equal to deaths) then between 17% and 19% of babies born alive would not have made it to their first birthday—and this excludes the non-negligible number of stillbirths. If there were fewer births than deaths, as the civil registration data would suggest at first glance, then this rate would be even higher. Life expectancy for males was higher than for females at younger ages; however, the gap closed and then reversed after about 26 years of age.

Figure 5: Chance of surviving to a given age by sex in Saint-Louis, 1860-1.



Source: Author analysis of data in état civil for Saint Louis, 1860-1. AOM 1 DPPC 4901 and AOM 1 DPCC 4903.

Was there any significant difference in life expectancy for different occupations? Without evidence about the age structure within each occupation we cannot estimate mortality rates or life expectancy. However, if we make the assumption that age and occupation are completely uncorrelated, we can consider the median age at death by occupation, presented in TABLE 10 for some of the main occupations in Saint Louis in 1860-1.

TABLE 10: Median age at death by occupation in Saint-Louis, 1860-1

Occupation	Median age at death	Number of deaths	Occupation	Median age at death	Number of deaths
Cannoneer	24	6	Farmer	41	40
Sailor	23	8	Boathand	36.5	70
Soldier	24	43	Mason	44	8
Cavalryman	25.5	8	Labourer	35	29

Artilleryman	23	19	Fisherman	36	11
Merchant	38	27	Weaver	42	7
Trader	49	9			

It is clear that military occupations were more fatal than non-military occupations. However, since there were relatively few military-related jobs, I use the whole-population male life expectancy curve to calculate age-specific life-expectancy (and hence the appropriate period over which the slaveowner could anticipate expropriating the product of her or his slave's labour).

Cost of maintenance of slaves

We have only scattered information about the cost of subsistence of slaves in Gorée and Saint Louis. The question can be divided into two parts: firstly, how much food, clothing and so on did one slave require, and secondly, what were the prices of each of these elements of the slave consumption basket? The first part of the question is easier to answer, at least approximately, than the second. Curtin discusses in some detail the estimated 'storage' requirements of slaves kept at Saint Louis and Gorée in the mid-eighteenth century. He notes that a *mémoire* in 1754 allowed for 1 kg of millet per slave per day, although this was slightly less for Christian Africans, who were given some meat as well.²²⁸ Curtin argues that non-grain costs were likely to be about the same as grain costs, and, for a lack of any more detailed information, we shall adopt this as our basic slave 'consumption basket': 1 kg of millet per day per slave, the cost of which is multiplied by 2 to account for non-grain costs. A number of other estimates besides Curtin's exist: a summary is in TABLE 11.

²²⁸ Philip D. Curtin, *Economic Change in Precolonial Africa* (Madison: University of Wisconsin Press, 1975), 196.

TABLE 11: Cost of subsistence in colonial Senegal in the late 18th and 19th centuries

Source	Year	Costs	Implied yearly cost
Crenne	1771	243 livres	486 livres
Curtin	Mid 18 th C	£2.74 for millet	£5.50
Pasquier	1840s	50 francs food	100 francs
Bédolierre	1844	77 francs food	148 francs
Notices statistiques	1837	Total 100 francs food, excluding lodgings & medical	150 francs
Chaize	1845	110 francs food	220 francs

Sources: Curtin, *Economic Change in Precolonial Africa*, 196. Verdun de la Crenne, *Voyage fait en 1771 et 1772 en diverses parties de l'Europe, de l'Afrique et de l'Amérique* (Paris, 1778); Roger Pasquier, 'Le Sénégal au milieu du XIXe siècle: la crise économique et sociale' (PhD thesis, Université de Paris-Sorbonne (Paris IV), 1987), vol 2, 533; Etienne de la Bédolierre, 'L'habitant du Sénégal', in *Les Français peints par eux-mêmes*, vol 3 'Les provinces', p. 415; for Chaize, FR ANOM SEN XIV/13.

This does not entirely exhaust the question of maintenance costs, however, since we must also decide who was responsible for paying them. It is widely agreed in contemporary sources that slaves received half of their nominal wage and gave half to their masters.²²⁹ But were slaves ever responsible for their own subsistence—and if not, what did they spend their half of their wages on?²³⁰ This point is less clear. Pierre Louis, a slave who worked as a master mason on Gorée (and who was the legal property of François de Saint-Jean, the mayor of Gorée and husband of the

²²⁹ This appears to have been a common practice elsewhere in sub-Saharan Africa: Thaddeus Sunseri, "Slave Ransoming in German East Africa, 1885-1922," *The International Journal of African Historical Studies* 26, no. 3 (1993): 481.

²³⁰ Many of the testimonies of free métis or European traders in the 1845 commission of inquiry accused slaves of having developed a taste for luxury and dissipating their earnings rather than saving: e.g., 'le luxe a malheureusement fait beaucoup de progrès chez [les esclaves] & leurs besoins se sont augmentés de jour en jour. Quant aux aisances de la vie, naturellement indolents et sensuels, comme tous les habitants des pays chauds, ils ont pour cela le penchant le mieux prononcé'. Testimony of Joseph Crespín, merchant, to Commission of Inquiry into Emancipation, 1845. AOM SEN XIV/13.

famous *signare* Anne Colas Pépin) told the Commission that an enslaved African ‘can sometimes refuse to work, because he knows very well that his master will nonetheless be obliged to feed him’.²³¹

However, the generalised nature of this arrangement seems to have been contradicted by at least some slaves when interviewed by the Commission of Inquiry into slavery in 1845. Amou Jhala, a slave owned by the mayor of Saint Louis, was born in Galam and lived in Saint Louis. He claimed that his master ‘kept everything for himself’, and that his sole means of providing for his family consisted of the ‘two pieces of guinée cloth, worth thirty francs’ that Alin gave him at the start of the trading season, which he would sell upriver; and the money made by his wife, who worked as a millet-grinder and also washed and ironed clothes for their master. ‘Many of those who own slaves’, Jhala said, ‘give them absolutely nothing and let them survive as best they can’.²³² That said, we might wonder whether subsistence was excluded from the set of possible things which might be considered ‘given’: the slave Toumané said that his ‘master had never given me anything, but he feeds me.’ Other points of Jhala’s testimony are confirmed though by that of Yoro Sarr, a slave of the merchant Jean Duchesne, who, when asked how he provided for his family, said that Duchesne gave him two pieces of guinée cloth, ‘with which I buy millet and tobacco and with that I feed myself and keep myself.’ His wife was free, and presumably worked, and when Yoro returned to Saint Louis he found what work he could: ‘my master allows it and then leaves me everything that I earn’.

Another slave, Mari Gour, testified that he earned thirty francs a month and was allowed to keep all of it himself to feed and keep himself and his wife, ‘who I ensure

²³¹ Testimony of Pierre Louis to the Commission of Inquiry into Emancipation, FR ANOM SEN XIV/13.

²³² Testimony of Amou Jhala, slave in Saint Louis, to the Commission of Inquiry into Emancipation, AOM SEN XIV/13

wants for nothing'.²³³ Charles Moussa, an enslaved boat-hand, was in an intermediate case: during the trading season, he was fed and clothed by his master, and when he returned to Saint Louis in the off-season, he worked and with his wages fed himself. Were slaves obliged to provide for their families? In cases where a male slave's wife and children were also slaves, it seems logical to assume that the master or mistress was responsible for their upkeep. A description of slave families by the French observer Charles Cottu in 1845 suggests however that women and children of enslaved males may have sometimes lived apart from the slave, and in these cases at least, the head of the slave household, rather than the master, seems to have been responsible for feeding, clothing and housing them:

...the artisan, like the sailor, shares with his master his daily profits, the largest portion of which goes to the upkeep of his family. The families of these native artisans live how they like: some stay close to the master's house, under the eye of the *signare*, who indulges the slave's children as much as her own; others, more proud and perhaps more nostalgic for their homelands, move away from the place that reminds them of their servitude and live in a hut in some deserted place, on the edge of the river, where the woman will have a garden, or near the sea.²³⁴

It seems, unsurprisingly, that there were a reasonably diverse set of arrangements when it came to dividing up the product of slave labour. Masters almost certainly wanted to extract as much value as possible, but allowing slaves to be responsible for their own upkeep in exchange for a smaller or larger proportion of their earnings would have allowed masters to offload some of the risk of price volatility for staples, which Pasquier claims was high.²³⁵ In order to assess the net income stream of *laptots*, therefore, I have assumed that they earned the *laptot* wage during the trading season of seven months, with a pro-rata allowance for food (56 francs).

²³³ Testimony of Mari Gour, slave in Saint Louis, to the Commission of Inquiry into Emancipation, AOM SEN XIV/13

²³⁴ Charles Cottu, 'Le Sénégal : histoire et situation actuelle de la colonie. I: premiers établissemens français au Sénégal', *Revue des Deux Mondes* 9, no. 2 (1845): 247–96

²³⁵ Roger Pasquier, "Le Sénégal au milieu du XIXe siècle: la crise économique et sociale" (Doctorat d'État, Université de Paris IV, 1987), 535.

The *Notices statistiques* suggests a rate of 1 franc a day was considered normal during the trading season, which would mean a total income of 210 francs per year. If we assume that the slaveowner kept half this figure, and the slave worker worked on his own account outside the trading season, then we have an annual income of 105 francs for a *laptot*. We know from Rondot's account of *pagne* weaving that weavers worked 6 days for their master and had Sundays to work for themselves.²³⁶ It seems likely that household production was not subject to the same kinds of incentive payments that boat-hands appear to have received. As a solution, I have chosen to assume that artisans kept half their pay; that labourers and weavers (who were not generally hired out) were entirely expropriated, except for subsistence costs, and that *laptots*, as above, earned their owners 105 francs a year.

Incorporating all the above information, Table 6 presents estimates of the internal rate of return for the purchase of a slave at market prices. This represents, from the point of view of the slaveowners, the marginal efficiency of capital: the discount rate at which the net present value of the expected income derived from the purchase of a slave would equal zero. It is best compared with the prevailing interest rate, which was argued above to equal at least 12%. Purchases yielding less than this would have been, in theory, not profitable: it would have been possible just to lend the money rather than buy slaves and earn a superior return. This, of course, brings up the question of the permissibility of interest-taking in Islam and the practical implications of the religious ban on usury on commercial operations in nineteenth century Senegal. It is certainly true that traders in Senegal were aware of the prohibition and, at least when asked by the Commission of Inquiry, thought it binding: several declared that they would never make any use of the deposit facilities of the proposed Bank of Senegal, which was to be established with a fifth of the capital of the emancipation compensation paid to slaveholders. Samba Agui,

²³⁶ Rondot, 'Fabrication des pagnes', 20.

for example, a trader who had already emancipated several slaves and sent them to Islamic teachers to be instructed in the faith, said of the Bank that ‘Muslim law prohibits usury as a crime. To our eyes, as well as those of all believers, whether free or enslaved, the interest paid by a savings bank would constitute usury and we unanimously say that we will never deposit our money there.’²³⁷ On the other hand, there is a great deal of evidence for credit relations in Senegal, as we saw above, and it is hard to believe that all such relations could have been contracted at zero interest; moreover nothing in Maliki jurisprudence forbade investing in profitable companies like the *Compagnie du Galam*, as we saw above.

TABLE 12: Internal rate of return for purchases of slaves at various ages, 1838.

Age:	20	25	30	35	40
Carpenter	119%	106%	100%	99%	103%
Blacksmith	87%	77%	73%	72%	76%
Boathand	100%	88%	83%	82%	86%
Mason	148%	131%	123%	122%	128%
Labourer	7%	4%	1%	0%	0%
Joiner	131%	116%	109%	108%	113%
Weaver	121%	107%	101%	100%	105%
Female slave*	16%	14%	13%	13%	15%

Source: author’s calculations, see text. Notes: It is assumed slaves are rented out, except for weavers and female slaves, and that hired slaves keep half of their wage.

What stands out in TABLE 12 is the fact that the market for skilled slaves appears, if our assumptions are granted, to have been drastically undercapitalised—that is to say, prices did not reflect expected earnings— while the market for unskilled labourers was probably slightly overcapitalised. Consider a slaveowner who buys a 25-year-old carpenter in 1838, exploits his labour for a year, and then sells the carpenter one year later. The slaveowner would have to pay 804 francs for the

²³⁷ Testimony of Samba Agui to the Commission of Inquiry, AOM SEN/XIII

carpenter, as well as 150 francs, we assume, for his food, clothing and lodgings, for a total of 954 francs outlay. When the slaveowner sold the slave at the end of the year, he could expect to earn 812 francs, leaving a deficit of 142 francs to make good with the product of the slave's work. At the prevailing wage rate for a carpenter—4.4 francs, the master's half of which would be 2.2 francs—the carpenter would have to work 65 days in order for the master to recoup his investment: about one day a week. If our other assumptions are reasonably accurate, then this implies either that there was very little work for skilled labourers in colonial Senegal (in which case it seems odd that the skill premium was so high) or that slaves were, relatively speaking, undervalued relative to their output.

Why were the labour services of enslaved artisans not fully capitalised into their prices? If the labour market were fully functioning, we would expect several mechanisms to eliminate this source of profits: the existence of supernormal profits ought to have led to new entry into the market. People would buy more slaves and have them trained as artisans until the marginal cost of training a new artisan was equal to the additional revenue.²³⁸ Free Africans could migrate to the city to take up a craft, and drive the wage for their industry downwards. If it is true that African skilled labourers worked only a fraction of the year, the owners of skilled labour services (either free labourers themselves or the owners of skilled slaves) ought to have bid the price of skilled labour down. One possible answer is that the sale of skilled slaves may have taken place when slaveowners had a high need for liquidity, such as when a debt was due, and were willing to accept much lower prices than a 'fair' valuation might suggest. There is some evidence for this hypothesis in the slave

²³⁸ The introduction of new slaves to insular Senegal was at this time forbidden. The institution that replaced slavery, the *engagement à temps*, was for all practical purposes a continuation of it, and a large number of Africans were coerced into service in Saint Louis and, to a somewhat lesser extent, Gorée.

price dataset presented in Chapter 1: 20.3% of all slaves in the dataset were skilled, but only accounted for only 7.7% of slaves who were sold.

THE INVESTMENT STRATEGIES OF SLAVEOWNERS AND THE CONSTRUCTION OF INEQUALITY

Slaveowners on Gorée and Saint Louis were drawn into a dynamic Atlantic economy by the possibilities of consumption and their ability to mobilise labour, skilled and unskilled, in the production of goods and services. Naturally, a free person's ability to mobilise labour was determined by the number and kind of slaves she owned—that is to say, by her wealth—and her wealth was determined by how successfully she could mobilise labour to produce profitably for the market, thereby increasing her ability to acquire more slaves. Measuring wealth by the predicted price of slaves owned by a single slaveowner, we can make an initial estimate of slave wealth in Gorée on the eve of abolition, drawing on a census of slaves and their owners drawn up in 1848 and preserved—though not particularly well preserved—in the Senegalese national archives. I have digitised this census and combined it with my estimates of slave prices from regression model 4 in Chapter 1, to produce estimates of slave wealth by slaveowner. Unfortunately, it is often difficult, sometimes impossible, to extract the names of slaveowners from the lists, due to the fact that the edges of the documents are in an advanced state of decay. I do not therefore attempt to use the names of individual slaveholders to relate individual slave holdings to the broader social history of Gorée, though piecing together identities of the slaveowners would be a useful extension of the present

study.²³⁹ This could draw on the extensive literature that exists on the political life of urban Senegal before and after abolition.²⁴⁰

Slave wealth was unequally shared on Gorée. Indeed, the slave lists indicate only 147 slaveowners. This is probably an underestimate; ‘small-time’ slaveowners may not have been canvassed by the census. But this would tend to bias our estimates of wealth inequality downward anyway. The Gini coefficient of inequality for wealth-in-slaves is 0.57, a very high number. The ‘poorest’ slaveowners on Gorée owned only one girl each, worth only around 270 francs at prevailing market prices. The richest slaveowner on Gorée, meanwhile, owned slaves worth 64,410 francs if evaluated at market prices. Assuming a 12% average return on investment, this fortune would have yielded an annual income of nearly 8,000 francs. The bottom 10% of slaveowners would have earned at most the equivalent of around 100 francs from the work of their slaves each year; the top 10% of slaveowners would have earned at least 2000 francs. In other words, owning a single slave would not have been sufficient to produce an income upon which a slaveowner might comfortably live. But owning—as some did—over 100 slaves would have produced an annual income that allowed for extravagance. An income of 8,000 francs a year would have made one rich, though not obscenely so, in Paris (in Balzac’s *Le père Goriot*, written in 1835, the eponymous bourgeois pasta-maker tempts Rastignac with his daughter’s 36,000 francs a year²⁴¹) but in insular Senegal, it was an enormous sum.

²³⁹ Slave censuses from ANS K 9 and ANS K 10, drawn up in order to plan the compensation of slaveowners after abolition. Due to the format of the lists, the name of the owner of slaves was listed on the top of the paper, which has often crumbled due to the conditions in which the documents have been preserved. The often illegible handwriting was also a problem. Though a similar census was probably undertaken on Saint Louis, no trace survives in the archives in Dakar.

²⁴⁰ The outstanding reference on this topic is Hilary Jones, *The Métis of Senegal : Urban Life and Politics in French West Africa* (Bloomington, MN: Indiana University Press, 2013), but see also Chapter 2 in Klein, *Slavery and Colonial Rule*.

²⁴¹ Honoré de Balzac, *Le père Goriot* (Paris: Wahlen, 1835), 210.

From the composition of slaveowners' 'portfolios', it seems clear that wealthier slaveowners owned comparatively fewer slave children—and this holds even when we measure wealth in slaves by the raw number of slaves owned.²⁴² This suggests that the premium paid for enslaved women of childbearing age, which might be interpreted as the price a slaveowner paid for 'reproducing' the stock of human capital, resulted from demand at the bottom end of the market. Poorer slaveowners may have acquired more children due to their lower prices, while wealthier slaveowners, who could more easily procure new supplies from the mainland, preferred the more profitable investment opportunities presented by adult slave acquisition. Wealthier slaveowners also seemed to own comparatively more slaves with market-oriented positions, working in the construction, trade or textiles sector instead of the domestic sector, though it is possible that some of the—especially female—slaves I have classified as working in the 'domestic' sector were in fact producing for the market, for example by pounding millet for sale. Wealthier slaveowners were also much more likely to be more diversified in terms of the occupations of their slaves. Dividing slave occupations into sectors (construction, textiles, trade, domestic and miscellaneous) and calculating the Hirschman–Herfindahl index²⁴³ of concentration for each slaveowner, I find a strong statistical relationship between diversification and wealth; unsurprisingly, since it would have been impossible for those who owned only one or two slaves to diversify into all sectors. Nonetheless, some households did appear to specialise. One slaveowner, for example owned 21 slaves, of which 9 were adult men; of these, two-thirds were weavers; one of his female slaves was also listed as a dressmaker, which suggests a

²⁴² Some of the correlation between the wealth measured in francs and the proportion of slaves under the age of 16 results mechanically from the fact that the price offered for enslaved children was lower than that of adults (see Chapter 1).

²⁴³ Albert O. Hirschman, *National Power and the Structure of Foreign Trade* (Berkeley: University of California Press, 1945), 157–61.

household heavily specialised in textile production. In another household, four of five adult male slaves worked in the construction sector, as masons or carpenters.

That wealthy slaveowners diversified their slave ownership is one piece of evidence in favour of the idea that the urban Senegalese economy in the middle of the nineteenth century was characterised by risk. In a bad gum-trading season, for example, the rate of return on a slave with specialist knowledge of the trade might be low, while slaves who spent their time weaving could still be expected to earn a reasonable profit for their masters. Diversifying across sectors was one way of mitigating risk, and potentially maximising expected profits. We can therefore tentatively characterise the Senegalese urban slave system as an extremely unequal one—in the obvious sense that the majority of workers were enslaved, and additionally in that wealth in slaves was highly unequally spread over slave-owning households. There were many households with only a few slaves, who were more likely to be engaged in domestic work than market-oriented work, but a number of large slave-owning households that were much more market-oriented, and diversified across the different sectors of the Senegalese economy. The stark inequalities generated by this system would likely have endured after abolition in 1848, too, since slaveowners were compensated for their losses (around 400 francs per slaves). Moreover, wealthy slaveowners could have easily purchased other capital goods, particularly boats and houses, which would have allowed them to continue to accumulate wealth after the end of slavery.²⁴⁴ Conversely, emancipation almost certainly was more catastrophic for less wealthy slaveowners, who could not have purchased real estate or other scarce capital goods, or financed trading voyages, with the small amount offered by the French government per liberated

²⁴⁴ This is notably the thesis of Mohamed Mbodj, ‘The Abolition of Slavery in Senegal, 1820-1890: Crisis or the Rise of a New Entrepreneurial Class?’ in Martin Klein (ed.) *Breaking the Chains: Slavery, Bondage, and Emancipation in Modern Africa and Asia* (1993): 197-211.

slaves. Finally, liberated slaves themselves almost never had any capital, and certainly not in the quantities necessary to launch themselves into the most lucrative sector of the economy, the import-export trade: as we saw above, financing a gum-trading expedition would have required considerable capital, probably well outside the realm of possibility even for a skilled slave saving all of his or her income above the level required for subsistence. The inequality of the colonial slave-based economy was therefore destined to outlive the system that produced it. The afterlife of Senegalese urban slavery is a topic left for future research, though the results from this chapter suggest strongly that enduring inequalities were created by its functioning.

URBAN SLAVERY AND AGRICULTURAL PRODUCTIVITY

One of the more perplexing questions about the slave labour system in Senegal was why it was necessary if, as some recent scholarship has emphasised, the productivity of labour and land in agriculture was low in Senegal in the nineteenth century. If the marginal gains to cultivation were as poor as this scholarship suggests, then procuring a ready supply of urban wage labour ought to have been relatively easy without the need for slavery: farmers would have been very willing to migrate to Gorée and Saint Louis and earn incomes that were unattainable in the countryside.

Yet there is no evidence that either town was ever flooded by low-wage migrant labourers in the pre-1848 period; indeed, one of the most pressing concerns for the owners of slaves in the Commission of Inquiry was that labour would, in a post-emancipation world, be too dear to purchase. There are, of course, non-economic reasons why this would be the case: the towns were under French jurisdiction, and there may have been a very legitimate fear on the part of a free migrant that he or she may have been enslaved; while the French would have deplored any large-scale

migration to their saturated towns. Land was also extremely scarce on both islands, and housing costs were therefore likely to be extremely high, meaning that higher nominal wages were probably counteracted by a significantly higher cost of living than in the hinterlands of Waalo and Kajoor or the Cap-Vert peninsular. Though the institution of slavery in continental Senegal no doubt limited the mobility of some agricultural labour, slaveowners could (and did) react to differential slave prices by selling slaves to the French colony when this was socially sanctioned. As the previous section has highlighted, relatively unskilled labour in the gum trade was reasonably well compensated, and if there had been ample supplies of low-wage labour due to low labour productivity in agriculture it ought to have been possible to procure sailors for the boats by offering modest wages.

Recently, Rönnback and Theodoridis have examined data from a well-known experiment in colonial agriculture: the two attempts to establish export-oriented agricultural plantations on the banks of the Senegal River in the nineteenth century.²⁴⁵ Their study is an ingenious use of archival material to provide answers to a question that has long vexed historians: why did Europeans ship African slaves across the Atlantic, rather than simply put them to work on plantations within Africa? They test what has become known as the ‘Fenoaltea thesis’, according to which the answer lies in the relative productivity of labour in agriculture in Africa and the New World.²⁴⁶ Rönnback and Theodoridis’s paper appears to confirm what is already known about non-volcanic tropical soils: they tend to be relatively infertile, and are quickly exhausted, lending themselves to land-extensive cultivation techniques with relatively low yields per unit of land.²⁴⁷ Perhaps more

²⁴⁵ Rönnbäck and Theodoridis, “African Agricultural Productivity.”

²⁴⁶ Stefano Fenoaltea, “Europe in the African Mirror: The Slave Trade and the Rise of Feudalism,” *Rivista Di Storia Economica* 15, no. 2 (1999): 123–66.

²⁴⁷ Rogier van den Brink, Daniel W. Bromley, and Jeffrey A. Cochrane, “Property Rights and Productivity in Africa: Is There a Connection?,” *Development Southern Africa* 11, no. 2 (1994): 177–82.

interestingly, they also show that *labour* was relatively unproductive in agriculture, at least in comparison to African and African-descended slaves in the New World.

Some simple calculations can show that labour was apparently spectacularly unproductive even when compared to urban labour in Saint Louis and Gorée. If we combine the estimates of physical productivity in indigo (1.9 kg/worker/year) with the average price of indigo in the period (12.5 francs per kilo), we obtain an annual *gross* average revenue productivity of labour in indigo production of 23.75 francs per person per year. At an average pay of 0.6 francs per day in Saint Louis, it would take 40 days to earn this amount working in an unskilled urban job. Though we have much less information about the *time* spent in production on the indigo plantations per worker, if we take the information from a set of ‘sample’ accounts for an up-river plantation found in French archives, we know that about 2841 days were worked in total, including a gardener and a *surveillant*, with the highest number of workers for any one task being 50 for weeding.²⁴⁸ If we assume that the plantation therefore employed these 50 workers all year round, the *lowest* possible estimate for any one individual’s labour input (and hence most favourable to the estimates of agricultural productivity) would be 56 days a year.²⁴⁹ The conclusion is simple: even making the most favourable possible assumptions (favourable, that is, to agriculture), the average product of labour on the land per day could not have

²⁴⁸ ‘Aperçu approuvé de quelques faits des dépenses et produits d’une indigoterie de 150 arpens (63 hectares) exploitée au Sénégal sur une concession de 300 arpens située dans le haut Walo’, AOM SEN XIII/20a.

²⁴⁹ It is worth pointing out that the notion of ‘labour productivity’ in an essentially seasonal sector like tropical agriculture should, if it is to be used as the basis of comparisons to other sectors or other parts of the world, be calculated using the finest possible level of temporal detail in the denominator: ideally, we would like to know output per hour worked. Rönnebeck and Theodoridis give simple annual averages. Relevant though these undoubtedly are for a slaveowner who is uninterested in slave leisure time and is deciding whether or not to keep his or her slaves in Africa to cultivate cotton or to sell them to an owner in the New World, caution should be used in interpreting them as a measure of ‘pure’ agricultural labour productivity. Elsewhere, I have attempted to measure sectoral labour productivity gaps in Northern Nigeria by taking the short agricultural working year explicitly into account.

been as high as in unskilled work in Saint-Louis. Recall that the cost of feeding a single male in Saint-Louis was at least 100 francs a year. If the revenue productivity of labour in indigo was representative, then the Senegal River Valley would seem to have been in a state of constant famine even if millet was half or even a third the price elsewhere as in Saint-Louis. And yet we know that Saint-Louis itself depended on millet surpluses from the Fuuta Toro in particular. Why, if agricultural productivity was so low, were the towns not flooded with migrants? Why did the Saint Louisian bourgeois traders fear the end of slavery and a drain of labour to the countryside, when they were in a position to offer much higher wages than a peasant farmer could earn on the land? Perhaps our estimates of productivity are low—or, even if they do reflect actual physical productivity, they do not give a complete picture of the option set available to Senegalese farmers, since they do not give us information about crops more suited to Senegalese conditions.

Rönnback and Theodoridis themselves make several important qualifications to their analysis, mostly with respect to the representativeness of their data. They note for example that the plantations were not managed by people with extensive agricultural experience; nor, indeed by people who necessarily had a good understanding of local conditions.²⁵⁰ They also suggest that the short time period under study may not be representative of the broad sweep of ‘precolonial’ Senegalese history. Here I re-emphasise these reservations, adding details that help to contextualise the Senegal River plantations, and add several more, with respect

²⁵⁰ This qualification deserves some amplification. Rönnback and Theodoridis’s characterisation of the planters as either European or African does not really reflect social reality in 19th century insular Senegal: the planters, who were all basically wealthy—the government required capital of at least 5,000 francs to claim a concession—were overwhelmingly *métis*, that is, the product of mixed marriages, ‘à la mode du pays’, between French sailors and African women. That some had French names and others traditional Senegambian names reflects less their national origins, as Rönnback and Theodoridis suggest, and more a distinction between those who had been baptised Catholic and those who were Muslim. Indeed it is noteworthy that the planter with the highest productivity in one of their samples, François Pellegrin, was in fact *métis* and Catholic, not ‘French’.

both to the representativeness of the data and to its probable quality. The scale and scope of subsidies offered by the colonial administration likely produced a political economy in which certain decisions were likely to have been poorly made and certain statistics likely to have been poorly or even fraudulently reported. Moreover, an implied doubling in agricultural productivity was very unlikely to have taken place over the course of the century or so since the Senegal River plantations, and that Rönneck and Theodoridis's central estimates (39 lbs of cotton per worker per year, and 22 lbs per acre per year, and 2.1 lbs of indigo per acre per year in the 1820s; 2.1 bushels of millet per acre per year in the 1840s) are almost certainly too low to be representative of 'pure' productivity, even if the data are a perfectly accurate reflection of European experiences of farming on the banks of the Senegal.

The first and general reason we might have for doubting very low productivity in agriculture is the existence of the agricultural surpluses required to feed the towns of Gorée and Saint Louis—not just permanent residents, of whom there were several thousand who had no means other than the market to satisfy their hunger, but also, during the period of the Atlantic slave trade, the captives being held there, often for months, before they were loaded on the ships that took them to the New World.²⁵¹ In 1837, it was estimated that over 9,000 tonnes of millet, over 300 tonnes of meat and 100 tonnes of dried fish were imported into Gorée and Saint Louis to feed the local population.²⁵² Agricultural surpluses for the towns were usually sourced in small part from Galam, but mostly from the kingdom of Kajoor, a coastal polity that stretched from Saint Louis all the way down to the northern Cap Vert

²⁵¹ Curtin argues that trade in foodstuffs was widespread in precolonial Senegambia, and though some of this was trade to balance surplus and deficit grain-producing areas, the existence of permanent towns implies something less pessimistic about productivity in agriculture. Curtin, *Economic Change in Precolonial Africa*, 197.

²⁵² *Notices statistiques*, 271. Smaller amounts of rice, *aloo*, vegetables, tamarind, beraf and groundnuts were also imported.

peninsular.²⁵³ Crucially, Oumar Kane argues that the kingdom of Waalo, which occupied the saline banks of the lower Senegal, also imported grain from Kajoor in exchange for river salt,²⁵⁴ a fact which suggests that the areas chosen for European plantations were not likely to be especially productive.

A second, more specific reason for questioning the assertion of low agricultural productivity is that the averages offered by Rönnebeck and Theodoridis are so far below estimates I have made, summarised in Table 12, of physical productivity in the Senegal River valley in the 1930s and 1950s, for Senegal as a whole in the 1960s, and for a 'savanna' economy in conditions that probably resembled the precolonial Senegal River valley (the Sokoto River valley in early colonial Northern Nigeria²⁵⁵ that the implied growth rates between the nineteenth and twentieth centuries are implausible. While it is certainly possible that there had been substantial productivity growth over the course of a century, it would have been achieved in the face of a largely stagnant agricultural technology, at least in indigo and staples, and no real amelioration in climatic conditions. To put the matter another way, the land productivity estimate, if representative, implies that it would have required 1.5 million hectares of millet planted simply to feed the population of Senegal in 1850

²⁵³ Searing, *West African Slavery*, 162.

²⁵⁴ Oumar Kane, *La première hégémonie peule: le Fuuta Tоро de Koli Tenella à Almaami Abdul* (Karthala Editions, 2004), 318. This point is also made by François Manchuelle, *Willing Migrants: Soninke Labor Diasporas*. Athens: University of Ohio Press, 71.

²⁵⁵ Average annual rainfall in Sokoto is today considerably higher than for the more northern Senegal River valley, but as Webb points out, the widespread cultivation of maize in the seventeenth and eighteenth centuries in the latter valley suggests that rainfall must have been on average at least 600ml a year, roughly what the Sokoto catchment received in the twentieth century James L. A. Webb, *Desert Frontier: Ecological and Economic Change Along the Western Sahel, 1600-1850* (Madison: University of Wisconsin Press, 1995), 8. As an aside, it is worth noting that Webb's argument that the zone in which maize was cultivated had shrunk over time casts some on the recent use of FAO-GAEZ maize suitability indices to proxy for historical maize cultivation in precolonial sub-Saharan Africa: Jevan Cherniwchan and Juan Moreno-Cruz, 'Maize and Precolonial Africa', *Journal of Development Economics* 136 (2019): 137–50. It also casts some doubt on the applicability of Rönnebeck and Theodoridis's data on the Fenoaltea thesis, since earlier slave shipments from Senegambia occurred at a time at which productivity in the Senegal River valley may have been much higher due to more favourable climatic conditions.

at a barebones subsistence level of consumption.²⁵⁶ In 1961, the total cropped area of Senegal was around 2.1 million hectares—of which half was in millet and the other half in groundnuts—for a population three times as large as in 1850. Even if we take into account the decline in millet production owing to imports of Indochinese broken rice (itself due to a switch out of subsistence crops to groundnuts), this massive decline in the per capita area cultivated seems dubious. A single man in the 1840s would have to cultivate 1.6 hectares of millet simply to meet his barebones subsistence requirements of the crop. If he had a family consisting of a wife and two children, he and his family would, conservatively, need to cultivate nearly 5 hectares. Yet by 1960, the average area cropped per adult was 1.07 hectares, and the average size of a farm was 3.37 hectares; this after a groundnut boom that brought large amounts of previously uncultivated land into production.²⁵⁷

We can compare their estimates also to other assessments made during the colonial period. One highly relevant comparison comes from a family budget gathered in 1937-8 by a local official as part of the Commission Guernut, a major effort of the French *Front populaire* government to gather information about living standards in their colonial empire. The budget is for a family living in the Gorgol district of colonial Mauritania, which lies on the northern banks of the Senegal River. It estimates that a hectare of millet would yield 375kg of millet a year, compared to Rönneback and Theodoridis's central estimate of 141kg a year. If both estimates were indeed representative of the productivity of land, it would suggest that the single-

²⁵⁶ Calculated from population figures given in Ewout Frankema and Morten Jerven, "Writing History Backwards or Sideways: Towards a Consensus on African Population, 1850-2010: African Population, 1850-2010," *The Economic History Review* 67, no. 4 (2014): 907-31. Subsistence millet requirements from Frankema and van Waijenburg, "Structural Impediments."

²⁵⁷ Figures from Moussa Sall, « Les exploitations agricoles familiales face aux risques agricoles et climatiques: stratégies développées et assurances agricoles » (PhD thesis, Université Toulouse le Mirail - Toulouse II, 2015), 24.

factor productivity of land had increased 165% in about 90 years, an annualised rate of 1.02%. By way of comparison, millet yields in Senegal as a whole increased 86% from the presumed average in the 1930s to 2017, an annualised rate of only 0.77%, according to FAOStat data,²⁵⁸ and this is almost certainly an overestimate of productivity growth, since the 1930s figure comes from southern Mauritania, where ecological conditions are much less favourable than in the typical hectare under cultivation in Senegal as a whole. Similarly, a 1957 inquiry into the middle valley of the Senegal—ruled, in the early nineteenth century, by the jihadist Imamate of Fouta Toro, which repulsed French attempts at agricultural colonisation—estimated millet yields at the equivalent of 5.7 bushels/acre in grain, though this was partly due to the devastating impact of locusts: yields on only those fields that had not been attacked by locusts were much higher, at 15.54 bushels per acre. A similarly high figure is given for the Upper Senegal in 1938 by Adrian Adams on the basis of extensive interviews.²⁵⁹

The 1840s estimates for cotton (72 lbs/acre of ginned cotton) seem more in line with Northern Nigerian yields in the early twentieth century—estimated in district re-assessment reports and digitised by the British Endangered Archives Project—though the 1820s estimates are extremely low. However, the Northern Nigerian estimates are for traditional methods of cultivation, and are therefore unlikely to be representative of more dedicated attempts at cotton cultivation: the Empire Cotton Growing Committee estimated an average outturn of about 80 lbs of ginned cotton per acre in Northern Nigeria, though this was partly due to low lint-to-seed ratio of native varieties of cotton, which yielded only 27% lint from a pound of seed cotton compared to 30-32% for exotic varieties.²⁶⁰

²⁵⁸ FAOStat, Annual national yield.

²⁵⁹ Cited in Manchuelle, *Willing Migrants*, 182.

²⁶⁰ Empire Cotton Growing Committee, 'Report to the Board of Trade of the Empire Cotton Growing Committee', House of Commons Sessional Papers, Cmd 523, p.50.

TABLE 13: Yields of various crops in Senegal & southern Mauritania.

Context	Millet (bshl/acre)	Cotton (lb/acre)	Indigo (lb/acre)	Notes
Dogondaji, Northern Nigera, 1913	7.0–8.2	54.5*		Plantation level, weighted (by acre) average. Drought year. British Library EAP535/3/7/5/4.
Kura, Northern Nigeria, 1929	10 (threshed)	60*	640	District level. British Library, EAP087/3/12.
Gorgol, Mauritania, 1938	6			Typical family
Upper Senegal River valley, 1938	16			Adrian Adams, cited in Manchuelle, <i>Willing Migrants</i> , 182.
Senegal River valley, 1957	5.7-15.54			Lower estimate includes destroyed fields
Senegal, 1822- 1843	2.1	22-76	204	Rönnback and Theodiridis

Notes: Cotton seed to lint ratios were assumed on the basis of estimates from the Empire Cotton Growing Committee. Rönnback and Theodiridis' estimate of indigo productivity has been replaced by estimates from the same primary source for raw indigo leaves rather than processed dye cakes. Source: see main text.

If the implied growth rates of productivity seem implausible, then what accounts for the low yields documented in the primary sources? Even if we take the statistics at face value, we ought also to acknowledge some of the factors that may have reduced yields without necessarily implying anything about the inherent productivity of Senegalese land or labour. The most obvious of these is the war the French fought, on and off, with the Trârza Emirate, for which the apple of discord

was the status of France's ally and client state, Waalo; the Senegal River plantations were a prime target for Trârza *razzias* during the conflict.²⁶¹ Because the Trârza could effectively end the trade in gum arabic, Senegal's most lucrative export, the French eventually agreed to their claims of sovereignty over Waalo. Equally destructive, from the point of view of the planters, were the guerrilla actions of displaced farmers, who—deprived of both their land and of a share in the compensation paid by the French to their ruler, the *brak* of Waalo—destroyed irrigation infrastructure, leading to the flooding of the colonial plantations.²⁶² This seems to have been the reason for the catastrophic failure of the indigo crop on one plantation in 1827, when African farmers down-river destroyed the plantation's levees in order that their grain crops not be deprived of floodwaters.²⁶³

However, there is at least one good reason for doubting the accuracy of the data itself, one that requires a more detailed understanding of the political economy of colonial agriculture in Senegal at the time. The plantations that popped up all of a sudden along the banks of the Senegal River were not the result of a miraculous efflorescence of entrepreneurialism among the Saint Louisian elite, nor even a market response to a change in world demand and commodity prices; they were the result of a deliberate and fiscally well-lubricated government policy.²⁶⁴

²⁶¹ Muhammed al Muhta As-Sa'd, 'Émirats et espace émiral maure. Le cas du Trârza aux XVIIIe-XIXe siècles', *Revue des mondes musulmans et de la Méditerranée* 54, no. 1 (1989): 53–82.

²⁶² Boubacar Barry, *Le royaume du Waalo: Le Sénégal avant la conquête* (Maspero, 1972), 250–52.

²⁶³ 'Rapport à Monsieur le Gouverneur sur le recensement des cultures du Sénégal, année agricole 1827', AOM SEN XIII/20a.

²⁶⁴ In this sense the Senegal River plantations can be seen as analogous to other colonial agricultural projects in the nineteenth century: see the case studies in Robin Law, Suzanne Schwarz, and Silke Strickrodt, *Commercial Agriculture, the Slave Trade and Slavery in Atlantic Africa* (Boydell & Brewer Ltd, 2013), particularly Robin Law on English and Dutch plantation attempts on the Gold Coast, pp. 116–138, Per Hernaes on Danish agricultural enterprises on the Gold Coast, pp. 158–180, and Gareth Austin's more general discussion of the connection between commercial agriculture and slave supply and demand in West Africa, pp. 243–266.

In order to develop productive capacity on the mainland in Senegal, the colonial government put in place an extraordinarily generous scheme of subsidies that amounted to 'deindustrial' policy, in the sense that it aimed to change the structure of the colonial Senegalese economy away from an exclusive focus on the urban import-export sector (and the economic activities connected to it by forward or backward linkages, such as boatbuilding) towards agriculture. This would involve both a diversion of (slave) labour and capital away from the trade and artisanal industry in the towns to the new plantations. Though the specific subsidies offered by the French administration changed over the course of the policy, the incentives listed in a decree for the year 1826-7 give something of a flavour: 30 francs would be paid per hectare of cotton planted; 60 would be paid for a hectare that had been tilled, and 200 francs would be paid for a hectare that had been completely cleared, tilled and irrigated. In addition, advances were available for the purchase of capital goods, and food was made available for workers.²⁶⁵ At other times, the government offered money for each worker employed, and even subsidised the purchase of rice and millet to keep them fed.

Already, it is easy to imagine the kinds of distortions which such subsidies would entail, especially if the conditions (about the minimum number of plants per hectare, and about the quality of plantings necessary to qualify a planter for subsidies) were ignored by hurried, indifferent or partial inspectors. If payments were made based on the number of hectares planted, land-extensive methods would have been preferred to intensive cultivation; similar subsidies for labour or capital would result in labour or capital-intensive methods being preferred. In addition, land that would not have been brought under cultivation in an unsubsidised

²⁶⁵ 'Règlement sur les Primes, les Encouragemens et les secours qui seront accordés aux cultures en 1826 dans la colonie du Sénégal', *Annales maritimes et coloniales*, vol 11, Paris, Imprimerie Royale, 1826, 621-22.

equilibrium because the costs exceeded the revenues would have been brought under cultivation in the subsidised equilibrium, biasing ‘fair’ physical productivity estimates downward.²⁶⁶ This is reason enough to doubt the relevance of the measures of physical productivity.

But the problem posed by the subsidy régime reaches deeper still: subsidies may not only distort production decisions, which in theory could be measured with input and output statistics if there were sufficient variation in subsidy eligibility. They may also distort the reporting of the input and output statistics themselves. There is ample evidence that this kind of statistical abuse may have occurred, even that it was rampant. Boüet-Willaumez, governor of Senegal in the 1840s, alluded to “more than one lack of good faith during the agricultural experiment”; Jules Duval, the ardent French colonial thinker, explicitly blamed the ‘scandalous fraud’ perpetrated by planters for the end of subsidies.²⁶⁷ A decree on the implementation of export-based subsidies for the 1828-29 season explicitly stated that such subsidies were to be preferred because they were less likely to be ‘abused’.²⁶⁸ The Afro-European writer Boilat was more explicit: ‘Considerable subsidies were accorded to the main colonists, who had cotton bushes and indigo plants in their gardens and cut off their branches to place them in the vast fields; the inspectors therefore awarded them subsidies, but the very next day these rootless twigs would have been entirely dried

²⁶⁶ Imagine that there are three possible hectares to cultivate with indigo—a, b and c—with revenue productivities of 20, 10 and 5 francs per hectare respectively, and a fixed cost of cultivation of 9 francs per hectare. Without subsidies, a and b will be cultivated and c left fallow. With a per-hectare subsidy of 5 francs, all three hectares become profitable. If we assume that indigo is 1 franc per kilogram, this means that measured physical land productivity will decline from 15 kg/hectare to 11.67 kg/hectare.

²⁶⁷ Édouard Bouët-Willaumez, *Commerce et traite des noirs aux côtes occidentales d’Afrique* (Imprimerie royale, 1848), 5; Jules Duval, *Les Colonies et la Politique Coloniale de la France... Avec deux cartes du Sénégal et de Madagascar, dressées par MVA Malte-Brun* (Bertrand, 1864), 118.

²⁶⁸ Decree by Governor Jubelin, Saint Louis, 11 June 1828. AOM SEN XIII/20a.

out by the sun'.²⁶⁹ The most detailed description of the alleged fraud is given by Anne Raffenel:

In order to kickstart the plantations, the government awarded a subsidy for each cotton bush. If it were only honourable men who took up this offer, no doubt it would have met with full success; but among the new colonists, the largest number saw only in the sacrifices of France to build a better future for its colony of Senegal, only a chance to make profits for themselves without running any risk. The distribution of the subsidies required a census that was undertaken by officials, who undertook this task without impartial rigour, that the government seemed to discourage...And how was this courtesy repaid? With fraud, by odious deceit: before the night of the inspection, branches cut from cotton bushes were stuck into the ground, and the trusting inspectors believed them to be healthy bushes. Aside from this infamous trickery, the thirst for lucre gave rise to other outrages: cotton plants were piled up without discernment, to give the illusion that there were more plants; a similar motive led to them being planted in badly chosen sites. Fake names were placed on the list of workers, and wages were falsely paid on this basis, while profits were also made on the sums allocated for the food of black workers on the plantations.²⁷⁰

In practical terms, this means we ought to consider the impacts of the subsidies on the reporting of the data itself. Subsidies based on inputs, like land or labour, not only encourage an inefficiently intensive use of these inputs; they also encourage an overreporting of them. In this instance, both the hectare-based payments for cotton and the subsidies for wages would have had the impact of underestimating labour and land productivity. Of course, output-based subsidies (and, later, export-based

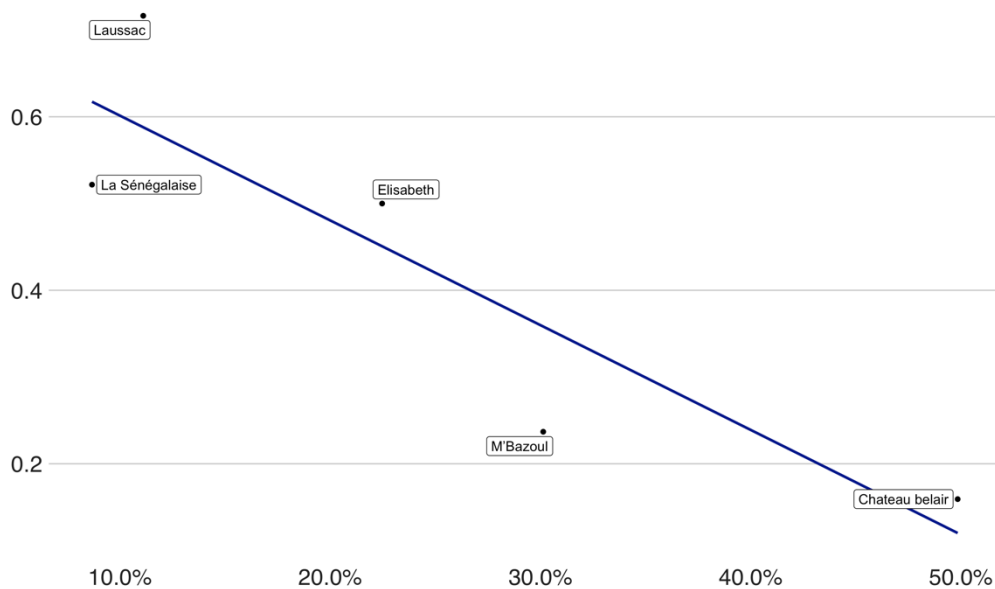
²⁶⁹ David Boilat, *Esquisses sénégalaises* (P. Bertrand, 1853), 342.

²⁷⁰ Anne Raffenel, *Nouveau voyage dans le pays des nègres : suivi d'études sur la colonie du Sénégal et de documents historiques, géographiques et scientifiques*, vol. 1 (BnF collection ebooks, 2016), 63–64.

subsidies) may have had exactly the reverse tendency, but not necessarily in the same proportions, especially if output was easier to monitor than inputs, which it almost certainly was for cotton and indigo exports. Rigorous quantitative tests of these possibilities are more or less impossible with the available sources. But some suggestive evidence from a sample of indigo farms in 1829 is presented in Figure 6. Though the sample size is extremely small (only five plantations reported both government and private spending), it suggests a negative relationship between the proportion of plantation-level spending financed by the government and the per-hectare yields. This is suggestive of at least some kind of correlation between exposure to the government subsidy regime and reported productivity, though it is difficult to test different hypotheses with the scant data.

FIGURE 6: Correlation between indigo yields and government subsidies, 1829.

Land productivity and subsidies



FR ANOM SEN/XIII/39a, 'Tableau synoptique de la culture des indigifères pendant l'année 1829'

Notes: on the horizontal axis is the share of government spending in total plantation spending; on the vertical axis is the average yield of indigo at the plantation (kg/hectare).

Frustratingly, this leaves us in the dark about actual labour and land productivity in Senegal in this period. Rönneck and Theodoridis are almost certainly correct to argue that both were somewhat lower in Senegal than they were in the New World plantations to which slaves were being sent, and almost certainly correct in supposing that the ability of European slaveowners to turn a profit in indigo and cotton production was the greater across the Atlantic, where many of the problems—climatic, geological and political—that beset the Saint Louisian planters were either non-existent or less salient. However it is also probably the case that their Senegalese estimates understate ‘typical’ productivity, for both factors of production, on the mainland.²⁷¹

Consequently, I see no reason to discard a hypothesis that Rönneck and Theodoridis’s data might lead us to reject—that of a continental Senegalese economy characterised by modest agricultural prosperity, and, outside the dry season, no vast ocean of labour producing so little on the land that they could be enticed to work elsewhere by exceedingly low wages. Manchuelle reports an estimate that a Soninke farmer in Upper Senegal might have produced annually a surplus of 200 and 235 kilograms of grain a year.²⁷² This figure is not very large, and does not suggest that fabulous wealth could be procured by grain cultivation, but it does suggest that the Senegal River plantations were not particularly representative of agricultural productivity in nineteenth century Senegambia, even in the arid North. Without further examination of the historical context of the Senegal River plantations that untangles in fine detail the impact of the subsidies and the records left by government inspectors, it may be more accurate to use measured yields from later

²⁷¹ Their estimates for Gambia seem, on the face of it, much less tainted by the problems mentioned here, and can probably be accepted at face value; though they are, of course, much higher than those for the Senegal River.

²⁷² Manchuelle, *Willing Migrants*, 40.

in the colonial period to proxy for early nineteenth-century yields than to rely on the dubious statistics from the period itself.

Let us conclude by looking at the economy of nineteenth century from the point of view of the wealthy elites of Saint-Louis and Gorée. From their point of view, investing in agricultural plantations was probably worth it when extravagant government subsidies were on offer, but hardly likely to be enticing in more austere times. It is noteworthy that the internal rate of return on several kinds of skilled slave (masons and carpenters) are roughly equivalent to the median profit rate on gum trading trips, though the rate of return on unskilled slaves was much lower. Of course, what distinguishes the gum trading trips is that they were inherently seasonal, and tied up capital for only a part of the year. But one could not invest as an owner of slaves for the hire market *seasonally*—that is, a slave had to be fed year-round, regardless of whether they could be hired out. The high estimated rate of return on skilled slaves might therefore reflect the seasonality of *their* work, and a true annual rate, adjusted for hours worked, might show profit rates more closely in line with unskilled labourers. In general, then, the analysis of this chapter shows two things: firstly, that capitalists (for that, in a very real sense, is what slaveowners were) in an ecological and economic environment like early nineteenth century urban Senegal faced risky and seasonally variable returns on their investments. Secondly, the processes that generated wealth in such a context were by their nature likely to generate profound inequalities, both between slaves and their owners and between slaveowners themselves.

*CHAPTER III. Consumption city, staple port:
the role of Dakar in structural change & growth*

The outstanding feature of Senegal in the colonial period was not its wealth—by the middle of the twentieth century, Côte d’Ivoire was richer—but rather its cities. Or perhaps it might be more to the point to say: its city, Dakar. By far the largest conurbation in Afrique occidentale française, Dakar had grown from a small Lebu fishing village in the nineteenth century to an important Atlantic port. But even without this jewel in the crown of French Africa, Senegal could boast of several medium sized cities: Saint-Louis (which served double duty as capital of the colony Senegal proper and the capital of Senegal’s poorer northern neighbour Mauritania), Rufisque, Louga, Thiès, Kaolack, Diourbel, and Ziguinchor, each of which had over 10,000 residents in 1950. By contrast, Côte d’Ivoire had only three such cities: Abidjan, the capital, as well as Bouaké and Gagnoa. Though Dakar, at 229,000 residents, was no match for Ibadan, the largest city of Nigeria in 1950 at nearly half a million residents, it was comparable in scale to Lagos (288,895) and overshadowed Accra (158,196).²⁷³

What really thrust Senegal to centre stage, however, was the size of its cities relative to its population. In 1950 fewer than one in twenty Ivorians lived in an city. One in twelve Ghanaians were urban residents, as were just over one in ten Nigerians. At mid-century, by contrast, one in *five* Senegalese lived in a town or city of more than 10,000 inhabitants. To put it another way, it would take Côte d’Ivoire until 1950 to attain the level of urbanisation that Senegal had reached forty years prior. Another colony in the federation had obtained reasonably important urban populations as early as Senegal: Dahomey, with its large coastal trading ports of Porto-Novo,

²⁷³ Data taken from François Moriconi-Ebrard, Dominique Harre, and Philipp Heinrigs, *Urbanisation Dynamics in West Africa 1950—2010: Africapolis I, 2015 Update* (Paris: OECD Publishing, 2016).

Abomey and Ouidah; but Dahomey's urban population rose slowly, in line with overall population, and by independence Côte d'Ivoire had outstripped it (see Table 14). It is worth pointing out that while Senegal's urbanisation rate was striking, the absolute size of Dakar was not by the standards of the land-abundant tropics. Southeast Asia provides a telling comparison: in 1911, Rangoon, Singapore, Saigon and Manila all had populations above 200,000.²⁷⁴

TABLE 14: Urbanisation rates in colonial French West Africa.

Decade:	1910	1920	1930	1940	1950	1960
Senegal	4%	5%	8.5%	13%	21%	24%
Mauritania					2%	4%
Mali		1.7%	1.6%	1.6%	4%	5%
Niger		2.3%			1%	3%
Upper Volta		0.6%	1%	2%	3%	3%
Côte d'Ivoire	0%	0%			4%	12%
Dahomey	6%	4%	5%	6%	5%	10%
Guinea	0.6%	0.5%	0.5%	1.1%	4%	8%

Sources: 1950-1960 OECD-Sahel and West Africa Club Africapolis database; 1910-1940s calculated from author's agglomeration-level dataset elaborated from published and archival colonial records: AOM 7 AFFECO 49. Note that Upper Volta was part of Côte d'Ivoire from 1932 to 1947; its population in the 1930s has been estimated using a geometric mean of its population in the 1920s and 1940s.

This purpose of this chapter is to draw up a balance sheet for Senegalese urbanisation from the point of view of long-term economic growth. This objective deserves some elaboration, since the growth of cities can be and usually is both the cause and the consequence of larger economic changes. I am here mainly interested in the latter, that is, in urbanisation's implications for structural change, rather than

²⁷⁴ Gregg Huff and Luis Angeles, "Globalization, Industrialization and Urbanization in Pre-World War II Southeast Asia," *Explorations in Economic History* 48, no. 1 (2011): 20-36.

its causes—though a neat separation of the two is rarely possible. A ledger, though, always has two sides. While cities offer the possibility of structural change, they come at a cost. Cities are capital-intensive, and thus costly to build and to maintain. In capital-poor economies, there is an opportunity cost to construction. The rest of the chapter is roughly structured therefore around two central questions: how much structural change was purchased by way of urbanisation, and at what price? After first clarifying some terminology, I give a brief descriptive history of urban growth in Senegal, paying particular attention to the urban structure of the country, its relationship to port structure, and the role of the federal government of *Afrique occidentale française* in determining not just the pace but also the nature of Dakar's growth.

Of course, the urbanisation rate depends crucially on the selection of the appropriate unit of analysis: Singapore, historically, is an extremely urbanised country, but only because since its separation from the rest of Malaysia in 1965 it has had absolutely no rural hinterland. 'Senegal' as the appropriate historical container for Dakar is something of an anachronism: for much of its history, and certainly for its most spectacular growth in the colonial period, Dakar was actually its own federally administered polity, the *circonscription de Dakar et dependences*, administered rather like Canberra, Brasilia or New Delhi. Moreover, on independence, it was intended to serve not just what became the Republic of Senegal but also what is now the Mali Federation. This entity was originally intended to federate all of the former colonies of *Afrique occidentale française*, but, in the event, only gathered two: Senegal and Soudan, the latter of which broke away shortly after to form what is now the Republic of Mali. Nevertheless Dakar was always a recognisably Senegalese city by dint of its population, its languages and its

cultures, and for this reason in calculating urbanisation rates I have considered it as ‘belonging’ to colonial Senegal.

Finally, it is useful to clarify the main concept underlying this chapter. By ‘urbanisation’ I mean the increase in the proportion of the overall population living in urban areas. This is related to but is not identical with the phenomenon of rural-urban migration. Cities can grow in one of two ways (three, if we consider the reclassification of territory as ‘urban’): natural increase of the resident population, and migration, domestic or international. The relative contribution of these two forces has not been constant in Dakar’s history, with the latter dominating in the early twentieth century. Though fertility rates were almost certainly reasonably high in early colonial Dakar, so too were mortality rates, especially infant mortality rates. Including stillbirths, the median age at death in Dakar in 1910-11 was 15. Fully 25% of babies did not live past seven months. Only a quarter of all deaths were of people aged 30 or older. Given that 604 births were registered in 1910, and only half were likely to make it to menarche, the overall death rate (657 deaths) appears to rule out any possibility of Dakar’s population growing through natural increase; indeed, if in-migration had halted, the young city might well have disappeared. This pattern was later reversed, since by the 1980s natural growth accounted for the vast majority—about 3 to 3.6 percentage points—of the overall annual increase in population, which was about 4 per cent. Migration therefore accounted for only 0.4 to 1 percentage points of this growth.²⁷⁵ With only three data points, it is difficult to make precise estimates of the relative contribution over time; however, by pooling the 1910-12 dataset with microdata from the 1988 and 2002 censuses, and considering only the dates of birth of each observed Dakar resident, we can make a rough guess. Using dates of birth as a proxy for observing the migrant-local split at

²⁷⁵ Philippe Antoine and Gora Mboup, “Senegal,” in *Urbanization in Africa: A Handbook*, ed. J. D. Tarver and T. J. Goliber (London: Greenwood Press, 1994).

each point in time requires making the (substantial) assumption that the life expectancies for local residents, compared to migrants from rural Senegal, was exactly equal, an assumption that is probably false, though probably not so false as to overturn the general pattern we observe in Figure 7, which shows a more or less steady decline in the contribution of rural-urban migration in Dakar's overall growth since the 1930s.

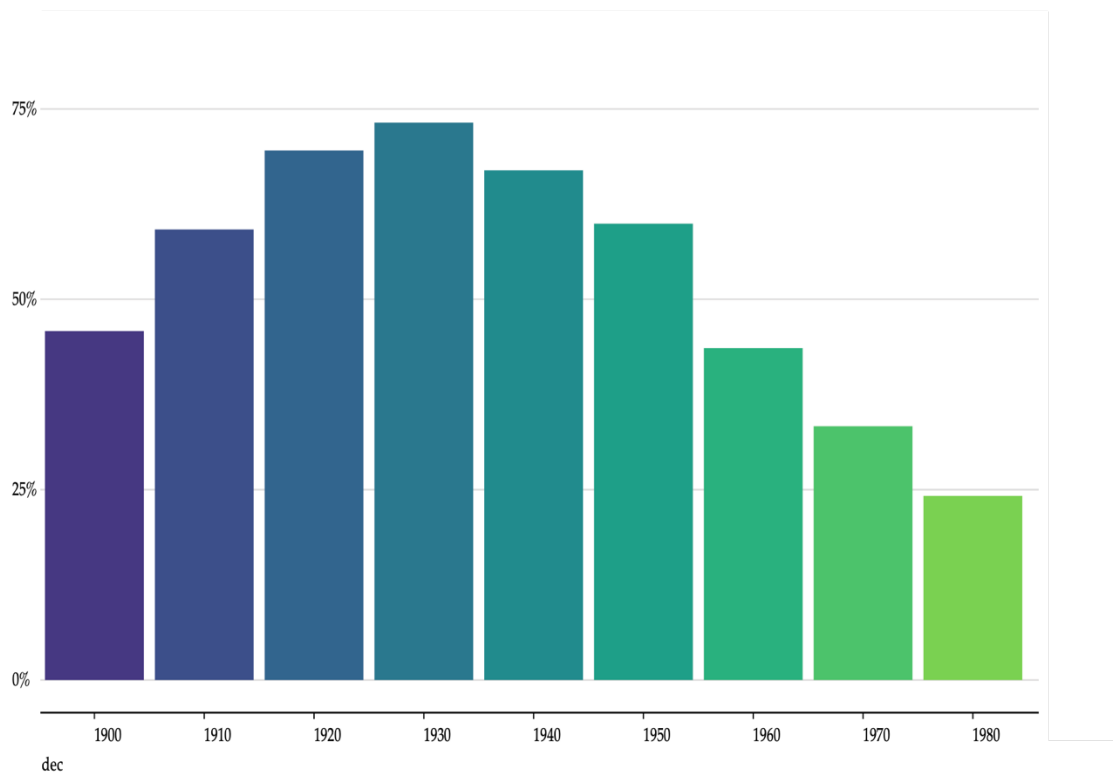


FIGURE 7: Proportion of Dakar residents born outside Dakar by year of birth.

Source: author's Dakar Social Structure dataset elaborated from death records in the *état civil* 1910-1912.

SENEGALESE URBANISATION: A BRIEF HISTORY

What became the colonial city of Dakar was built on Lebu foundations; 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.²⁷⁶ 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.²⁷⁷ 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".²⁷⁸ Several decades later, a visitor, Dr 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'.²⁷⁹

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.

²⁷⁶ Assane Sylla, "Une république africaine au XIXe siècle (1795-1857)," *Présence africaine*, no. 1 (1955): 47-65.

²⁷⁷ Alain Dubresson, "Croissance urbaine et thèmes de recherche en Afrique tropicale : l'exemple de Rufisque," *Villes en parallèle* 1, no. 1 (1978): 39.

²⁷⁸ Pierre Loti, *Le roman d'un spahi* (Paris: Calmann Lévy, 1896), 94.

²⁷⁹ Léon D'anfreville de La Salle, *Dakar et la colonisation française* (Paris: Revue, 1912), 503.

A more substantial line, the Thiès–Kayes line 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, as well as Kaolack, the dominant port of the increasingly prosperous Sine-Saloum, the second groundnut basin of Senegal. Rufisque continued to serve as a major marketing centre in the groundnut trade, and indeed it was not until the 1930s that Dakar would definitively supplant it. 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 trade collapsed: that year it took only 33,560 tonnes. Kaolack suffered a modest decline, to 90,757 tonnes.²⁸⁰

Dakar’s growth accelerated during the Great Depression, almost doubling in population over the course of the 1930s. The increase was not as dramatic in Senegal’s other cities, though almost all of its towns grew somewhat. By the 1950s, Dakar’s dominance of the Senegalese city-system was much more pronounced than before the war. This can be seen in the rank-size distribution plots in Figure 2. These plot show the relationship between a city’s rank (that is, whether it is the largest, the second largest, the third largest city, and so on) and its population, both expressed as in natural logarithms. A perfectly linear relationship would indicate a lognormal distribution of city sizes within a country, which has often been taken as an indication of a mature urban structure. Senegal’s distributions consistently show a middle ‘hump’; that is, a larger than expected group of cities of middling size. The evolution of Côte d’Ivoire’s urban system is rather interesting: in 1926, it possessed a large number of medium-sized towns, but no real cities. Over time, however, the distribution of city sizes began to resemble Senegal’s more closely, though the

²⁸⁰ Figures taken from Assane Seck, *Dakar, Métropole Ouest-Africaine* (Dakar: Institut fondamental de l’Afrique noire, 1970), 401.

Senegal displayed more weight in the middle; i.e., it possessed a more substantial urban second-tier than did Côte d'Ivoire. The reason for this is partly administrative: Saint-Louis continued to act as the *de jure* capital of the colony of Senegal throughout the colonial period—and it was also considered the capital of Mauritania. This meant that colonial Senegal's 'first' city continued to grow, albeit slowly. Another administrative accident, the physical separation of the Casamance from northern Senegal by the British colony of Gambia, contributed to the strength of Ziguinchor as an economic and political capital for the region. Two other major cities owed their growth to their economic potential: Kaolack, as a port for the groundnut trade, and Thiès, the provisional terminus of the Dakar-Niger and then an industrial satellite of Dakar. Finally, another city was a religious creation: Touba, the spiritual home of the Mouride brotherhood, and the destination of the annual Grand Magal.²⁸¹ In the analysis that follows, I focus on Dakar as the 'gateway' city of Senegal, though I also analyse some microdata from mid-century Kaolack to show that the processes of rural-urban migration worked very similarly in Senegal's 'second-tier' cities.

²⁸¹ See particular Chapter 1 in Guèye, *Touba*.

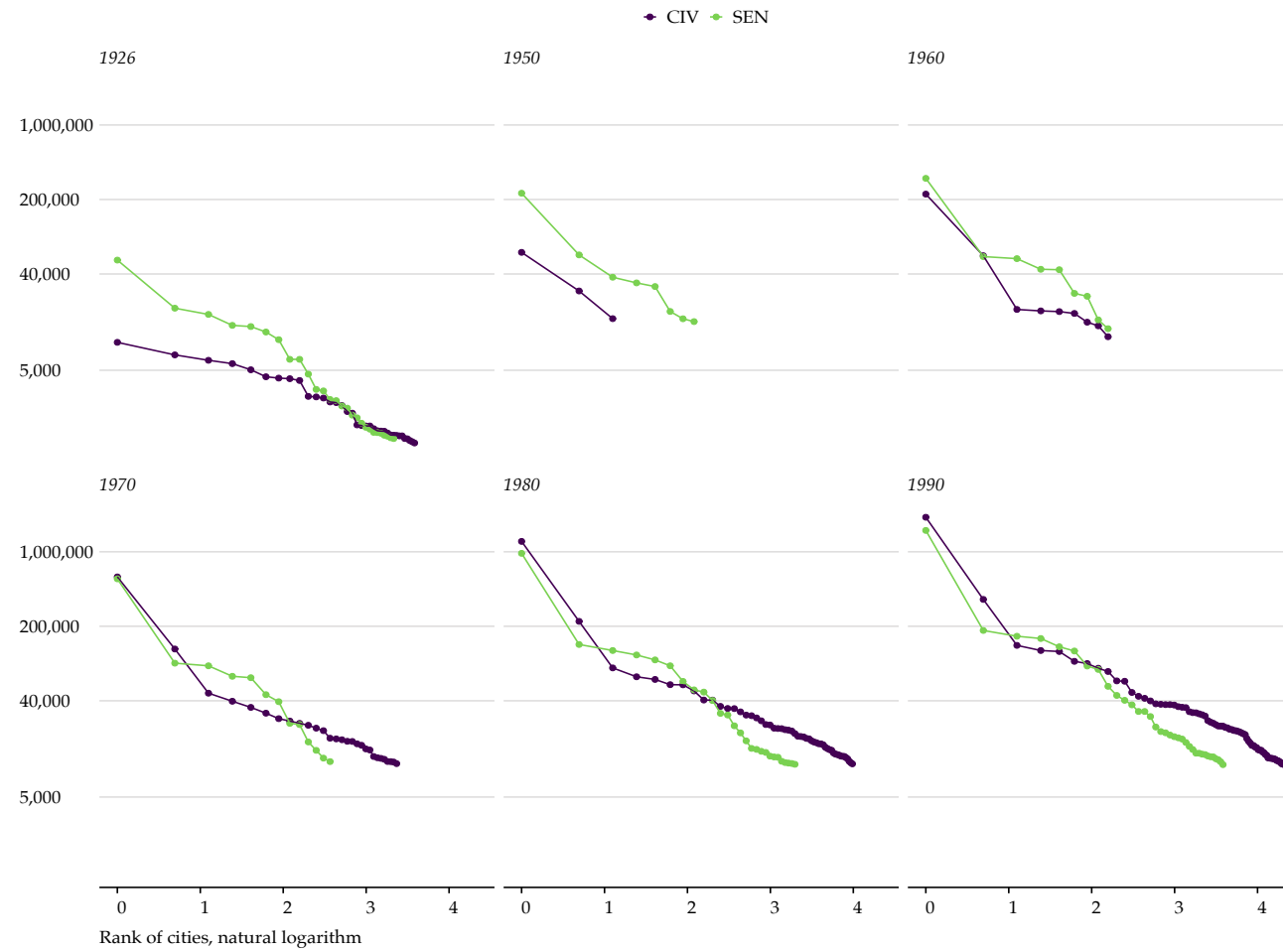


FIGURE 8: Rank-size distributions of urban centres in Senegal and Côte d'Ivoire, 1926-1990.

Source: author's agglomeration dataset (1926; for more details, see text) and Africapolis (1950-1990)

As Huff argues was the case for Malaya, the existence of several ports does not necessarily imply that economic activity would be evenly shared between them; ‘gateway’ ports like Singapore tend to benefit from agglomeration economies in service industries like banking and insurance, and hence tend to display more diversified occupational structures than secondary ports.²⁸² In every respect, Dakar exemplified this pattern. It was the seat of the Banque de l’Afrique occidentale, the most important bank in French West Africa. Dakar also hosted the most important West African branch of other private French banks, like the Banque commerciale africaine and the Banque de l’Afrique française. French trading firms, after initially preferring Rufisque, clustered in Dakar, and the Dakar Chamber of Commerce became the most important private sector lobby in the federation. But the most consequential function of Dakar from the point of view of its economic structure was the decision to move the capital of the federation from Saint-Louis to Dakar, and, crucially, to bestow the federal government with its own, comparatively substantial, financial resources. In practice, this implied a growing concentration of highly-paid French workers in Dakar; the establishment of a federal government brought a large number of the federation’s bureaucrats to Dakar and the areas of policy annexed by the *gouvernement général* were generally organised from Dakar. Their salaries were paid for not by the tax most visible to the farmers of Côte d’Ivoire or Niger, the *impôt de capitation*, but rather by the import and export taxes that the federal government had wrested from the colonies.

The top-heavy nature of this system has been described as ‘fiscal Jacobinism’, recalling the process by which substantial power was taken from French provinces

²⁸² Gregg Huff, “Export-Led Growth, Gateway Cities and Urban Systems Development in Pre-World War II Southeast Asia,” *The Journal of Development Studies* 48, no. 10 (2012): 1431–52.

and given over to Paris.²⁸³ Assuming that the demand for imports in AOF was more price-elastic than its supply, the burden of federal government revenue-raising rested largely on the consumers of imported goods across the federation. This was ‘manna from heaven’, in the sense suggested by Gollin, Jedwab and Vollrath,²⁸⁴ but it took the form not of oil reserves or diamond mines, but lopsided fiscal federalism. Taking 1925 as a benchmark year, I calculate the net fiscal transfer between colonies by summing together all federal revenue and expenditure by colony, assessing each budget item by line in the *Compte définitif du budget général* of the federation. Unfortunately, budgets were not so disaggregated as to allow us to distinguish cleanly between Dakar and the rest of Senegal, but the overall pattern, shown in Table 15, was characterised by flows of revenue from the coastal colonies to the inland colonies, and to Senegal—and hence to Dakar. For the average Dahomean worker, federation was a bad deal: in 1925, the per-worker net fiscal transfer was worth 2.78% of the unskilled nominal wage—very close to Manning’s estimate of 3% of GDP.²⁸⁵ Conversely, federation was an excellent affair for Soudanese and Mauritanian subjects: per worker federal spending exceeded taxation in those colonies by 1.26% and 1.66% per worker, measured as a fraction of the unskilled wage there. Though the magnitudes may seem low, they are reasonably large given the economies concerned, and how close they were to subsistence: in a counterfactual scenario in which each colony was self-sufficient, taxes in Soudan would have had to have been raised by the equivalent of 1% of income; and conversely Dahomean citizens would have enjoyed. Following Gollin, Jedwab and Vollrath, we can consider a worker or a farmer living in these colonies being subject

²⁸³ Mamadou Fall, “L’AOF : jacobinisme fiscal et administration des affaires 1900-1945’,” in *AOF : réalités et héritages : sociétés ouest-africaines et ordre colonial*, ed. Saliou Mbaye, Charles Becker, and Ibrahima Thioub (Paris: Karthala, 1995), 523–32.

²⁸⁴ Douglas Gollin, Remi Jedwab, and Dietrich Vollrath, “Urbanization with and without Industrialization,” *Journal of Economic Growth* 21, no. 1 (2016): 35–70.

²⁸⁵ Patrick Manning, “Public Finance and Capital Investment: A National Perspective on Colonial Dahomey,” *Canadian Journal of African Studies* 14, no. 3 (1980): 320.

to a subsistence constraint, below which consumption could not fall, at least for long. The nominal unskilled wage in Bamako in 1925 was sufficient to purchase only four fifths of an Allen-style subsistence basket; an increase in government spending of 1.26% per prime-age male financed by Soudanese taxpayers would have therefore represented a reasonably large burden.

Because of the subsistence constraint, the rate of monetary taxation paid by rural households was low relative to income. In sample of household budgets from Soudan français in 1938, described in more detail in Chapter 5, the median household paid 5.6% of their income in direct taxes; financing spending in the colony without fiscal transfers would probably have involved raising taxes on the average Soudanese family by about 20 per cent. Under AOF's fiscal federalism, it was financed mostly by Dahomean and Ivorian taxpayers instead. Senegal's fiscal transfer was positive—unlike the other coastal colonies save Mauritania—but its magnitude was low relative to the unskilled male wage. But most of federal spending in Senegal was concentrated in Dakar, so the impact of federalism on the macroeconomic structure of the capital city would have been much larger than this figure suggests. Why is this important for an analysis of structural change? In the 'manna from heaven' model of Gollin, Jedwab and Vollrath, an exogenous increase in income leads to a less-than-proportional increase in demand for food and a more than proportional increase in demand for manufactures and services. Given the set of relative prices, manufactures are generally imported and services are produced locally. We might therefore expect that 'fiscal Jacobinism' would result in a consumption city, in which workers were more likely to produce services than goods—at least prior to World War II, when enforced autarky closed off the possibility of procuring manufactured goods from Europe and lead to the development of import-substituting industry in Dakar.

TABLE 15: Fiscal transfers in Afrique occidentale française in 1925.

Colony	Transfer per male worker (francs)	Per worker transfer ÷ unskilled wage
Côte d'Ivoire	-4.9	-0.47%
Dahomey	-24.3	-2.78%
Guinée	-3.7	-0.5%
Haute-Volta	0.01	0%
Mauritanie	25.5	1.66%
Niger	2.1	0.23%
Sénégal	8.4	0.45%
Soudan française	7.9	1.26%

Sources: Fiscal database compiled from Gouvernement général de l'Afrique occidentale française Comptes définitif du budget général de l'Afrique occidentale française en 1925 and the Budget général de l'Afrique occidentale française en 1925. Population from Frankema and Jerven, 'Writing history', divided by 3.33 to reflect the share of working-age men in the population (fraction derived from Louis Verrière, 'Population du Sénégal', 1960-1). Nominal unskilled labourer wages from the Budgets locaux of the colonies for 1925. This includes all ordinary expenditure, but excludes spending on loan budgets, which were mainly used to finance railway and port construction.

Since we have no city-level estimates of output structure, one rough measurement of the difference between 'consumption' and 'production' cities in Afrique occidentale française might simply be the ratio of the value of goods exported at a port to the value of goods imported. Taking 1929 as an example, in Table 3, I calculate this ratio for the major ports of Afrique occidentale française; the 'IMEX index' is the ratio of imports to exports. Importantly, these figures are for long distance shipping and cabotage, so they account for some outward flows from major ports to minor ones. Two distinctive facts emerge. The first is that the largest port by traffic in each colony also had the lowest production ratio; a small exception is Guinea, where Farmoriah had a slightly lower ratio than Conakry. In the case of Senegal, Guinea and Dahomey, these ports were attached to a political capital (of the federation in the case of the former; of a colony in the latter two), and Senegal's political capital, Saint-Louis, also had a production ratio lower than one. The

secondary ports of Senegal—Kaolack, Rufisque, Foundiougne, Ziguinchor—were all, on the contrary, ‘production ports’, exporting more than they imported. All four of these ports were either located in major groundnut producing regions or, in the case of Rufisque, had a historical connection with the groundnut trade.

The second salient fact is that Senegal’s port structure was, despite the importance of the coaling trade in the Port of Dakar,²⁸⁶ still much more balanced than any of the other coastal colonies in the federation. Indeed, the balanced nature of the port hierarchy in Senegal helps to explain its precocious urbanisation rates: dominant as Dakar was, the urban population of the country was not entirely concentrated in the capital. Dakar traded about four times as much as the second most important port, Kaolack. In Côte d’Ivoire, however, the largest port—before the massive work on the Port d’Abidjan in the 1940s and 1950s, Grand-Bassam—exported twelve times as much as the next most important port, Assinie. Guinea and Dahomey had similarly lopsided structures. This fact is the more interesting because a large part of Dakar’s pre-eminence in Senegal for both imports and exports was due to its role as the most important coaling station on the West African coast. This did not necessarily change the balance *between* imports and exports: in 1929 the total tonnage of coal imported and exported was roughly equal, the residual representing domestic Senegalese consumption. But it is telling that even one of Dakar’s main economic outputs—in the period before World War II at least—was a service export (selling non-local coal to ships) based entirely on Dakar’s advantageous location on the West African coast.

TABLE 16: Port traffic in 1929 in Afrique occidentale française.

²⁸⁶ Daniel Castillo Hidalgo, “The Port of Dakar: Technological Evolution, Management and Commercial Activity,” in *Atlantic Ports and the First Globalisation, c. 1850–1930*, ed. Miguel Suárez Bosa (London: Palgrave Macmillan UK, 2014), 90–111.

Colony	Port	Total traffic (million francs)	IMEX index
Dahomey	Cotonou	220	0.7
	Porto-Novo	19.4	1.5
	Grand-Popo	16.1	3.3
	Ouidah	9.4	4.4
Côte d'Ivoire	Grand-Bassam	401	0.9
	Assinie	31.3	2.3
	Sassandra	16	1.1
	Tabou	9.5	1.3
Guinée	Saboya	2.4	27
	Conakry	235	0.6
	Victoria	15.4	1.4
	Farmoriah	9.2	0.5
Senegal	Benty	2.6	1.9
	Taboria	1.3	2.9
	Matakong	0.5	1.7
	Dakar	1449	0.5
	Kaolack	312.7	1.9
	Rufisque	198.3	1.9
	Foundiougne	101	2.3
	Ziguinchor	71.4	1.7
	Saint-Louis	70.2	0.7
	Mbour	52.6	2.3
	Joal	8.9	1.5

Source: Gouvernement général de l'Afrique occidentale française, *Statistiques commerciales de l'Afrique occidentale française*, 1929, Dakar, 1930. The 'IMEX index' is the ratio of the value of goods exported to the ratio of good imported.

Another possible test of the hypothesis that Dakar was a consumption city (geared towards the production of non-tradeables rather than tradeables) would be to look at the wage structure of the various colonies. While this approach is limited by the

fact that most labour income in Afrique occidentale française accrued to smallholder farmers and not wage labourers, it does give us some sense of the make-up of the 'non-subsistence' or modern sector of the economy, which is precisely the sector of the economy that expands under an exogenous income shock. Using the national accounts of the AOF for 1956, I compute the proportion of wages paid in the 'trade-exposed' modern sector and the 'trade-sheltered' sector in each colony, the former consisting of agriculture, industry and mining, and the latter of construction, transport, commerce, banking, domestic service and the liberal professions. As Table 4 shows, the share of trade-exposed sectors in Senegal's aggregate wage bill was low, as we might expect from a 'manna from heaven' economy. Though it had the largest industrial base of any of the constituent colonies of AOF, manufacturing and mining together were outweighed (at least in terms of their share of the colony's wage payments) by the construction sector alone. Though Côte d'Ivoire was slightly richer than Senegal on a per capita basis by 1956, its wage bill was much more heavily trade-exposed, largely due to its plantation agriculture sector. In terms of modern, wage-labour production, Senegal's economy was relatively weighted towards non-tradeables, even though it had a substantial industrial sector by African standards.

TABLE 17: Trade-exposed wage share in Afrique occidentale française, 1956.

Colony	Trade-exposed wage share
Senegal	20.7%*
Soudan français	48%
Mauritanie	45%
Guinée française	61%
Côte d'Ivoire	56%
Haute Volta	17%
Dahomey	21%
Niger	10%

*Of which industry accounted for 18%.

Source: Afrique occidentale française. Service de coordination des affaires économiques et du plan, *Comptes économiques de l'Afrique occidentale française, 1956* (Haut-commissariat Général, 1959).

MIGRATION AND PRODUCTIVITY

The growth of Dakar implied major structural change for the Senegalese economy. Farmers do not usually move to the city in order to continue farming. Indeed the most obvious difference between rural-to-urban migrants and the *navétanes* who came elsewhere in the Western Sudan hinterland to the Senegalese groundnut fields during the agricultural high season was that the former changed their occupation. Indeed, change was the point. The hard fact of the Senegalese climate is that, outside the riparian zones, agriculture can only occupy labour for a small fraction of the year. New crops, better techniques and an expansion of land cultivated per person can result in some growth in output, as indeed they did during Senegal's groundnut boom; however, a shift out of agriculture to work that can occupy workers for the entire year seems to be the most important way in which an arid, tropical economy can cast off the shackles of the seasons.

The classic solution to this problem is rural by-employment: this is to say, a non-agricultural occupation carried out in order to supplement income. By mid-century, at any rate, by-employment was still reasonably prevalent in at least some parts of rural Senegal. A survey of communities on either side of the Senegal River (in Senegal and Mauritania) showed that a substantial minority of workers had second jobs: mostly, though, within the primary sector. About a quarter of farmers and agricultural workers had some kind of by-employment in the primary sector (for example, fishing). Nearly half of all secondary-sector workers also worked in the primary sector part-time, as did around a quarter of all service sector workers (see Table 5). Much rarer were by-employments in the secondary and tertiary sector: fewer than one in twenty farmers had another job in the secondary sector,

and fewer than one in thirty had one in the tertiary sector. The overall impression is of the ubiquity of agriculture: those on the land sometimes diversified their incomes by working as artisans or service sector workers, but not always: large proportions of those whose principal occupation was off the land nonetheless spent some time on it.

TABLE 18: By-employment in the middle Senegal Valley, 1957.

	Primary	Secondary	Tertiary
Primary	25.5%	4.1%	2.9%
Secondary	47.7%	0.9%	0.2%
Tertiary	25.7%	0%	0.86%

Source: elaborated from Mission socio-économique du Fleuve, *Enquête dans la moyenne vallée du Sénégal*, 1957.

The possibility of engaging in primary-sector by-employment was, however, a result of the unique ecological context of the valley: the flooding of the Senegal created fertile land that could be cultivated during the dry season, and also provided possibilities for fishing. While valuable—indeed, the Wolof word for floodplains *waalo*, gave its name to the kingdom that dominated the lower valley prior to French conquest—the supply of floodplain land on which to grow a second annual crop was limited without further irrigation infrastructure. Elsewhere in West Africa, the same pattern obtained: where year-round cultivation was possible, comparative advantage dominated, and workers simply shifted from one primary sector occupation to another.²⁸⁷ This was, however, a relatively rare phenomenon. Dry-season work was typically not agricultural work. Trading, weaving and other industrial handicraft production and mining were more common, and provided a range of goods that could either be consumed within the family unit or traded for

²⁸⁷ Kenneth Swindell, “Population and Agriculture in the Sokoto Rima Basin of North-West Nigeria : A Study of Political Intervention, Adaptation and Change, 1800-1980,” *Cahiers d’études Africaines* 26, no. 101 (1986): 75–111.

cash. As urban centres in Senegal grew, the possibility for *urban* by-employment did as well. Temporary work could be found in a number of industries: construction and petty commerce were doubtless important employers, but the most important was probably the Port of Dakar and the trading companies that exported groundnuts from it: at the peak of the trade, unskilled labour was required to stack and load the groundnuts onto ships.

If we are to believe these magnitudes, the flows of seasonal migration to Dakar might have doubled the population of unskilled workers in the *saison morte*. Certainly this would be in line with what had been recorded in Kaolack in the 1950s (see below). Given this was early in Dakar's history as a groundnut trading centre, an annual doubling is probably an overestimate: there may be good reason to suppose that mortality was higher among seasonal migrants, who probably lived in less salubrious conditions and may have undertaken more hazardous jobs. Even if it is an unrealistic upper bound, though, the data does suggest a substantial seasonal increase in the temporary population of Dakar at a very early stage in Dakar's history. The next section shows that these temporary migrants were much more likely than permanent residents of Dakar to be unskilled labourers and somewhat more likely to hold non-manual semi-skilled than semi-skilled manual or high-skilled occupations. A large number of these workers probably found work in the Port of Dakar, where the seasonal rhythms of trade pushed up demand for labour unevenly across the year. But others would have found work in construction, in petty trade, and possibly in groundnut processing factories.

THE OCCUPATIONAL ATTAINMENT OF MIGRANTS

I use four different sources to piece together a history of migration and urbanisation in late nineteenth and twentieth century Senegal. The first is a town census from

1875 that lists place of birth and occupation, in addition to a wealth of other details, digitised from a (poorly) preserved copy in the Archives nationales du Sénégal. The second is a collection of death records from the 1910s in Dakar, described in more detail below. The third source is a complete electoral roll for Kaolack in 1955, which, exceptionally, lists place of birth and occupation. These first three sources—handwritten, for the census and the civil registry, and typed for the electoral roll—have been transcribed and cleaned for analysis. The fourth, and in many ways the richest source is the IPUMS 10% sample taken from the 1988 and 2002 censuses of Senegal. Though there are other census materials that might usefully have been drawn on, I was unable to gain access to the 1976 census microdata, held only by the Senegalese statistical agency. The most comprehensive census prior to this was the 1955 Dakar census, which—though rich and analysed with great attention to detail—does not give much by way of information about the occupational attainment of rural-urban migrants, though it does provide one table on occupations and ethnicity that is of interest. It shows that international migrants entered some occupations disproportionately: in the 1955 Dakar census, 40% of the 900 migrants from Portuguese Cabo Verde were employed in construction, compared to only 9% of Wolof men with an occupation. Meanwhile, three in every four working Lebanese men were engaged in trading.²⁸⁸

For technical reasons, it is necessary to collapse the abundance of occupational titles into a coherent scheme. The classification of occupations is as much art as it is science.²⁸⁹ Two systems have seen wide use: the Primary-Secondary-Tertiary system developed originally by E. A. Wrigley and used by the Cambridge Group, and the

²⁸⁸ Ministère du développement et de la coopération technique, service de la statistique et de la mécanographie, *Recensement démographique de Dakar (1955): résultats définitifs* (Dakar: République du Sénégal, 1958).

²⁸⁹ Javier Silvestre, María Isabel Ayuda, and Vicente Pinilla, “The Occupational Attainment of Migrants and Natives in Barcelona, 1930,” *The Economic History Review* 68, no. 3 (2015): 985–1015.

HISCO system, based on the ISCO classifications for contemporary data.²⁹⁰ The great advantage of HISCO is the family resemblance it bears to ISCO, allowing for easier translation between the two systems, and, more importantly, the various sets of additional classification systems that have been built on top of it, particularly the HISCLASS system. Owing to the latter feature of the HISCO system, I have used it in the analysis here. In the following section, I manually code all occupational descriptions into HISCO occupational codes, and, using the **hisco** package in R to load a crosswalk, convert this into HISCLASS categories.²⁹¹ I manually converted about half of the codes for which the **hisco** crosswalk provided no equivalents. Then, following Silvestre, Ayuda and Pinilla, I collapse the HISCLASS codes into a five-category occupational hierarchy: category I is composed of unskilled manual labour occupations; category II is composed of semi-skilled manual occupations, category III is composed of semi-skilled non-manual occupations, and category IV is composed of high-skilled, non-manual occupations (see Table 6). However, I also add two additional categories (V and VI), to account for agricultural and military occupations. Dakar was a major garrison for the *Tirailleurs sénégalais*, and since their migratory path was distinct and not necessarily voluntary,²⁹² I have chosen to model the occupational attainment of military occupations separately.

TABLE 19: Simplification of HISCLASS codes into broad categories.

Category	Description	HISCLASS	Common occupations in 1910-11 Dakar dataset
I	Unskilled, manual	11,12	Shepherd, labourer, gardener

²⁹⁰ Marco H. D. van Leeuwen, Ineke Maas, and Andrew Miles, *HISCO: Historical International Standard Classification of Occupations* (Leuven: Leuven University Press, 2002).

²⁹¹ For more information on the CEDAR project from which the package originated, see Albert Meroño-Peñuela et al., “Improving Access to the Dutch Historical Censuses with Linked Open Data: Social and Economic History,” *Research Data Journal for the Humanities and Social Sciences* 3, no. 1 (2018): 13–26.

²⁹² Myron J. Echenberg, “Paying the Blood Tax: Military Conscription in French West Africa, 1914–1929,” *Canadian Journal of African Studies / Revue Canadienne Des Études Africaines* 9, no. 2 (1975): 171–92.

II	Low and medium skilled, manual	6,7,8,9	Carpenter, bricklayer, weaver
III	Low and medium skilled, non-manual	3,4,5	Commercial clerk, orderly, driver
IV	High skilled, non-manual	1,2	Doctor, interpreter
V	Agriculture	62110	Farmer
VI	Military	58330, 58340	Soldiers

Source: author's adaptation of Silvestre, Ayuda and Pinilla, 'Occupational attainment'.

The first part of the empirical strategy follows closely the design of Silvestre, Ayuda and Pinalla. Regression models estimate the likelihood of a Dakarois worker being engaged in a military, high-skilled, low and medium skilled manual or low and medium skilled non-manual occupation relative to the likelihood of being engaged in an unskilled manual occupation, given various characteristics, including their place of birth.

The multinomial density for any one observation y is given by a function:

$$f(y) = \prod_{j=1}^4 p_j^{y_j}$$

where p denotes probability and j indexes an occupational category, and the p_{ij} are parametrised with a multinomial logit function:

$$p_{ij} = \frac{e^{x_i'}}{\sum_{I=1}^M e^{x_i' \beta_I}}$$

Regressions coefficients are presented in exponentiated form as relative risk ratios: i.e., for a given multinomial logit coefficient β_i I report $\tilde{\beta}_i = e^{\beta_i}$. These can then be interpreted as the multiplicative change in the likelihood of a person belonging to an occupation in category IV instead of category I given that they are a seasonal

migrant rather than a local (for example). Consider a coefficient $\widetilde{\beta}_i$ on a variable recording migrant status, in a regression relating to high-skilled occupations. If $\widetilde{\beta}_i$ is less than one, it indicates that the probability of taking a high-skilled occupation instead of an unskilled one was lower for seasonal migrants than it was for Dakar-born workers, a result that is in line with what we might reasonably expect. There are two phenomena in particular that I will highlight in the following analysis. “Skilled bias” refers to a category of workers being more likely to have semi-skilled or skilled jobs instead of unskilled ones, *when compared to some other category of workers*. “Non-manual bias” suggests that a particular person in a semi-skilled job (locals/migrants) is more likely to have a non-manual rather than a manual job.

EARLY DAKAR: EVIDENCE FROM THE 1876 CENSUS

As we saw above, Dakar began its life as a rather torpid garrison town superimposed on a Lebu fishing village. Unusually, we have a very detailed source on Dakar’s socio-economic structure early in its development: a complete census of adults undertaken in 1875-6, which lists names, occupations, sex, marital status, literacy and birthplace. The original is kept in the Archives nationales du Sénégal, and is in a poor state. It paints a vivid picture of a town in transition: many of its residents were Lebu fishers who had yet to be displaced by French urban expansion. The occupation matched dataset includes 221 people, of whom 97 were born in Dakar itself. About one in ten residents were born in Saint-Louis, and a similar number had been born in nearby Gorée, and had moved off the crowded island. Of the migrants from the rest of Senegal, the largest group came from the North, with 15 migrants from the Fuuta Toro alone. There was also a small number from Portuguese Guinea and some from Fuuta Jallon, in what was to become the colony of Guinea. Finally, a substantial minority of residents were European, mostly

French, and mostly employed by the colonial administration. Local Dakarois (which includes those born in Rufisque and on Gorée) were just as likely as migrants from elsewhere to take semi-skilled manual jobs, somewhat less likely to have semi-skilled non-manual jobs, and less likely to have high-skilled and military jobs. Overseas migrants, mostly French, clustered in non-manual jobs, largely in trade or administration. At this early stage in Dakar's history, high-skilled workers came more or less exclusively from abroad, though Saint-Louis and Gorée had reasonably well-established schools.

TABLE 20: Occupational attainment of Dakar residents by migration status in 1876.

	Local	Senegalese migrant	Overseas migrant
High-skilled, non-manual	-	1.2%	25%
Semi-skilled, manual	48%	48%	5%
Semi-skilled, non-manual	5%	7.2%	50%
Military	-	7.2%	15%
Unskilled, manual	46%	36%	5%

Source: 'Recensement de Dakar, 1875-6', ANS 3G 127 (367). Columns may not add to 100 due to rounding.

DAKAR AS THE NEW CAPITAL OF A FEDERATION: EVIDENCE FROM CIVIL REGISTRATION DATA

Dakar was officially designated the capital of Afrique occidentale française in 1905. The partial census of 1904 counted 18,477 residents;²⁹³ by no means a metropolis, but by Western African standards a considerable town, and rivalled in the

²⁹³ 'Recensement général de 1904 : résultats généraux', ANS 22G 19

federation only by Porto-Novo in Dahomey, which, when counted a few years later, had a population of about 19,000 residents (compared to Dakar's 24,831 residents in that year) and Saint-Louis, with 24,697 residents in 1909. If Dakar was a garrison town from the point of view of its European residents, its African residents had more varied occupations: d'Anfreville de la Salle describes them as 'those who sweep streets, build houses, carry the luggage of travellers; they take on low-level employment in commerce and in the administration.'²⁹⁴ To accompany its new role as political capital, Dakar would need new buildings and infrastructure. The construction sector was therefore a major employer of labour, particularly migrant labour.

Documenting the process of migration to Dakar in this period is complicated by the sources: though there was a census of all of the *pays d'administration directe* (that is to say, the parts of Senegal governed directly by colonial administrators and not indirectly through local rulers) in 1904, the original microdata have not survived, and, if those who participated were asked about the birthplace, no information has survived in either published or archival form. I therefore turn to another source, which, though imperfect, has rich potential. The civil registry (*état civil*) has long been spurned by historical demographers of Francophone Africa, mostly for very good reasons.²⁹⁵ In France the use of civil registries is considered standard in historical demography, in conjunction with the nominative lists of the censuses.²⁹⁶ In French colonies, however, the civil registries suffered from extremely poor coverage. Recording marriages, births and deaths was not compulsory for

²⁹⁴ de La Salle, *Dakar et la colonisation française*, 505.

²⁹⁵ See Louis Lohlé-Tart and Michel François, *État civil et recensements en Afrique francophone: pour une collecte administrative de données démographiques* (Paris: Centre français sur la population et le développement, 1999).

²⁹⁶ The *état civil* largely superseded the parish registries in the task of vital registration under Napoleon. Demographic reconstruction in France has used both sources: an early and still famous example being Etienne Gautier and Louis Henry, *La population de Crulai, paroisse normande: étude historique* (Presses universitaires de France, 1958).

most of the population for most of the period of colonial rule. The problem is especially acute in rural areas, where, by and large, people never registered any act with any authority. This makes accurately calculating birth and death rates or evaluating age structure almost impossible. Even though in 1905, the governor of Senegal ordered that all colonial officials could in theory be eligible to record marriages, rather than the governors of each province alone being responsible for this task, marriages were almost entirely unrecorded in rural areas. Births and deaths were in some places, but the records are still nowhere complete, probably covering less than 20% of the population, and with a, very probably, substantial bias in the socio-economic status of those whose lives are documented in them. For another thing, it may have excluded at least some of the poorest Africans living outside the geographical boundaries of Dakar but whom we might consider residents anyway. In law, Dakar was a racial category; in 1910-11, it was still defined so as to exclude the projected *ville africaine* of Médina, to the north of the *ville européenne*, Dakar proper. Until 1915, the boundary lay on what is now, more or less, Avenue el Hadji Malik Sy, a major southwest-northeast boulevard that separates Plateau from the suburbs of Médina and Gibraltar. Dakar's legal borders were progressively shifted outwards over time, so that by independence even its old commercial rival Rufisque had been assimilated into the city.²⁹⁷ The establishment of Médina did not, however, mean that Plateau was inhabited exclusively by Europeans or even that they were anywhere near a majority.

However, the registries ought not be entirely discarded. In towns like Dakar and Saint-Louis, the coverage of the registries was reasonably broad, though it is hard to say how close to total. The utility of the civil registries also varies depending on the research question. Fortunately, since we are interested here in occupational

²⁹⁷ Denise Bouche, "Dakar pendant la deuxième guerre mondiale. Problèmes de surpeuplement," *Revue française d'histoire d'outre-mer* 65, no. 240 (1978): 424.

data, we are not necessarily interested in the completeness of the registries as records of births, deaths and marriages; we require only that it be a broadly representative sample. And there are other features of the *état civil* that make it an interesting source for social history: in addition to providing basic information about the deceased and two witnesses, like names, age and sex, the death records also contain information about the deceased's occupation, his or her place of birth and place of usual residence, and, sometimes, his or her parents' and their occupations. In the case of deceased men, the records only give scarce information about the occupations of wives, these largely consisting of millet-grinding and homemaking, although occasionally wives had more market-oriented occupations like 'washerwoman', 'cola nut merchant' or 'griot'. An interesting case is when a young woman died leaving behind parents and a husband: in these cases we can then get an occupationally-based measure of female social mobility. The data on place of birth and place of residence is combined with the data on occupations to measure the occupational attainment of rural-urban migrants, both temporary and permanent.

TABLE 21: Occupational attainment of male Dakar residents, 1910-1912.

	II	III	IV	V	VI
Age	1.08*** (0.01)	1.13*** (0.02)	1.13*** (0.02)	1.03*** (0.01)	1.03*** (0.01)
Age squared	1** (0.00)	1*** (0.00)	1** (0.00)	1 (0.00)	1** (0.00)
Rural-urban migrant	0.59*** (0.2)	0.75** (0.14)	0.63*** (0.05)	0.08*** (0.22)	6.69*** (0.05)
Seasonal-temporary migrant	0.09*** (0.02)	1.3*** (0.01)	1.05 (0.04)	0.31*** (0.16)	0.28*** (0.01)

Urban-urban migrant	3.29*** (0.09)	1.5*** (0.02)	1.03*** (0.01)	0*** (0.00)	2.93*** (0.02)
Constant	0.14*** (0.02)	0.01*** (0.01)	0.00*** (0.01)	0.56*** (0.02)	0.1*** (0.01)
Year fixed effects	YES	YES	YES	YES	YES

The état civil for Dakar has been photographed by the Archives nationales d’Outre-mer, with all registries from 1731 to 1917 digitised and published.²⁹⁸ The collection for Saint-Louis is longer—dating back as far as 1731 (albeit with several large gaps). For Gorée the collection dates from 1777; for Rufisque, from 1855. I have digitised all deaths taking place in 1910, 1911 and 1912, observing as much detail as possible. I restrict the dataset to men aged sixteen or older born in Africa (though not necessarily in Senegal). These restrictions bring the sample size down to 471. In **TABLE 21**, I regress a series of variables on occupational attainment of adult males in Dakar between 1910 and 1912.

Predictably, age plays a significant role: the younger a man was, the more likely to be engaged in unskilled work. The coefficients on the migration variables suggest an interesting pattern. Moving to the city usually implied a change in occupation. Indeed, this is why urbanisation is so closely related to structural change: it implies a reallocation of labour from agricultural to industry or services. This was not universally the case in Senegal, of course, since there was also non-agricultural work in rural areas. Dongo Diop, for example, was a weaver who died in Dakar; he was born in Baol sometime in the 1860s. While we have no information about the where

²⁹⁸ AOM 1 DPPC 6557; AOM 1 DPPC 6593; AOM 1 DPPC 6594.

his parents had lived (they had both passed away by the time Dongo died in 1911), we know that his father had also been a weaver, suggesting that at some point either Dongo or his father had moved to the city, perhaps because it offered a greater market for textiles. For other migrants, though, moving almost certainly meant a socioeconomic upgrade: to take but one example, Abdou Diallo was born in the 1890s to a farming family in Kaedi, on the right bank of the Senegal River; when he died in 1911 he was a shopkeeper in Dakar. An interesting case is that of the blacksmiths, of which we only have two in our dataset, and only one with an identifiable place of birth: Alipe Diong, who was born in Ouakam, in what is now the suburbs of Dakar. His father was a blacksmith as well; a strong indication that this traditionally caste occupation had been handed down from father to son. Metalworking's association with caste does not seem to have prevented the sons of metalworkers from obtaining unskilled work in the city, though: both Mamadou Cissé and Gaye Sy were born to blacksmiths in Bakel, again in northern Senegal, on the border with Mauritania. At some point both Mamadou and Gaye moved to Dakar and became labourers (*manœuvres*).

To examine this point more systematically, we can look at a simple measure of social mobility. Only a minority of the observations in our dataset contain information on both an adult male's occupation and his father's, and we should be careful in assuming that the observations we observe are a random selection of Dakarois (male) residents. Usually when a man died and his father was also deceased, no information is available on the paternal occupation. Since no written records were kept from which the family history of a dead man might be obtained, the public officials who recorded entries in the *état civil* were reliant on the information given to them by the friends, colleagues or neighbours of the deceased, who may not have known much about the condition of the man's parents. This would be especially true in the case of migrants, and it is noticeable that there is

rarely information on parental occupation for deceased adult men who were born very far from Dakar—for example, in neighbouring colonies like Soudan français. With this in mind, consider the transition matrix given in Table 14. Many sons remained in the same occupational categories as their fathers, as we can see from the percentages on the diagonal: the sons of fathers with unskilled manual jobs were more likely to follow their fathers' footsteps; the sons of fathers with semi-skilled manual jobs were similar. The only categories in which this pattern did not obtain were the high-skilled and agricultural categories. The latter is easy to understand, and more or less inevitable given that our sample was from sons who had moved to Dakar. Most of those who left agriculture found work as unskilled manual labourers; a smaller fraction found manual semi-skilled work, and only a few found non-manual work. The fact that high-skilled fathers tended to have sons who worked in unskilled jobs is more puzzling, but can be explained by one of the constituent occupations in the high-skilled category, the Islamic *marabouts*, who were usually if not invariably literate and taught children in Quranic schools. Sometimes their sons also became marabouts, but the market was presumably limited, and more of them became unskilled labourers.

TABLE 22: Social mobility of sons living in Dakar, 1910-12.

	I	II	III	IV	V	VI	Total son occupation
I	65%	14%	0%	43%	42%	0%	40%
II	27%	68%	37.5%	28.5%	19.2%	0%	25%
III	3.8%	4.5%	50%	0%	3%	0%	5%
IV	3.8%	9%	0%	14%	5%	0%	6%
V	0%	4.5%	12.5%	0%	29%	50%	22%
VI	0%	0%	0%	14.2%	1.8%	50%	2%

Notes: Occupation of sons in rows; occupations of fathers in columns (using category labels from Table 19). Percentages are calculated for each column (i.e., the table shows for

each category of paternal occupation the proportion of sons in each occupational category.)

The opportunity cost of a farmer permanently migrating to Dakar was the product of the farmer's labour in the fields. For this reason, it seems probable that migrants would be more likely to come from areas of Senegal with lower labour productivity in agriculture. While we lack spatially disaggregated estimates of sectoral labour productivity, we can assume that labour productivity was probably correlated with land productivity. Lacking historical data on land productivity by region, I turn to the Food and Agricultural Organization's Global Agro-Ecological Zones dataset (FAO-GAEZ). This gives estimates of the potential yield per hectare of various crops, including the major crops grown in Senegal, millet and groundnuts. I use the crop suitability index for both of these groups, and take a simple average, resulting in a Senegal-appropriate agricultural productivity index at the 5 arc-minute cell level. I superimpose an administrative map of Senegal onto this highly-disaggregated map of crop suitability and take the mean value of the index for each of the contemporary regions of Senegal. I also use Google Maps to calculate the time necessary to walk from the capital city of each region to Dakar, and incorporate this as a proxy for the cost of rural-urban migration.

Because we do not have reliable estimates of population from each of the regions of Senegal in this period, I cannot calculate migration rates by region to test the idea that less fertile regions sent relatively more migrants to the city than more fertile regions. But the opportunity cost of agriculture should have operated at the occupational level, given the substantial premium on skill: farmers who could earn good incomes from the land would only have chosen to migrate to Dakar if they could obtain reasonably well-paying jobs (or, to be more precise, would only have remained in Dakar if the job they found there paid a better living than they could obtain back at home). We should therefore expect a positive correlation between

the productivity of sending regions and the probability of migrants attaining semi-skilled work. Restricting my dataset to rural-urban migrants, I re-estimate the relative likelihood that a migrant would take a semi-skilled rather than an unskilled job in Dakar, depending on the agricultural productivity of their region of birth, and the cost of moving to Dakar as proxied by the number of hours taken to walk to Dakar from a migrant's region of birth.

TABLE 23: Male occupational attainment in Dakar, 1910-12 and agricultural productivity

	Semi-skilled, manual	Semi-skilled, non- manual
Age	1.10* (0.06)	1.03 (0.12)
Age squared	1.00 (0.00)	1.00 (0.00)
Agricultural productivity index, log	1.12 (0.35)	7.5*** (0.63)
Temporary migrant	0.18*** (0.57)	3.60 (0.49)
Hours walk to Dakar	0.84 (0.15)	0.77 (0.19)
Constant	0.09*** (0.08)	0.00*** (0.08)
Year fixed effects	YES	YES
Note: * p<0.1, **p<0.05, ***p<0.01		

The results, given in Table 23, do suggest that the further away from Dakar a migrant had come from, the more likely they were to have an unskilled job, but the effect is not statistically significant. Seasonal migrants were much more likely to have non-manual, semi-skilled jobs than unskilled jobs, and more likely to have unskilled jobs than semi-skilled manual jobs. The coefficient on the agricultural productivity index is, as expected, above one, suggesting that opportunity cost played a role in migration decisions, though only statistically significant for the semi-skilled non-manual category. Though several interpretations are possible, the most plausible is the one outlined above: agricultural productivity imposed an income threshold for the migration decision: only those whose incomes exceeded expected earnings in the city (once moving costs were accounted for) chose to relocate to Dakar.

A long temporal gap separates the civil registry data from the next possible data source for Dakar, the 1988 census, for which a 10% sample of the underlying microdata are available. I run the same model as in Table 23, though I add a measure of literacy. The results are given in Table 24. Importantly, the pattern of occupational attainment did not change over the course of eighty years or so: rural-urban migrants are still much less likely than local-born residents to have any kind of semi-skilled or skilled occupation. Literacy is a strong predictor of the likelihood of gaining skilled work, but it does not cancel out the effect of migration: compared to their city-born counterparts literate migrants were less likely to be working in semi-skilled or skilled occupations—a result that does not change if we replace the literacy dummy with a continuous variable measuring years of schooling. Once again, we see a non-manual bias for migrants; that is, condition on a rural-urban migrant gaining a semi-skilled job, the job itself was much more likely to be a non-manual job than a manual one, compared to a local resident of the same age and literacy.

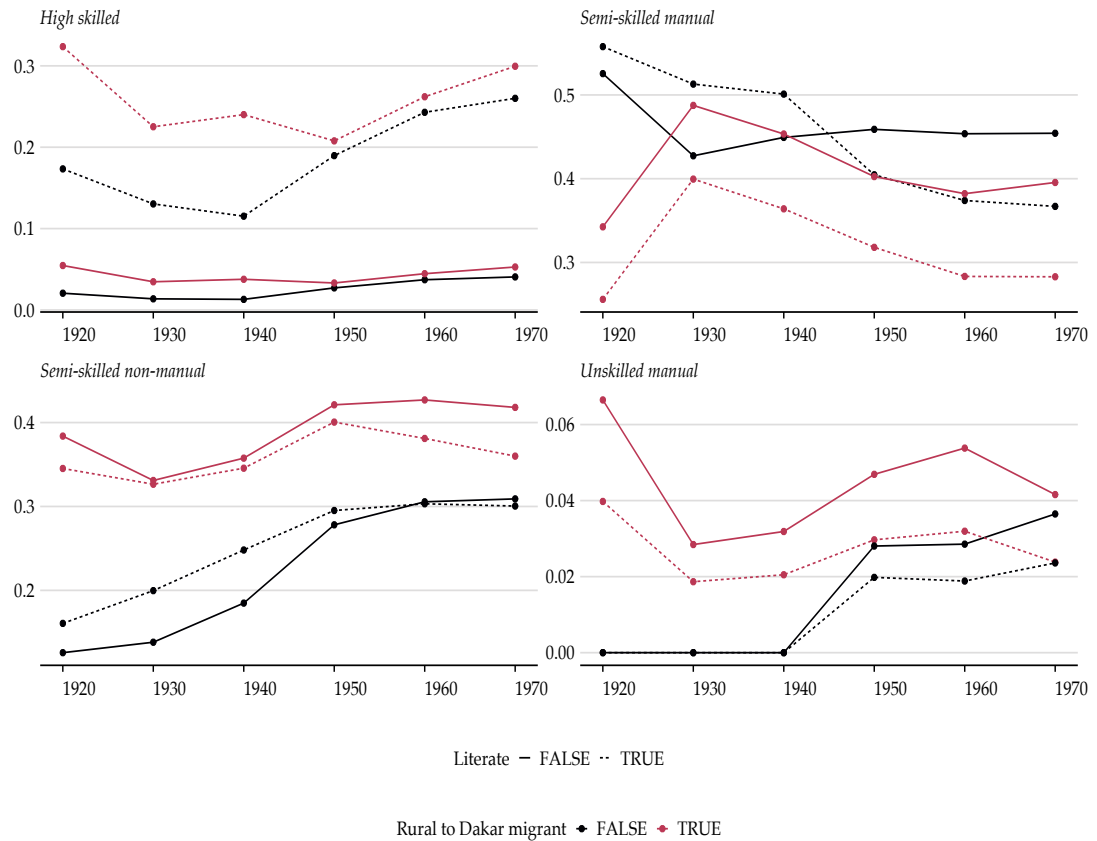
TABLE 24: Occupational attainment of men in Dakar, 1988

Dependent variable: occupational category					
	II	III	IV	V	VI
Literacy	1.245*** (0.036)	1.499*** (0.036)	9.745*** (0.051)	0.3777*** (0.059)	1469247*** (0.001)
Rural-urban migrant	0.466*** (0.034)	0.788*** (0.035)	0.705*** (0.044)	0.228*** (0.053)	0.684*** (0.0002)
Age	0.914*** (0.007)	0.958*** (0.007)	0.949*** (0.008)	0.969*** (0.007)	0.866*** (0.012)
Age squared	1.001*** (0.0002)	1.001*** (0.0002)	1.001*** (0.0002)	1.001*** (0.0002)	1.002*** (0.0004)
Constant	53.156*** (0.004)	18.658*** (0.003)	2.436*** (0.007)	7.871*** (0.007)	0.000 (0.001)
Note:	*p<0.,1	**p<0.05	***p<0.01		

We can also plot the predicted probability of occupational attainments by decade of birth, giving us a very rough glimpse of change over time (Figure 9). Predictably, literacy is a strong predictor of the likelihood of obtaining a high-skilled non-manual job for all birth cohorts, but especially for rural-urban migrants born in the first half of the twentieth century. Interestingly, in the earlier cohorts, it appears that *literate* rural-urban migrants were more likely than *literate* locals to obtain high-skilled work; this is because workers in rural areas with very high levels of education were more likely to migrate than those with only a few years' education. For semi-skilled non-manual jobs, however, migrant status is a much better predictor than literacy: rural-urban migrants to Dakar were much more likely than locals to have these kinds of occupations, especially those born in earlier cohorts;

conversely, locals were much more likely to have unskilled manual jobs than were migrants. Semi-skilled manual positions are a mixed bag: local-born workers in Dakar were about as likely to obtain this kind of work whether or not they were literate; for rural-urban migrants, literacy was *negatively* related with this probability, and while there was very little difference in the predicted probability of working in this kind of job between illiterate workers, whether local or not, for literate workers there was a clear preference for locals. In other words, local-born Dakarais were much more likely to be literate than not, and therefore literacy played a weaker role in determining occupational attainment for them. For migrants, literacy was much more salient: literate migrants clustered in high-skilled jobs, while illiterate migrants were much more likely to find work in semi-skilled or unskilled positions. This suggests a degree of selectivity both in terms of educational attainment and in terms of migration: in rural Senegal, only more promising students were likely to become literate, and only those with a reasonably good chance of securing well-paid skilled work migrated to Dakar. When less-skilled rural workers moved to the city, they tended to obtain unskilled work *and* non-manual work, like taxi-driving or guard work. The semi-skilled *manual* positions—in carpentry, masonry, and so on, but also factory work—were more commonly taken by locals.

FIGURE 9: Occupational attainment by literacy, migration status and birth cohort.



Source: Predicted probabilities from multinomial regression on data from IPUMS 1988 10% sample.

Was this pattern unique to Dakar? As we saw above, the city was not the only cog in Senegal's urban system. The groundnut boom led to the growth of a number of second-tier conurbations, usually attached to important ports. Of these, the largest was Kaolack, located advantageously on a partly navigable river and draining the fertile regions from Baol to Nioro. Though Kaolack never acquired the industrial base of Dakar, it did possess some basic light manufacturing from a relatively early date: a groundnut oil factory, belonging to the Société des huileries et rizeries ouest-africaines, was processing about 15,000 tonnes of groundnuts a year by the end of

the 1920s. Kaolack had a busy port, as we saw above. Located on the right bank of the Saloum river, it was connected to the Dakar–Niger railway by a branch line, and could therefore also serve as an outlet for groundnut exports from the Soudan. Its economic life was heavily centred around the trade: 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 44,904.²⁹⁹ Though documentation on Kaolack’s urban economy is not as rich as for Dakar, I have used a sample from a complete electoral roll of Kaolack, preserved in an archival series devoted to the referendum on the *loi cadre* in 1958.³⁰⁰

TABLE 25: Determinants of the occupational attainment of men in Kaolack, 1958.

	II	III
Migrant	0.592*** (0.212)	0.639*** (0.260)
Age	1.045*** (0.014)	1.268*** (0.027)
Age squared	1.0*** (0.0002)	0.997*** (0.001)
Numerate	1.321*** (0.227)	0.509* (0.272)
Constant	0.629*** (0.010)	0.003 (0.003)

Source: Author analysis of electoral roll of Kaolack, preserved in AOM 1 AFFPOL 3541.

Table 25 presents results for a similar regression as the ones estimated in the Dakar tables. Due to the absence of a significant military presence, or a large number of high-skilled workers and farmers in the city of Kaolack, I remove these occupational categories, focussing solely on the semi-skilled and unskilled categories. Similarly, due to a lack of information on the electoral roll, I am unable

²⁹⁹ ‘La population de Kaolack’, in Gouvernement général de l’Afrique occidentale française, *Bulletin hebdomadaire d’information et de renseignements*, 25 March 1935, Dakar, 6.

³⁰⁰ AOM 1 APPFOL 4539 and AOM 1 AFFPOL 3540

to adjust for the *kind* of migration, though presence on an electoral roll almost certainly indicated a permanent migrant rather than a temporary one. Since the names listed on the roll were of living people, I am able to add an additional variable that made little sense when considering the occupational attainment of the dead: numeracy, as proxied by a reported age ending in 0 or 5. The original source lists year of birth rather than age, but, as would be expected in the presence of age heaping (the phenomenon whereby people with low levels of numeracy tend to report ages rounded to the nearest 5 or 10 years), there is a higher proportion of years ending in 3 and 8 than any other digits, resulting in ages in the year 1958 that predominantly end in 5 or 0. Once again, the older the worker, the more likely to hold a semi-skilled occupation. A migrant to Kaolack was, all other things being equal, more likely to have an unskilled manual job than a semi-skilled one; Kaolack, like Dakar, sourced its unskilled labourers from rural Senegal, while local-born workers were more likely to have at least semi-skilled jobs. This pattern obtained despite controlling for human capital in the form of numeracy, suggesting that—as for Dakar—a migrant to Kaolack with the same level of human capital and of the same age as a native-born man was less able to obtain more skilled (and probably higher paid) work.

The role of human capital in Dakar's growth merits further elaboration. A recent study of human capital in Senegambia has used age heaping to estimate the numeracy of Senegalese residents in the nineteenth and twentieth centuries. Capelli and Baten conclude that areas under direct colonial control—especially the Quatre Communes of Dakar, Saint-Louis, Rufisque and Gorée—had exceptionally high numeracy; elsewhere in Senegambia, areas of Islamic influence tended to have lower numeracy. The groundnut boom had differing impacts on human capital accumulation depending on the political nature of the various Senegambian societies that participated in it; in the rigidly hierarchical Wolof polities of the

northern and central regions, the groundnut boom did not lead to higher numeracy; in Sine and Saluum, the more egalitarian and more densely populated Sereer polities saw rising human capital accumulation when the groundnut boom took off.³⁰¹ Given the strength of rural-urban migratory flows, it is worth considering to what extent human capital accumulation in rural Senegal contributed to an increasingly skilled workforce in Dakar.

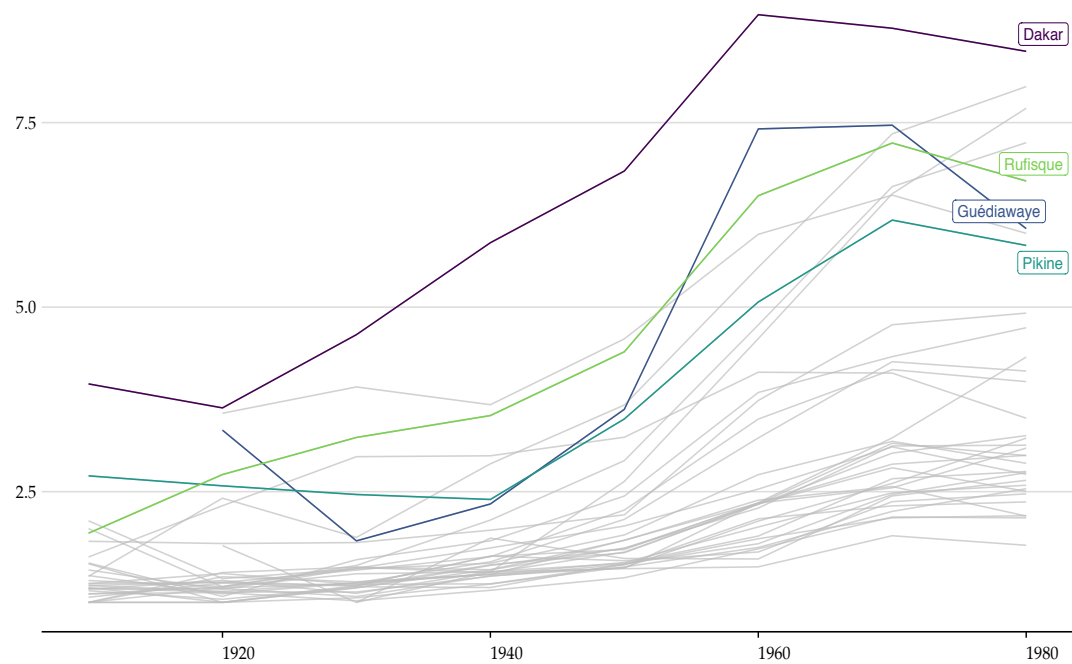
Those born in cities tend to be better-educated, for two main reasons: firstly, there tend to be more schools in cities, and secondly, the opportunity cost of school attendance is usually lower in urban compared to rural areas, since children are much less likely to be employed in secondary or tertiary sector jobs than they are to be employed on a family farm. By 1930, it was estimated that just over half of Dakar's children were in schools, up from only a third in 1926-7.³⁰² Using the recorded date of birth in the IPUMS 10% samples from the 1988 and 2000 censuses, we can also calculate rough estimates of the average years of schooling for people born in each *département* of Senegal by year of birth, a calculation depicted graphically in Figure 5. The *départements* of greater Dakar—even the peripheral slums of Guédiawaye and Pikine—are consistently among the most educated of Senegal, rivalled only, and especially since independence, by the *départements* of the Casamance.³⁰³

FIGURE 10: Years of schooling by place and year of birth, 1988-2002.

³⁰¹ Gabriele Cappelli and Joerg Baten, "European Trade, Colonialism, and Human Capital Accumulation in Senegal, Gambia and Western Mali, 1770–1900," *The Journal of Economic History* 77, no. 3 (2017): 920–51.

³⁰² Figures from Exposition coloniale internationale de 1931 : *Dakar et dépendances*, (Paris, 1931), 133.

³⁰³ On the demand for education in the Casamance, see Céline Labrune-Badiane, "Can We Speak of a 'Desire for Education' in 1860–1930 Casamance?," *Histoire de l'éducation* 128, no. 4 (2010): 29–52.



Source: IPUMS microdata from 1988 and 2002 censuses.

The divergence began in the early twentieth century with low but sustained investment in education in the capital. Dakar was home to the two most important of the ‘vocational schools’ (*écoles professionnelles*): the Ecole Pinet-Laprade, on the island of Gorée, and the Ecole des pupilles mécaniciens, in Dakar. The former taught various manual skills, like carpentry and smithing; in the latter, students were taught the skills needed in the ship-building and maintenance workshops of the Port of Dakar. An early report in the *Annales coloniales* on the Ecole Pinet-Laprade was glowing: ‘the Pinet-Laprade School has had rapid and encouraging results. The machine-fitting students are now able to build all of the main parts of a steam engine; the blacksmiths are well on their way to making excellent pieces of ironwork with a certain artistic sense to them, and the carpenters will, with their

efforts throughout the year, be able to put on a real exhibition of their furniture.³⁰⁴ In 1909, there were 37 students at the school. The majority of them were from Senegal; Soudan français sent eleven students and Dahomey six. Most students studied either carpentry or machine-fitting (*ajustage*), while one studied boiler-making and two lathe-work. We have little information about the exact origin of students; though of the 3 students from Senegal admitted in 1911, 2 were from Dakar and 1 from Saint-Louis, suggesting the importance of urban birth to professional education in early twentieth-century Dakar.³⁰⁵

In addition, of course, there were regular primary schools, much more evenly dispersed over the territories of Senegal and the other colonies of the federation. The general framework of French schooling in AOF was a hierarchical one: students in the hinterland would attend local schools; the best would be sent to regional schools, and the best students in the regional schools would be sent to the large institutions in the capital—either the manual vocational schools, the short-lived *Ecole commerciale Faidherbe*, designed to train clerks, and the *Ecole Normale*, in 1913 renamed the *Ecole William Ponty* and which would train the most academically gifted students to become schoolteachers in their turn.³⁰⁶ This hierarchy, directing African students towards essentially urban—or, at any rate, non-agricultural occupations—if they showed talent, was largely dismantled in the

³⁰⁴ ‘L’école Pinet-Laprade a donné des résultats rapides et tout à fait encourageants. Les élèves ajusteurs sont désormais capables de construire de toutes pièces les principales parties d’une machine à vapeur ; les forgerons s’entendent fort bien à réaliser des ouvrages de ferronnerie où ne manque pas un certain sentiment d’art, et les menuisiers pourraient, avec leurs travaux d’une année, constituer une véritable exposition du mobilier.’ ‘L’enseignement en Afrique occidentale française’, in *Les annales coloniales*, 17 June 1913, p.3

³⁰⁵ Afrique occidentale française, *Situation générale de l’année, 1910-11*; ‘Les grandes écoles de l’Afrique occidentale française’, in *Bulletin de l’enseignement de l’Afrique occidentale française*, January 1913, p.25.

³⁰⁶ Denise Bouche, “L’école rurale en Afrique occidentale française de 1903 à 1956,” *Historical reflections. Reflexions historiques* 7, no. 2/3 (1980): 207–19. The *Ecole William Ponty*, which was moved from Saint-Louis to Gorée in 1913, absorbed the *Ecole Faidherbe* in 1920, taking over its function of training employees for commercial firms.

turn from ‘assimilation’ to ‘association’ in the 1930s. French officials began to stress the importance of agricultural education for African children, and even renamed the school in Médina—only a few kilometres from downtown Dakar—a ‘rural’ school.³⁰⁷ While it might be assumed that these schools simply served to produce employees for the colonial administration, the limited statistics on the occupational attainment of graduates, summarised in Table 26 suggest otherwise: most entered the private sector, in either commerce or industry.

TABLE 26: Occupational attainment of primary school graduates, 1909.

	Boys	Girls
Industry	104	4
Commerce	137	3
Agriculture	27	
Government	15	
Domestic service	25	13
Further studies	71	29
No occupation	60	17

Source: Afrique occidentale française, *Situation générale de l'année*, 1909

Senegal not only produced skilled workers for its own needs: it also supplied them to the rest of AOF, to AEF, and, famously, to non-French colonies like the Belgian Congo. A colonial report on Côte d'Ivoire in 1899 declared that all craftsmen came ‘either from Senegal or the British Gold Coast’.³⁰⁸ In theory, skilled workers might even be sent to France to ‘perfect’ their trade: a long debate in the Conseil général

³⁰⁷ See, for a more detailed exposition of the changes in French educational philosophy in Afrique occidentale française and its changing attitude towards the desirability of urban employment for Africans, David Nelson, “Defining the Urban: The Construction of French-Dominated Colonial Dakar, 1857-1940,” *Historical Reflections. Reflexions Historiques* 33, no. 2 (2007): 225–55; Tony Chafer, “Teaching Africans to Be French?: France’s ‘Civilising Mission’ and the Establishment of a Public Education System in French West Africa, 1903-30,” *Africa, Quaderni*, 2001, 190–209.

³⁰⁸ ‘Rapport d'ensemble sur la situation générale de la colonie de la Côte d'Ivoire en 1899’, Grand Bassam, Imprimerie du Gouvernement, 1900, p.38

in October 1912 turned on the desirability of awarding scholarships for promising candidates to study typography and printing in France before returning to work in one of the colony's two printing shops.³⁰⁹ Two members of the Council, Devès and Guillaibert, complained of the Administration's reluctance to finance metropolitan studies for apprentice craftsmen, even though it paid for some scholarships for French tertiary education. Devès went further, suggesting that the government's reluctance to invest in training local workers meant that Africans employed by the printing office could only ever hope to be 'mere servants, even though they are as well trained as [the] craftsmen.'³¹⁰

Because there was little education on offer in rural Senegal in the early twentieth century, migrants were not highly selected for human capital. Over time, however, a gap emerged between the average years of schooling of rural-urban migrants and those that remained in rural areas (see Figure 11). There was, in other words, a brain drain towards Dakar, as the most highly educated workers in the countryside moved to take advantage of employment opportunities in the city. An interesting exception are three districts in the Casamance—Bignona, Oussouye and Ziguinchor. The amount of schooling received by the average person born in each of these districts rose substantially over the course of the twentieth century, but seems to have played little role in migrant selection. Several other districts show a similar pattern (for example, Thiès and Mbour), but they tend to be geographically close to Dakar, unlike the Casamance. This suggests that, for whatever reason, Casamance did not suffer from a relative brain drain in the twentieth century, unlike many of the districts in the north, east and centre of the country, like Tambacounda, Kolda or Bakel. It is notable that the area of Senegal singled out by

³⁰⁹ 'Procès verbal de la réunion du Conseil général', 30 Octobre 1912, Saint-Louis, 60.

³¹⁰ 'ces malheureux indigènes, dans votre organisation, ne peuvent être que des domestiques, il y en a qui ont autant d'instruction que vos ouvriers.' Ibid, p.63.

Capelli and Baten as having seen rising human capital during the groundnut boom—the Serère regions of Sine and Saloum—were among those that saw the smallest gaps between the educational levels of Dakar-bound migrants and those who stayed behind.

A more detailed study of fiscal contributions—and the return to education—by department would be necessary to determine the extent to which the brain drain implied that the regions ‘financed’ the accumulation of human capital in Dakar via migration. But recall that in all of the regressions in which a measure of human capital as included, migrants were still less likely to obtain skilled work than locals when they had similar levels of human capital. Two conclusions are possible: either our measure of human capital misses some important aspect of the urban experience, such that a Dakar-born worker with (say) primary education is inherently more suited to skilled work than a similar worker born in a village in Kajoor or the Saloum, or rural-urban migrants were unable to find employment commensurate with their skills, a phenomenon that is well-documented in contemporary studies of international migration.³¹¹ This need not mean that their migration resulted in no net increase in productivity, since the return to education in rural Senegal was much lower than in Dakar. Indeed, when I run the same regression as in Table 24 and change the sample to those born in rural Senegal, the coefficients on the ‘migrated to Dakar’ variable are all over 1, suggesting that for men born in the countryside, migrating to Dakar doubled the chance of obtaining a semi-skilled or highly skilled job when compared to the chance of obtaining an unskilled job, even when adjusting for human capital.

³¹¹ See, e.g., Barry R. Chiswick and Paul W. Miller, “The International Transferability of Immigrants’ Human Capital,” *Economics of Education Review* 28, no. 2 (2009): 162–69.

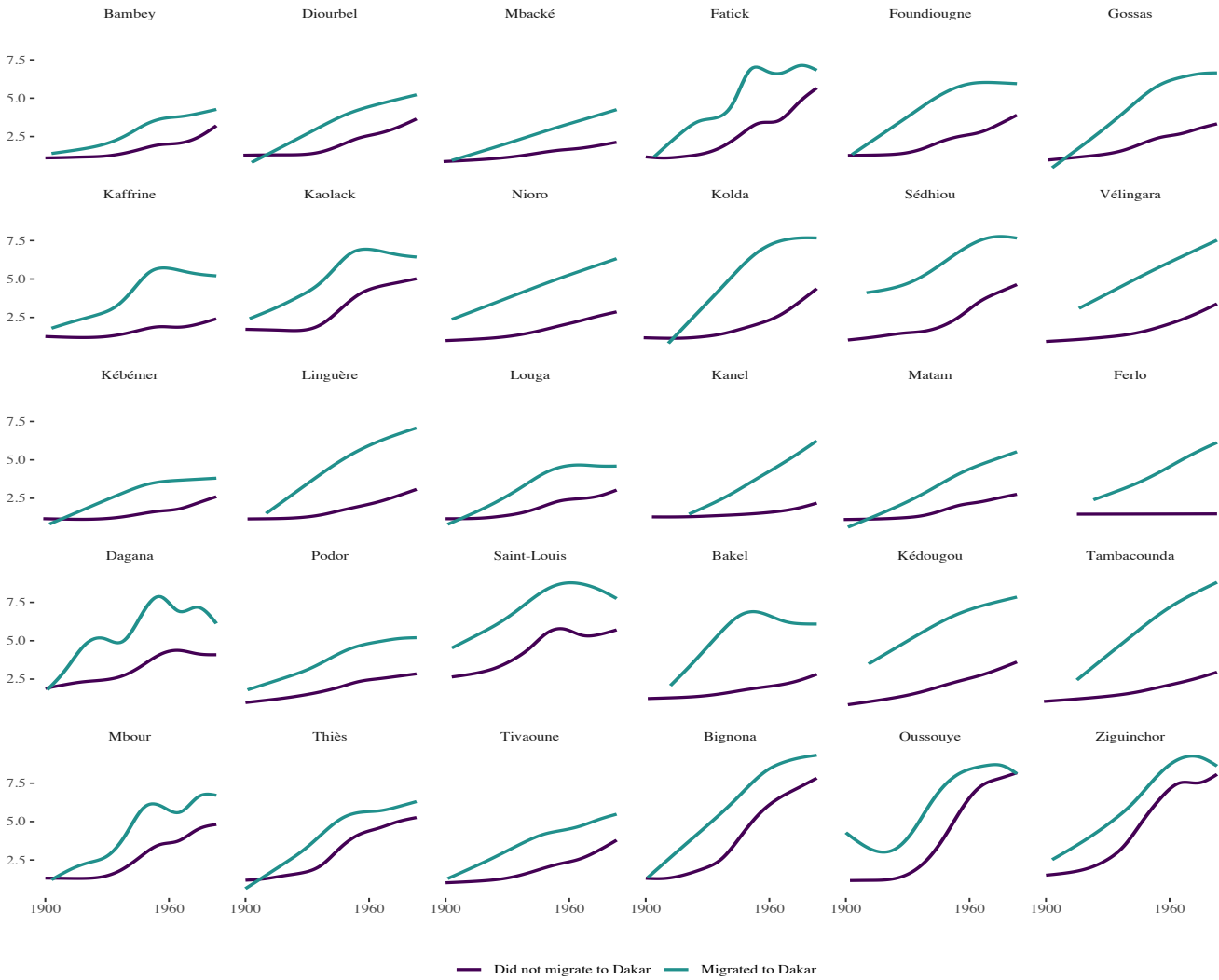


FIGURE 11: Educational attainment by place and year of birth, and migration status, 1988-2002

URBANISATION: WHO WON?

Quantifying the costs of urban growth in Dakar are not easy. We lack detailed national accounts for the colonial period, with the exception of the very end of French rule, where several estimates were made. According to one official evaluation, total Senegalese nominal GDP in 1951 was 37 billion francs. If the estimate of private construction in Dakar—about 1 billion francs a year—was accurate, this would imply that the cost of supplying private buildings to Dakar was about 3% of Senegalese GDP, each and every year.³¹² Another point estimate, for 1969, is supplied by Samir Amin, suggested that investment in land and construction in Dakar amounted to about 2 billion francs in that year; total nominal GDP was 217.4 billion francs in 1969, implying that 1% of Senegalese GDP in that year was absorbed by Dakar's growth.³¹³ It is difficult to make a firm estimate of public investment, but one estimate, a contemporary one from Agence-France Presse, suggests that *private* (as opposed to public) investment in construction was only 20% of total construction investment. If this estimate was accurate, an upper bound estimate for the annual 'cost' of Dakar's expansion in the mid-20th century would be around 15% of total Senegalese GDP.³¹⁴ Of course, this is not necessarily a 'cost', in the sense that the level of gross domestic output is not fixed. However, if we consider gross savings and gross investment as a fixed pool of funds that can either be devoted to constructing buildings or to acquiring productive capital, the large sums mentioned here can be taken indicative of a large opportunity cost to

³¹² 'Essai de recapitulation des éléments connus à Dakar pour servir à un calcul du revenu national de l'A.O.F.', AOM BIB SOM 314723

³¹³ Samir Amin, *Le monde des affaires sénégalais* (Paris, France: Les Editions de Minuit, 1969), 161; nominal GDP from Harold Nelson et al., *Area Handbook for Senegal*, 2nd ed. (Washington D.C.: American University, 1973), 248.

³¹⁴ 'La construction immobilière à Dakar', AFP Spécial Outre-Mer 4-5 July 1954, n.2380, extracted in AOM 1 AFFPOL 2163.

urban growth. A later attempt to calculate the national revenue of AOF, in 1956 estimated that there were 173 firms in the ‘buildings and public works’ sector, which between them generated 6.8 billion francs in revenue, just under 36% of the federation total for this sector.

Substantial though private investment in dwellings was, public investment in social overhead capital was even larger. By 1929, just before the onset of the Great Depression and an attendant collapse in spending, public investment in Dakar’s urban amenities was about 15 million francs a year: about 282 francs for every resident, representing about 13% of the urban unskilled wage.³¹⁵ While the 1930s saw a substantial decline in this figure, the end of the Second World War presaged another boom era for public works. For state-financed investment, the 1950s were an exceptional decade. In 1946, the French established the Fonds d’investissement pour le développement économique et social des territoires d’outre mer (FIDES), a fund for social and economic development in its colonial territories. Much of the money was earmarked for infrastructure—55% of the funds disbursed in the first Four Year Plan from 1948 to 1952, and 42% in the second plan from 1953-1957.³¹⁶ A disproportionate amount (relative to population) was invested in Dakar: for every ten francs spent in all of Afrique occidentale française, one was spent on Dakar.³¹⁷ FIDES spent large sums on developing social overhead capital in Dakar: it was, for example, the source of funding for the massive urban electrification program;³¹⁸ but it also spent lavishly on roads, water infrastructure, and other urban amenities.

³¹⁵ Calculated from the *Comptes définitifs* and *Budgets généraux* of the Circonscription de Dakar et Dépendances and the federation of Afrique occidentale française.

³¹⁶ Ghislaine Mathy, ‘Y at-il eu une politique d’infrastructure de l’AOF?’, in *Colloque AOF: Esquisse d’une intégration africaine* (Direction des Archives du Sénégal Dakar, 1995), 472.

³¹⁷ Sheldon Gellar, ‘West African capital cities as motors for development’, *Civilisations* 17, no. 3 (1967): 258.

³¹⁸ Thomas Saupique, ‘L’électrification de la ville de Dakar après 1945’, *Outre-Mers. Revue d’histoire* 89, no. 334 (2002): 85–104.

Whether or not investment in ‘social overhead’ capital stock of urban economies is an impediment or an encouragement to growth has long been a contentious topic in development economics. This has particularly been the case for investment in dwellings.³¹⁹ Building a house can be thought of as essentially purchasing a consumption item, and therefore reducing the proportion of national income that can be devoted to productive investment, especially in the presence of a savings constraint. It is also true that the construction industry produces a product that cannot be traded, meaning that its growth is entirely circumscribed by the domestic market for its output. But construction may also have strong linkages to other sectors, such as building materials that can be traded. It is also not entirely true that housing is not productive in an economic sense: in many developing countries, the family home is also a space of production, and in this sense building homes spares workers the expense of building dedicated premises for their work.³²⁰ For these and other reasons, some development economists, including Arthur Lewis, explicitly advocated the sector as growth promoting.³²¹

Were Senegal’s growing cities a burden on its economy? In the first half of the twentieth century, Dakar drew workers from its rural hinterland. When they came, they tended to work in comparatively unskilled jobs, compared to local-born workers with similar levels of education. Though the probability of obtaining skilled work was lower for migrants, it was almost certainly higher for migrants than for men who were born in rural Senegal and did not move to Dakar. Migration

³¹⁹ See, for an overview Godwin Arku, “The Housing and Economic Development Debate Revisited: Economic Significance of Housing in Developing Countries,” *Journal of Housing and the Built Environment* 21, no. 4 (2006): 377–95.

³²⁰ Samuel K Afrane, ‘The Integration of Housing and Economic Activities: A Case Study of Low-Income Settlements in Kumasi, Ghana’ (PhD thesis, University of British Columbia, 1993).

³²¹ Godwin Arku, ‘The Economics of Housing Programmes in Ghana, 1929–66’, *Planning Perspectives* 24, no. 3 (2009): 291.

did therefore contribute to structural change, despite possible labour market failures in Dakar. The cost of this structural change was substantial, entailing large investments in social overhead capital as well as the Dakar housing stock, though the comparatively slow increases in housing supply led to high prices, meaning that the economic benefits of urbanization accrued mostly to landlords.

CHAPTER IV. *The fruits of the boom: real
wages and inequality in the twentieth century*

As the city of Dakar grew, so did the fraction of the Senegalese population who relied on wages to buy their daily ration of millet or rice.³²² As Chapter 1 showed, waged labour co-existed alongside slave labour in the French ports for centuries. The abolition of slavery marked the transition to a waged workforce in Senegalese cities, and especially in Dakar, the capital of the federation of *Afrique occidentale française*. As we saw in Chapter 3, Senegal was not only the most urbanised colony in French West Africa; its workers were more likely to work for a wage than workers in any other colony of the federation, and possibly in West Africa more broadly. This chapter examines the evolution of the wage labour force in Dakar through the lens of the real wage; that is to say, the wage adjusted for changes in the prices of consumer goods.

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.³²³ To date, however, none have been constructed for cities in French Africa. In this chapter, 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 other cities in the region. Incomes grew

³²² A version of this chapter has been published as an African Economic History Network Working Paper (no. 60), entitled ‘Fruits of the boom’ (2021). I am grateful to Erik Green for comments on a draft. The housing costs portion of the paper was presented at the Utrecht Living Standards in the Past workshop, where I received excellent feedback from other participants. I am also grateful to Michiel de Haas for very incisive and extensive comments on the agricultural incomes portion of the chapter.

³²³ Frankema and van Waijenburg, “Structural Impediments”; Juif and Frankema, “Coercion and Compensation”; Bolt and Hillbom, “Potential for Diversification”; Pim de Zwart, “South African Living Standards in Global Perspective, 1835–1910,” *Economic History of Developing Regions* 26, no. 1 (2011): 49–74.

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.³²⁴ 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. I then consider rural incomes, by deriving estimates of per-farmer production of groundnut and millet, the two major crops of Senegal, adapting a methodology used in historical national accounting to derive food production. I estimate that agricultural incomes sometimes exceeded urban ones; and that growth in the countryside tracked growth in the city closely after World War II.

PREVIOUS STUDIES

The recent efflorescence of real wage studies, including in Africa, has left French Africa—indeed, all of Africa outside the British Empire, save for Frankema and Juif’s study of mining wages in the Belgian Congo³²⁵—untouched. Mostly this is a question of sources. Historians of British colonies benefit from the existence of the colonial Blue Books, annual compendia of statistics that include key information on consumer prices and nominal wages. Elsewhere, I have questioned the accuracy of these statistics for African colonies, particularly for staple food prices.³²⁶ But as I

³²⁴ Elise Huillery, “The Black Man’s Burden: The Cost of Colonization of French West Africa,” *The Journal of Economic History* 74, no. 1 (2014): 1–38.

³²⁵ Juif and Frankema, “Coercion and Compensation.”

³²⁶ Tom Westland, “How Accurate Are the Prices in the British Colonial Blue Books?,” *Economic History of Developing Regions* 32, no. 1 (2022).

argue, these questions are mainly important for studies of short-term movements in incomes; for long-run trends, the *Blue Books* are a valuable source, and the wage series that have been derived from them by Frankema and van Waijenburg constitute by far the most significant advance in the historiography of living standards in colonial Africa. For this reason, the lack of a similar publication for the French African colonies (until the belated publications of the somewhat unhappily named *Annuaire statistique*, which were not annual publications, in the post-World War II period) has hampered comparative work on real wages. Any attempt to draw long-run series requires lengthy archival searches to construct annual consumer price series.

There have been three previous attempts to construct real wage indices for Dakar. Ibrahima Thioub's is the most comprehensively documented.³²⁷ 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.³²⁸ 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). He 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

³²⁷ Ibrahima Thioub, "Économie coloniale et rémunération de la force de travail: le salaire du manœuvre à Dakar de 1930 à 1954," *Outre-Mers. Revue d'histoire* 81, no. 305 (1994): 427–53.

³²⁸ Frederick Cooper, *Decolonization and African Society: The Labor Question in French and British Africa* (Cambridge: Cambridge University Press, 1996).

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. Moreover, 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.³²⁹

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.³³⁰ 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. 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.³³¹ 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 French researchers were pioneers in many aspects of the study of labour relations

³²⁹ Hélène Almeida-Topor, “Crise commerciale et crise du colonial en Afrique noire,” *Outre-Mers. Revue d’histoire* 63, no. 232 (1976): 538–43.

³³⁰ Monique Lakroum, “Les salaires dans le Port de Dakar,” *Outre-Mers. Revue d’histoire* 63, no. 232 (1976): 640–53.

³³¹ Elliot Berg, *Real Income Trends in West Africa, 1939-1960*, 1962.

in Africa, the recent wave of historical real wage studies has not produced a single study of French Africa, a lacuna this chapter rectifies.

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.³³² Tantalisingly, 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. The real wage requires two kinds of data: a nominal wage series, and the Allen price index to deflate it.

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

³³² Robert C. Allen, "The Great Divergence in European Wages and Prices from the Middle Ages to the First World War," *Explorations in Economic History* 38, no. 4 (2001): 411–47.

extensively drawn upon to estimate wage rates across French colonies by Marlous van Waijenburg in order to estimate the shadow price of forced labour.³³³ The budget documents have many advantages 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 van Waijenburg's aggregate 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. 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.³³⁴

³³³ van Waijenburg, "Revenue Imperative."

³³⁴ Letter from François Dunand to President of the Chamber of Commerce of Dakar, 16 August 1934, ANS FCCD 366.

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

Cheeseparating 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.³³⁵ In order to ensure that the government of the circonscription de Dakar et dépendances was not paying above market rates for unskilled workers, its officials gathered reports. 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, from 1931 to 1944 (with some gaps). The wage observations are for a ‘trimester’ (i.e. a three-month period). The subset of unskilled labourer wages comprises 173 observations. In Table 27, I present the trimmed (25%) mean of these observations for unskilled labourers (*manœuvres*) 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

³³⁵ Cooper, *Labor Question*, 155.

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.

TABLE 27: Public sector wage premium, unskilled labourers.

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

Source: ANS Fonds Chambre de Commerce de Dakar, various;
Budgets généraux de l'Afrique occidentale française various editions.

The evolution of the nominal wage itself is of little interest, except in comparative perspective. In Figure 12 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 post-war 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 below, 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 France and the rest of the world. Pigeaud and Sylla 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.³³⁶ Regardless of the motive, the overvaluation ensured that Senegalese labour was dear compared to counterparts elsewhere in West Africa.



FIGURE 12: Nominal wages in US dollars in Accra and Dakar, 1914-1960.

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

³³⁶ Fanny Pigeaud and Ndong Samba Sylla, *L’arme invisible de la Françafrique: une histoire du franc CFA* (La Découverte, 2018).

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 argue, the optimal contents of the subsistence basket may change depending on the relative prices of goods. They deal with this problem by calculating separate baskets for different staples; thus they have both a ‘maize’ and a ‘rice’ basket for Lagos. I approach this question slightly differently. The problem can be formally stated as a constrained maximization 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.³³⁷

However, in order to maintain comparability with baskets used in studies elsewhere, I have proceeded somewhat differently (see Table 28). 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. 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.

TABLE 28: Contents of Dakar subsistence basket

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%

³³⁷ Robert C. Allen, "Absolute Poverty: When Necessity Displaces Desire," *The American Economic Review* 107, no. 12 (2017): 3690–3721.

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.³³⁸ 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, rice had another advantage: it does 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. 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.³³⁹ 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.

³³⁸ Mor Ndao, *Le ravitaillement de Dakar de 1914 à 1945* (Editions L’Harmattan, 2009).

³³⁹ Adetoyeje Y. Oyeyemi et al., “Cardiovascular Responses to Millet Pounding Activity among Women in a Rural Community in Northeastern Nigeria,” *Annals of African Medicine* 16, no. 1 (2017): 24–29.

Thus at least some Dakaroise women 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.³⁴⁰ 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.³⁴¹ 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. 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.³⁴² 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.³⁴³ I 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 required to

³⁴⁰ Mireille Lecarme, “La « fatigue » des femmes , le « travail de la mère » en milieu populaire dakarois,” in *Femmes plurielles*, ed. Danielle Jonckers, Renée Carré, and Marie-Claude Dupré (Paris: Editions de la maison des sciences de l’homme, 1999), 258.

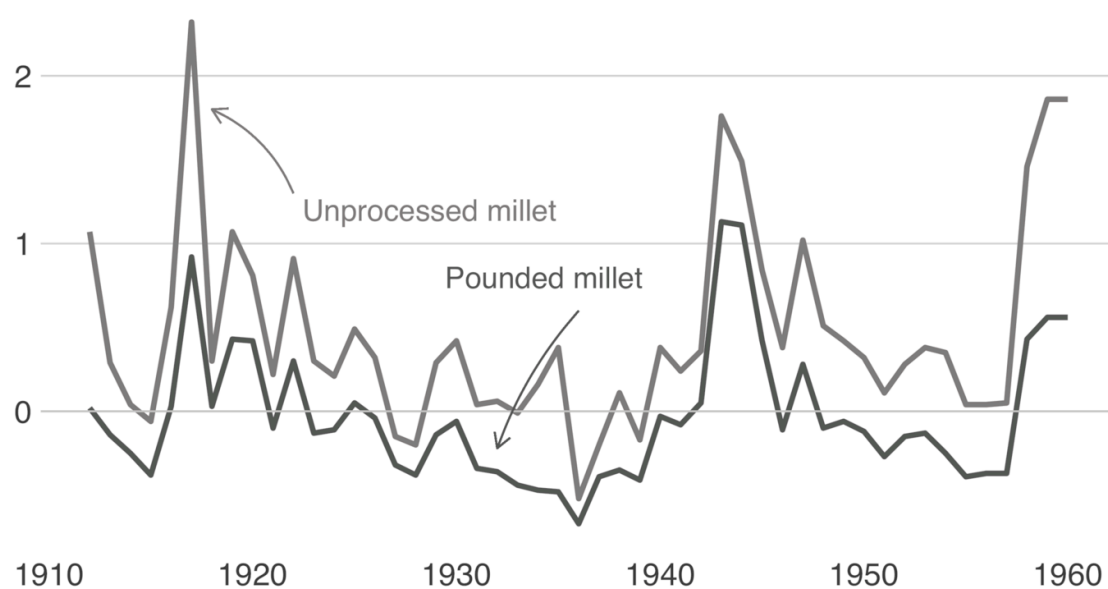
³⁴¹ Isabel Droy, *Femmes et développement rural* (Paris: Karthala, 1990), 105.

³⁴² Gouvernement général de l’Afrique occidentale française, *Budget local de la colonie du Sénégal*, 1890.

³⁴³ Gouvernement général de l’Afrique occidentale française, *Budget local de la colonie du Soudan français*, 1929.

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 1, in which a value above zero indicates that rice was more expensive than millet, and a value below zero that it was cheaper.

FIGURE 13: Price premium on rice compared with pounded and unpounded millet in Dakar, 1914-1960.



Author dataset

Notes: 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 millet prices inflated by 0.08 times the daily male unskilled wage.

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 economics about the need to account for the value of unpaid female labour³⁴⁴ 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 even the poorest household spent about three-quarters of their ‘grain’ budget on rice; richer families spent about nine-tenths (see Table 29).

TABLE 29: Millet and rice purchases by household income in Dakar, Thiès and Saint-Louis, 1954-5.

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%

Source: [...]72; author calculations.

³⁴⁴ Nancy Folbre and Barnet Wagman, “Counting Housework: New Estimates of Real Product in the United States, 1800–1860,” *The Journal of Economic History* 53, no. 2 (1993): 275–88.

DAKAR'S URBAN WAGE IN COMPARATIVE PERSPECTIVE

Real wages in Dakar were low by global standards in the first half of the twentieth century. 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.³⁴⁵ 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.³⁴⁶

The rapid increase in real wages in the post-war 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 post-war novelty.³⁴⁷ 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,

³⁴⁵ Hélène d'Almeida-Topor, "Recherches sur l'évolution du travail salarié en AOF pendant la crise économique 1930-1936," *Cahiers d'études africaines* 16, no. 61/62 (1976): 103–17.

³⁴⁶ Babacar Fall, "Sénégal: le travail au XX^e siècle" (PhD, University of Amsterdam, 2010), 174.

³⁴⁷ Iba Der Thiam, *Histoire du mouvement syndical africain: 1790-1929* (Editions L'Harmattan, 1993).

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.³⁴⁸ According to Guèye, the efforts of the Labour Inspectorate helped to dampen down more militancy; the majority of the matters it dealt with were related to wages.³⁴⁹

Though much forced labour was devoted to public works, and as such served as an implicit tax,³⁵⁰ it was also sometimes used for private enterprises. Most notoriously, African farmers were coerced into working at sisal plantations and processing factories in eastern Senegal.³⁵¹ 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 1956³⁵²—it almost certainly led to an increase in wage labour demand on the part of the colonial government, which could no longer rely on coerced labour to undertake arduous tasks on public works. This probably resulted in a positive shock to the real wage.

FIGURE 14: Welfare ratios across West African capitals, 1914-1960.

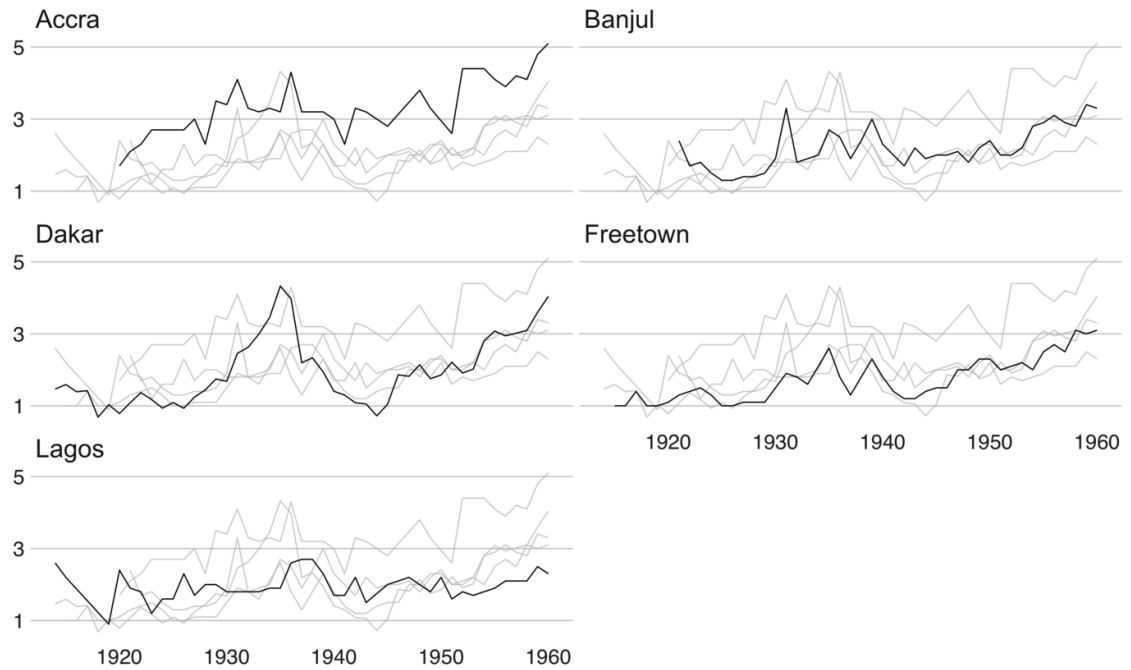
³⁴⁸ Ousmane Sembène, *Les bouts de bois de Dieu: Banty Mam Yali* (Paris: Le Livre Contemporain, 1960).

³⁴⁹ Omar Guèye, “The Inspection Du Travail and the Resolution of Work Conflicts in French West Africa (AOF),” in *Rethinking Work: Global Historical and Sociological Perspectives Publishers*, ed. Rana P. Behal, Alice Mah, and Babacar Fall (Delhi: Tulika Books, 2011), 170–82.

³⁵⁰ van Waijenburg, “Revenue Imperative.”

³⁵¹ Oussouby Touré, “Le refus du travail forcé au Sénégal oriental,” *Cahiers d’études africaines* 24, no. 93 (1984): 25–38; Romain Tiquet, *Travail forcé et mobilisation de la main-d’œuvre au Sénégal: années 1920-1960* (Rennes: Presses universitaires de Rennes, 2019).

³⁵² Babacar Fall, *Le travail forcé en Afrique occidentale française (1900-1946)* (Paris: Karthala Editions, 1993), 289.



Source: for Dakar, this paper; for other cities, Frankema and van Waijenburg, 'Structural impediments'.

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.

LABOUR PRODUCTIVITY IN AGRICULTURE

As we have seen, Dakar was the main port for Senegalese—and Soudanese—groundnuts. Its fortunes were tied to the groundnut sector in at least two ways. First, increasing trade volumes meant more hands were required to pack

groundnuts into bags and load them onto ships. A growing groundnut trade led to higher labour demand in the port itself, and, *ceretus paribus*, ought to have led to higher wages. A similar argument has been made by Choy and Sugimoto for twentieth-century Singapore.³⁵³ Additionally, groundnut farmers could, and did, leave for better-paid waged employment, and underemployed urban workers could, and did, return to the countryside to cultivate the fields.

Measuring agricultural productivity in the non-settler African colonies, where agricultural production was rarely well recorded, is no easy task. In the most methodologically rigorous effort so far, de Haas constructs model output structures across a variety of smallholder crops, and produces current income series by multiplying fixed output by current producer prices.³⁵⁴ A similar method was used by Vanhaeverbeke to estimate incomes of groundnut and millet farmers in Senegal from 1890 to 1968: he assumed a fixed pattern of land use (3 hectares of groundnuts and 3 hectares of millet per household) and fixed yields (700 kg/ha for groundnuts and 400 kg/ha for millet).³⁵⁵ In order to account for fluctuations in yields, Vanhaeverbeke and de Haas both take multiyear averages.

This procedure yields estimates that, while they do not adjust for changing crop mixtures or yields, do account for changes in prices. Valuable though it is, it is I believe hazardous to translate this without adjustment to a Senegalese context, as van Vanhaeverbeke did. Each farmer faced a choice between cultivating groundnuts for export or food for consumption and domestic markets, and crucially, farmers made different choices depending on the set of market prices

³⁵³ Keen Meng Choy and Ichiro Sugimoto, "Staple Trade, Real Wages, and Living Standards in Singapore, 1870–1939," *Economic History of Developing Regions* 33, no. 1 (2018): 18–50.

³⁵⁴ Michiel de Haas, "Measuring Rural Welfare in Colonial Africa: Did Uganda's Smallholders Thrive?," *The Economic History Review* 70, no. 2 (2017): 605–31.

³⁵⁵ André Vanhaeverbeke, *Rémunération du travail et commerce extérieur* (Centre de recherches des pays en développement, 1970).

facing them. For example, in the First World War, the collapse in groundnut prices led to record millet harvests, according to local officials. A similar phenomenon attended the devastation in the global groundnut market during the Great Depression: Senegalese farmers chose instead to plant millet and cassava. Though some degree of retrenchment from cash crop markets occurred almost everywhere in the tropics in the 1930s, this phenomenon was no doubt amplified in places like Senegal where the main cash crops were annual rather than perennial. During the 1920s, when groundnut prices were more buoyant, on the other hand, the trend was reversed in many parts of Senegal: in the southeast region of Bundu, for example, millet production fell sharply, replaced by rice imports, and more land was devoted to groundnut production.³⁵⁶

To account for annual peasant planting choices, I develop a new procedure for estimating agricultural production in Senegal, which may be of use in other African contexts where cash crop production came with a very definite opportunity cost in terms of food production. The first step is quite simple: I estimate groundnut production by dividing exports by the number of farming families. Following much recent work on national accounts in premodern economies, I use a demand equation to estimate the underlying demand for food in Senegal.³⁵⁷ I assume this can be met either by rice imports or domestic production. Since we can observe the former directly in trade statistics, the latter can be derived as a residual.

Reliable figures on domestic millet production are more or less non-existent except for the last decade or so of colonial rule. However, it is important to make some

³⁵⁶ Abdou Karim Tandjigora, "L'évolution économique et sociale comparée de deux régions sénégalaises dans le processus de colonisation, décolonisation et développement : le Boundou et le Gadiaga, 1885-1980" (PhD, Bordeaux 4, 2012).

³⁵⁷ See particularly Malanima, "Long Decline." Malanima built on the pioneering efforts of Crafts in N. F. R. Crafts, "English Economic Growth in the Eighteenth Century: A Re-Examination of Deane and Cole's Estimates," *The Economic History Review* 29, no. 2 (1976): 226.

attempt at estimating millet output because the cash crop boom in Senegal was not a case of pure vent-for-surplus. More land was brought under cultivation as the international demand for groundnuts grew, but some land that had previously been devoted to millet was given over to groundnuts, with Indochinese rice imports making up the caloric deficit. In addition to the usual annual fluctuations of the weather, the individual decision of each farming household as to how much land they would devote to each crop mattered for their income.

In brief, I used a demand function to estimate the demand for food in colonial Senegal:

$$d_f = Y^\alpha P_f^\beta P_m^\gamma$$

where d denotes demand, Y income (proxied here by the real urban wage), P price, and f and m represent food and non-food products respectively. The Greek exponents are the relevant elasticities. In other words, food demand is a function of income, the price of food, and the price of all other products. We know from the Slutsky-Schulz relationship that direct, crossed and income elasticities must sum to zero:

$$\alpha + \beta + \gamma = 0$$

thereby constraining our possible exponent choices. I have chosen $\alpha = 0.3$, $\beta = -0.4$, $\gamma = 0.1$, which are fairly standard in the historical accounting literature. Using indices of the real wage, the real price of food and the real price of non-food products, I then derive a series for food demand.

This demand-side approach is, so far, fairly standard.³⁵⁸ However, it relies on an assumption that is thoroughly unrealistic for most cash-crop economies: that food trade is balanced (i.e., that imports and exports were strictly equal, and thus cancelled each other out). In colonial Senegal, millet—as well as other food crops, like cassava and, in the Casamance, rice—and groundnuts were grown domestically, and broken rice was imported, largely from French Indochina. Ignoring for a moment the possibility of a rise in per hectare land productivity, increased groundnut production could come either from a decline in food acreage (in which case we would expect rice imports to rise to meet food demand) or from an expansion in total hectares cultivated, in which case either food production or rice imports might rise to meet the rise in income. For this reason, in estimating food production, I assume that demand is met partially by imported rice, the volume of which I can measure, and by local production, the residual.

Using 1954 as a benchmark year, I calculate total food production and demand in Senegal by adding up food crops and expressing them in millet equivalents, using their caloric values per 100g to derive conversion factors. In 1954, millet accounted for about two-thirds of domestic food production, measured in calories, and somewhat less of total food supply taking into account imported Indochinese rice (Table 30). Adding these together, we get an estimate in millet-equivalent tonnes of total food demand for 1954. I multiply this by the index calculated above to yield a time series, expressed in millet-equivalent tonnes, of Senegalese food demand. Subtracting observed rice imports in each year yields domestic Senegalese food production, which I convert to current francs by multiplying by the Dakar millet

³⁵⁸ Nuno Palma and Jaime Reis, “From Convergence to Divergence: Portuguese Economic Growth, 1527–1850,” *The Journal of Economic History* 79, no. 2 (2019): 477–506; Rodney Edwinsson, “Testing the Demand Approach to Reconstruct Pre-Industrial Agricultural Output,” *The Scandinavian Economic History Review* 64, no. 3 (2016): 202–18; Leonardo Ridolfi and Alessandro Nuvolari, “L’histoire Immobile? A Reappraisal of French Economic Growth Using the Demand-Side Approach, 1280–1850,” *European Review of Economic History* 25, no. 3 (2021): 405–28.

price, which serves as a proxy for a more comprehensive domestic crop price index (p_f).

TABLE 30: Structure of carbohydrate supply in Senegal, 1954.

Crop	Millet equivalent tonnes ('000)
Domestic:	
Millet & sorghum	321
Casamance rice	78
Maize	23
Sweet potato	16
Cassava	45
Imported:	
Indochinese rice	68

Source: Gouvernement general de l'AOF, *Annuaire statistique de l'Afrique occidentale française*, 1954, volume 5 t.3.

To this, we must add the output of the groundnut sector. Statistics for groundnut exports (in shelled equivalents) in Senegal are comprehensive and have been collected by other authors.³⁵⁹ In order to estimate per household groundnut production, I divide by the rural population of Senegal—that is, by the total population minus the urban population. The urban population in each year was estimated by linearly projecting between census years. I further divide by four³⁶⁰ to arrive at a figure for *per household labour productivity in agriculture*, which, when inflated by nominal output prices, gives an equivalent expression to the urban nominal unskilled wage as used in the Allen welfare ratio methodology. It is worth

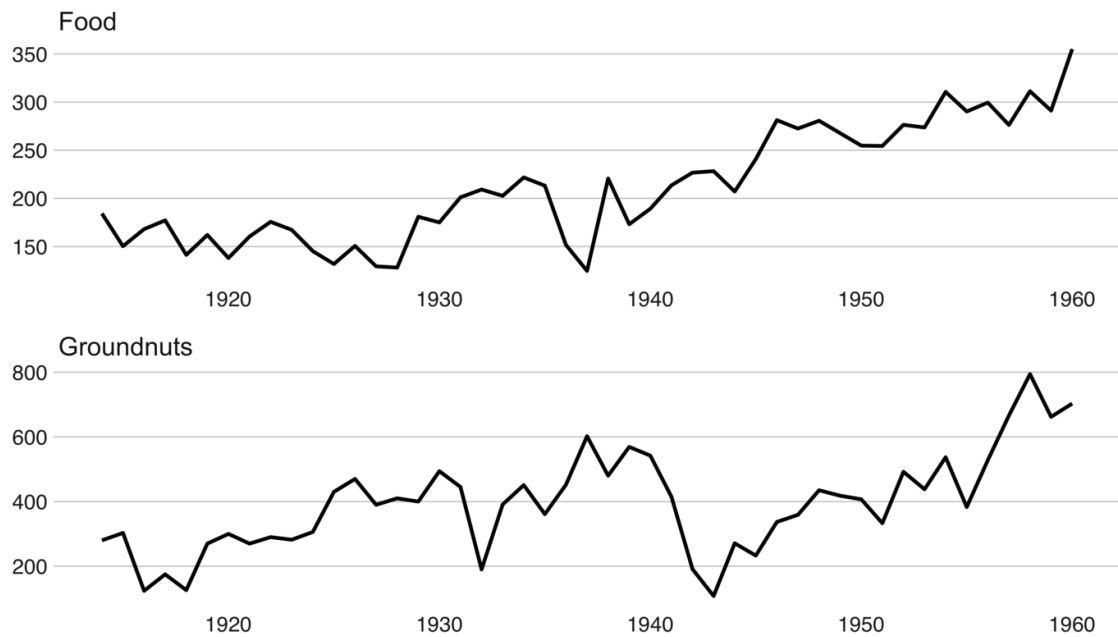
³⁵⁹ Vanhaeverbeke, *Rémunération du travail et commerce extérieur*.

³⁶⁰ I divide by four and not three, as is usual in the welfare ratio literature, to make a minimal allowance for the fact that families tended to be larger in rural Senegal than in Dakar, though since the first complete census was not conducted until 1976, this is an assumption I make based on conjecture.

pointing out some of the limitations of this exercise. Firstly, the choice of the urban real wage to proxy for ‘income’ is an imperfect one: it introduces a degree of circularity—though since the resulting rural income series is indexed and then used to project backwards from an actual estimate of output, the problem is less about the comparative *levels* of incomes between city and countryside and more about the rate of change of the latter. While incomes in Dakar could affect rural production to some extent, the ready supply of Indochinese rice probably made farmers much less responsive to changes in urban incomes. And because grain markets were not highly integrated, it is unlikely that the Dakar real wage had much of an impact on farmers in regions that were far from the capital.³⁶¹

FIGURE 15: Estimated agricultural output by crop type in Senegal, in thousands of tons, 1914-1960.

³⁶¹ This criticism, it should be noted, applies equally to recent attempts to estimate per capita GDP in British Africa: Stephen Broadberry and Leigh Gardner, “Economic Growth in Sub-Saharan Africa, 1885–2008: Evidence from Eight Countries,” *Explorations in Economic History*, no. 101424 (2021): 101424. It seems doubtful, to put it mildly, that the real wage and the price of maize in Lagos could tell us much about the state of the millet harvest in Katsina, given the fragmented nature of markets, particularly before the arrival of the railway to Northern Nigeria.



Source: see text.

We can therefore estimate both groundnut and food production in total from 1914 to 1960. I plot these two series in Figure 15. Partly as a result of the elasticities chosen in the demand equation, food production is much less volatile than is groundnut production. Food production more or less stagnated up to the Second World War—though the Great Depression did lead to a substitution away from groundnuts towards millet. It increased substantially after the War, as did groundnut production. Over the whole period, the two series are positively correlated, though particularly in the earlier decades, there is a negative correlation in growth rates, which may be evidence of a groundnut-millet trade-off. Rural nominal incomes almost always lagged urban nominal wages (see Figure 16). This was particularly the case during the Depression and after World War II; in several years in the 1920s, however, buoyant groundnut prices helped push rural incomes higher than their urban equivalents.

FIGURE 16: Urban nominal wage premium in Senegal, 1914-1960.

HOUSING & THE NATURE OF URBAN INEQUALITY

The evidence from the previous section suggests two main developments. First, 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. Second, that the nominal wage in Dakar usually exceeded nominal agricultural incomes in the countryside. However, we cannot conclude from this that *real* incomes in the city exceeded *real* incomes in the countryside unless we can be sure that both city-dwellers and farmers faced the same price vector.

Because of the sparse and scattered nature of the data in the Senegalese archives, such a proper comparative price history of Senegal lies outside the scope of this thesis. The second-best deflator is the urban price index calculated above, which I have used here. It should, though, be noted that price dispersion for the basic necessities was quite wide, even towards the end of colonial rule. In 1956, for example, millet was being sold for 15 francs per kilogram in Saint-Louis, 17 francs in Ziguinchor, 18 francs in Kaolack, 20 in Diourbe and Louga, 21 in Dakar, 25 in Mbour, and 30 francs in Thiès.³⁶² The lowest price among these cities was, in other words, half the price in the most expensive city. Rice, an imported good, displayed much less variation across space, from 28 francs at minimum in Kaolack, up to 35 francs in Diourbel. Similar patterns could be observed for other goods: cassava was twice as expensive in Saint-Louis as in Thiès; sugar prices, on the other hand, varied only within a narrow band.³⁶³ Of course, for farmers who consumed their entire millet crop, as well as for *navétanes* who paid for a fixed amount of food in kind, the market price of grain is irrelevant; 220 kilograms of homegrown millet is 220 kilograms of millet regardless of how much it might fetch at local markets.

However, the difference in staple food prices was probably dwarfed by the rural-urban gap in the price for an important service that has often been neglected in real wage studies: housing. The reason for this neglect is simple: 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

³⁶² For Dakar, 'Tableau du minimum vital à Dakar' ; for other centres, 'Relève des prix des denrées et articles entrant dans le minimum vital du manœuvre ordinaire', in ANS FCCD 368.

³⁶³ Ibid.

assumption to which he recommended scholars turn their attention in future.³⁶⁴ 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 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. As we saw in Chapter Three, a housing boom in Dakar in the mid-twentieth century led to skyrocketing rents and poor quality housing. 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.³⁶⁵

³⁶⁴ Allen, "The Great Divergence."

³⁶⁵ Maurice Voisin, 'J'accuse le Crédit foncier de saboter la bonne entente entre blancs et noirs en Union française', extract in AOM AFFPOL1 2163.

If the Crédit 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 Côte d'Ivoire especially—agricultural employees on plantations (see Table 31). 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.

TABLE 31: Share of workers with employer-provided housing by colony and sector, 1956

Sector	CIV	BEN	GIN	BFA	MRT	NER	SEN	MLI
Public	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 and 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%

Source: *Annuaire statistique de l'Afrique occidentale française*, vol 6.

HOUSING AND THE DEVELOPMENT PROCESS

The importance of housing costs in the 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 Lewis's theory of unlimited supplies of labour. In his 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). But a constant welfare ratio of one would not necessarily show that there was surplus to be extracted from the poorly-paid urban worker. Nor, even if such a surplus existed, would it necessarily be the case that the worker's employer would be the one to benefit from it.

In the following paragraphs, I sketch a rough theoretical model of a modified Lewis model with an urban landlord as well as a capitalist employer to show that landlords could be the beneficiary of a gap between the marginal product of workers in a 'capitalist' sector and the real income those workers enjoyed. 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 as 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 he 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? The landlord's income is simply an increasing function of r . The landlord 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.

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 sources 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 accommodation for migrant workers and accommodation allowances to unskilled workers employed by the French administration.

In Figure 17 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. Perhaps just as interesting is the comparison with the agricultural real wage (calculated on the assumption that housing costs in rural Senegal were low, using local dry-season labour for

construction and repair of houses, and using the urbanisation rate to calculate the agricultural share of the labour force). The two series closely follow one another, especially in the post-1945 period. The most substantial divergence is actually between 1920 and 1930, a buoyant time for the global groundnut market and one of relative prosperity in rural Senegal. Unskilled rural-urban migrants in this period may have earned enough to live on themselves, but not enough to feed, clothe and house a family of four. The closeness with which the two series follow each other after the mid-1930s may be read as evidence in favour of the proposition outlined above: that is, that landlords, who possessed a scarce and valuable asset in the form of housing located close to employment opportunities in Dakar, were able to extract rents from workers, keeping the real wage in the city close to the opportunity cost of urban labour, which was set in the countryside.

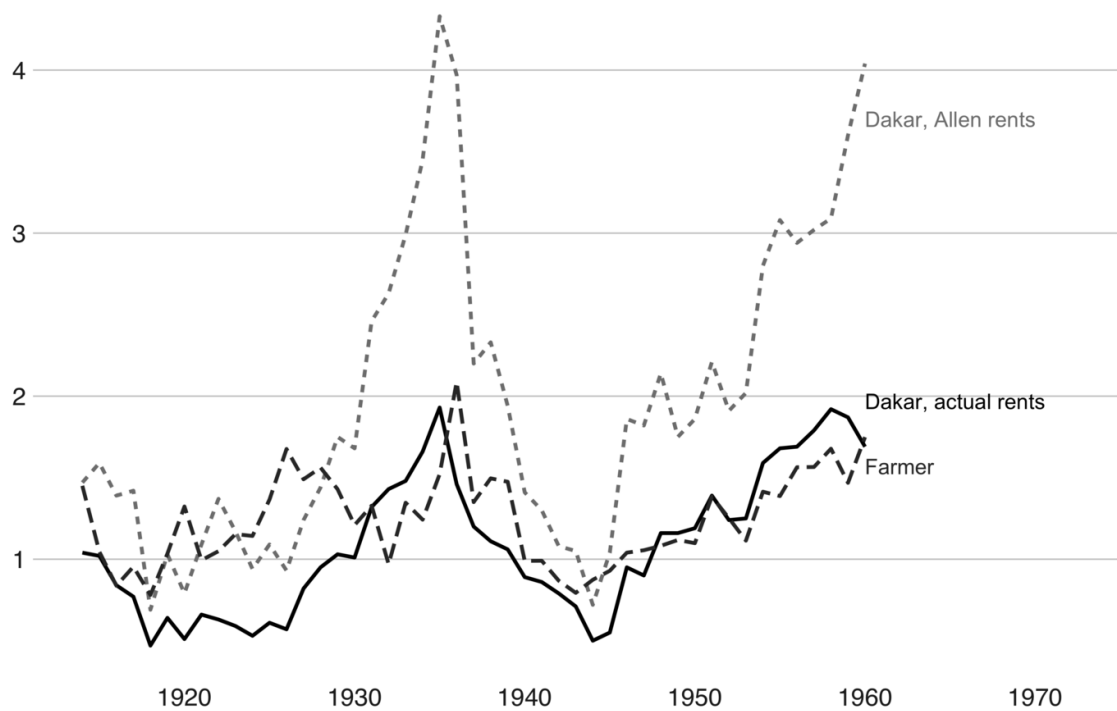


FIGURE 17: Welfare ratios in rural Senegal and Dakar with 'Allen' rents and actual rents.

HOUSING COSTS ACROSS WEST AFRICA IN THE DEVELOPMENTAL DECADE

Dakar was by no means an exception. Across colonial Africa, large cities experienced major housing crises, particularly in the final decades of imperial rule.³⁶⁶ Compiling a full rental series for all of West Africa for the purposes of comparison is beyond the scope of this thesis; however, as an indication, in Table 32 I present a range of estimates of rental costs for unskilled labourers in various

³⁶⁶ James R. Brennan, "Between Segregation and Gentrification: Africans, Indians, and the Struggle for Housing in Dar Es Salaam, 1920-1950," in *Dar-Es-Salaam: Histories from an Emerging African Metropolis*, ed. James R. Brennan, Andrew Burton, and Yusuf Lawi (Oxford: African Books Collective, 2007).

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. These estimates suggest that the 5% standard is a considerable underestimate, and that for certain periods and certain cities—Ouagadougou, Freetown, or Niamey—housing costs might be the single most important determinant of the real wage of unskilled labourers.

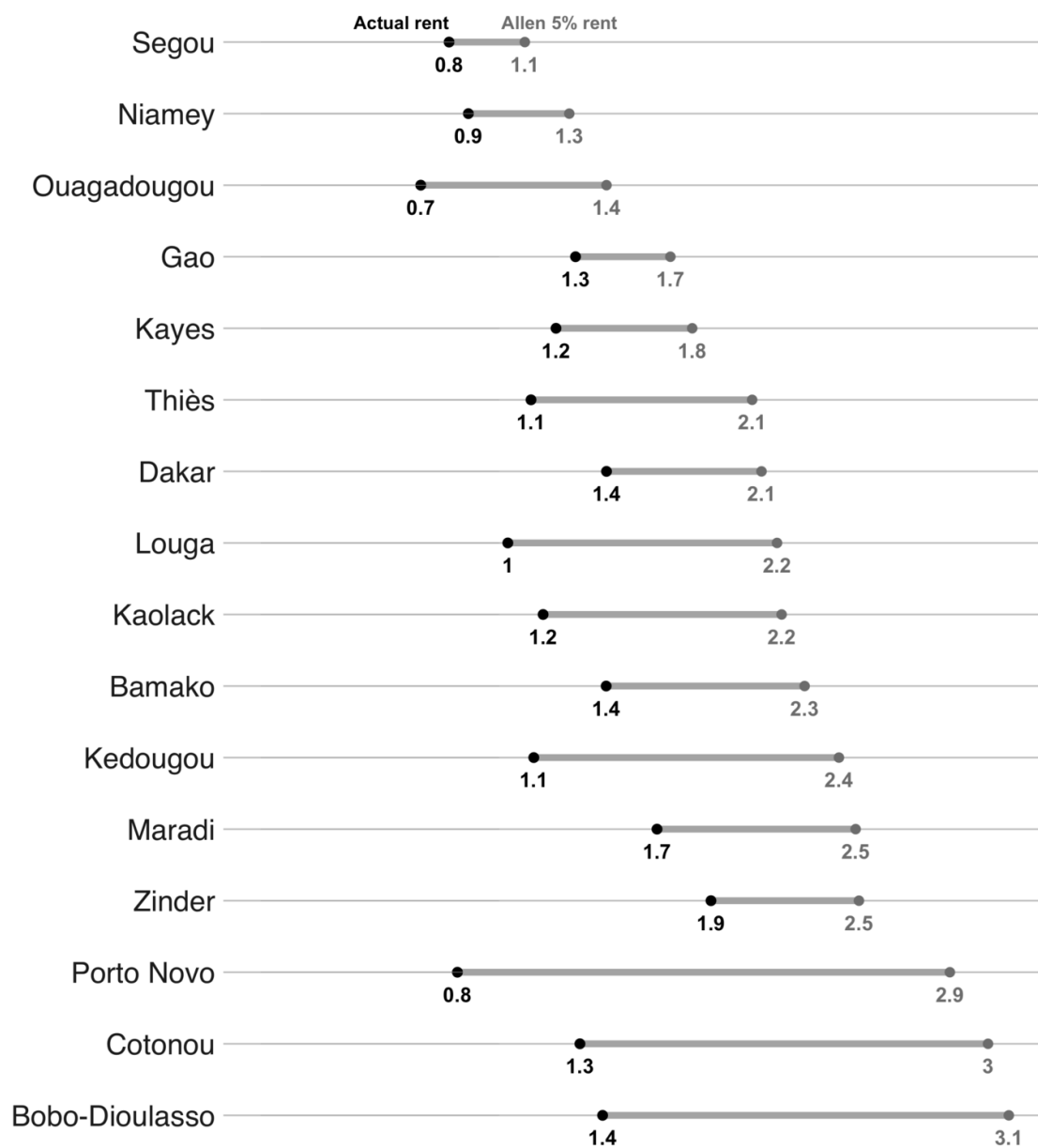
TABLE 32: Working class rents as a share of subsistence basket costs across West Africa.

Location	Description	Rent as % of basket
Kampala, 1950 ^[C]	“Dwellings built of stabilised earth...rents range from Sh. 13 per month, plus Sh 2 water rate to..[Sh 75]”	70%
Bathurst/Banjul, 1940 ^[B]	“For the unskilled labourers...4s for the rent of a room [monthly]”	20%
Accra, 1940 ^[B]	“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 ^[B]	“rent, amounting to at least four to six shillings monthly, and even this entails sharing a room”	96%
Dakar, 1951 ^[A]	“case en paille, loyer mensuel de 800 francs”	47%
Bamako, 1951 ^[A]	“pièce en banco...400-500 francs”	80%
Abidjan, 1951 ^[A]	“le simple droit de déposer sa natte, avec plusieurs autres, dans une ‘baraque’ est payée à 5 à 600 frs par un manoeuvre”	50%
Cotonou, 1951 ^[A]	“loyer mensuel pour une pièce en banco ou en chaume varient de 800 à 1000 francs”	139%
Niamey, 1951 ^[A]	“une pièce en banco...750-1000 francs à Niamey”	86%
Ouagadougou, 1951 ^[A]	“pièce en banco...1000 francs à Ouagadougou”	150%
Conakry, 1951 ^[A]	“loyer mensuel d’un simple-abri variant entre 1000 et 2000 francs”	84%

Sources: [A] : ‘Essai de recapitulation des éléments connus à Dakar pour servir à un calcul du revenu national de l’A.O.F.’, AOM BIB SOM 314723 [B] J. Orde Browne, Labour

conditions in West Africa, May 1941, London. [C] Kampala: Colonial Office, *The British Territories in East and Central Africa*, 1945-1950, June 1950, London, p.128. Subsistence basket costs taken for French colonies from ANS 22 G 222, ANS 22 G 223, ANS G 225, and *Annuaire statistique de l'Afrique occidentale française*, vol 5 t.3; for British colonies from Frankema and van Waijenburg, 'Structural impediments'.

FIGURE 18: Welfare ratios in French West Africa, 1951, standard and rent-adjusted.



Sources: Senegal ANS 22G 136, Haute Volta ANS 22G 223, Guinée ANS 22G 222, Soudan ANS 22G 227, Niger ANS 22G 225. Rents from AOM BIB SOM 314723. Wages from same source as prices or from *Annuaire statistique de l'Afrique occidentale française*, vol 5 t 3.

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 standard methodology yields a welfare ratio of 1.5 in 1950³⁶⁷—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 32, the welfare ratio declines to just over 1. More drastically still, the Lagosian real wage declines from 2.3 in 1960 to 1.1 if we take into account house rent. In Figure 18, 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.³⁶⁸

³⁶⁷ Frankema and van Waijenburg, "Structural Impediments."

³⁶⁸ Mauricio Drelichman and David González Agudo, "Housing and the Cost of Living in Early Modern Toledo," *Explorations in Economic History* 54 (2014): 27–47; Luis Felipe Zegarra, "Living Costs and Real Wages in Nineteenth Century Lima: Levels and International Comparisons," *Australian Economic History Review*, no. aehr.12186 (2020), doi:10.1111/aehr.12186.

The other fact is the correlation between the ‘traditional’ welfare ratio and the size of the adjustment, demonstrated in Figure 19. 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.

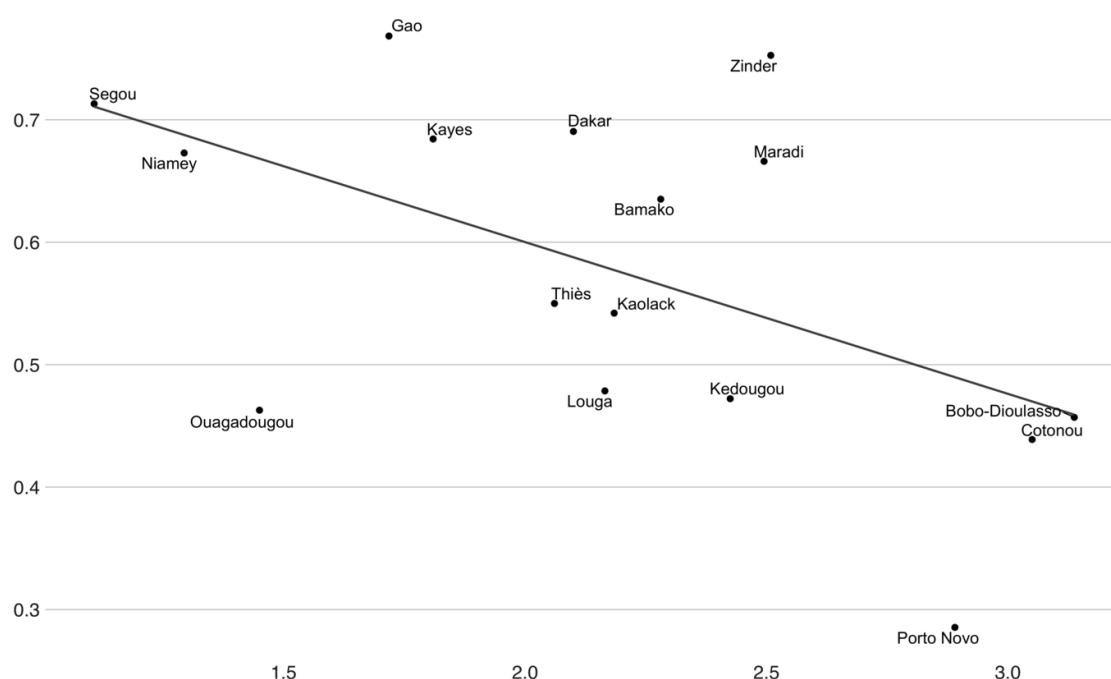


FIGURE 19: Relationship between the traditional welfare ratio and rent-adjusted welfare ratio. Notes: On the x-axis is the welfare ratio with a 5%-rent assumption and on the y-axis is the ratio of the actual-rent welfare ratio to the 5%-rent welfare ratio.

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, 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.³⁶⁹ 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, certainly at the upper end of a plausible commute), then the ‘possibility’ circle defined by the worker’s willingness 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 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.³⁷⁰

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 murky, and without well-functioning credit and/or land markets, even those who possess clearly-defined rights to land may not

³⁶⁹ Edmond Bernus, “Abidjan: note sur l’agglomération d’Abidjan et sa population,” *Bulletin de l’Institut fondamental d’Afrique noire. Serie B: Sciences humaines* 24, no. 1 (1962): 54–85.

³⁷⁰ See generally Issa Faye, El-Hadj M. Bah, and Zekebweliwai F. Geh, *Housing Market Dynamics in Africa*, PDF, 1st ed. (Basingstoke, England: Palgrave Macmillan, 2018).

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.³⁷¹ 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.³⁷² The outbreak of bubonic plague in 1914 in Dakar was a catalysing factor in the construction of the Médina, north of Plateau, as a segregated area for African dwellings.³⁷³ 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.³⁷⁴ This could even be a justification for banning durable constructions in the ‘African’ suburbs of colonial towns, like Guet N’Dar in Saint-Louis.

³⁷¹ Maynard W. Swanson, “The Sanitation Syndrome: Bubonic Plague and Urban Native Policy in the Cape Colony, 1900–19091,” *Journal of African History* 18, no. 3 (1977): 387–410; P. D. Curtin, “Medical Knowledge and Urban Planning in Tropical Africa,” *The American Historical Review* 90, no. 3 (1985): 594–613.

³⁷² Liora Bigon, “Bubonic Plague, Colonial Ideologies, and Urban Planning Policies: Dakar, Lagos, and Kumasi,” *Planning Perspectives: PP* 31, no. 2 (2016): 205–26; Kalala Ngalamulume, “Keeping the City Totally Clean: Yellow Fever and the Politics of Prevention in Colonial Saint-Louis-Du-Sénégal, 1850–1914,” *Journal of African History* 45, no. 2 (2004): 183–202.

³⁷³ Elikia M’Bokolo, “Peste et société urbaine à Dakar : l’épidémie de 1914,” *Cahiers d’études africaines* 22, no. 85/86 (1982): 13–46.

³⁷⁴ Alain Sinou, “Idéologies et pratiques de l’urbanisme dans le Sénégal colonial” (École des hautes études en sciences sociales (EHESS), 1985).

On the other hand, 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.³⁷⁵ 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.”³⁷⁶ 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.³⁷⁷

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

³⁷⁵ Bouche, “Problèmes de surpeuplement.”

³⁷⁶ Report to President of France, AOM 1AFFPOL 2163

³⁷⁷ Letter from Pierre Chichet to Ministre de la France d’Outre Mer, 13 March 1953, AOM 1AFFPOL 2163.

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.³⁷⁸

The major problem of industrial growth in an open land-abundant economy is to ensure that the real wage is high enough to attract productive workers to the factories while keeping the nominal wage low enough that what is produced in those factories remains price-competitive with foreign goods. In the particular case of a *colonial* economy, both of these imperatives may still be salient even without any express desire for industrialisation. Indeed, in many ways, the policy objectives of European colonial powers can be summed up in Mehmet Genç's famous description of the economic philosophy of the Sublime Porte in ruling the major Ottoman cities: provisionism (providing cheap and plentiful food for the masses), fiscalism (maximising revenue and minimising outlays) and traditionalism (hewing, as far as possible, to established practices).³⁷⁹ High urban real wages help to appease a potentially dangerous group of colonised subjects. As we saw in Chapter 4, French administrators were not at all enthusiastic about the idea of mass migration to Dakar, but given the relatively large African population, a policy of high purchasing power might keep them satisfied enough not to challenge French rule. On the other hand, the colonial administration was probably the single largest employer in Dakar, and wages made up a large part of the expenditure side of its annual budget. High nominal wages made it more difficult to balance the books. The solution to this dual problem is simple: keeping food prices as low as possible.

³⁷⁸ Laurent Fourchard, "De la residence lignagère à la rente immobilière: cours et compounds en Afrique occidentale française et au Nigéria, fin XIXe siècle-1960," *Le Mouvement social*, no. 204 (2003): 47.

³⁷⁹ Mehmet Genç, *Osmanlı imparatorluğu'nda devlet ve ekonomi*. Ötüken Neşriyat AŞ, 2000.

The French administration of Senegal struggled at times to maintain secure food supply to its cities. The beginning of the twentieth century had proved a particularly difficult time in this respect: the famine of 1913-14—which affected much of the Sahel region—was responsible for many deaths and great hardship in Senegal, and placed a great deal of strain on the supply of food to the Quatre Communes in particular.³⁸⁰ As Senegal entered the First World War alongside the metropole, its provisioning system came under new stress, as the colony was obliged to send food to France to help with the war effort. Even when famines threatened, the general government of the AOF tended to take a minimalist approach to solving the problem. Though it did lend money to help procure emergency supplies, in the main, it expected these loans to be repaid in full, and in good time. In August 1914, after terrible harvests the previous year, the AOF government was obliged to pay for 450 tons of maize to feed the city of Saint-Louis, at the price of 78,000 francs, which, after the crisis had passed, the city administration was required to repay, despite its complaints that a substantial portion of the food purchased by the AOF government was of very low quality. Some in the *conseil général* of the colony argued more forcefully that the government ought to intervene forcefully when required in grain markets in order to lower the price of foodstuffs for the *indigènes*. In a debate in 1918 over ‘the provisioning of the population’, François Devès, scion of the influential *métis* Devès family, accused the government of profiting obscenely from the sale of basic foodstuffs by imposing high reference prices for the calculation of sales taxes. Devès noted that the administration obtained rice at 53 centimes a kilo, and the fixed price set for sale was 90 centimes a kilo. Millet, he argued:

purchased upriver at a low price, is then sold at Tivaouane and on the railway line at 60 or 80 francs for 100 kilograms. In 1914, when rice was sold

³⁸⁰ Ndao, *Ravitaillement*, 16–24.

at 80 francs for 100 kilograms, the Government taxed it as though it sold for 40 francs. And at that time the government did not have in its hands the decree of 1917, which it does today; that did not prevent it then from banishing the spectre of famine which threatened the country.³⁸¹

For Devès, a regular advocate for the *indigènes* of Senegal, the chief concern had to be the relief of the starving, and this justified the administration requisitioning food from the granaries of the European trading firms. Others, however, adopted a more colonial attitude. Price intervention would distort incentives for producers, as the Secretary General of the *conseil* noted in another debate in 1917, and could therefore not even solve the humanitarian problem, since an imposed lower price would simply reduce the quantity supplied:

As far as millet is concerned, there is reason to fear that by setting too low a price, the government would limit producers' profits, and that we would risk seeing them abstain from bringing their harvest to market. The same fear applies to other goods, if taxed.³⁸²

It would, of course, be wrong to say that the substitution of millet for groundnuts in Senegal was responsible for famine, since famines obviously predated the cash-crop era (lack of rain, or too much of it at the wrong time, will destroy food crops just as they destroy cash crops); a strong specialization in any one crop, subsistence or cash-crop, makes it more rather than less likely that bad weather conditions or disease will entirely destroy a year's harvest. However, the colonial authorities had a good fiscal reason to prefer that Senegalese farmers specialize more strongly in groundnuts, even if this left them open to the possibility of unreliable food supplies: the AOF government in particular relied upon taxes on cross-border trade to

³⁸¹ Procès-verbal de la séance du 20 juillet 1918, Gouvernement de Sénégal et dépendances, *Conseil général : procès-verbaux* (Saint-Louis, Senegal, 1918).

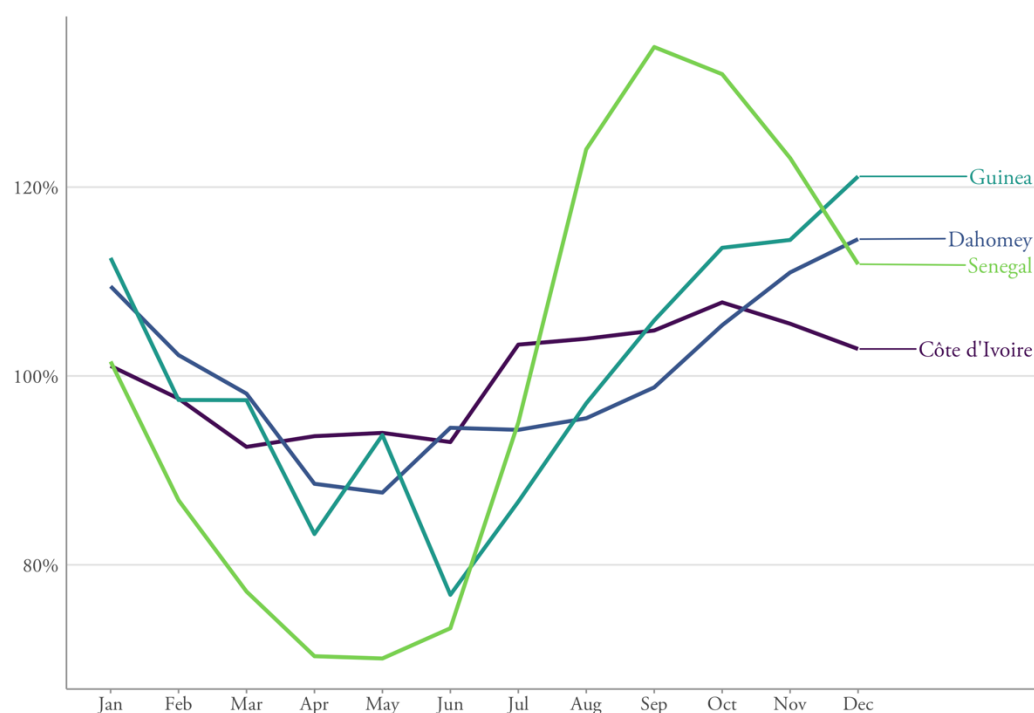
³⁸² Gouvernement de Sénégal et dépendances, *Conseil général : procès-verbaux* (Saint-Louis, Senegal, 1917), 134.

finance itself. Therefore, a key concern of the colonial government was how to ensure that groundnut production could be increased while assuring farmers that they would not starve if the groundnut harvest was poor.

The institutional response to this dilemma was the *sociétés indigènes de prévoyance* (SIP)—literally, ‘indigenous provident societies’, which were formed all across the AOF in response to the particularly brutal famines of the early twentieth century, following a model already devised in Algeria and French Indochina. Though they never had the power of the marketing boards set up in British colonies during World War Two,³⁸³ the SIP became an integral part of the agricultural economy of the AOF. The guiding philosophy of the SIP was the colonial assumption that African farmers were, to turn the name of the institutions around, improvident: they made little provision for seed capital or for food insurance, and therefore government intervention was required to instil in them the European virtue of foresight. Membership in the SIP of one’s *cercle* was therefore eventually made compulsory for all African farmers. The SIP would serve as a kind of counter-seasonal financial institution, allowing or requiring African farmers to save some of the specie earned at the end of the harvest for the rest of the year. In the case of Senegal, especially, the monetary base showed a distinctive seasonal pattern (Figure 20) and combined with what we can assume from crop cycles to have been a differing seasonal pattern for monetary demand, this implies that money would have been dear during the dry season and planting season and cheap afterwards. The SIP were designed to counter this pattern, and get rid of the ‘usurious’ lending that traditionally took place during the *soudure* (the hungry season).

FIGURE 20: Seasonal factors in money circulation in French West Africa.

³⁸³ For an explicitly comparative perspective, see AI Asiwaju, “The Co-Operative Movement in the Colonial Context: A Comparison of the French and British Rural West African Experience to 1960,” *Journal of the Historical Society of Nigeria* 11, no. 1/2 (1981): 89–108.



Notes: Calculated as average deviation from a 13-month moving average. Sources: Calculated from data on monetary circulation given in annual reports of the Banque de l'Afrique occidentale, AOM 1 AFFECO 772 and AOM 1 AFFECO 184/E.

The SIP would store emergency grain supplies, distribute seeds during the sowing season, and even made attempts to muscle in on the marketing of the groundnut harvests, although they met with fierce resistance from the Levantine traders who had previously monopolised this role on behalf of the mostly Bordelais merchant houses. The ability of the SIP to replace the traders—which was certainly the intention of the colonial government, at least from the 1930s³⁸⁴—was hampered by their inadequate financing and their habit of paying farmers in instalments. While the *ristourne* (a payment made during the dry season for a part of the previous season's crop) was supposed to ensure that farmers did not suffer before the start

³⁸⁴ Abdoul Sow, « Les sociétés indigènes de prévoyance du Sénégal des origines à 1947 » (PhD thesis, Université de Dakar, 1984), 11.

of the new season, and that they were well-fed during the wet season, farmers were suspicious that the SIP might not pay the *ristourne*—a suspicion stoked by the merchant houses, who realised the danger the SIP presented to their business model.³⁸⁵ The SIP never displaced the Levantine traders nor the merchant firms to whom they sold the crop, although they began to serve as commercial intermediaries.³⁸⁶

The SIP never managed to revolutionise agricultural production in Senegal. Part of the reason they could not play any great role in keeping the price of grain low and real wages high is that the relevant price of grain was, as we have seen, determined not by the productivity of millet-growers in Senegal but by rice-growers in the Mekong Delta, half a world away. When the need to contain food prices became urgent, more direct price controls would thus be needed. As in many other countries around the world, the principle macroeconomic management tool during World War II was an incomes policy: that is to say, restraining both nominal wages and prices to prevent inflation. The isolation of Dakar following the Allied blockade made provisioning the colony exceedingly difficult, and wholesale price and wage controls were undoubtedly the only conceivable remedy. The Director General of Finances was specifically opposed to any increase in nominal wages, despite the clamours of local workers for an improvement in their living standards; any effort to raise the real incomes of workers, he thought, “should be oriented towards limiting the cost of living.”³⁸⁷

³⁸⁵ Robert L. Tignor, “Senegal’s Cooperative Experience 1907-1960,” in John Waterbury and Mark Gersovitz (eds) *The Economy of Risk and Choice in Senegal*, (London, 1996), 56.

³⁸⁶ Andrew Arsan, *Interlopers of empire: the Lebanese diaspora in colonial French West Africa*. Oxford: Oxford University Press, 2014.

³⁸⁷ Letter from Director General of Finances, AOF, to Director of Political and Administrative Affairs, no 4992/F, Dakar, 5 June 1942, ANS K 237 (versement 26).

The control mechanisms which the administration drew on actually predated the War. The coming of the Popular Front government in Paris led—in colony as in metropole—to the establishment of official committees in the 1930s across the urban centres of French West Africa to fix wholesale and retail prices for imported and local commodities.³⁸⁸ In theory their powers were considerable, but in practice they appear to have had a limited effect on the prices of basic foodstuffs consumed by African workers: the official Price Surveillance Committees determined that millet prices could not be controlled: there was too much difficulty in obtaining representative supply prices, given the huge variance in quality, provenance and date of harvest. On the other hand, the Committees *did* regulate the price of imported rice, though their effectiveness can be doubted, given that the rice price was overwhelmingly determined by conditions in Indochina.³⁸⁹ The Popular Front government also legalised unions for African workers who were literate in French and introduced collective bargaining, which, though not a centralised wage-setting mechanism, certainly formalised the process of private-sector wage formation. Other factors may also have helped keep real wages in Dakar higher than elsewhere in French West Africa. During the war, the price of imported goods was probably a good deal lower in Dakar than elsewhere in the Federation, as a large proportion of imports destined for Guinée, Côte d'Ivoire or Dahomey were first shipped to Dakar. Before the war, Conakry, Abidjan and Cotonou were provisioned directly from French ports, and the price of freight from the metropole did not vary markedly between the different West African ports.³⁹⁰

³⁸⁸ Thioub, 'Economie coloniale', 441

³⁸⁹ 'Prix du mil et du riz', letter from President of the Wholesale Price Surveillance Committee to Administrator of the Circonscription of Dakar, 32/2 14 January 1937, ANS K 237 (versement 26).

³⁹⁰ Direction générale du Plan et de la Statistique, 'Rapport d'enquête sur le coût de la vie comparé à Dakar et à Abidjan, pour les fonctionnaires européens', Dakar, 15 August 1945, ANS 22 G 215 (versement 215).

In the post-independence period, the cooperative model of agricultural development formed the basis of the ‘African socialism’ advocated especially by Senghor’s Prime Minister Mamadou Dia; and, indeed, it was the apple of discord that eventually led the power struggle between two most powerful politicians of the *Union progressiste sénégalaise*, and eventually to Dia’s political demise and the centralisation of power in the Presidential palace. Dia’s enthusiasm for democratic cooperativism was disliked especially by the landholding Mouride *seriñ*, who sided with Senghor and formed his power base in rural Senegal for much of the rest of his rule.³⁹¹ After the fall of Dia, the ambitions of rural socialism were scaled back, though cooperatives continued to supplant the merchant firms (who, from 1960, had to be licensed by the State) in the marketing of groundnut harvests. The effective nationalisation of the trade was completed in 1966 when the *Office national de coopération et d’assistance au développement* (ONCAD; originally known as the *Office de commercialisation Agricole du Sénégal*) was formed, subsuming a variety of previously established government agricultural institutions. The independent Senegalese government thereby completed a project begun by the colonial administration in the 1930s: it took control of one of the ‘hands’ of the price scissors by monopolising the purchase of groundnut crops, enabling it to dictate prices to farmers and hence, if it chose, to turn the domestic terms of trade against the groundnut-growing peasants and in favour of the industries of Dakar. ONCAD did extract fairly large taxes from groundnut producers, as Table 33 documents. In the 1973 harvest, nearly a half of the total sale price of groundnuts to the Dakar oil mills was pocketed by ONCAD, with farmers taking only 38% of the revenue. With the accession of Abdou Latté Mbacké to the head of the

³⁹¹ See Donal B Cruise O’Brien, “Co-Operators and Bureaucrats: Class Formation in a Senegalese Peasant Society,” *Africa* 41, no. 4 (1971): 263–78.

Murīdiyyah order in 1968, the political cost of such extraction had become higher: Mbacké encouraged his followers to turn away from groundnuts and back to traditional crops like millet.³⁹² As the global commodity bubble popped in the 1970s, ONCAD's ability to extract a meaningful surplus from farmers declined, and the office was abolished in 1980 (TABLE 33).

TABLE 33: Price structure of Senegalese groundnuts, 1967-1976.

	Sale price to oil mills, francs per kg	% producer price	% ONCAD profit
1967	17.75	107%	-24%
1968	25.25	75%	13%
1969	28.53	70%	19%
1970	38.34	52%	37%
1971	34.24	67%	15%
1972	41.90	54%	30%
1973	76.00	38%	48%
1974	52.76	76%	1%
1975	53.20	75%	1%
1976	63.45	63%	18%

Source: IMF SM/76/216, IMF SM 71/61; author calculations.

THE HIGH NOMINAL WAGE, THE AFRICAN FOOD PRICE PUZZLE, AND INDUSTRIAL GROWTH

One of the puzzles about contemporary African economies is the 'food price puzzle': West African food prices are around 30 to 40 percent higher than in

³⁹² Donal B. Cruise O'Brien, *Symbolic Confrontations: Muslims Imagining the State in Africa* (London, England: Hurst, 2004), 68.

countries with similar levels of per capita income.³⁹³ At the same time, African labour costs are by world standards high.³⁹⁴ Are these two phenomena linked? Though a full analysis of the historical roots of high unit labour costs in Africa lies beyond the scope of this dissertation, it is interesting to look at the comparative wages and cost of food in West Africa and land-abundant Southeast Asia across the twentieth century.³⁹⁵ For the reasons enumerated in the introduction to this thesis, these two regions form a very natural comparator group. Moreover, Dakar and Freetown (the other West African example I have chosen) are also comparable to cities like Rangoon, Bangkok and Manila because of the weight of rice in the consumption basket. In Sierra Leone, rice is produced domestically; in Senegal, it was mostly imported, though there was considerable production in the Casamance—which was poorly integrated with the rest of the Senegalese economy due to the barrier of the British colony of Gambia.

In Figure 21, I show the ratio of the cost of a kilogram of rice in Rangoon to the cost of either a kilogram of its calorific equivalent (1.2 kg) of millet in Dakar, as well as the ratio of the nominal unskilled labourer wage in Rangoon to the equivalent wage in Dakar, from 1914 to 1940. All were converted to US dollars at market exchange rates first to make the calculation possible. The resulting nominal wage ratio is a mixed bag: mostly nominal wages were higher in Dakar, but the devaluation of the French franc in the 1920s sometimes pushed the nominal wage below the level prevailing in Rangoon, where the currency was the rupee, pegged to sterling. But the food price story is quite different: grain was always cheaper in Rangoon than in

³⁹³ Thomas Allen, “The Cost of High Food Prices in West Africa,” *OECD West African Papers* 2017, no. 8 (2017).

³⁹⁴ Alan Gelb et al., “Can Sub-Saharan Africa Be a Manufacturing Destination? Labor Costs, Price Levels, and the Role of Industrial Policy,” *Journal of Industry, Competition and Trade* 20, no. 2 (2020): 335–57.

³⁹⁵ See also the comparison of nominal wages across West Africa and East Africa, and to India, in Frankema and van Waijenburg, “Structural Impediments.”

Dakar (though rough parity was achieved in the mid 1920s). This advantage was particularly evident during the two major collapses in world trade, during World War One and in the Great Depression. The difficulties of obtaining grain from Indochina struck Senegal particularly hard in the First World War, while Burma had a thriving domestic rice industry from which it could supply itself.

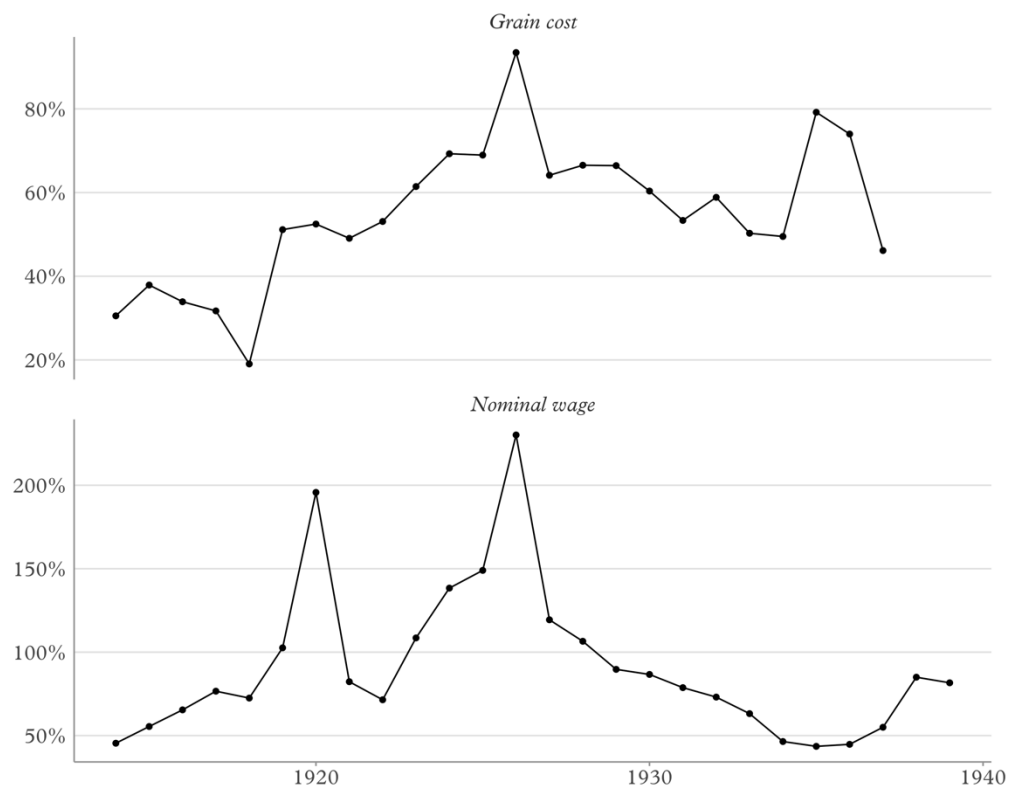
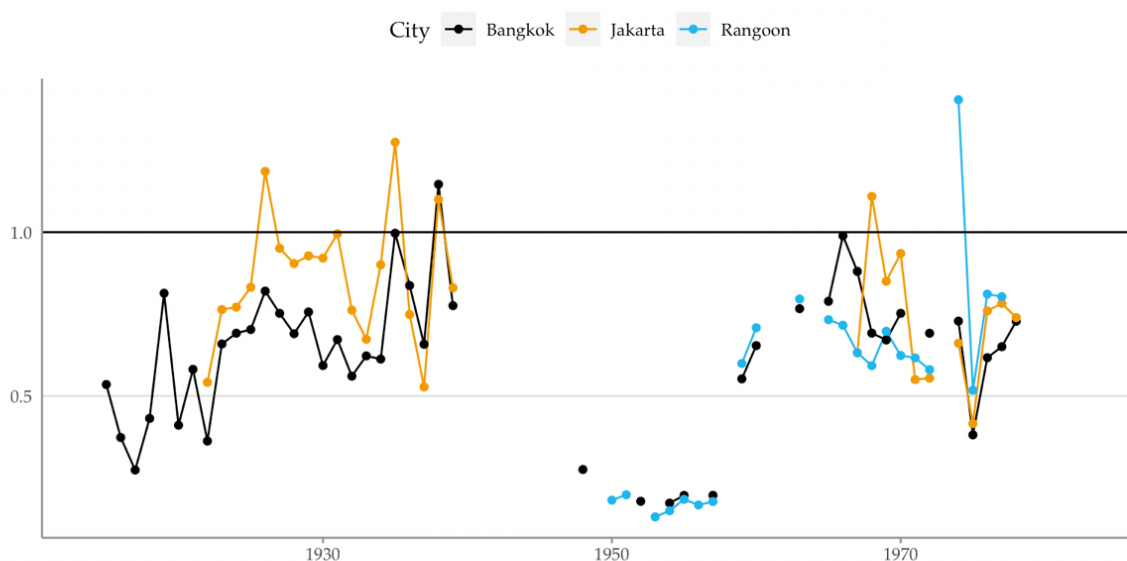


FIGURE 21: Relative prices and wages in Dakar and Rangoon at international prices. Ratio of rice price in USD in Rangoon to rice or millet price in Dakar in USD, 1914-1937 (top panel), and nominal unskilled male wage in Rangoon to Dakar, 1914-1940 (bottom panel). Source: for Dakar, as above; for Rangoon, Statistical Abstract of British India (various editions) and Jeffrey G. Williamson, *Real Wages and Relative Factor Prices in the Third World 1820-1940: Asia* (Institute of Economic Research Working Papers, 1998).

Rangoon was not an outlier. In Figure 22, I use a more comprehensive food basket. I calculate the cost of the food portion of the Allen basket presented above—rice, cooking oil, sugar and meat—for Bangkok, Jakarta and Rangoon from 1914 to 1980, and compare it to the cost of the same basket for Dakar. (I could find only rice prices for Rangoon prior to the 1950s; the more comprehensive series for Rangoon therefore only begins in 1950). With some rare exceptions, it was cheaper to buy a subsistence basket of food in Jakarta, Bangkok and Rangoon than it was in Dakar for a large part of the twentieth century. Some of the blame for the extremely low ratio in the 1950s is due to the massive overvaluation of the French franc, and the even greater overvaluation of the CFA franc, as we saw above. But the phenomenon of high food prices in Dakar was more general than this, and obtained even in the 1920s when the franc was relatively undervalued.

FIGURE 22: Ratio of food prices in Southeast Asia to food prices in Dakar.



Sources: Prices for Bangkok: *Statistical Yearbook of the Kingdom of Siam*, various editions, *Statistical Yearbook of Thailand*, *ILO Yearbook of Labor Statistics*, *ILO October Inquiry*; Jakarta: *Indisch Verslag*, *Statistisch jaaroverzicht van Nederlandsch-Indië*, *Buku Saku Statistik Indonesia*; *ILO October Inquiry*; Rangoon: *ILO October Inquiry*. Prices for Dakar from this chapter.

There are two interesting implications of this fact. The first is that for any given nominal wage, the real wage in Southeast Asia would be higher than in Dakar. Imagine a hypothetical textile firm trying to decide whether to invest in a new plant in Bangkok or Dakar, in which cities—let us assume for the sake of argument—labour productivity is roughly the same. Suppose, further, that in order to entice a farmer away from the fields to work in the textile factory, the firm must offer a *real* wage of at least two Allen subsistence baskets. Because food prices were lower in Bangkok, the minimum viable *nominal* wage in Bangkok would be lower than in Dakar. Consequently either the international price of textiles produced in Bangkok would be lower than in Dakar or the profit rate of firms would be higher: either way, Bangkok would be a more attractive destination for a profit-maximising firm than Dakar. Alternatively, assume that instead of offering the same real wage across locations, the firm decides to set up textile factories in Dakar and Bangkok and offer the same *nominal* wage, equivalent to the marginal product of labour at international prices. The lower price of food in Bangkok ensures that the real wage there is higher than in Dakar. Because of Engel's law, the share of food in total consumption is lower, and domestic demand for manufactures is higher than in Dakar. The more sophisticated structure of demand in Bangkok would in that case lend itself to greater scope for import substitution industrialisation than in Dakar, where urban workers are forced to devote a larger share of their income to food. In the following chapter, I consider domestic demand and the prospects for import substitution industrialisation in more detail.

CHAPTER V. *The path from cash crops to
industry: a staples perspective.*

In his classic treatment of the economic structure of colonial rule in West Africa, A. G. Hopkins drew on aspects of staple theory, an approach to economic history pioneered largely by Canadian scholars who sought to explain the course of that country's history through an examination of the impact of a succession of export staples.¹ The staples thesis originated in the pioneering work of Harold Innis on the trade in fur and cod in colonial Canada, and was revived by Kenneth Buckley and Melville Watkins in more theoretical form several decades later.² Unlike other theories of economic development popular in the 1950s and 1960s, such as the Lewis model or the Solow-Swan neoclassical growth model, staple theory does not lend itself easily to representation in the form of a toy model with simple graphical representation or closed-form solutions.³ A major aspect emphasises the role of economic linkages attached to a dominant export staple: backwards, forwards, and final demand. The growth in exports of the staple drives overall economic growth, but also induces a multitude of 'spread effects' as new industries are established and grow in order to either supply inputs to the staple sector or use the staple in producing some other good. A groundnut oil factory in Dakar might purchase groundnuts from farmers, representing a backward linkage; it may then sell the oil to a restaurant that uses it to prepare dishes to sell to customers, representing a forward linkage from the point of view of the factory. The 'final demand' linkage is simply the increase in demand for all goods as a result of rising per capita income attributable to growth in staple exports. Other linkage effects are also possible: for

¹ Hopkins, *Economic History*, 174–78.

² Kenneth Buckley, "The Role of Staple Industries in Canada's Economic Development," *The Journal of Economic History* 18, no. 4 (1958): 439–50; Melville H. Watkins, "A Staple Theory of Economic Growth," *The Canadian Journal of Economics and Political Science / Revue Canadienne d'Economie et de Science Politique* 29, no. 2 (1963): 141–58; Melville H. Watkins, "The Staple Theory Revisited," *Journal of Canadian Studies. Revue d'études Canadiennes* 12, no. 5 (1977): 83–95.

³ This might explain its scholarly eclipse: Paul Krugman, "The Fall and Rise of Development Economics," *Rethinking the Development Experience: Essays Provoked by the Work of Albert O. Hirschman*, 1994, 39–58.

example, a 'loanable funds' linkage might emphasise the role of rural savings in financing capital formation in other sectors. Hopkins argued that the advent of the cash crop boom of the nineteenth and twentieth centuries in West Africa, the transition to 'legitimate commerce', generated domestic linkages that were much stronger than those of the past.

Though many aspects of Hopkins's interpretation of West African economic history have been pursued in further research, his invocation of staple theory has received very little attention, perhaps because, as Hopkins himself conceded, linkages were usually weaker than in the classic cases of 'staple' growth in Australia or Canada.⁴ There have been two prominent exceptions to this relative neglect: the first was Richard Roberts's discussion of linkages and multiplier effects in long-distance trade in precolonial Africa. Roberts notes that kola nut trade had only minimal backwards linkages (the production of baskets and leaves to help the kola retain moisture while being transported); salt, on the other hand, had several forward and backwards linkages, including the making of tools needed to mine for salt in the desert, pottery and fireplaces for evaporation, and containers for transportation.⁵ The second exception, and more germane to my purposes, is Gareth Austin's discussion of the linkage effects of the cash-crop boom of the twentieth century.⁶ In this chapter, I develop Austin's argument with specific attention to Senegal and French West Africa more broadly. First I turn to the most

⁴ Other economic historians have tended to concur. See for example William Gervase Clarence-Smith, *Cocoa and Chocolate, 1765-1914* (Routledge, 2003), 2; Gareth Austin, "Resources, Techniques, and Strategies South of the Sahara: Revising the Factor Endowments Perspective on African Economic Development, 1500-2000," *The Economic History Review* 61, no. 3 (2008): 614.

⁵ Roberts, "Ecologically Specialized Trade."

⁶ Austin, "Labour-Intensity," 217-211. Some more recent literature that takes up a staples approaches focuses specifically on Ghana: Franklin Obeng-Odoom, "Resource Curse or Blessing in Africa's Oil Cities? Empirical Evidence from Sekondi-Takoradi, West Africa," *City Culture and Society* 4, no. 4 (2013): 229-40; Edward Horesh, "Where Have All the Linkages Gone? Staples in the Ghanaian Economy," *IDS Bulletin* 9, no. 3 (2009): 25-29.

obvious linkage between export crop growth and industrial growth: the final demand linkage. Having examined urban incomes in Dakar in the previous chapter, here I quantify the impact of cash crop growth on rural incomes, and, using a collection of household budgets from rural and urban French West Africa, I sketch the structure of demand for manufactured goods, particularly textiles, which were, in the microeconomic sense, a luxury good: i.e, the income elasticity of demand was greater than unity. I then trace the development of industry across the territory of French West Africa, showing that its growth and structure was conditioned by climatic conditions which produced marked seasonality of labour supply. I discuss the potential financial linkages from the leading sector of the Senegalese economy, groundnuts, to industrial growth. Finally, I look at intersectoral linkages of inputs and outputs in a comparative perspective. I show that direct intersectoral linkages were weak, and while there was some strengthening of them during the period of concerted industrial policy in the 1960s and 1970s, they weakened again with the onset of structural adjustment.

THE FINAL DEMAND LINKAGE

The argument of this section is simple: as Senegalese farmers became richer, their consumption increased, and its structure changed. The same phenomenon applied to urban workers whose incomes were tied to the groundnut boom. Because preferences are not homothetic, this rise in demand changed the structure as well as the magnitude of consumer demand. In particular, higher purchasing power meant that both urban workers and peasants could and did consume more of three specific manufactured goods: processed groundnut oil, bread, and textiles. That said, in an open economy, this may not necessarily result in a structural shift in output: the increased demand for manufactures could be and often was met by

imports, though one of the most important light manufactures, textiles, could also be produced at low cost by artisans during the dry season.⁷

It may seem fairly obvious that global cash crop markets enriched the African farmers who could participate in them. Cash cropping usually increases money income, and this allows peasants to both increase their consumption and to diversify it towards goods that can only be obtained with cash.⁸ But there are some possible mechanisms that might work in the opposite direction. Exposure to global commodity markets may lead to volatility in prices, which, in the absence of perfectly-functioning credit markets, may be impossible to insure against⁹—though cash may also prove to be a superior store of value compared to subsistence grain storage, allowing cash croppers to smooth consumption even without credit markets.¹⁰ The introduction of cash crops might also lead to a worsening of the distribution of income, which might in turn lead to a concentration of land ownership and a rise in tenancy.¹¹ The most rigorous attempt to document rural living standards in colonial Africa is Michiel de Haas's meticulous and innovative study of the living standards of Ugandan smallholders: his figures suggest that the

⁷ Austin, "Labour-Intensity."; on the ability of handicraft manufacturers to compete with imports see especially Katharine Frederick, *Twilight of an Industry in East Africa: Textile Manufacturing, 1830-1940* (Cham: Springer International Publishing, 2020); Roberts, *Two Worlds of Cotton: Colonialism and the Regional Economy in the French Soudan, 1800-1946*.

⁸ See e.g., Michael Euler et al., "Oil Palm Adoption, Household Welfare, and Nutrition Among Smallholder Farmers in Indonesia," *World Development* 93 (2017): 219–35; Eric S. Clayton, "Small-Scale Cash Crop Production in a Developing Economy," *Economic Development and Cultural Change* 9, no. 4, Part 1 (1961): 618–24; Philip Roessler et al., "Extractive Colonial Economies and Legacies of Spatial Inequality: Evidence from Africa," *VoxEU. Org* 6 (2020).

⁹ François Bourguignon, Sylvie Lambert, and Akiko Suwa-Eisenmann, "Trade Exposure and Income Volatility in Cash-Crop Exporting Developing Countries," *European Review of Agricultural Economics* 31, no. 3 (2004): 369–87; Fafchamps, "Cash Crop Production, Food Price Volatility, and Rural Market Integration in the Third World."

¹⁰ Tadesse Kuma et al., "Cash Crops and Food Security: Evidence from Ethiopian Smallholder Coffee Producers," *The Journal of Development Studies* 55, no. 6 (2019): 1267–84.

¹¹ Jeffrey G. Williamson, "Trade, Growth, and Distribution in Southeast Asia, 1500–1940," in *Routledge Handbook of Southeast Asian Economics*, ed. Ian Coxhead (Routledge, 2014), 44–64.

real incomes of smallholders fluctuated but did not show any dominant trend either upward or downward over the colonial period.¹² But partly because of the research question and partly because of the nature of Ugandan agriculture, de Haas's 'model farms' each include some cash crop production; moreover, acreage and yields are fixed in his methodology, with variation in incomes coming exclusively from changes in output and consumer prices. Thus it is difficult to conclude anything about the aggregate contribution of the Ugandan cash crop boom to Ugandan living standards without some kind of counterfactual or variation in extent to which farming households participated in the cash crop economy.

In order to test the extent to which the cash crop boom led to higher incomes in rural areas of French West Africa, I have gathered data on retail prices and wages in 63 towns across the Federation around 1948. Unfortunately, due to archival lacunae, the real wage dataset does not include any observations from Côte d'Ivoire or Mauritania; despite this, it offers by far the broadest cross-section of colonial living standards measurements in any part of Africa between the Sahara and the Zambezi gathered thus far. To test the relationship between the cash crop boom and living standards, I augment the information on real wages with data on average annual per capita cash crop output by administrative *cercle* from 1950 to 1954, taken from the 1954 edition of the *Annuaire statistique de l'Afrique occidentale française*. The variable is measured in nominal francs. Additionally, in model 2, I add a variable measuring the distance between a town and the nearest colonial railway (all French colonial railways except for some towns in southern Niger, for which I measured distance to the Kano railway in Nigeria). To control for the fact that the production variable may simply be reflecting general agricultural productivity rather than export crop-specific productivity in a given location, in

¹² de Haas, "Measuring Rural Welfare."

model 3 I add a variable that measures the potential maximum yield in kilograms of the major cereal crops in French West Africa within a 50km radius of the town in question. Due to gaps in the production data, the number of observations falls to 51 towns, with all Guinean towns dropping out of the sample ('industrial' crops were not documented on a subnational level in Guinea).

The results, given in the first regression in Table 34, suggest unambiguously that living standards in rural French West Africa towards the end of colonial rule depended strongly on participation in the cash crop boom. The effects were quantitatively large. Though a regression model cannot really offer us a true glimpse into a counterfactual history, the models suggest, for example, that had cash crops never come to French West Africa, the real wage in Segou would have been 50% lower than it was. Neither access to rail transport or cereal productivity offer any additional explanatory power once cash crop production is accounted for, which suggests that this result is not simply an artefact either of general agricultural productivity in a given area, nor of the broader economic market integration promoted by railways. I also tested the addition of a variable measuring the population size of the towns being studied, on the hypothesis that agglomeration effects might lead to higher wages in larger towns, but the variable did not add any further explanatory power either.

There are some econometric problems with using cash crop production per capita, measured in francs, as an explanatory variable. Production choices might not be orthogonal to the real wage: for example, in places where the real wage might be higher for some unconnected reason, it may be easier to attract migrant labourers and hence for farmers to plant more cash crops, or access to credit may be easier. Increased cash crop production might also lead to a decline in subsistence crop production, which could in turn lead to higher grain prices, pushing the real wage

lower. To address some of the endogeneity concerns, I employ in the fourth model an instrumental variable approach: per capita production of cash crops is instrumented with an index of cash crop suitability within a 50km radius of the town in question, derived from the FAO-GAEZ agricultural suitability indices for groundnuts, cotton, cocoa, bananas, coconuts and palms—the main cash crops of AOF. The estimated elasticity of the real wage to cash crop production increases in magnitude when the instrumental variable technique is used, though the explanatory power of the model falls. While none of the models have particularly high explanatory power, the correlation between export crop production and unskilled labour incomes is strong enough to suggest a link.

Table 34: Cash crop production & the real wage in rural French West Africa.

Dependent variable:	Real wage, logged			
Method:	OLS		IV	
Regression number:	(1)	(2)	(3)	(4)
Per capita cash crops ('000 francs, log)	0.070*** (0.024)	0.053* (0.029)	0.073** (0.030)	0.116** (0.053)
Distance to rail (km, log)		-0.036 (0.034)		0.005 (0.046)
Cereal productivity (ton/ha)			-0.009 (0.061)	
Constant	2.066*** (0.077)	2.250*** (0.187)	2.068*** (0.080)	2.077*** (0.231)
Observations	51	51	51	51
R ²	0.151	0.171	0.151	0.075
Adjusted R ²	0.133	0.137	0.115	0.037
Note:	*p<0.1; **p<0.05; ***p<0.01			

The dependent variable is the Allen-style real wage in 51 towns across French West Africa c.1950; in model 4 a cash crop suitability index instruments for per capita cash crop production.

THE STRUCTURE OF DEMAND

The cash crop boom, then, led to an appreciable increase in incomes in the vast hinterland of *Afrique occidentale française*. As long as the colonial Federation endured, with low barriers to trade between the colonies and an inbuilt cost advantage for Dakar manufacturers due to their proximity to local transport, the demand of consumers for some manufactured goods throughout rural French West Africa could, at least theoretically, be met by local supply. As incomes rose, the structure of demand changed as well as its level. Though the kinds of detailed surveys upon which development economists have come to depend to measure household consumption did not exist in colonial French West Africa, we do have access to some historical household budgets, which can be made to serve a similar purpose. For urban demand, I draw on a set of household budgets collected in the second-rank Senegalese city of Thiès by Yvon Mersadier in the 1950s. Mersadier presented the individual budgets in full, making them easy to analyse when compared to other household budget studies in urban West Africa in the 1950s, which tend to be presented only in the form of grouped categories. Thiès itself was relatively industrialised thanks to the presence of the Dakar-Niger railyards and workshops, which dated from the period when Thiès was the western terminus of the railway. It was also in a reasonably productive groundnut region. It had a population of around 40,000 people by the late colonial period, reflecting its status as a satellite of Dakar.

In order to analyse the structure of household consumption in Thiès, I estimate a series of demand functions, product by product. Very simply, I regress the natural logarithm of the quantity consumed, measured in kilograms¹³ on the natural

¹³ Except for oil and fresh milk, measured in litres, and condensed milk, measured in grams.

logarithm of per capita expenditure (a proxy for income, and often more accurate than recorded income) and the natural logarithm of household size, yielding two elasticity estimates.

$$\begin{aligned} \log (\text{Quantity}) \\ &= \alpha + \beta \cdot \log (\text{Per capita expenditure}) + \varphi \\ &\quad \cdot \log (\text{Household Size}) + \epsilon \end{aligned}$$

The β parameter gives the income elasticity of demand; the φ parameter indicates whether there were scale economies in consumption within households (the latter is often more important for durable goods; per *person* expenditure on television sets or washing machines, for example, will decline as family size grows because more than one person can use the same washing machine). Rice and millet were roughly mirrors of one another: a 1 percent increase in income would, *ceteris paribus*, lead to a 0.356% increase in rice consumption and (though the coefficient is statistically indistinguishable from zero) a 0.28% decline in millet consumption. Demand for bread increased with income, and the 95% confidence interval leaves open the possibility of a unit elasticity. Fish, meat, condensed milk and cooking oil were all approximately unit-elastic. Thus the structure of household demand in Thiès for foodstuffs suggested some demand-side potential for very basic industrial growth: bread required flour milling and baking; oil required extraction from groundnuts, and condensed milk required processing. Most (though not all) of the raw materials for these goods could be sourced locally: the main exception was wheat flour, which had to be imported. As urban incomes rose, demand for these products among urban Senegalese households would grow about as fast, suggesting that at least in the short term a growing food processing industry would not be faced with demand bottlenecks even if it produced only for the local market.

TABLE 35: Income and family size elasticities of demand for food products in Thiès, 1954.

Product	$\hat{\beta}$	$\hat{\varphi}$
Rice	0.356* [0.018, 0.694]	-0.231 [-0.565, 0.102]
Millet	-0.280 [-0.886, 0.325]	-0.234 [-0.784, 0.316]
Bread	0.693** [0.316, 1.069]	-0.026 [-0.397, 0.346]
Fish	1.157* [0.768, 1.546]	0.199 [-0.185, 0.582]
Meat	1.174** [0.8, 1.549]	0.497* [0.121, 0.873]
Cooking oil	0.944** [0.609, 0.1.280]	-0.015 [-0.346, 0.316]
Vegetables	1.785** [1.381, 2.189]	0.334 [-0.065, 0.732]
Cassava	0.136 [-0.699, 0.970]	-0.703 [-1.415, 0.009]
Sugar	0.252 [0.080, 0.584]	-0.435* [0.0762, -0.107]
Condensed milk	1.138** [0.512, 1.765]	-0.725* [-1.340, 0.109]
Fresh milk	-0.248 [-1.228, 0.733]	0.684 [-1.647, 0.280]

Source: Calculated from family budgets presented in

* $p < 0.05$; ** $p < 0.01$

Thiès, however, was not necessarily representative of all of the towns of the interior. To estimate the structure of rural demand, I draw on a collection of around 100 household budgets from across French West Africa. They have been taken from the records of the Commission Guernut, an inquiry into the colonial empire launched by the Popular Front government in 1936. Henri Guernut, a human rights activist who had been Minister of Education in the Sarraut government prior to the coming to power of the Front, was charged, among other things, with investigating the

standard of living of colonial subjects.¹⁴ To draft his final report, he requested reams of documentation from colonial-level and local officials throughout the empire. In particular, the Commission asked officials to ‘draw up, if possible, several household budgets’ from their districts.¹⁵ The budgets are a difficult primary source: though in theory the standardised expenditure and income categories proposed by the Commission in its questionnaires ought to have made comparison easy, in practice they were interpreted in different ways by different local officials. The most difficult were the items ‘produits agricoles’ and ‘vente de récoltes’. The questionnaire gave no guidance as to how this division ought to be put in practice. One interpretation of these two categories (an interpretation which appears to have been largely followed by Indochinese officials) might have been to distinguish between production for subsistence and for the market; on the other hand some local officials in AOF appear to have interpreted ‘produits agricoles’ as a catch-all category for all agricultural production. A similar problem arises with the spending item ‘nourriture’, which sometimes appears to have included food produced by the household itself and at other times appears only to have included food purchased on the market. Interpreting this in order to yield homogenous data has required reading the descriptive detail attached to the budgets and a certain amount of guesswork based on plausibility: a very poor family with a very low food share, for example, probably indicates that subsistence production was excluded from the food spending category; I therefore add it back in.

A farming household budget from the district of Louga, in the ‘old’ groundnut basin, gives an idea of the nature of expenditure among rural families (Table 36).

¹⁴ Marc Lagana, “L’échec de la commission d’enquête coloniale du Front populaire,” *Historical Reflections/Réflexions Historiques*, 1989, 79–97.

¹⁵ Vincent Bonnacase, *La pauvreté au Sahel: du savoir colonial à la mesure internationale* (KARTHALA Editions, 2011).

The household in question was composed of three men, two women and three children: counting each child as half an adult for the purposes of measuring consumption units, this means that the family was composed of 6.5 adult equivalents, compared to the 3 assumed in the welfare ratio calculations. Total income for the family was 3075 francs annually, which, if scaled by household size, would be the equivalent of an annual wage of 1420 francs for a family of two adults and two children, as in the welfare ratio literature. By way of comparison, in 1938, the nominal wage in Dakar was 2100 francs. Perhaps what is most striking about this particular family is the low share of food in the budget, and the comparatively large share of clothing: food accounted for a mere 36 per cent of the household budget and clothing a rather surprising (given the level of nominal income) 28 per cent. Equally of note is the large share of the budget devoted to what we might lump together under the heading of ‘social obligation spending’—religious expenditure, customary expenses, and entertaining between them accounted for 7 per cent of total spending by the family, while taxation accounted for another 4 per cent. It is noteworthy that about 11 per cent of estimated income came from non-agricultural sources, or about 22 per cent from non-crop sources. The dry conditions and the long *harmattan* in Louga (which is only about 75 kilometres southwest of the border with Mauritania) ought to have provided opportunities for diversification of income; especially given the presence of the cattle trade; still, four in five francs of this family’s income was from selling or consuming crops, the production and processing of which would likely have occupied less than half a year’s labour.

TABLE 36: Example of a household budget from Louga, 1938. Source: see text.

Income	Francs	Expenditure	Francs
		Food	780
Harvest, consumed	600 →	Harvest, consumed	600
Harvest, sold	1800	Clothes for 3 men	350
Animals sold	250	Clothes for 2 women	400
By-employment, male	175	Clothes for 3 children	300

By-employment, female 250	Housing	200
	Lighting	75
	Entertaining	100
	Religious expenses	25
	Customary expenses	150
	Taxes	170
	Miscellaneous	650

Having collected and homogenised the useable budgets from across French West Africa, I estimate the equation:

$$w_{ij} = \alpha + \beta \log(X_i) + \gamma COLONY_i + \epsilon$$

where w_{ij} is the budget share of the j th good for the i th household, X_i the total household expenditure of household i and $COLONY$ a vector of colony-level dummies. In Table 37, I present the estimates of β_j as well as the mean values of w_j for the Guernut budgets, and calculate the Engel elasticity (equal to one plus the ratio of the semi-log expenditure coefficient divided by the mean budget share), which are compared to similar estimates from the Thiès urban budgets.

The consumption patterns documented in the table suggests that the home market in French West Africa would offer some scope for import substitution industrialisation alongside continued cash crop growth, at least at the level of the entire federation of French West Africa. In particular, the Engel elasticities of demand for rural housing and for clothing in both rural and urban areas was greater than one, suggesting that demand for construction materials and textiles would rise in rural areas if the momentum of the cash crop boom could be sustained. For most of French rule, this demand was met by European manufactures, some of whom came to regard the *débouché* of French West Africa as a relatively sheltered port in

the storms of global economic competition.¹⁶ Whether or not Dakar industry would be in a position to supply these goods depended on two factors. The first was political: would markets in the hinterland of French West Africa remain open to Senegalese production after the end of colonial rule? This was by no means a settled question until more or less the moment of independence, when it became obvious that the Federation would fracture until all of its constituent parts became independent nation states. The second factor was the extent to which competitors—in Asia or Europe, if tariff barriers were not erected, but also elsewhere in West Africa and in particular inside the walls of the West African Customs Union—would be able to meet demand at lower cost.

Table 37: Income elasticities of demand in French West Africa, 1938 and in Thiès, 1954.

	Rural FWA, 1938			Thiès, 1954		
	$\hat{\beta}$	\hat{w}	$1 + \frac{\hat{\beta}}{\hat{w}}$	$\hat{\beta}$	\hat{w}	$1 + \frac{\hat{\beta}}{\hat{w}}$
Food	-0.076*	64%	0.9	-0.166*	81.6%	0.8
Clothing	0.040*	14%	1.3	0.080*	12.9%	1.6
Taxes	-0.021**	5.1%	0.6	0.007	2.5%	1.3
Hospitality	0.014*	2.4%	1.6	—	—	—
Religious & customary	0.009	5.3%	1.2	0.007	4.3%	1.2
Housing	0.013*	0.7%	2.9	-0.003	5.1%	0.9
Lighting	0.04*	0.6%	7.7	-0.001	1.3%	0.9
Spending on children	0.014	1.6%	1.9	—	—	—

¹⁶ Jacques Marseille, “L’industrie cotonnière française et l’impérialisme colonial,” *Revue d’histoire économique et sociale* 53, no. 2/3 (1975): 386–412.

Source: author dataset elaborated from budgets in AOM GUERNUT 100 and 101 and in Mersadier, 'Structure de budgets'.

THE GROWTH OF COLONIAL INDUSTRY IN FRENCH WEST AFRICA

If demand for light manufactured goods in rural and urban French West Africa was stimulated by the expansion of export agriculture, did the nature of imperial rule constrain the colonies to forever import those goods? Though the take-off of modern manufacturing in French West Africa came only with the Allied blockade of Dakar in 1940 and the attendant necessity of import substitution,¹⁷ the seeds of industry had begun to push through the soil before the War. Slowly, because, according to Mohamed Mbodj's study of an abortive attempt at setting up a meat cannery in Senegal during the First World War, the colonial government was, though not actually hostile, entirely uninterested, and the Bordelais and Marseillais merchants who dominated the groundnut trade saw nothing to interest them outside that trade.¹⁸ The nature of the archives makes quantifying pre-war industry in AOF difficult. Industrial production did not receive regular attention in the *Rapports économiques* of the Senegalese or French West African governments. Fortunately, the Aix-en-Provence colonial archives hold an—as yet unused—source that approximates an industrial census: the Guernut Commission of 1938 sent a questionnaire to district administrators asking for information on all

¹⁷ Catherine Coquery-Vidrovitch, "Vichy et l'industrialisation aux colonies," *Revue d'histoire de la deuxième guerre mondiale* 29, no. 114 (1979): 69–94.

¹⁸ Mohamed Mbodj, "Un essai d'implantation agro-industrielle coloniale au Sénégal : la conserverie de Lyndiane (Sine-Saloum), 1912-1919," in *Entreprises et entrepreneurs en Afrique (XIXe et XXe siècles)*, ed. Catherine Coquery-Vidrovitch and Alain Forest, vol. 1 (Paris: Editions L'Harmattan, 1983), 363.

industrial establishments employing more than 10 workers. The size restriction is unfortunate, since it prevents us from adequately assessing the size of the informal industrial economy (though as civil registry data becomes more available for later periods, artisanal production can be assessed by occupational data). Nonetheless the inquiry provides an excellent ‘snapshot’ of manufacturing prior to the beginning of the Second World War and the Allied blockade of Dakar.

Altogether, the survey identifies 143 industrial installations across Senegal, Mauritania, Dahomey, Upper Volta, Niger and Côte d’Ivoire, and Togo.¹⁹ This number is lower if a number of adjustments are made: several of the firms are more commercial than industrial (for example, it includes transportation providers, ship refuelling, and port handling facilities, all three of which I have excluded). Moreover, since the survey was filled out by administrators in each *cercle* in AOF, each branch of a firm in a different *cercle* was incorporated; thus, for example, there are individual responses for the cotton-ginning operations of the Association cotonnière coloniale in Sikasso, Abomey, Koutiala, Ségou, Bouaké, Oumé, Tougan and Koudougou. I have however chosen to keep these separate in the statistics that follow, as they give some indication of the spread of manufacturing across the territory of AOF.

TABLE 38: Number of industrial enterprises by sector & colony in AOF, 1937.

Sector	SEN	CIV	MLI	BEN	BFA	MRT	NER	TOG
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¹⁹ No responses from French Guinea are kept in the overseas archives in Aix-en-Provence, either for the industrial survey or for any other Guernut survey (some miscellaneous documentation was collected outside of the survey mechanism); it is possible that some of responses may have been preserved in Conakry. A League of Nations, then a United Nations mandate territory, Togo was not *de jure* a part of Afrique occidentale française; however, it was a *de facto* member of the bloc. Haute Volta was territorially part of Côte d’Ivoire during the Guernut survey; I have separated the two colonies for the purposes of analysis.

Carpentry	1	4	1	0	0	0	0	0
Chemicals & explosives	2	0	0	0	0	0	0	0
Construction & public works	6	0	3	4	1	0	1	0
Building materials	0	5	2	0	0	0	0	0
Energy	5	0	0	0	0	0	0	0
Food, drink and tobacco	3	3	0	1	0	1	0	0
Forestry & wood	2	10	0	0	0	0	0	0
Vehicle maintenance	0	0	1	2	0	0	0	0
Mining	1	3	1	0	0	0	0	0
Oil and soap	4	2	0	1	0	0	0	1
Printing	1	0	1	0	0	0	0	0
Agricultural processing	5	14	8	3	3	0	0	7
Refrigeration	2	0	0	0	0	0	0	0
Textiles	2	1	0	0	1	0	0	0

Source: AOM GUERNUT 56; author analysis.

Unsurprisingly, the most common industrial firm in pre-war Afrique occidentale française was the kind that processed agricultural goods for export. Unginned cotton, unprocessed sisal and unshelled groundnuts were expensive to ship to France, given the price-weight ratio, and even industrially unsophisticated processing prior to transport could therefore be relatively profitable. The most widespread variety of large-scale processing, at least in terms of number of workers, was cotton ginning, but groundnut decortication and, less commonly, oil extraction were also widespread. Processing was naturally a procyclical activity: both output and employment in the crop processing industries was directly proportional to the size of the harvest. These cyclical effects could be quite large: at the Tougan ginning factory, in Upper Volta, the workforce of 17 labourers was unchanging from year to year but the ginning season varied from two to five months depending on the quantity of cotton that had been harvested. The economic impacts of seasonality

are considered in more detail below. Overcapacity appears to have been a problem in at least a few industrial firms in AOF prior to the War; a factory in Soudan français that produced alcohol from waste sisal material produced about 25,000 litres of industrial-purpose alcohol but had the machinery to produce ten times as much.

Given the conditions of labour scarcity, recruitment and retention of suitable workers must have posed considerable difficulties. For this reason, it is interesting to note the widespread phenomenon of labour hoarding among the French West African industrial firms during the Great Depression. As we saw in Chapter Five, the real wage in Dakar increased during the Depression, as the price for staples collapsed in the face of a relatively stable nominal wage. But unemployment also rose, and the output of industrial goods fell substantially in many areas. Industrial employment, output *and* labour productivity appear to have declined during the crisis. Maurel and Prom's Dakar ice-making business, for example, employed 90 African and 25 European workers before the crash; by 1937, this had fallen to 60 African and 15 European workers.²⁰ Labour productivity measures, however, suggest some degree of labour hoarding.²¹ Productivity in aggregate and per worker fell in this particular enterprise: from 2900 tonnes of ice produced in 1931/2 (that is, about 25 tonnes per worker) to 1600 tonnes (21 tonnes per worker) in 1937. The decline in production and per-worker productivity was also experienced in agro-industrial firms, like the sisal processing factory *Société anonyme de sisal de la Casamance*, in Kolda. In 1934, it produced 2.75 tonnes of processed sisal per

²⁰ Feuille 'Maurel et Prom frigorifique', AOM GUERNUT 56

²¹ On labour hoarding in the industrialised world, see Ben S. Bernanke and Martin L. Parkinson, "Procyclical Labor Productivity and Competing Theories of the Business Cycle: Some Evidence from Interwar U.S. Manufacturing Industries," *The Journal of Political Economy* 99, no. 3 (1991): 439–59.

worker; in 1937, that had fallen to 1.6 tonnes per worker.²² Elsewhere in A.O.F, a Beninese cotton-ginning factory processed 75 tonnes of raw cotton per worker per year in 1927 and only 50 tonnes in 1937; another saw a decline from 80 tonnes per worker per year to 70 just between 1935 and 1937.²³

The decline in productivity may be slightly overstated due to the nature of industrial production in many of these enterprises, which did not necessarily employ all workers year round. For one enterprise for which we possess estimates of the working year—the Association cotonnière coloniale’s cotton-ginning business in Abomey, Benin—we observe an apparent decline in per-worker-year productivity of 64% when using aggregate employee numbers, but when corrected for the decline in the ginning season (from around 8 months to 6 months) the decline was only 55%.²⁴

TABLE 39: Number of workers by sector and employment seasonality in Afrique occidentale française, 1937.

Sector	Sector size		Firm size & seasonality	
	Firms	Employees	Average employees per firm	Maximum employee numbers to annual mean
Wood and furniture	6	266	44	130%
Construction & public works	15	7083	443	138%
Building materials	7	670	74	121%
Energy	6	284	47	105%

²² Calculated from Feuille ‘Société anonyme de sisal de la Casamance’ AOM GUERNUT 56

²³ Calculated from Feuille ‘John Walkden et Cie Ltd’; Feuille ‘Société commerciale de l’Ouest africaine à Dassa-Zoume’, AOM GUERNUT 56

²⁴ Calculated from Feuille ‘Association cotonnière coloniale’, AOM GUERNUT 56

Food, drink and tobacco	7	1712	95	150%
Forestry & wood	12	5097	340	132%
Vehicle maintenance	3	90	30	127%
Mining	6	1038	208	230%
Oil and soap	8	2221	171	147%
Printing	2	90	45	121%
Agricultural processing	43	5363	112	165%
Refrigeration	2	108	54	167%
Textiles	4	362	4	100%

Source: AOM GUERNUT 56, author analysis.

Seasonality of employment was obviously related to the crop calendar, and hence to climatic conditions. In Table 40, I use the ratio of the maximum number of employees throughout the year to the average number of employees as a measure of the seasonality of employment.²⁵ I consider two indicators of climatic conditions: latitude and annual rainfall, hypothesising that the further from the equator and the closer to the Sahara, in general, the shorter the agricultural growing season and the lower the opportunity cost of labour during at least some part of the year. This would militate in favour of higher seasonal industrial employment in industry. This hypothesis appears to be confirmed in the data in all four of the regression specifications. The effect of higher rainfall is not as clear-cut. While we might expect that higher rainfall is positively correlated with lower seasonality in non-agricultural employment, it is not obvious that this relationship would hold once we control for latitude also; I therefore also control for the interaction of (log) rainfall and latitude. The results suggest that higher rainfall was associated with *more* industrial seasonality at equatorial latitudes. One possible interpretation is

²⁵ Sometimes information was given only for the average number of employees. Occasionally, further qualitative information indicated that the number of workers was fixed across the year, and in these instances, I have assumed the minima and maxima to equal the average number. Firms without such indications were discarded from the sample. Where a maximum and minimum was provided but no average, I used the arithmetic mean of the minimum and maximum number of employees to represent the average.

simply that higher rainfall increased agricultural productivity during the agricultural season, raising the opportunity cost of labour. At savanna latitudes, the relationship was, more predictably, negative. Higher rainfall was associated with more stable, less seasonal industrial employment. Though several interpretations are possible, the most obvious is that in low-rainfall Sahelian areas of French West Africa, a ‘Lewisian’ supply of labour existed in the dry season, and to some extent modern industrial enterprises could organise production around this stock of labour.

The effects of both rainfall and latitude, and their interaction, are robust to the inclusion of sectoral and colony dummies, and both kinds of dummies together. That the coefficients retain significance with the inclusion of the sectoral dummies is particularly interesting. It suggests that the reason industrial employment was more seasonal in more northerly towns and cities like Dakar, Saint-Louis, and Kayes was not simply that these cities attracted different kinds of industrial enterprises when compared to their more southerly counterparts in AOF like Abidjan or Porto Novo; rather, production processes *within* each sector may have differed across locations to take account of the availability of cheap seasonal labour. Indeed, Pierre Boisson, the Vichy governor of French West Africa, saw this adaptation of industrial methods to the tropical crop calendar as a vital element in any future industrialisation of the colonies.²⁶

Table 40: Determinants of industrial employment seasonality in Afrique occidentale française, 1938

Ratio of maximum employee number to average employee number, 1937

²⁶ Cooper, *Labor Question*, 148.

	(1)	(2)	(3)	(4)
Annual rainfall (log)	1.592** (0.467)	1.924** (0.572)	1.764** (0.486)	2.202** (0.597)
Latitude	0.622** (0.225)	0.917** (0.319)	0.716** (0.230)	1.094** (0.340)
Interaction	-0.082** (0.032)	-0.141*** (0.047)	-0.096*** (0.033)	-0.176*** (0.051)
Constant	-11.179*** (3.432)	-12.721*** (4.072)	-12.485*** (3.560)	-14.333*** (4.201)
Sector fixed effects	NO	NO	YES	YES
Colony fixed effects	NO	YES	NO	YES
Observations	100	100	100	100
R ²	0.124	0.312	0.286	0.454
Adjusted R ²	0.096	0.235	0.117	0.260
Residual Std. Error	0.613 (df = 96)	0.564 (df = 89)	0.606 (df = 80)	0.555 (df = 73)
F Statistic	4.509** (df = 3; 96)	4.038** (df = 10; 89)	1.690* (df = 19; 80)	2.337** (df = 26; 73)
Note:	* p < 0.1 ** p < 0.05 *** p < 0.01			

Productivity in some industrial sectors varied with the climate, and it is possible that this phenomenon drove employment seasonality to some extent. For example, the textile factory of ICOTAF noted in its monthly report for June 1957 that a large number of wooden weaving shuttles had broken that month, possible due to a combination of the quality of the wood and the humid climate.²⁷ Seasonal labour supplies might also be correlated with seasonality in other factors. Electricity supply in the tropics is often most compromised during the rainy season(s)—at least where hydroelectric supply is not available. The ICOTAF activity reports give an indication of the duration of blackouts during a given month, and show a distinctly

²⁷ 'Rapport d'exploitation no. 51 : periode du 1er au 30 Juin 1957', Dakar, 6 July 1957, AMM, Fonds Ets. Schaeffer et Cie, 4/5280, 03A1766.

seasonal pattern of outages (Table 41): nearly five hours in the month of July (in *nawet*, the rainy season) and none in November and December (in *noor*, the dry season). Indeed, this pattern obtains even today in Senegal, where, in 2017, the average customer of Senelec would have experienced 22 minutes of outages in December but nearly 10 hours of outages in the month of June.²⁸ For this reason, we might expect that factories would be content to function with fewer paid workers during *nawet*. However, stopping work during the rainy season, when humidity was high, could also lead to serious issues with machine maintenance. ICOTAF was forced to halt much of its production during August 1957, due to a general strike and the arrival of the Asian flu epidemic in Dakar. The monthly report stated that:

stopping work for a prolonged period of time during the rainy season with humidity frequently reaching 90% made restarting the factory difficult, especially for the spinning machines. We attempted to keep the machines from rusting by cleaning and lubricating them daily, which allowed us in spite of everything to avoid serious damage.²⁹

Table 41: Minutes of electricity outages at ICOTAF's Dakar factory, May 1957-1958.

May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
38	48	285	100	n.a	50	0	0	15	15	n.a	10

Source: Compiled from monthly activity reports in Archives municipales de Mulhouse, Fonds Ets. Schaeffer et Cie, 4/5280 03A1766.

²⁸ Figures given for the Systems Average Interruption Duration Index for 2017 on the Senelec website:

<<http://www.senelec.sn/indicateur/#:~:text=En%20d'autres%20termes%2C%20notre,le%20rapport%20Doing%20Business%202018>>, accessed 9 May 2021.

²⁹ 'Rapport d'exploitation no. 53 : periode du 1er au 31 août 1957', Dakar, 11 September 1957, AMM, Fonds Ets. Schaeffer et Cie, 4/5280, 03A1766

But the ability (or desire) of modern industrialists in Senegal to adjust employment levels to take advantage of seasonal factor swings appears mostly to have been limited to mining and food processing industries, to judge by data on seasonal employment given in the 1968 annual report of the Direction de l'Industrie: in mining, about a quarter of all employees were either day labourers or seasonal workers, while in the 'meats and preserves' sector, dominated by canned fish factories, the majority of workers were seasonal (see Table 42). For the most part, other manufacturing industries were less likely to employ seasonal workers, though one in ten workers in the relatively capital-intensive chemicals sector were seasonal, just as in the mechanical industry.

Food processing industries may have had a relatively seasonal supply of raw materials, making seasonal employment a logical arrangement, and they may have been less capital-intensive, implying a less acute need to recoup capital costs by using machinery at full capacity. If, as Chapter 5 argued, Senegal was 'Lewisian in the dry season'—that is to say, it possessed effectively unlimited supplies of labour during part of the year—then at least some industries appear to have been able to organise production around this phenomenon. What is not clear is the extent to which the statutory minimum wage bound employers of seasonal labour. Senghor, during the French parliamentary debates on the Code du Travail for overseas territories, had successfully insisted that any worker whose labour was hired by an employer ought to be covered by the Code.³⁰ However, the explanatory memorandum for an amendment to the Senegalese Code du Travail in 1970 explained that seasonal workers and day labourers often feared that their employment would be summarily terminated if they dared to insist on their legal

³⁰ Cooper, *Labor Question*, 294.

rights. (This resulted in the Code's ban on any employee being hired more than twice by any one firm).³¹ It seems likely therefore that seasonal workers had only marginal workplace protection, and may not have received the statutory minimum wage.

Table 42: Seasonal workforce in Senegalese industry, 1968.

Sector	Size of workforce	% temporary/ seasonal
Mining	1626	23%
Fats and oils	2632	18%
Meat & preserves	1389	71%
Grains and flours	443	10%
Biscuit factories	436	0%
Confectionery	170	11%
Drinks	481	0%
Other food industries	664	5%
Textiles	2486	0%
Shoes and clothes	1326	0%
Wood and furniture	799	4%
Paper	141	0%
Printing	419	0%
Chemicals	1260	9%
Construction materials	609	2%
Mechanical industry	1562	11%
Other manufacturing	262	18%
Electricity and water	2131	0%

Source: Calculations from data given in government of Senegal, Ministry of Planning and Industry, 'Rapport annuel de la Direction de l'Industrie, 1968', Dakar, 1968.

³¹ Republic of Senegal, 'Exposé des motifs du projet de loi complétant les articles 35 et 45 du Code du Travail', Dakar, 19 December 1969. Available online at <https://www.dri.gouv.sn/sites/default/files/LOI/1970/Commission-loi-decentralisation-et-travail/LOI-N-1970-04-DU-27-JANVIER-1970.pdf>.

THE LOANABLE FUNDS LINKAGE

One of the limitations of cash crop growth in West Africa was precisely that its egalitarian nature prevented the accumulation of large fortunes, unlike in plantation economies like the coffee barons who financed the industrial growth of São Paulo.³² Though some Europeans did purchase land and set up plantations, especially in French Guinea and Côte d'Ivoire,³³ most agricultural production in French West Africa was smallholder-oriented. This was mostly true of Senegal in particular, though the existence of large Mouride-organised *daara* could easily be described as a species of dryland plantation, with attendant implications for capital formation, as we shall see below.

Indigenous credit systems in Senegal followed a pattern common to much of West Africa.³⁴ If credit could not be obtained on sympathetic terms through family networks, then both people³⁵ and land³⁶ could be pawned, despite the legal abolition of slavery (and the ambiguous status of pawnship in Islam³⁷) and the general abundance of land. For obvious reasons, neither solution to the problem of credit

³² Warren Dean, *The Industrialization of São Paulo, 1800-1945* (University of Texas Press, 1970).

³³ Babacar Fall, "Économie de plantation et main-d'œuvre forcée en Guinée française : 1920-1946," *Labour, Capital and Society/Travail, capital et société*, 1987, 8–33; Jean-Pierre Chauveau and Jean-Pierre Dozon, "Colonisation, économie de plantation et société civile en Côte d'Ivoire," *Cahiers O. R. S. T. O. M. Serie sciences humaines* 21, no. 1 (1985): 63–80.

³⁴ See generally Gareth Austin, "Indigenous Credit Institutions in West Africa, c.1750-c.1960," in *Local Suppliers of Credit in the Third World, 1750–1960*, ed. Gareth Austin and Kaoru Sugihara (London: Palgrave Macmillan UK, 1993), 93–159.

³⁵ Martin A. Klein and Richard Roberts, "The Resurgence of Pawning in French West Africa during the Depression of the 1930s," *African Economic History*, no. 16 (1987): 23–37; Andrew F. Clark, "'The Ties That Bind': Servility and Dependency among the Fulbe of Bundu (Senegambia), c. 1930s to 1980s," *Slavery & Abolition* 19, no. 2 (1998): 91–108.

³⁶ Dennis Galvan, *The State Must Be Our Master of Fire: How Peasants Craft Culturally Sustainable Development in Senegal* (University of California Press, 2004), 104–25.

³⁷ On which see Paul E. Lovejoy and David Richardson, "The Business of Slaving: Pawnship in Western Africa, c. 1600–1810," *Journal of African History* 42, no. 1 (2001): 68.

could have offered a viable source of capital for any kind of modern industrial enterprise. The other major form of credit was the rotating credit association, or tontine (*natt* in Wolof). These have taken many forms, but all serve as a way to pool meagre savings. Michel Lelart, writing on Beninese tontines, distinguishes between ‘mutualist’ and ‘commercial’ tontines, the former serving to essentially increase the velocity of money while the second allows for a species of capital accumulation.³⁸ Abdoulaye Kane argues that this distinction holds for Senegalese tontines as well.³⁹ Commercial tontines might connect with the formal credit economy indirectly, since organisers often keep the savings pool in bank accounts, and to this extent the commercial tontine system may represent a very circuitous loanable funds linkage from cash crop production to manufacturing, mediated by the profits of petty traders in urban centres. But the more substantial contribution of tontines is more likely to be on the demand side of the market, since they facilitate the purchase of more expensive items manufactured items, whether for consumption⁴⁰ or investment.⁴¹

In theory, under the economic *pax gallica* of colonial rule, capital could move freely within the franc zone, and profitable industrial enterprises in Dakar ought to have found finance in the metropole. In practice, of course, foreign capital cannot be a perfect substitute for domestic capital, since market imperfections, particularly

³⁸ Michel Lelart, “L’épargne informelle en Afrique. Les tontines béninoises,” *Revue tiers-monde* 30, no. 118 (1989): 271–98.

³⁹ Abdoulaye Kane, “Financial Arrangements Across Borders: Women’s Predominant Participation in Popular Finance, from Thilogne and Dakar to Paris. A Senegalese Case Study,” in *Women and Credit: Researching the Past, Refiguring the Future*, ed. Beverly Lemire, Ruth Pearson, and Gail Campbell (Oxford: Berg, 2002), 295–319.

⁴⁰ Leslie W. Rabine, “Dressing Up in Dakar,” *L’Esprit Créateur* 37, no. 1 (1997): 84–108.

⁴¹ See e.g. Ibrahima Hathié and Cheikh Oumar Bâ, “L’agriculture familiale à l’épreuve de la sécheresse et de la libéralisation au Sénégal,” in *Diversité des agriculteurs familiaux de par le monde : exister, se transformer, devenir*, ed. Jean-Michel Sourisseau et al. (Versailles: Editions Quae, 2015), 207.

asymmetric information, make it much more likely that French savers will prefer French investments. Moreover, foreign credit was generally mediated by French banks, which, like their British counterparts,⁴² were highly cartelised and loaned money conservatively.⁴³ Even in the twenty-first century, the lion's share of the capital stock in developing countries is financed from domestic sources, and there is some evidence, albeit tentative, that countries for which self-financing ratios are higher grow faster.⁴⁴ The open capital account was as much a curse as it was a blessing, since foreign firms could easily expatriate any profits from a successful business venture in *Afrique occidentale française*. For this reason, the likelihood of substantial investment from French merchant capital was likely to be restricted either to processing industries like decortication and oil-making factories which could effectively reduce transportation costs between Senegal and foreign ports by increasing the value to weight ratio of exports. This state of affairs obtained until after the Second World War, when import-substitution industries were set up, some with participation from French merchant firms: the Dakar matchmaking firm *Société Aofienne de Fabriques d'allumettes*, for example, was set up with money from several important French merchants.⁴⁵ European firms that did set up in Dakar, like the Alsatian textile firms analysed further below, often struggled, at least initially, because they tried to replicate techniques that made sense in metropolitan conditions, and with metropolitan relative prices, but which were poorly adapted

⁴² Gareth Austin and Chibuike Ugochukwu Uche, "Collusion and Competition in Colonial Economies: Banking in British West Africa, 1916–1960," *Business History Review* 81, no. 1 (2007): 1–26.

⁴³ Large parts of the history of private banks in French West Africa remain to be written, but see for some details Hamos Hongla, "La caisse d'épargne en Afrique occidentale française," *Outre-Mers*, no. 322 (1999): 291–330.

⁴⁴ Joshua Aizenman, Brian Pinto, and Artur Radziwill, "Sources for Financing Domestic Capital – Is Foreign Saving a Viable Option for Developing Countries?," *Journal of International Money and Finance* 26, no. 5 (2007): 682–702.

⁴⁵ Ibrahima Thioub, "Entreprises, entrepreneurs et Etat dans une économie dépendante : domination étrangère et marginalisation des autochtones (Dakar-Sénégal), 1930-1973" (PhD, Paris 7, 1989), 160.

to African contexts.⁴⁶ Foreign firms may also be more likely to use imported inputs, limiting their contribution to African economic growth.⁴⁷

One more promising source of capital for early industrialisation elsewhere in the land-abundant tropics has been trade diasporas, like Chinese merchants in Southeast Asia or the Indian community in East Africa.⁴⁸ For several centuries, Soninke diaspora traders⁴⁹ dominated long-distance trade within Senegambia—and more broadly in West Africa—specialising in the trading of goods with high value-weight ratio (like salt, gold or kola nuts) across ecological zones.⁵⁰ Juula merchant capital seems to have been important in the rise of the leather industry of the central Sudan, as well as the later textile export industry.⁵¹

As the groundnut boom developed, the lower rungs of the trading hierarchy became increasingly dominated by Arabic-speaking traders (mostly Syrian and Lebanese, but with some Moroccan participation as well), and is perhaps these trading

⁴⁶ Paul Samuel, “Industriels alsaciens au Sénégal dans les années cinquante,” *Revue française d’histoire d’outre mer* 83, no. 312 (1996): 3–27.

⁴⁷ Austin, Frankema, and Jerven, “Manufacturing Growth,” 368.

⁴⁸ David Himbara, “Myths and Realities of Kenyan Capitalism,” *The Journal of Modern African Studies* 31, no. 1 (1993): 103–6; Wasana Wongsurawat, *The Crown and the Capitalists*, Critical Dialogues in Southeast Asian Studies (Washington, D.C., DC: University of Washington Press, 2019); Ching Fatt Yong, Julio Antonio Gonzalo, and Manuel Maria Carreira, *Tan Kah-Kee: The Making of an Overseas Chinese Legend* (World Scientific, 2014); J. A. C. Mackie, “Overseas Chinese Entrepreneurship,” *Asian-Pacific Economic Literature* 6, no. 1 (1992): 41–64.

⁴⁹ Various referred to as Dioula, Juula, Dyola, and, further east, Wangara.

⁵⁰ See especially Curtin, *Economic Change in Precolonial Africa*, 59–91; Peter Mark and José da Silva Horta, “Trade and Trade Networks in the Greater Senegambia: An Introductory Essay,” *Mande Studies* 9 (2007): 1–8.

⁵¹ Paul E. Lovejoy, “The Role of the Wangara in the Economic Transformation of the Central Sudan in the Fifteenth and Sixteenth Centuries,” *Journal of African History* 19, no. 2 (1978): 184–85; Moses E. Ochon, “The Wangara Trading Network in Precolonial West Africa: An Early Example of Africans Investing in Africa,” in *Africans Investing in Africa* (London: Palgrave Macmillan UK, 2015), 9–27.

expatriate communities that offer the closest comparison to Chinese merchants in Southeast Asia or Indian merchants in East Africa. Wealth obtained via the import-export trade could be considerable even far into the Sudanic hinterland: Brahim Boularaf, a Moroccan trader who kept stores in Gao, Bourem and Ansongo in the French Soudan, was estimated to have personal liquid wealth of at least 100,000 francs in 1930.⁵² On the other end of the spectrum, Nicolas Makoul, a Lebanese trader also in the French Soudan apparently resorted to ‘doubtful commercial methods’ to compensate for a lack of capital, the local administrator going as far as saying that ‘his very existence is hard to explain’.⁵³ As Andrew Arsan has argued, Levantine wealth in French West Africa was sometimes more substantial than traditional notions of essentially petty traders and intermediaries would suggest: he documents cases like those of the Risha brothers, who held around 6 million francs in real estate investment by the time of their bankruptcy in 1931.⁵⁴ Lebanese traders faced much the same set of relative investment returns as any other investor in French West Africa. As we saw in the previous chapter, the most lucrative place to store one’s money was often in real estate: the high rental rates that could be enjoyed from such investments would usually exceed by some distance the profit rates on industrial ventures. But eventually, as a combination of growing domestic incomes and State-directed incentives for industrial production changed these relative rates of return, Levantine capital found its way into industry. Successful Levantine traders in AOF eventually formed considerable industrial enterprises that endured into the post-independence era, ranging in scale from large modern manufacturing

⁵² ‘Fiche de renseignements particuliers : annex confidentielle : Brahim Boularaf, in ANS Q 45, versement 19.

⁵³ ‘Fiche de renseignements particuliers : annex confidentielle : Nicolas Makoul’, in ANS Q 45, versement 19.

⁵⁴ Andrew Arsan, *Interlopers of Empire: The Lebanese Diaspora in Colonial French West Africa* (Oxford: Oxford University Press, 2014), 131.

concerns like the food company Patisen and the soapmaking business Savonnerie Africaine Fakhry.⁵⁵

Another way in which the expansion of groundnut cultivation might have led to industrial development in Senegal is also through the loanable funds linkage, this time from a group of entrepreneurs who had the ability to extract resources from the groundnut sector and reinvest it elsewhere, and who were much less likely than the Levantine traders to be accused by farmers of exploitation and profiteering, and therefore run the risk of government intervention. Many of the Mouride leaders practised an extremely extractive form of agricultural production that relied on the free labour of their *taalibe* (Koranic students). In an interview in 1968, the griot Massamba M'Bengue, who had lived on a Mouride *daara* plantation in his youth gave a frank description of the extent of maraboutic extraction:

The entire harvest belonged to the marabout: that is to say, to the master of the Koranic school. In order to eat we begged for alms in the village, the people made us millet dishes.

Later on, he had become the *taalibe* of another teacher, Serigne Assane, who, according to M'Bengue, 'stayed at home while people farmed for him'.⁵⁶ The *seriñ* who managed to accumulate the most followers were about to make quite handsome incomes from their control of disciple labour.⁵⁷ Could the Mouride in

⁵⁵ Ibid., 231.

⁵⁶ Interview with Massamba M'Bengue printed in Jean Roch, *Les mourides du vieux bassin arachidier sénégalais : entretiens recueillis dans la région du Baol* (Dakar: ORSTOM, 1971), 40–41.

⁵⁷ For a rough sketch of the order of wealth of the marabouts, see Majhemout Diop, *Histoire des classes sociales dans l'Afrique de l'Ouest: Tome 2: Le Sénégal* (Paris: Editions L'Harmattan, 1985). The literature on Mouridism and its connection to the groundnut economy is vast: on the brotherhood itself and its theological underpinning, see Cheikh Anta Babou, *Fighting the Greater*

particular have become a source of capital for a growing Senegalese industrial sector?

Thanks to the collapse of the *Banque française de l'Afrique* during the Great Depression, we have at least some indication of the scope for capital formation among the Mouride leaders, as well as other traders.⁵⁸ The BFA was a major commercial bank that had first opened in French Equatorial Africa and spread into major cities in French West Africa. It fell into grave difficulty with the fall in world commodity prices in 1930, and the French government was obliged to step in to try to secure a saviour. Because of this, some of its client lists have been preserved in French national archives. Unsurprisingly, the Dakar branch of the BFA was its most important in Senegal. In 1931 around 400 thousand francs had been deposited in current accounts (*comptes courantes*) and about 1.4 million francs in deposit accounts. Many of its clients were prominent players in Senegalese business. The renowned Lebu entrepreneur and property owner Alassane N'Dir held a (relatively small) current account with 10,394.45 francs. About a third of the total amount deposited in current accounts and a quarter of the money in deposit accounts were of small accountholders (i.e., they had deposited less than 10,000 francs). A number of Senegalese businessmen had relatively substantial accounts with the bank:

Jihad: Amadu Bamba and the Founding of the Muridiyya of Senegal, 1853–1913 (Ohio University Press, 2007); Tidiane Sy, *La confrérie sénégalaise des Mourides: un essai sur l'islam au Sénégal* (FeniXX, 1969); Guy Rocheteau, *Pionniers mourides au Sénégal: colonisation des terres neuves et transformations d'une économie paysanne* (Office de la recherche scientifique et technique outre-mer, Centre ORSTOM ..., 1973); Jean Copans, "Les marabouts de l'arachide: la confrérie mouride et les paysans du Sénégal," 1980; Paul Pélissier, "L'arachide au Sénégal : Rationalisation et modernisation de sa culture," *Les cahiers d'outre-mer* 4, no. 15 (1951): 204–36.

⁵⁸ A very summary history of the BFA's bankruptcy can be found in Lionel Zinsou-Derlin, "La Banque de l'Afrique occidentale dans la crise," *Outre-Mers. Revue d'histoire* 63, no. 232 (1976): 508.

Mapaté Diagne held over 34,000 francs; Mactar Diop over 50,000 francs, and Demba Diallo nearly 85,000 francs.⁵⁹

Perhaps surprisingly, given the prohibition on usury in Islam—recall from Chapter 2 the traders’ disdain for the proposed Banque du Sénégal in Saint-Louis prior to the abolition of slavery—the Mouride brotherhoods did make use of the bank, and had accounts that would have collected interest. For example, a term deposit for 100,000 francs was listed under the name of Cheikh Mbacké Bousso, then one of the most prominent of the Mouride marabouts, though it is unclear whether the term deposit was a personal account or held for a Mouride brotherhood in his name.⁶⁰ Amadou Moustapha Mbacké—the son of the brotherhood’s founder Amadou Bamba—held a deposit account worth 52,168 francs at the Saint-Louis branch. This was probably only a small fraction of the wealth at his disposal: we know, for example, that he loaned the community of Diourbel the 235,000 francs required for the construction of a school, requesting its repayment in 1936 in order that he could commence work on the Great Mosque of Touba, where his father had been laid to rest.⁶¹

We know very little about how the early expansion of Mouride groundnut production was financed; but this confirms that the most important *seriñ* were connected with the formal credit economy in Dakar by the 1930s. Not only could they draw on their own profits to lend; they also had privileged access to credit themselves. By the time the State became involved in large-scale lending, in the final years of French rule, Mouride *seriñ* took advantage of their political power to take

⁵⁹ Bank account lists in AOM 1 AFFECO 369-70.

⁶⁰ Ibid.

⁶¹ Procès-verbal du Conseil général du Sénégal, 1 January 1936, 176.

out loans, many of which were not repaid in a timely fashion. In 1959, the *Caisse centrale de crédit agricole du Sénégal* listed the marabout Bassirou M'Backé as a defaulting client over a loan of 3,186,000 francs made to him in 1950; he still owed 735,884 francs, and was at least a year late in payments. Cheikh Awa Balla M'Backé, another prominent *seriñ*, owed about half of the money loaned to him in 1955, and was also at least a year late. Even though some of the other *seriñ* appear to have repaid their loans more promptly, the Caisse's figures here are deceptive, since, as the annual report warned that the debts 'are only repaid when formal undertakings are given to the debtors that the exact amount they repay will be loaned to them again in the following months'.⁶²

However, by and large, Mouride businessmen appear to have used this groundnut-derived wealth to invest more in commerce than industry. There were some exceptions, but rarely successful ones. In the late 1980s Djilly M'baye, the 'richest man in Senegal' and a Mouride businessman, took a 28 per cent stake in SOTEXKA, a cloth-making factory in Kaolack: the project was a commercial catastrophe.⁶³ The Senegalese state eventually bailed out the company, taking a 64% stake in SOTEXKA by the early 1990s. Despite cash injections from foreign institutional sources, like the African Development Bank, the factory never ran a profit, and by 1995 had run up accumulated losses of over 11 billion CFA.⁶⁴ Perhaps the most important instance in which the Mouride *confrerie* moved into the industrial space was more a matter of sovereignty than economics: the State ceded much of its

⁶² Caisse centrale de crédit agricole du Sénégal, 'Rapport annuel de présentation pour l'exercice 1959', ANS 1 R 416. More generally, on the State-*seriñ* credit nexus, see Momar C. Diop, 'L'État, la confrérie mouride et les paysans sénégalais,' *Labour capital and society. Travail capital et société* 17, no. 1 (1984): 44–64.

⁶³ Boone, *Merchant Capital*, 233 fn 81.

⁶⁴ Banque africaine de développement, 'Rapport d'achèvement du projet de rehabilitation de la société textile de Kaolack — République du Sénégal'.

holdings in the *Société électrique et industrielle de Baol* (SEIB) to the Mourides; Baol, the name of a precolonial Wolof kingdom, is the centre of Mouride power; its major urban conurbation, Mbacké–Touba, is the seat of the Mouride brotherhood and enjoys substantial effective political autonomy.⁶⁵

INTERSECTORAL LINKAGES

The final kind of linkages emphasised by staple theory are input-output linkages: that is to say, the purchases made by one sector of the productive economy from another. The Keynesian concept of a ‘multiplier’ is often used when discussing these linkages. Just as a government spending \$1 million on a building project during a recession might generate more than \$1 million worth of output because of the way that such a project might generate extra demand for other kinds of goods, so too do the backward linkages from a restaurant serving a plate of mafé in Dakar, the production of which requires inputs from the groundnut sector, the pastoral sector, the meat processing sector, and to a greater or lesser extent the energy sector. Some sectors, being more intensively forward- or backward-linked than others, will generate more output through linkages for a given increase in final demand. But mere intensity of intermediate input usage was not always a sign of an industry that generated linkages: some Senegalese manufactures, like flour factories, generated very little by way of domestic backward linkages since most of their inputs were imported; others, like groundnut oil factories, depended nearly exclusively on domestic inputs (essentially, shelled groundnuts), and therefore are recorded as having strong domestic linkages. In Table 45 I document the share of imported inputs in all intermediate inputs used by major Senegalese economic sectors.

⁶⁵ Moriba Magassouba, *L’islam au Sénégal : demain les mollahs ? La “question” musulmane et les partis politiques au Sénégal de 1946 à nos jours* (Paris: Karthala, 1985), 33.

Significant variation between sectors is apparent: some industries, like chemical manufacturing, relied nearly exclusively on imported inputs, and never generated much by way of backward linkages. Others, like the textile sector, did slowly shift towards using more domestically-produced inputs, generating demand within Senegal (though not necessarily increasing economic efficiency).

Perhaps one of the strongest linkages from the cash crop boom in West Africa was, as Austin argued, the backward linkages from agriculture to transport, noting that the increasing use of motor vehicles gave birth to a multitude of firms that repaired or modified imported vehicles. The backward linkage from agriculture to transport was indeed one stressed by Watkins in his formulation of staple theory. Generally, in West Africa, it was a linkage that was heavily shaped by government intervention. Often the most significant capital investment in transport—rail and road—is undertaken by governments, and this was the case in Senegal as elsewhere in colonial West Africa. Colonial administrations paid for rail and road projects either monetarily or by the extensive use of *corvée* labour.⁶⁶ But smaller-scale physical capital formation in agricultural-linked transportation could very well be private, and was one way in which savings could easily be mobilised for investment by farmers who produced a surplus, representing a loanable funds linkage.⁶⁷

⁶⁶ See in general Fall, *Le travail forcé en Afrique occidentale française (1900-1946)*; Tiquet, *Travail forcé et mobilisation de la main-d'œuvre au Sénégal: années 1920-1960*; Ibra Sène, "Colonisation française et main-d'œuvre carcérale au Sénégal : de l'emploi des détenus des camps pénaux sur les chantiers des travaux routiers (1927-1940)," *French Colonial History* 5, no. 1 (2004): 153–71; and more broadly Kwabena Opare Akurang-Parry, "Colonial Forced Labor Policies for Road-Building in Southern Ghana and International Anti-Forced Labor Pressures, 1900-1940," *African Economic History*, no. 28 (2000): 1–25. For a meticulous quantification of the value of forced labour to colonial fiscal capacity in French Africa see van Waijenburg, "Revenue Imperative."

⁶⁷ As Hill argues for migrant cocoa farmers in the Gold Coast: Polly Hill, *The Migrant Cocoa-Farmers of Southern Ghana: A Study in Rural Capitalism* (1963; repr., Woodbridge, England: Boydell & Brewer, 1997), 190.

To judge by motor vehicle import statistics, private investment in transport in Senegal was considerable. It was also an area of enterprise undertaken by the *Sociétés indigènes de prévoyance*, to which, in theory, all farmers, groundnut-producing or otherwise, belonged. Though their primary aim was to smooth consumption, lower wholesaling markups (and hence cut into the profits of the Levantine traders, if not the profits of the marabouts) and distribute seed and credit, in some parts of Senegal they acquired considerable capital assets. To take but one example, the Bignona SIP in the Casamance had acquired by 1934 a Citroën car, two vans, a motor boat, a bicycle, and two ox carts, and planned to purchase a Citroën truck in 1935.⁶⁸ The other major capital contribution of the SIPs in Senegal, and one which deserves a more thorough historical treatment than I can offer here, is the building of wells to allow for an expansion of groundnut cultivation into the more arid parts of the Senegalese interior,⁶⁹ an activity that technically also counts as a backward linkage from agriculture, though on a relatively small scale. However, from the limited data available, it seems as though this kind of expenditure represented only a small fraction of the expenditure of the SIPs. Elsewhere in *Afrique occidentale française*, the SIPs also acquired basic capital equipment to process raw agricultural goods. In Côte d'Ivoire, for example, they acquired mechanical crushers to speed up the processing of palm nuts, since, according to Marcel Boyer, local notables felt that only a collective credit association could afford to purchase the machinery necessary⁷⁰—though European merchant firms had

⁶⁸ Colonie du Sénégal, Cercle de Bignona, 'Rapport annuel 1934 : Sociétés indigènes de prévoyance'.

⁶⁹ Valy Faye, "Le travail agricole rural en milieux Wolofs et Sérères du Sénégal de 1819 à 1960" (PhD, University of Amsterdam, 2016), 148.

⁷⁰ Marcel Boyer, 'Les sociétés de prévoyance de secours et de prêt mutuels agricoles en Afrique occidentale française', PhD dissertation, Université de Paris, 1935, 145-6.

already been importing mechanical crushers, with around twenty in use in the Lagunes *cercle* by 1911.⁷¹

One source for studying linkages in output—the forward and backward linkages—are the classic tool of industrial planners: the input-output table. These detail the purchases made from one sector of the economy by another; it is therefore possible to measure at least some of the linkages between sectors. Since the decline of the period of High Developmentalism, input-output tables have suffered something of a neglect outside very specialised areas of economics, like regional economics and the construction of computable general equilibrium models. Their use by development economists on the other hand is much less common than it was at the height of concerted industrial policy in the 1960s and 1970s in the developing world. Part of this neglect is no doubt deserved: the Lucas critique—that any attempt by policymakers to exploit an observed statistical relationship between two variables is liable to change the nature of that relationship—is as relevant to the use of IO tables as it is for the Phillips Curve (which posited a stable relationship between inflation and employment). The coefficients in an IO table document the relationships between economic sectors that existed at a given moment, not solid structural features that could easily be exploited by policymakers looking to ignite industrial growth by channelling resources to ‘key’ sectors. But if they are an unreliable tool for industrial planning, input-output tables can be useful tools for an economic historian who simply wishes to observe the past and not predict the future.⁷² In order to study the development of input-output linkages in Senegal and

⁷¹ Gouvernement général de l’Afrique occidentale française, *Rapport d’ensemble annuel*, (Paris, 1911), 180.

⁷² See for example Jari Kaupila, “Quantifying the Relative Importance of Export Industries in a Small Open Economy during the Great Depression of the 1930s: An Input–Output Approach,” *Cliometrica* 3, no. 3 (2009): 245–73; John Dodgson, “Gregory King and the Economic Structure of

their connection to agriculture, I develop in the rest of this section two kinds of comparison, drawing on two sets of IO tables that I have collected, digitised, and harmonised. The first is a cross-country dataset, comparing Senegal with other countries in French West Africa and across the rest of the continent a year as close as possible to formal independence. This dataset enables us to compare the density of the ‘industrial fabric’ of each economy. The second is Senegal-specific dataset, comprised of six IO tables between 1959 and 1982.

LINKAGES IN THE TROPICS: AFRICA AT ABOUT 1960

The cross-country tables are presented in summary form in Table 44. Comparing input-output tables with one another is no easy task. Before the advent of international standards for industry classification, the sectoral detail in these tables was a choice of the compiling authority and tended to reflect the individual economic structure of the given economy, rather than a structure that might facilitate comparison across countries. To make such comparisons possible, I have aggregated the sectors in all original tables into five composite sectors. I use the traditional primary, secondary and tertiary divisions, but given the nature of African economies in the mid-twentieth century, I separate out utilities like electricity and water, and extractive industries, from the secondary and primary sectors respectively. (The next four paragraphs give a technical explanation of the method of analysis used; the historical argument resumes on page 290.)

Early Modern England: An Input-Output Table for 1688,” *The Economic History Review*, 2013, doi:10.1111/1468-0289.12006.

In order to analyse the input-output tables in a linkages framework, they must first be transformed. First, the value of industry i 's inputs supplied to industry j is expressed as a percentage of the total output of industry j at producer's prices (i.e., value added plus inputs, ignoring markups), to form an input coefficients matrix, A . This is subtracted from an identity matrix of the same dimensions; this new matrix is then inverted to form the Leontief inverse or 'total requirements' matrix, $[I-A]^{-1}$. The Leontief inverse can then be used to calculate the strength of linkages between sectors: how much the output of a given sector depends on purchasing inputs from another. In the seventy or so years since the study of input-output linkages has been formalised, a number of different possible indices have been proposed. Neither Hirschman's nor Watkins's discussion of linkages offered a definition that could easily be taken to input-output tables; indeed, Hirschman was just as interested in the potential emergence of new industries stimulated by possible linkages as he was in the linkages that actually existed in an economy at a given time. Each of the indices that have been devised in Hirschman's wake capture at best a part of the overall concept of 'economic linkages'.⁷³

Total backward linkages could very easily be defined as the column sums of the Leontief matrix, and can be interpreted as the increase in total production in the economy for a 1-unit increase in demand for the output of a given sector, taking into account all backward linkages and assuming they remain stable. Forward linkages are less easy to define. One simple method would be to use the row sums instead of the column sums of the Leontief inverse. However, by symmetry, every Leontief backward linkage from sector i to sector j represents a forward linkage

⁷³ For a reasonably comprehensive discussion of linkage measurements, see Ina Drejer, "Input-Output Based Measures of Interindustry Linkages Revisited - A Survey and Discussion," (Montreal, Canada, 2002).

from sector j to sector i . Leontief forward linkages would therefore appear to be a redundant measure. Moreover, interpreting a forward linkage calculated from the Leontief inverse in a meaningfully economic sense would also be difficult. To see why, note that the backward-linkage-focused Leontief framework implicitly posits the predominance of Leontief production functions: that is to say, production functions in which inputs are used in fixed proportions and cannot substitute for one another (of the form $y = \min(\alpha m, \beta n)$ where y is output, m and n inputs, and the Greek letters technical coefficients).⁷⁴ A decline in the supply of inputs from the fertiliser sector to the groundnut sector, for example, would necessarily result in a proportional decline in groundnut output, since no substitute inputs are available to make up for the missing fertiliser. In this sense, the forward linkage from fertilizer to groundnut sectors is only a ‘permissive’ linkage; it enables growth but cannot cause it (since a 10% increase in fertilizer output could not by itself lead to any increase in groundnut output, if all other inputs to groundnuts are held constant). On the other hand, the backward linkage from groundnuts to fertiliser could be considered causal, since growth in demand for groundnuts will stimulate a growth in demand for fertiliser, the supply of which is assumed elastic for the purposes of the thought exercise. For this reason, economists who are interested in forward linkages in the Hirschmanian sense have often used the inverse of the Ghosh output matrix⁷⁵ rather than the Leontief. The Ghosh model is not without controversy⁷⁶ (its underlying assumption is that any increase in output from a given sector will be allocated in fixed proportions to other sectors), but it is used here

⁷⁴ Burgess Cameron, “The Production Function in Leontief Models,” *The Review of Economic Studies* 20, no. 1 (1952): 62–69.

⁷⁵ Ambica Ghosh, “Input-Output Approach in an Allocation System,” *Economica* 25, no. 97 (1958): 58.

⁷⁶ See for example: Jan Oosterhaven, “On the Plausibility of the Supply-Driven Input-Output Model,” *Journal of Regional Science* 28, no. 2 (1988): 203–17; Erik Dietzenbacher, “In Vindication of the Ghosh Model: A Reinterpretation as a Price Model,” *Journal of Regional Science* 37, no. 4 (1997): 629–51; Louis de Mesnard, “Is the Ghosh Model Interesting?,” *Journal of Regional Science* 49, no. 2 (2009): 361–72.

essentially for purposes of comparability with the now vast literature on input-output linkages.

In each table I give the 5x5 matrix of backward linkages from the Leontief inverse matrices, multiplied by 100. For a given linkage (i, j) in the matrix, the coefficient corresponds to the increase in output in the *i*th industry if output in the *j*th industry increased by 100 units of currency, assuming all technical coefficients remained stable. For example, the backward linkage from the secondary sector (column) to the primary sector (row) in Senegal in 1959 was 28, suggesting that an increase of 100 francs in Senegalese industrial output would, if every inter-industrial relationship were stable, increase demand for inputs from agriculture by 28 francs. Below the linkages matrix, I give total backward and forward linkages for each sector, with backward linkages calculated from the Leontief inverse and forward linkages calculated from the Ghosh inverse matrix as described above.

These latter linkage scores are normalized for each economy (i.e., they are not directly comparable in magnitude across economies). Thanks to this normalisation, the scores give an indication of whether a given sector had above average (score > 1) or below average (score < 1) linkages compared to the whole of that economy in that year. For Senegal in 1959, we can see that the secondary sector and the extractive sector had above-average backward linkages when compared to the Senegalese economy as a whole, while the primary sector, tertiary sector and utilities had above-average forward linkages. I then categorise industries based on the strength of their backward and forward linkages. Category I sectors have generally weak linkages with the rest of the economy, both forward and backward; Category II sectors depend on demand in the rest of the economy but are independent with respect to input supply; Category III sectors are interlinked with

the economy through both supply and demand for intermediate goods, and category IV sectors do not depend on other sectors to purchase their goods, but do rely on other sectors for their own inputs.⁷⁷

Hopkins' general point that there were only weak linkages between agriculture and the rest of the economy in West Africa is basically confirmed by these tables: in Côte d'Ivoire, Nigeria and Mali the primary sector had below-average linkages, both forward and backward. In three other African economies—Tanganyika, Zambia and Sudan—the same basic fact obtained. Senegal, however, was an exception, along with Niger. The forward linkages from agriculture were above average compared to other sectors of the economy, reflecting mainly the share of the groundnut crop that was processed domestically using modern methods—and, for Niger, the ginning of cotton. Only in Côte d'Ivoire did the secondary sector have above-average links both forwards and backwards; in all other economies the secondary sector was essentially a final-goods sector, producing for domestic consumers or for export. Generally speaking, services sectors in landlocked 'savanna' economies had above-average forward linkages, which mostly reflects the contribution of transportation to other sectors, including agriculture. In Sudan, for example, the services that the transport sector provided to agriculture accounted for 50% of the inputs it provided to other sectors, and around a quarter of transport's total output.

Forward linkages from agriculture were generally weak: in Table 43, I give the (non-normalized) forward linkage multipliers from the primary sector for all countries

⁷⁷ This nomenclature follows the scheme described in Ronald E. Miller and Peter D. Blair, *Input-Output Analysis*, 2nd ed. (Cambridge, England: Cambridge University Press, 2012), 560.

in the IO database. The forward linkages from Senegalese agriculture were stronger than in any of the other African economies in the database; for Sudan, Côte d'Ivoire, Congo and Nigeria, a 100-unit increase in agricultural output would tend to lead to less than 10 units of additional output in forward-linked sectors. There were, of course, processing industries in each of these countries: the Ivorian cooking oil sector had strong backward linkages, for example, while in the Republic of Congo it was the wood-processing sector with the highest linkages backwards, in that instance to the forestry sector. In Nigeria, the sector with the highest backward linkages was metal manufacturing, reflecting in large part the processing of tin mined on the Jos Plateau. These represented real linkages, but quantitatively these sectors were small relative to total output when compared to the Senegalese groundnut-groundnut oil nexus. (There were other sectors in Senegal with reasonably high backward linkages too: particularly in chemical manufacturing, meat processing, construction materials and the construction industry.)

But this outsized forward linkage, of course, could represent a bottleneck as well as a stimulus. If the Senegalese groundnut crop in any given year were deficient or the prices offered on the world market exceeded what the factories could offer, then oil production might decline. The share of groundnuts made into groundnut oil in Senegalese factories stagnated in the 1950s and 1960s, fluctuating around 30-40% of the total groundnut crop in the late colonial and early independence years (Figure 23).

TABLE 43: Strength of forward linkages from agriculture in selected African countries.

	Forward linkages from agriculture
Sudan (1961)	1.06

Côte d'Ivoire (1958)	1.07
Republic of Congo (1967)	1.08
Nigeria (1959)	1.10
Tanganyika (1961)	1.20
Zambia (1964)	1.23
Niger (1960)	1.26
Mali (1959)	1.36
Senegal (1959)	1.68

Source: Author calculations from data presented in Table 44

In none of the nine countries for which I could compile input-output tables were there substantial *backwards* linkages from agriculture, though the tables may underestimate these somewhat, given the difficulty of measuring the agricultural sector's consumption of service-sector outputs, like transportation. In particular, there were few industrial enterprises that produced or serviced agricultural machinery—of which there was generally very little in most of the 'peasant export' African economies at least—or that manufactured fertilizer, though the establishment of the Compagnie sénégalaise des phosphates de Taïba in 1959⁷⁸ would contribute to growing backward linkages from agriculture to the extractive and chemical industries of Senegal in the post-independence period, as we shall see below.

TABLE 44: Intersectoral linkages in African economies at about the end of colonial rule Senegal 1959⁷⁹

	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	11	28	1	4	1
Secondary	1	11	2	17	3
Utilities	1	1	8	2	0
Extractive	0	0	0	0	0

⁷⁸ A potted history can be found in Mouhamadou Lamine Diallo, "L'industrie du phosphate de Taïba au Sénégal: front minier et tensions locales," *VertigO*, no. Hors-série 28 (2017).

⁷⁹ Input-output table reproduced in UNECA Statistical Bulletin for Africa, no 2 (1967).

Tertiary	1	20	22	60	22
Total backward	0.8	1.12	0.93	1.28	0.88
Total forward	1.21	0.82	1.19	0.76	1.03
Category	II	IV	II	IV	I
Côte d'Ivoire, 1958⁸⁰					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	5	7	0	0	0
Secondary	1	16	2	1	4
Utilities	0	2	3	2	4
Extractive	—	0	0	0	0
Tertiary	2	4	2	4	7
Total backward	0.94	1.15	0.94	0.94	1.02
Total forward	0.90	1.00	1.22	0.85	1.04
Category	I	III	II	I	III
Tanganyika 1961⁸¹					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	—	45	—	2	1
Secondary	—	1	—	—	0
Utilities	—	3	—	1	2
Extractive	—	1	—	3	1
Tertiary	1	9	10	6	8
Backward	0.85	1.33	0.93	0.94	0.95
Forward	0.97	0.85	1.38	0.83	0.97
Category	I	IV	II	I	I
Zambia, 1964⁸²					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	—	10	—	—	—
Secondary	3	10	3	3	4
Utilities	—	1	1	5	1
Extractive	—	—	15	1	—
Tertiary	3	13	5	4	9
Total backward	0.90	1.13	1.04	0.96	0.96

⁸⁰ Input-output table reproduced in UNECA Statistical Bulletin for Africa, no 2 (1967). Original matrix included imports in requirements matrix; import ratio by cell has been calculated by assuming the total imports–domestic production ratio for each sector obtained in each cell.

⁸¹ Input-output table reproduced in UNECA Statistical Bulletin for Africa, no 2 (1967).

⁸² Input-output table reproduced in UNECA Statistical Bulletin for Africa, no 2 (1967).

Total forward	0.93	0.77	1.35	0.77	0.96
Category	I	IV	III	I	I
Nigeria 1959⁸³					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	—	19	2	1	1
Secondary	—	13	13	2	3
Utilities	—	1	—	2	1
Extractive	—	2	8	—	—
Tertiary	—	3	2	1	—
Total backward	0.87	1.19	1.09	0.93	0.91
Total forward	0.88	0.92	1.22	1.12	0.86
Category	I	IV	III	II	I
Sudan 1961⁸⁴					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	1	15	—	—	—
Secondary	—	2	—	1	1
Utilities	—	1	—	—	1
Extractive	—	—	—	—	—
Tertiary	7	14	16	83	2
Total backward	0.84	1.02	0.9	1.43	0.81
Total forward	0.89	0.86	1.16	0.90	1.16
Category	I	IV	II	IV	II
Mali, 1959⁸⁵					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	8	26	1	—	1
Secondary	1	6	1	—	4
Utilities	2	3	4	—	6
Extractive	—	—	—	—	—
Tertiary	17	28	29	—	6
Total backward	0.94	1.20	1.00	—	0.86
Total forward	0.90	0.72	1.02	—	1.37

⁸³ Input-output table derived in Nicholas G. Carter, “An Input-Output Analysis of the Nigerian Economy, 1959-60,” in *Planning without Facts*, ed. Wolfgang Stolper (Harvard University Press, 2013), 323–38.

⁸⁴ Input-output table published in Republic of Sudan, ‘National income of Sudan in 1961/1962’, Khartoum, 1964.

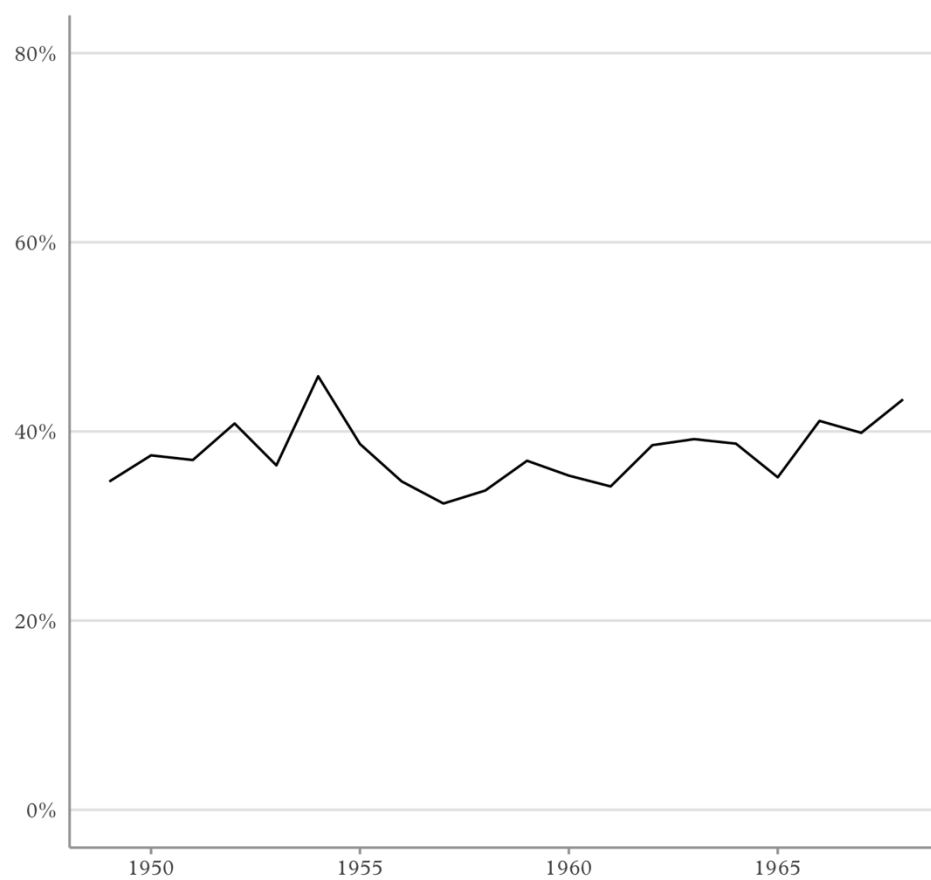
⁸⁵ Partial input-output table reproduced in UNECA Statistical Bulletin for Africa, no 2 (1967); completed with data from the *Comptes économiques du Mali*, 1959.

Category	I	IV	III	—	II
Republic of Congo, 1967⁸⁶					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	—	4	—	—	—
Secondary	3	6	2	2	4
Utilities	—	—	1	1	1
Extractive	—	—	—	—	—
Tertiary	8	13	6	15	9
Total backward	0.96	1.07	0.95	1.02	0.99
Total forward	0.93	0.96	1.12	0.86	1.11
Category	I	IV	II	IV	II
Niger, 1960⁸⁷					
	Primary	Secondary	Utilities	Extractive	Tertiary
Primary	—	16	1	—	—
Secondary	—	2	4	—	2
Utilities	—	—	—	—	—
Extractive	—	—	—	—	—
Tertiary	—	—	1	—	9
Total backward	0.93	1.07	0.95	—	0.99
Total forward	1.12	0.96	1.12	—	1.11
Category	II	IV	II	I	II

FIGURE 23: Proportion of groundnut crop sold to oil factories, 1949-1968.

⁸⁶ Constructed from data in the *Travaux préparatoires à l'élaboration du plan : comptes économiques du Congo*, 1967.

⁸⁷ Constructed from data in the *Comptes économiques du Niger*, 1959.



Source: Data from World Bank, Rapport no. AW-15a, 'Situations et perspectives économiques du Sénégal', vol 3, 1970.

LINKAGES IN SENEGAL FROM INDEPENDENCE TO STRUCTURAL ADJUSTMENT

In order to examine linkages over time, I can draw on four comprehensive input output tables for Senegal at crucial moments in its industrial history: a 1959 table, just before independence and the devising of the First Four Year Plan, a 1962 table, in the middle of that Plan; a 1974 table, in the year of the establishment of the Dakar Industrial Free Trade Zone, and a table for 1982, a period of considerable economic distress after the beginning of the structural adjustment programs (Senegal became the first country to accept a World Bank structural adjustment loan in 1980).⁸⁸ Furthermore, I can construct a fairly complete 26-sector input-output table from information in the Senegalese *Comptes économiques* for 1979. A more aggregated table can also be constructed from data in the *Comptes économiques* for 1969 (distinguishing nine sectors). The most serious problem with building these the 1969 table is that the original ‘*comptes des secteurs*’ in the national accounts for 1969 from which I have constructed it do not explicitly distinguish between domestic and imported inputs.⁸⁹ In order to make the 1969 table comparable, I first need to estimate intermediate input matrices, which I do by assuming that the import penetration in any given linkage from sector i to sector j is equal to the total import ratio of i . I make some adjustments to account for the fact that some inputs, like road transportation services, could not be produced locally and therefore must have been entirely imported.

⁸⁸ Reprinted in, respectively, United Nations Economic Commission for Africa, *Statistical Bulletin for Africa*, vol 2, (1967); United Nations Industrial Development Organization, *Input-output tables for developing countries*, New York: United Nations, 1985, vol 1, and Sounka N'Diaye, “La source CUCI peut-elle constituer une alternative à l’enquête TEI ?” (PhD, UN Institut africain de développement économique et de planification, 1992), 130–31.

⁸⁹ The 1969 tables give a breakdown of imported and domestic inputs, but not by sector. The data sources for 1974 and 1979 can supply only an aggregate ‘imported inputs’ estimate for each sector, rather than the full sectoral import matrices available for 1959 and 1982, but this is sufficient to calculate the magnitude of domestic linkages.

TABLE 45: Import ratio of inputs by sector, 1959-1982.

Imported inputs as a proportion of total inputs					
Sector	1959	1969	1974	1979	1982
Agriculture & fishing	5	n.a	6	12	12
Fats & oils	4	4	3	3	18
Cereals & flours	44	85	64	48	73
Confectionary & drinks	52	82	84	47	49
Meat & preserved goods	30	7	7	3	18
Energy	21	10	17	1	23
Mining	17	19	25	18	16
Chemicals	43	76	86	85	90
Construction material	47	n.a	29	9	27
Metalwork	55	n.a.	n.a.	n.a	n.a.
Woodwork	30	n.a.	62	34	n.a.
Textiles & leatherworking	69	65	37	38	44
Tobacco & matches	80	n.a.	61	61	41
Printing & paper	65	n.a.	63	55	54
Construction	28	33	29	6	19
Transport	7	n.a.	16	2	18
Services	10	n.a.	26	25	9
Commerce	4	n.a.	8	6	17

Source: author calculations; see main text for sources. Sectors in 1974, 1979 and 1982 have been aggregated to form comparable sectors to those in the 1959 tables.

Over the first twenty years of Senegalese independence backward linkages from agriculture increased, as farmers and pastoralists increasingly used domestic inputs; domestic forward linkages from agriculture generally declined, however, especially in the ‘liberal’ phase of industrial growth in the 1960s. A number of other sectors became increasingly woven into the fabric of the Senegalese economy: backward linkages from the textiles sector became more important, particularly towards the services sector. The Senegalese construction sector also used more domestic inputs over time—mostly construction materials, but also chemicals. The energy sector also became a major consumer of inputs from domestic chemicals manufactures and services sector enterprises. Though it is difficult to draw firm conclusions from

single-year snapshots, it is noticeable that in several sectors the 1979 table seems to mark a peak, with a decline in linkages from the 1979 to the 1982 table. The most likely culprit, of course, is the onset of structural adjustment. Many of the policies implemented in the stabilization programmes put strain on intersectoral linkages: the abolition of the groundnut marketing organisation ONCAD in 1980 due to unsustainable debt levels and the cut to fertiliser subsidies, for example, would have put stress on the linkages between agriculture and the metalworking sector and fertiliser producers, while the shift from an import-substituting economic strategy to one preoccupied with maximising export revenue meant that domestic manufacturers were no longer necessarily took priority in the market for domestically produced inputs.

The latter consideration leads to a broader point to be made about the development of domestic linkages in Senegal and indeed in West Africa. Linkages, as the original staple theorists acknowledged, were not necessarily ‘organic’, emerging naturally from the interplay of economic forces during a period of export expansion. They could be brought into being by deliberate policy, or, more subtly, shaped and supported by policymakers. A fairly representative case is that of the Senegalese textile industry. Though its history has been more thoroughly documented elsewhere, particularly by Catherine Boone,⁹⁰ it is worth revisiting in order to study understand how the development of economic linkages in the Senegalese economy was shaped as much by non-market as by market forces.

⁹⁰ Boone, *Merchant Capital*.

TABLE 46: Forward and backward linkages in the Senegalese economy from independence to structural adjustment.

Backwards linkages						
	1959	1962	1969	1974	1979	1982
Agriculture	1.14	1.18	1.10	1.19	1.23	1.23
Food & drink	1.83	1.67	1.52	1.51	1.77	1.67
Energy	1.32	1.12	1.35	1.19	2.47	1.75
Mining	1.82	1.3	1.45	1.17	1.72	1.59
Other manuf.	1.22	1.17	1.12	1.22	1.32	1.23
Construction	1.50	1.38	1.38	1.25	1.78	2.49
Services	1.26	1.04	1.26	1.19	1.29	1.41
Textiles	1.14	1.34	1.15	1.37	1.54	1.55
Mechanical	—	1.12	1.11	1.13	1.63	1.27
Forward linkages						
Agriculture	1.65	1.56	1.27	1.34	1.43	1.40
Food & drink	1.04	1.07	1.08	1.05	1.07	1.06
Energy	1.65	1.43	2.27	1.65	1.65	1.86
Mining	1.07	1.00	1.28	1.02	1.29	1.09
Other manuf.	1.33	1.14	1.08	1.21	1.93	1.67
Construction	1.27	1.24	—	1.06	1.05	1.18
Services	1.44	—	1.39	1.37	1.57	1.63
Textiles	1.05	1.34	1.18	1.16	1.13	1.19
Mechanical	—	2.05	—	—	2.56	1.56

Source: Analysis of author's Historical Senegal Input-Output database, constructed from sources described in text.

The modern Senegalese textile industry grew in shallow economic soil. As we saw above, the cash crop boom led to increased demand for textiles across French West Africa, but any Dakarois capitalist had to compete not only with Alsatian factories (which eventually set up subsidiary firms across Africa, starting in Dakar in the 1950s) but also with more established African firms, especially by the time the Dakar textile industry became a serious business in 1950s and 1960s. In this period an informal arrangement divided up the AOF colonies between the new Senegalese factories and the much more established Ivorian Gonfreville complex at Bouaké, which had gone from 1632 spindles in 1925 to 10848 in 1960; producing 250 tonnes of yarn in 1926 to 2000 tonnes of yarn in 1960 (as well as 420 tonnes of cloth).⁹¹ Senegal would export principally to its neighbours (Soudan français/Mali, Guinea, and Mauritania), while Côte d'Ivoire would do the same, supplying Upper Volta, Dahomey and Niger.⁹² The Senegalese textile firms clearly saw the former AOF colonies as a *chasse gardée* in the same way that France in general did: in 1961, for example, the Mauritanian government was approached about the possibility of importing cloth from India; a possibility which the French Syndicat general cotonnier saw as prejudicial to their interests in the country; some at ICOTAF agreed, and proposed joining the effort to prevent Indian competition on Mauritanian markets.⁹³ But Mauritania was extremely poor, relations with Mali took a nasty turn very early in the period of independence, while the Guinean market was largely shut to Senegalese and French industry alike after the colony's 'no' vote in the referendum on the *loi cadre* and its accession to independence.

Of these misfortunes probably the most important was the break with Mali, which followed a tense few months of federation with Senegal under the name of the

⁹¹ Figures from UN Economic Commission for Africa, 'L'industrie textile en Afrique de l'ouest : marché — entreprises — perspectives', E/CN.14/INR/129, 3 November 1966, 50.

⁹² 'Filés', in ANS FCCD 329.

⁹³ 'Note pour Monsieur Levylier, Mulhouse, 27 May 1961. AMM 03AA53, dossier 3a.

Federation du Mali. This entity was designed to group together all of the constituent colonies of Afrique occidentale française after independence, however, largely thanks to the obstructive diplomatic efforts of Félix Houphouët-Boigny, the eventual Federation only ended up with two: Senegal and what is now Mali and was then the République du Soudan.⁹⁴ This pairing made more economic sense than some other abortive federalisms in West Africa, like the Ghana–Guinea ‘Union of Independent African States’, since Senegal and Mali had many economic complementarities. One in particular was the industrial production of cotton, particularly through the Office du Niger scheme.⁹⁵ Some of its output was sold to Senegalese textile factories: by the end of colonial rule, about 80% of the raw cotton spun by the four main Cap Vert firms (ICOTAF, Cotonnière du Cap Vert, Manufactures de Rufisque and SOTIBA) came from Mali. Though Senegal can hardly be said to have enjoyed a *global* comparative advantage in textile manufacturing, in the context of a customs union between Senegal and Mali—with, let us imagine, high common external tariff barriers—it almost certainly would have enjoyed a *local* comparative advantage, and given its relative capital abundance it made perfect sense for Senegal to buy raw cotton from its neighbour and send it back over the border in the form of finished textiles. This state of affairs was the cause of some bitterness between the two countries: Modibo Keïta’s post-Federation antipathy towards Senegal extended to what he saw as a Senegalese presumption to a privileged position in the West African division of labour: in a speech to the Malian cadres of the Rassemblement démocratique africain at an Extraordinary Congress, Keïta claimed that ‘the Soudanese Republic was the most

⁹⁴ Modou Ndoye, “La Fédération du Mali à l’épreuve de l’indépendance : chronique d’un échec,” *Africa: Rivista trimestrale di studi e documentazione dell’Istituto italiano per l’Africa e l’Oriente* 50, no. 2 (1995): 151–76.

⁹⁵ Jean Filipovich, “Destined To Fail: Forced Settlement at the Office du Niger, 1926–45,” *Journal of African History*, 2001, 239–60; Monica M. van Beusekom, “Colonisation Indigène: French Rural Development Ideology at the Office Du Niger, 1920–1940,” *The International Journal of African Historical Studies* 30, no. 2 (1997): 299.

important market of Senegalese industry and business...our Republic [is] not poor, and Senegal was made rich from our wealth'.⁹⁶

The acrimonious break-up of the Federation in 1960 therefore not only cut off a vital source of demand for Senegalese textiles, it also threatened a crucial supply chain, and the other potential sources of cotton in the franc zone could not make up for the loss. Instead, the textile firms turned to artificial fibres. In a note that was sent directly to Prime Minister Mamadou Dia, ICOTAF requested that the Senegalese government lower import charges on rayons.⁹⁷ The government acceded, and the *taxe forfaitaire* on rayon was adjusted from 15% to the equivalent rate on Malian cotton (2%), though the definitive application of this measure was subject to approval by the entire West African Customs Union committee.⁹⁸ Other measures to soften the blow were, however, less palatable to the Senegalese government. In particular, it was concerned that any retrenchment in production and hence in employment in textiles would have grave social consequences, and requested that the Dakar factories not reduce working hours or fire employees.⁹⁹

The Dakar industry itself was cartelised, a state of affairs that in fact facilitated the development of industrial value chains, since some firms specialised in producing plain cloths that could be purchased by other firms in order to produce finished textile goods. The two most important firms, SOTIBA and ICOTAF, appear to have had reasonably formal non-competitive agreements from an early date: at a meeting in December 1957 between representatives of the two firms, Bernard Thierry-Mieg,

⁹⁶ Modibo Keita, *Discours et interventions* (Bamako: La ruche à livres, 1965), 9.

⁹⁷ 'Note concernant l'approvisionnement en matière première des filatures du Sénégal', 3 October 1960. AMM 03AA53.

⁹⁸ Hamet Diop, 'Rapport fait au nom de la Commission des finances sur le projet de loi no 20/61/ANS'; Loi sénégalaise no 61-26, 1961, available online at <http://www.dri.gouv.sn/sites/default/files/LOI/1961/SENEGALAISE/61_26.pdf>, accessed 10/3/2021.

⁹⁹ 'Note sur la situation de l'industrie textile au Sénégal', October 1960, ANS FCCD 329.

director of ICOTAF, said that he was ‘astonished’ by the range of cloth manufactured by his rival, and particularly by the quantity of cotton drill, which, according to Thierry-Mieg violated ‘formal verbal undertakings which had been made by SOTIBA’. For his part, SOTIBA’s Charles Leibel declared that he was ‘simply trying to earn his living’ and that in any case ICOTAF had violated the agreement first by manufacturing bleached yarn and rayon fabrics. This little fracas did not appear to irreparably damage relations between the two firms, since ICOTAF finalised an order from its rival at the same meeting for 50,000 metres of guinea cloth and 5 tonnes of yarn a month for the following January and February.¹⁰⁰

The Third Four-Year Plan (1969-73) made the forward linkage from agriculture to industry an explicit target of Senegalese industrial policy: the first goal mentioned in its industrial policy section was “to integrate further agriculture and industry, by adding value and domestically processing local products by creating agro-industrial complexes based around crops, fishing and forestry”.¹⁰¹ As part of this effort, for example, an accord was concluded guaranteeing an absolute minimum tonnage of the annual groundnut crop for the oil factories, with a further allocation depending on the size of the harvest.¹⁰² That this effort largely failed was not entirely a fault of planning: the Third Plan coincided with the first of the great Sahelian droughts of the second half of the twentieth century, and agricultural production—particularly of groundnuts—declined markedly. A more far-reaching intervention was the establishment of the Société de développement et des fibres textiles (SODEFITEX), a parastatal responsible for developing the cultivation of cotton in the upper

¹⁰⁰ ‘Entrevue avec le représentant de la SOTIBA’, Dakar, 17 December 1957. AMM, Fonds Ets. Schaeffer et Cie, 4/5280.

¹⁰¹ République du Sénégal, Ministère du Plan et de l’Industrie, *Troisième plan quadriennal de développement économique et social 1969-1973*, Dakar, 1969, 121.

¹⁰² World Bank, Rapport no. AW-15a, ‘Situations et perspectives économiques du Sénégal’, vol 3, 1970.

Casamance and eastern Senegal that largely took over the role of the French state-backed institution the *Compagnie française pour le développement des fibres textiles* in organising the entirety of the cotton value chain in Senegal.¹⁰³ In stark contrast to the failed cotton venture analysed in Chapter Two, cotton was a relative success story, reaching 45,200 tonnes in 1977. But by then the country's textile industry was well on its way to decline, and instead of feeding the factories of Dakar, cotton became an export crop.

The links between Senegal's groundnut boom and growth in the rest of the economy, particularly the industrial sector, were real—and, at least compared to the rest of the West Africa, strong—but they were fragile, as the evolution of the forward linkages measure for agriculture from 1959 to 1982 shows. The reliance on groundnut exports to create a growing domestic demand for manufactures was also a risky strategy, as production in labour-surplus India and China would, as Arthur Lewis argued, ensure that the real world price of groundnuts and groundnut oil was tied to farmers' incomes in Gujarat and Shandong.¹⁰⁴ Nor was there a clear channel by which an agricultural surplus could be directed from agriculture to manufacturing: merchant capital, as Boone argued in her history of the Senegalese textile sector, had little incentive to stimulate truly competitive manufacturing, while the Mouride wealth made in the groundnut trade was transferred mostly into non-industrial investment. Parastatals like ONCAD could extract money from groundnut producers in order to finance industrial investment, but it was

¹⁰³ A brief history is in E. D. Van Hoven, "The Nation Turbaned? The Construction of Nationalist Muslim Identities in Senegal," *Journal of Religion in Africa. Religion En Afrique* 30, no. 2 (2000): 225–48. On cotton parastatals in Africa see Claire Delpuech, "A Short Analytical History of Cotton Institutions in West Africa," *Groupe d'Economie Mondiale Sciences Po Working Paper Series*, 2009.

¹⁰⁴ In particular, Lewis argued that the relative price at which tropical goods like groundnuts would trade for industrial goods produced in developed countries would be set by the relative productivity of *grain* agriculture in tropical countries and developed countries. Lewis, "Unlimited Supplies"; Angus Deaton and Guy Laroque, "A Model of Commodity Prices after Sir Arthur Lewis," *Journal of Development Economics* 71, no. 2 (2003): 289–310.

constrained in its ability to do so by political factors—as well as the poor trajectory of world groundnut prices.

CONCLUSION. *Reflections on a land-
abundant path of economic change.*

In a discussion of ‘labour-abundant industrialisation’ that engages with Kaoru Sugihara’s concept of labour-intensive industrialisation, Gareth Austin has introduced the idea of a ‘labour-scarce, land-extensive’ development path.⁵⁰⁰ Such a path, initially at least, was very different from the ‘labour-intensive’ path that characterised the wet-rice economies of East Asia, and from the ‘capital-intensive’ path followed by European countries and their temperate colonies. For Austin, industrialisation in a country following the land-extensive path to industrialisation would almost certainly follow a period of specialisation in export agriculture. A decline in mortality led to a rising population that will over time result in truly labour abundant, at which point the land-extensive path fuses with the labour-intensive path (which, as capital accumulates, itself fuses with the capital-intensive path further on). In some respects, the development of formerly land-abundant economies in Southeast Asia—Thailand and southern Vietnam in particular—clearly demonstrate the validity of the ‘fusion’ hypothesis: though neither country is fully industrialised, their development since the Thai turn to export-oriented industrialisation in the mid-1980s and have both grown rapidly based on low-wage, relatively labour-intensive manufacturing exports.⁵⁰¹ It lies beyond the scope of the thesis to predict whether such a future lies ahead for Senegal, or West Africa more broadly, though there are some very crucial differences between Southeast Asia and West Africa that make a prediction that transposes one region’s recent past to the other’s future hazardous.

The major theme of the dissertation has been structural change: that is to say, the shift in the make-up of economic output away from agriculture and towards

⁵⁰⁰ Austin, “Labour-Intensity.”

⁵⁰¹ Somboon Siriprachai, “Export-Oriented Industrialisation Strategy with Land-Abundance: Some of Thailand’s Shortcomings,” *Thammasat Economic Journal* 16, no. 2 (1998): 83–138.

industry and services. This necessarily involves a reallocation of the factors of production (in Senegal chiefly labour and capital; there was some minor loss of some agricultural land to mining and urban expansion, though this was dwarfed by the amount of new land brought under cultivation). As the Introduction argued, few if any of the most popular economic models of long-run structural change adequately capture the West African experience. Labour scarcity makes the Lewis model, predicated on the existence of unlimited supplies of labour, an awkward fit, applicable perhaps to the economics of the dry season but of little help in explaining the evolution of the real wage or of the pace of urbanisation. Myint's vent-for-surplus model also fails as an explanatory framework: as the introduction outlined, there are empirical problems with the theory, and, more seriously for my purposes, it has nothing to say about industrialisation or urbanisation. I have also drawn on the 'staple theory' tradition, particularly in the final chapter of this thesis, but staple theory does not have the same theoretical clarity as Lewis or Myint. I have sketched out some of the features of structural change in an economy characterised, historically, by scarce and often enslaved or otherwise coerced labour, abundant land, sharp seasonal swings in factor ratios and relative factor incomes, and a dominant city to which labour, and particularly skilled and educated labour, is magnetically drawn by the promise of higher incomes.

In fleshing out a model to account for these features of the 'land-abundant path', I would argue that attention should be given some of the recurring themes from this thesis: notably, the connection between skill and urbanisation, the *structure* of the cost of living, and the strength of intersectoral linkages between agriculture and industry. In the first two chapters, I argued that slavery in urban Senegal was not just an institutional response to labour scarcity, it was also a system that drastically reduced the cost of skilled labour in an environment in which skill was in short supply. Sugihara's discussion of the labour abundant path of industrialisation

focuses on the role of skills, particularly generalist and managerial, in labour intensive growth: ‘the accumulation of human capital’ in Tokugawa Japan, he argues, ‘became an ingrained value in Japanese society and contributed to slow but steady economic progress.’⁵⁰² In my discussion of caste, I emphasised the *management* of skill in a tropical savanna climate that generated acute labour pressure in both agriculture and linked artisanal crafts. In discussing the phenomenon of urban slavery, I continue this theme, documenting the high price of skilled labour in urban Senegal in the 1830s and 1840s and the way in which manumission in particular was used to induce effort in skilled occupations while keeping wages as low as possible (though not, by world standards, very low at all). In the third chapter, I show that urban-born workers were more likely to hold skilled occupations, even when controlling for literacy and schooling, which might provide some hope that the massive growth in urban populations in Africa in the past several decade may—if it has not already—produce a stock of labour that can be internationally competitive, even at higher African wage rates.

The importance of the distribution of income to industrialisation was brought out in both the fourth and fifth chapters. In my study of real wages in Senegal, I make a novel argument about living standards in developing countries by concentrating on housing costs. Not only do I show that the cost of housing was at times in Dakar’s history the most important component of the overall cost of living, I also argue that high rents reallocate urban surpluses away from *both* urban workers *and* capitalists and towards landlords. I suggest that this points to the need for a renewed focus in African economic history on the study of the economic and investment strategies of urban landholders. Building on the work of Frankema and van Waijenburg, I also show that nominal wages were relatively high in West Africa compared to

⁵⁰² Kaoru Sugihara, “The Second Noel Butlin Lecture: Labour-Intensive Industrialisation in Global History,” *Australian Economic History Review* 47, no. 2 (2007): 121–54.

similar economies in Southeast Asia, even though real wages were at a similar level. Food prices were generally higher in Senegal than in comparable economies in Southeast Asia, which pushed nominal wages higher and made Senegalese labour uncompetitive compared with equivalent workers in land-abundant Southeast Asia.

In the fifth chapter, I sketched out an application of ‘staple theory’ to the West African cash crop boom, tracing several kinds of linkages between agriculture and the rest of the economy. Thinking in terms of economic linkages can be hazardous, since it is easy to assume that a linkage that existed between two economic activities was causal, perhaps even that one activity was a necessary condition for another. This is part of the reason for the varied reception of Eric Williams’ thesis about the profits of the slave trade and the British Industrial Revolution: merely demonstrating, as Williams did, that some of the profits of the slave trade were reinvested in industry does not prove that the trade was *necessary* for the growth of industry; if it had been abolished sooner, capital would have come from somewhere else. Historians are not natural scientists; there are no other eighteenth-century Britains with which we can run the experiment. But the tropical cash crop boom was a phenomenon widespread enough to give us a relatively large number of cases to study linkages. A truly useful theoretical model of industrialisation in the land-abundant tropics, and the connection between agriculture and industry, is a task for comparative history, and I am not convinced that we yet have all the historical material we need to attempt the comparison. The modest goal of this thesis has been to supply some of that material for Senegal. Its economic history contains many of the features—coerced labour, land abundance, rapid agricultural export growth in the twentieth century, colonial dominance—that characterise the land-abundant tropics more broadly. A more ambitious project that synthesises the nineteenth- and twentieth-century history of structural change in Senegal with

similar and divergent experiences of Thailand, Vietnam, Ghana, and Nigeria—to name only a few of the natural comparators—is necessary not just to understand the economic history of the land-abundant tropics but also to gain some insight into the present, perhaps even the future, of economic development in West Africa.

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