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African Seaports and Maritime Economics in Historical Perspective

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Editors

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This book is especially dedicated to all the anonymous souls that have been lost in the depths of the sea, in search of a better life.

Preface and Acknowledgments

Seaports constitute a critical element in the conduct of global trade. This explains the considerable volume of literature on them across space, time and disciplinary boundaries. Although Africa is a minor player in global shipping and maritime trade, its products—forest and agricultural produce, and minerals—and markets are vital to the manufacturing and defence industries of the developed countries of the world. Consequently, African seaports are important not only as conduits for conveying raw material and industrial manufactures in opposite directions, but also for their strategic location along the sea lanes of the world. They are also important as gateways to a vast continental hinterland that is richly endowed with human and natural resources.

Until the opening of the Suez Canal in the nineteenth century, European shipping lines mandatorily called at Africa's Atlantic and Indian Ocean ports on their voyages to the Orient. Still, in the aftermath of the opening of the Suez Canal, African seaports have continued to contribute to maritime exchanges between Europe and the Americas, on the one hand, Asia and Oceania, on the other. In effect, the study of African seaports is justified by their continuing economic and strategic importance in global trade. This book is a collaborative effort by scholars of African seaports and shipping drawn across disciplines and generations. It aims to shed light on developments in the field since the 1980s, building on foundational work by an earlier generation of scholars. In particular, it provides a sequel to the epochal 1970 book on African seaports edited by Brian Hoyle and David Hilling, the only other volume

with a continent-wide coverage of the field. This book, therefore, fills a major gap in the literature by combining primary research and synthesis of secondary literature in examining developments in the ports and shipping sectors of African countries since the late nineteenth century. While it was not possible to cover every single country or region, the contributions by geographers, historians and economists make available in one volume up-to-date research on African maritime economics and history. It addresses issues of concern to the scholarly and general reader. The book also charts the way for future research, provoking further interest in and debates on the subject. We gratefully acknowledge the help of everyone who contributed to the completion of this project, especially the contributors, who laboured to deliver their chapters on schedule. Our deep gratitude goes to our publishers, Palgrave Macmillan and, especially, Rachel Sangster, Lavanya Devgun and Preetha Kuttiappan, the editors who commissioned the project and gave us every encouragement along the way. We acknowledge, on behalf of the contributors, the support of our respective research assistants and, above all, our most supportive families.

Lagos, Nigeria — Ayodeji Olukoju
Las Palmas de Gran Canaria, Spain — Daniel Castillo Hidalgo
December 2019

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CHAPTER 1

Introduction

Ayodeji Olukoju and Daniel Castillo Hidalgo

Oceans and other water bodies cover almost three-quarters of the Earth's surface. Given the vast distances that separate continents, it is understandable that more than eighty per cent of world trade is seaborne. This underscores the importance of the maritime sector, especially seaports and shipping, and the attendant scholarly and general interest in it. This is exemplified by Africa, a huge continent that is almost entirely enclosed by extensive coastlines, especially on its western and eastern margins. The maritime sector is strategic to the economic development of virtually all African countries. The global expansion of seaborne trade and the move towards economic integration on the continent in recent decades have underscored the importance of shipping and seaport development as major assets in national planning and economic policymaking.

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Massive investments in port infrastructures in the last decade have been at the core of maritime development policies in Africa. Hence, between 2007 and 2017, not less than fifty billion dollars were invested in port infrastructures across the continent (Ndungidi 2017). In addition, the economic and social opportunities in the *Blue Economy* and related sectors attracted the interest of private and public stakeholders in Africa (Hassan 2016). Nevertheless, there is nothing new in this fresh emphasis on the development of seaborne trade as a plank of the socio-economic development of the continent. The nexus between external/maritime trade and domestic economic performance is a recurring issue for most African countries since the late nineteenth century. However, Africa's different maritime façades have experienced divergent evolutionary patterns in accordance with changing hinterland and foreland dynamics. Thus, the long-term effects of maritime networks configuration (reinforcement, concentration and dispersion) seem to exert some influence on port evolution and the way the shipping and maritime sector evolved on the African continent (Kosowska-Stamirowska et al. 2016).

However, other self-reinforcement effects on port evolution and the long-term configuration of regional hierarchies are discernible in the ports' hinterlands. This structural approach was adopted by earlier scholars exploring how port and seaborne indicators were related to economic performance. This book follows the path of the pioneer collection edited by Brian Hoyle and David Hilling a half century ago (Hoyle and Hilling 1970). By applying multiple methodological approaches, contributors to that landmark book set the academic benchmarks for a comprehensive evaluation of the complex relationship between seaports and development. They established a causal relationship between regional economic development and the operational capacity of seaports—their handling of commodities which directly impacted on GDP performance. Hence, they stated that seaborne trade would be an appropriate proxy for gauging the relative state of the overall economy. Though this quantitative approach did not capture wealth distribution and the levels of economic inequality in African societies, it aimed to demonstrate how the development of seaborne trade positively affected the macroeconomic structure. This optimistic approach was fuelled by the extraordinary growth of the African economies from the end of the World War II up to release date of that book. The same goes for the theoretical model proposed by Taaffe et al. (1963). Building on economic orthodoxy, it held that the evolution of transport systems under market and liberal regulations would promote economic expansion and mitigate mass poverty. Hence,

accumulation of capital and its reinvestment in local and regional infrastructures would promote regional integration, facilitate commercial exchanges and the consolidation of market economies. This approach coincided with the developmental theories fostered during the post-war golden age.

The 1970s economic crises disrupted this self-predicted progressive path. The crises exposed the fragility of the economic structure of dependent countries where incomes and wealth (both public and private sectors) were heavily dependent on the evolution of external sectors (Jerven 2015). The catastrophic combination of the precipitous fall in the world market prices of raw materials and commodities (the economic mainstay of most African countries), the inflation caused by the increasing prices of energy and the crisis of the state structures (tax revenue crisis) heavily affected port development and the way the African continent was inserted into the second wave of globalization from the late 1980s. Some contemporary authors like Samir Amin (1971) have highlighted the structural weakness of West African economies which continued to rest upon foundations established during the colonial period. The Marxist approach by Amin was a kind of wakeup call for other African countries which had had similar historical experiences. The Cold War context also explains and fed the intellectual controversy. Nevertheless, both approaches observed how the historical pattern of transport evolution was conditioned by the colonial policies of the European powers. The consolidation of the colonial state required appropriate transport infrastructure both at the coast and in the inland regions (Young 1994). The arbitrary partition of Africa and the establishment of a historical artificial borders by the imperial powers influenced transport policy as well as budgetary allocations to the sector. The relative lack of inland transport development (with the notable exceptions of South Africa, and, to a lesser extent, Algeria) capable of integrating the colonial territories reinforced the extraverted structure of regional economies (Oliete and Magrinyà 2018; Debrie 2010). In general, the main inland transport corridors—railways and road—articulated productive agricultural and mining regions to the major seaports. The core transport structure was almost completed during the inter-war period as economic extraction was intensified.

The second wave of globalization unleashed a general cargo revolution and world-integrated container markets, which deeply modified the entire African port systems. The demographic push and the sustained growth of African economies fostered port development and

global investments in the sector. Overall port throughput experienced an impressive growth, with containerization playing an important role. This technological revolution also required important investments in port infrastructures, human capital, technical equipment as well as institutional reforms. The public–private partnership strategies also fostered these structural transformations. Major national seaports, as privileged carriers of seaborne trade, exemplify this institutional reform by which the landlord port management model rapidly spread throughout the continent. Nevertheless, in spite of some relevant changes and the recent emergence of massive regional nodes (i.e. Tangiers-Med), the African port-system structure reveals an important degree of stability in terms of hierarchy. Long-term evolutionary patterns are essential to observe how the current port network works. We have summarized the major driving factors of port evolution in Africa in Table 1.1. All variables and issues provided there are explored in each chapter of this book. This edited collection seeks to provide a comprehensive explanation of seaport evolution on the African continent from multiple disciplinary approaches. First, we pay intellectual tribute to pioneers, Babafemi Ogundana, B. W. Hodder, Brian Hoyle, David Hilling, William Hance, Irene Van Dongen, and Richard J. Peterec, among other scholars, who explored port geography and economics from the late 1950s. They inaugurated economic geography analysis of seaports in Africa. Thus, this book aims to continue this scholarly tradition introducing recent methodological approaches from geography, economics and history.

1.1 Profile of African Seaports

The port is the interface between the sea and the land as well as the nexus between the local endowment and the global economic, political, social and cultural dynamics (Olukoju 2004). Seaports mirror global shifts and provide examples of institutional flexibility as well as spatial adaptation to the demands of the shipping industry. Thus, the evolution of seaports is intimately tied to technological advances in the shipping sector, which demand adequate solutions for the requirements of shipping, shippers and other stakeholders in the maritime and ancillary economic sectors (Harlaftis et al. 2012). Hence, how the various constituencies in the port community (workers, companies and institutions) interact and evolve defines the evolutionary path of seaports. Seaports

Table 1.1 Historical driving factors of port evolution in Africa, 1880–2010s

Period	*World Shipping Industry*	*African Port Development*	*Inland Transport Infrastructures*	*Overall economic factors*	*Major institutional factors*
1880–1913	Transition from sail to steam. British merchant fleet hegemony. Increased tonnages. Maritime industry changes	Construction of modern port infrastructures (1880s). Prevalence of coastal trade. Scattered port system	Construction of railways. Poor road systems. Limited inland waterways	Expansion of cash-crop productions and mining sectors. Growth of external-related sectors (trade). Extractive economies	Scramble of Africa. Colonial occupation and borders configuration. Settlement of the colonial state
1914–1945	Oil tankers. Introduction of liquid fuels. Increased drafts	Enlargement of port infrastructures (1920s). Port concentration dynamics. Improved facilities (export of cash-crops and ores)	Railway growth (intermodal connectivity). Beginning of road transport concurrence (late 1930s)	Colonial commodities price crisis. Urban growth and regional metropolization. Stagnation of GDPpc	Establishment of Protectorates in former German colonies. Development of the colonial institutional regime
1946–1960	Post-war shipping boom. Increased tonnages and drafts. Scale economies and Super-Tankers (late 1950s). Beginnings of containerization	Port creation (specialized terminals). Expansion of seaborne trade. Congestion of port infrastructures	Relative decline of railways. Increased importance of road transports. Limited expansion of paved roads	Post-war inflation. Demographic and economic growth heavily dependent on seaborne trade. Metropolitan investments (i.e. FIDES plan)	Socio-economic instability and decline of the colonial states. United Nations agreements and political independences. Transfer of transport-economic infrastructures

(continued)

Table 1.1 (continued)

Period	*World Shipping Industry*	*African Port Development*	*Inland Transport Infrastructures*	*Overall economic factors*	*Major institutional factors*
1961–1972	First global wave of containerization. Expansion of bulk trade (crude oil and oil products). Free registry policies	Improvement on port terminals. Increased port specialization	Crisis of railway systems. Limited inland integration. Road system extension. *White elephant* policies	Massive public investments and nationalization of productive sectors. Increased international concurrence on raw materials. Economic growth	New pro-socialist oriented States. Nationalism and regional rivalries. Political instability and fiscal unbalances. Cold War
1973–1995	Containerization transition and specific container vessels. Diminution of the world fleet (units). Mechanization. Scale economies	Financial crises. Stagnation and limited development. Reinforcement of regional gateways. International Donors dependence (IDA, BIRD, EDB, IMF, Persian Gulf)	Increased recurrent costs. Deterioration of roads. Definitive railway crisis	Fiscal and trade unbalances. Drop of trade exchanges. External debt crises. Structural Adjustment Plans and public sector crises. Drop of GDPpc and social impact	State crises and structural adjustment plans. Apartheid crisis in South Africa and international isolation. Increased economic dependence from outside

(continued)

Table 1.1 (continued)

Period	*World Shipping Industry*	*African Port Development*	*Inland Transport Infrastructures*	*Overall economic factors*	*Major institutional factors*
1996–2010s	Second wave of containerization. Post-Panama vessels General cargo revolution. Fall of seaborne freights and transaction costs. Capital predominance and Global Shipping Lines	Expansion of container terminals. Growth of bulk trade and general cargo. PPP initiatives and port devolution. Reinforcement of multimodal connectivity (high priority "main streets")	Emergence of inland transport corridors (railways and roads). Trade facilitation and increased regional integration. Relative improvement on road infrastructures. Projects funded by international donors	Sustained but unequal economic growth dependent on the external trade. Demographic growth and urban overcrowding. World increased Importance for mining commodities (copper and chrome). Cooperation policies. Slow recovery of public sectors (health-education)	Interregional cooperation. Prevalence of autocratic political leaders. OECD and non OECD donors. Increased presence of Asian investors (China PR). Political revolutions (Northern Africa) and democracy consolidation

Sources Authors' elaboration building on Castillo and Ducruet (2018, p. 400) and Oliete and Magrinyà (2018, p. 4)

are, therefore, complex entities with a diversity of character and features, referring to different things in different contexts.

In other words, as Hercules Haralambides recently stated, a seaport:

> can be anything from a sheltered stretch of sea, protecting a handful of fishing boats somewhere in the South Pacific; a block of cement in a small Greek island, on which a passenger ferry would lower its ramp to disembark passengers; a buoy onto which a tanker would moor to offload its oil through a pipeline; a finger-pier alongside which a bulk carrier would unload its coal on a conveyor belt; a cool port (i.e. a refrigerated facility in Latin America) exporting fruit to Europe (…) At the other end, there is the mind-boggling Yangshan Deep Water Port (of Shanghai), handling 40 million containers a year, or the equally impressive industrial complex of the Port of Rotterdam, running for forty kilometres along the river Meuse to the North Sea. (Haralambides 2019)

The foregoing statement captures the taxonomy of the world's ports and reflects the diversity of African seaports. The dimensions and varying experiences of the seaport in Africa from the mid-nineteenth century are explored in this book. The "Anyport" model development in Africa proposed by Bird (1963) and applied to East African seaports by Brian Hoyle (1968) depicts the long-term transformations of the regional maritime façades. In spite of the relative minimal transformations in terms of port infrastructures before the era of European rule, the bays and natural harbours of East Africa provided outlets for extensive seaborne trade from the Middle Ages onwards. This pattern was replicated around the continent. Making allowance for the special characteristics of each maritime façade, the evolution of modern major seaports continued along a historical path. Nevertheless, as it happened worldwide, the major transformations in terms of port infrastructures had taken place during the second half of the nineteenth century. The European engineers who planned the construction of seaports on the African continent tended to privilege the most significant outlets of seaborne trade, thus retaining the historical patterns of port hierarchy. It is also true that a number of historically important outlets for seaborne trade were displaced during the late nineteenth century and the early twentieth century, as exemplified by Bagamoyo (Tanzania), Badagry (Nigeria) and Saint-Louis or Rufisque (Senegal). Institutional lock-in also represented a political choice to rationalize economic resources and public expenditures. In overall terms, the colonial port planning policies were based on an "imperial port"

schedule, where major seaports handled the lion's share of the colony's seaborne trade. Those maritime nexuses were aligned with the inland transport system (railways and roads) and it permitted the connection of the productive regions (i.e. cash crops and minerals) to the coastal evacuation centres.

In addition to their gateway functions, seaports in Africa have played an essential role as agents of "development". Building on the orthodox economic thought, the ports were conceived as generators of external economies which should promote economic clustering processes. Then, the positive spin-off effects of trade would yield increasing returns and promoting investments and job creation. In fact, United Nations figures on urbanization and migratory flows reveal the impressive growth of port cities in Africa during the second half of the twentieth century. Consequently, the major urban agglomerations on the continent are mainly located in the coastal zones. However, the acknowledged symbiotic relationship between ports and port cities is complex and multifaceted. This has led to studies of the social and urban challenges of port cities. For example, it has been demonstrated that the African port city exhibits specific segregationist features related to differential access to basic services, a situation that has remained unchanged from the colonial times (Freund 2012, pp. 242–244). Besides all, the waterfront space evolved and interacted with the urban environment from initial setting to the late stages of specialization as articulated by James Bird. Moreover, port expansion in the vicinity of the city entails occupying new land and the displacement of human settlements, which could create social unrest.

Furthermore, the port centralization policies reinforced the major role played by dominant seaports throughout the decades. Consequently, the concentration of cargo on those ports tended to overwhelm the infrastructures, necessitating institutional reforms as well as the emergence of specialized terminals. Those terminals concentrated specific functions as export terminals: oil terminals in the Gulf of Guinea, gas and oil terminals in Algeria or Libya, ore terminals in South Africa or Mozambique, timber terminals in the Cote d´Ivoire or Angola, or even petrochemical industrial complexes along the Moroccan Atlantic coast. In addition, the general cargo revolution also fostered the emergence of specialized container terminals. From the semi-automated Egyptian terminals of Damietta or El Dekhla, and the emergent regional hubs such as Durban to the extraordinary rising of Tangiers-Med, these infrastructures have promoted a major insertion of the continent into the

global trade networks. As stated by Tsubota and Ducruet in this volume (Chapter 8), the continental seaborne connectivity has rapidly increased in the past decades and more broadly in terms of Africa-Far East economic exchanges. Thus, this book provides a long-term explanation of the path-dependence and path-creation dynamics of African seaports and how resilience and institutional plasticity evolved in the long run.

This book also grapples with the developmental impact of seaports in Africa. It is now generally accepted that seaports are much more than gateways but opinion is divided over their supposed role as drivers of growth and development (Olukoju 2020). Whatever position anyone adopts, it is clear that the potential of African seaports as agents of development varies with local and regional contexts. As experienced elsewhere, African ports have indeed served to promote the goal of redressing neglect of particular localities, but they have also promoted lopsided concentration of resources and rural–urban population movements.

A related issue is port-hinterland transport links, which, with the notable exception of Southern Africa, has not developed beyond the legacy of colonial rule. The solution seems to lie in the optimization of the continent's transport corridors. This is, however, contingent upon an efficient intermodal transport system that coordinates road, rail and inland waterways within and across the national boundaries. Regional integration on the European model, if successfully pursued, could facilitate intra-African trade, which is negligible for much of the continent. In this connection, it has been suggested that Africa's transport corridors be transformed into development corridors for the continent to overcome its developmental challenges and to promote even development by bridging the gap between port and hinterlands, especially the landlocked countries (Olukoju 2020).

1.2 Structure of the Book

This book is structured into seven main chapters combining regional, thematic and historical perspectives. The first chapter after this introduction by Guy Saupin provides a broad sweep of Africa's precolonial transport infrastructure in the wider political, economic and social contexts. With a focus on the mid-1840s to the 1880s, it examines dimensions of port reforms based upon the various commodity trades handled by the ports. Hence, it begins with the infamous slave trade, highlighting

its alignment with the inland transport systems, especially the waterways, and the changes that accompanied the suppression of the trade. Saupin demonstrates how the trade and its abolition affected the port cities involved in it. In the second half of the century, especially from the 1860s, two major dynamics intervened: steam shipping and the onset of various European colonial regimes. African ports on the strategic maritime edges of the continent in Egypt, South Africa and the Cape Verde Islands (on the Atlantic shipping routes) attracted important investments in acknowledgement of their rising profile in the expanding global steam shipping industry. While Saupin had focused entirely on the nineteenth century, Daniel Castillo and César Ducruet extended the discussion from the 1880s to recent times. Their contribution is particularly significant for delineating the phases or epochs of regional seaport development across the continent. This longitudinal approach presents trends in port evolution, the main political, economic and social drivers of change in port hierarchies and the structure of maritime networks on the continent. The two scholars adopted two major interconnected indicators in their analysis: commercial throughput and shipping traffic. On the one hand, analysis of the former, including the specific nature of the cargo), unveils the continent's economic specialization by region, as well as economic change in the long run. On the other hand, analysis of call of vessels building on data collected from Lloyd Register affords the observation of regional port hierarchies throughout the period covered. The chapter thus explores the local and global endowments in the configuration of port systems on the continent in the long duree from the onset of steamship to the age of containerization.

The intrusion of European colonial powers from the late was a watershed in the history of African seaports, not least because of differences in their colonial administrative practices. This subject is addressed in the next chapter by Miguel Suárez Bosa, which compares the differential port development policies and practices of the French and Spanish in their respective enclaves in the Protectorate of Morocco, following the Algeciras Conference of 1906, which partitioned the territory. This chapter presents an illuminating case study of the relevance of path creation to port development and the way maritime networks are conditioned by past institutional choices. Thus, the emergence of Casablanca in the French enclave heavily conditioned port development in the south of the country. In contrast, there was less impressive port development in the northern part of the protectorate, attributable to financial issues and the

special status of the international port of Tangiers-Ville. The northern port sector was almost unmodified, except with the rise of the secondary ports of Safi and Jorf Lasfar, until the recent, impressive emergence of Tangiers-Med.

The evolution of major seaports of the Gulf of Guinea is the focus of the next chapter by Edmund Chilaka and Ayodeji Olukoju. Though primarily devoted to examining developments and transformations since the 1970s, it also delves into the era of European colonial rule, which set the background for the developments considered in the chapter. The authors highlight national and regional port hierarchies over the long duree, culminating in contemporary developments, and the major drivers of change. The divers included colonial and post-independence port policies (concentration and diffusion), inland transport developments (railways, in the main), global economic cycles and political instability occasioned by civil wars, developments in the shipping industry, including rise of mega firms, bigger ships and containerization, and the ongoing quest for regional hub status. The chapter also examines the impact of seaports on national and sub-national development, including social aspects of port city development. In the end, the authors emphasize the continuing influence of colonial legacies in port and railway development, the increasing role of foreign stakeholders, especially, mega shipping firms, the recourse to the landlord model of port administration and intense inter-port competition within and across national boundaries in the Gulf of Guinea.

Chapter 6, authored by Lourdes Trujillo, Ivone Pérez and Casiano Manrique de Lara, is a multivariate analysis of port performance in selected East African ports during the early twenty-first century. The authors' study of port performance demonstrates how institutional endowments affected performance. Their analysis of official statistics provided by local and international institutions and port authorities highlights the impact of port reform on efficiency and of management structure on throughput expansion. The cross-country application of management models highlights the widespread adoption of the landlord model across the continent. The apparent success of this model is illustrated in its adoption in the management structure of East African seaports.

The East African study is complemented in the next chapter which also adopts a multivariate analysis of seaport evolution in Southern

Africa in an insightful analysis of the region's container traffic, Theo Notteboom and Darren Fraser focus on the rapid changes and path-dependent dynamics in the maritime sector of the region. Unlike other regions of Africa, Southern Africa had been served by a relatively well-developed system of inland transport corridors, which fostered inter-port competition in the region. The authors analyse the management models in the various seaports in the context of a functioning regional port system and the impact of containerization on the expansion and emergence of new terminals which also complemented the traditional leading seaports. Containerization in the region has been accompanied by institutional adaptation and the relative plasticity of the regional port network.

The final chapter by César Ducruet and Kenmei Tsubota explores the maritime linkages between Africa and Asia in the long duree. This is a major departure from the predominant focus on Africa's economic relations with the erstwhile European colonial overlords. Yet, as demonstrated in this chapter, Africa's maritime relations with Asia have been maintained since the late nineteenth century. This is buttressed by evidence of continuity of maritime exchanges between the two continents united by the Indian Ocean. Relying on and analysing quantitative data on trade and shipping, the authors provide compelling evidence of the diversification of Africa's maritime trade since independence. From the turn of the twenty-first century, there has been a steady increase in the Asian presence in the seaborne trade, especially of the eastern seaboard, with Chinese investment in the sector. This development keys into Chinese initiatives, such as the Silk Road, which in particular has modified the global supply chain, in which African seaports are likely to play an essential role in the coming years.

In the final analysis, the chapters in this book validate the pivotal role of transport in the economy. The entire volume in various ways evokes the oft-quoted assertion of the British colonial administrator, Frederick Lugard that "the material development of Africa may be summed up in one word – transport" (Cited in Olukoju 1996). Without subscribing to the monocausality implied in the Lugardian dictum, this book speaks to the continuing importance of transport—especially maritime transport—but only in the overarching context of intermodalism, political and economic dynamics, and the intersection of local and global factors.

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CHAPTER 2

African Seaports in Transition, 1850–1880s

Guy Saupin

2.1 Introduction

The role played by the African continent in global history during the Early Modern Age (1450–1850) was based on the *globalization* of economic exchanges (Bayly 2002, pp. 47–73, 2004; Marnot 2012a). It was chiefly a process relating to the exportation of slaves to the American markets (Morgan 2009, pp. 223–248) as well as to the Arabic markets in the Indian Ocean (Clarence-Smith 1989). Moreover, the shores of the continent also represented an essential nexus connecting the seaports located among Europe, India and China. Nevertheless, Africa's maritime facilities varied greatly and they did not share a common feature in terms of historical seaborne trade evolution: the Mediterranean coast had a long history of seaborne trade since Ancient times, and a similar kind of development could be seen along the Oriental coast from the Middle Ages. On the contrary, along the Atlantic coastline, seaborne trade had been historically limited (except for Morocco) and extremely focused on short-sea shipping. Despite these limitations and the differences among

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coastlines, it is important to note that the African political and economic players retained their agency role throughout the Early Modern Age, and more broadly from the perspective of exchange terms (Northrup 2002; Saupin 2014, pp. 7–30, 439–445).

During the transition phase between the consolidation of Western Imperialism and the scramble for the continent, three factors allowed the previous dynamics to continue, also equipping them with facilities both locally and regionally. The first factor was the replacement of the slave trade and the progressive but constant increase in demand for raw materials from European industry. This scheme replaced the former seaborne trade designed to chase and capture African slaves from *razzias*, intra-African wars as well as legal sanctions (Law 1995; Law et al. 2013). It was also the result of an increase in economic liberal thought in favour of abolitionist movements inspired by liberal philosophy as well as religious constraints. Great Britain led the anti-slavery banner from the early nineteenth century, challenging the other European nations involved in the slave trade. The corresponding African kingdoms and their elites were hostile to abolitionism due to the fact that their political and economic power highly depended on this activity. Thus, this economic, social and political upheaval was about to modify the institutional structure for both the African natives and the European expatriates acting as middlemen for their colonial commercial companies.

The second point relates to the agency role in seaborne trade. After an initial stage of relative wealth for African producers and traders built on the increased demand for raw commodities from European industry, we found a second phase dominated by the consistent decline in prices between 1873 and 1893 (Eltis 1987). Nevertheless, the issues related to the deterioration of exchange terms were more important in terms of African agency. The regional institutions and the African economic agents began to lose control of seaborne trade in favour of large imperial companies heavily funded by the Western capitals and supported by the metropolitan industrial sectors. Port cities located in a privileged position were the spaces where this phenomenon took place. They were the gateways where the local and the global met.

The third factor was related to the adaptation of African port infrastructures to the demands of international shipping and seaborne trade. However, this process was not equal everywhere and it depended on the technical legacy, the degree of seaborne trade development and the interface between sea and land. African institutional geopolitics

and the existing balance between slaves and commodities exportation emphasized these differences (Law and Strickrodt 1999). In addition, the creation of the Colonial State and the modernization of infrastructures during the early stages of the colonization process marked the path of transformation between 1850 and 1890 (Llinares and Saupin 2020).

These privileged locations were dedicated to being transformed in key elements during the globalization period of 1880–1914 (Suárez Bosa 2014). This chapter focuses on an overview of the degree of transformation of African seaports, addressing the aforementioned three elements relating to this transition period of European colonization.

2.2 The African Seaport: An Interface Between Sea and Land for a Globalized Economy Dominated by Europe

The diplomatic support of the United States and the international observance of the Treaty of Vienna (1815) reinforced the anti-slavery movements supported by the British government since 1807. Their former rivals accepted the new institutional framework reluctantly (Pétré-Grenouilleau 2004). French merchants continued to smuggle African slaves until the 1830s but its definitive institutional abolition was confirmed in 1848. The slave trade and traditional forms of slavery were interdicted throughout the French empire. Nevertheless, Portuguese traders continued trading slaves until 1839. They traded clandestinely with slaves from Angola, Sào Tomé and Principe or Mozambique, shipping them to Brazil, Zanzibar, the Afrikaner States and the sugar-based economy of Spanish Cuba. Despite all of these regulatory policies, the slave trade continued until the last third of the nineteenth century. Nevertheless, this activity rapidly declined since the 1840s (Eltis and Richardson 2008). Figures for the 1811–1867 period showed that at least of a quarter of all deported slaves in the long term was moved during this phase (Tables 2.1 and 2.2). On the contrary, from 1851 to 1867 the overall figure descended to 8.5%. During these later years, Central and West Africa provided the majority of human trade (68,345) from Bénin (13,266), Mozambique (12,126) and Sierra Leone (1640). This illegal trade took place in secondary ports outside of political and military control. This was the case for Cabinda, Loango (Angola) and the remote shores along the Congo estuary. Hence, the clandestine

Table 2.1 The Atlantic slave trade after British abolition (nineteenth century)

Years	*Slaves embarked (Atlantic Africa)*
1811–1820	718,824
1821–1830	810,990
1831–1840	524,307
1841–1850	429,091
1851–1860	176,884
1861–1867	54,941
1811–1867	2,712,037

Source Author's elaboration building from Slavevoyages.org

trade hampered the technical transformation of old wharves even when vessels' tonnages grew. Klein estimated that the average slave ship moved from 200 tons (eighteenth century) to 300 before 1850. By that date, the average tonnage reached 600–800 tons (Klein 2002). In the Bay of Benin, the Abomey kingdom artificially confirmed the predominance of Ouidah as its major seaport to the detriment of others like Lagos, Badagry, Keta or Popo (Strickrodt 2015). On the Eastern side, the Island of Mozambique, which retained a significant share of the Atlantic trade, moved towards the maritime Indian networks from 1850 onwards (Alpers 2005; Capela 2002).

One of the major obstacles to abolition came from the African elites, whose economic and political power was chiefly based on the revenues obtained from the boom in the Atlantic slave trade during the eighteenth century. Their wealth and political status were closely tied to the control of external trade, geared towards the exportation of captives and the virtual monopoly of imports. Institutional adaptation was a key issue for their political survival as the ruling elites. A common solution was the modification of traditional, centralized institutions to structures based on a relatively shared structure of power between the centralized dynasty and major state-cities. On the other hand, they were also able to encourage agricultural reconversion to cash-crop productions. Nevertheless, traditional slavery was even reinforced once the Atlantic markets closed. These tensions were sometimes alleviated by way of diplomacy between the African rulers and the European colonizers. If diplomacy failed, the violence and *gunboat policies* came into force. The siege and bombing of Lagos by the Royal Navy in 1851 warned the local elites that colonial action was on the way. In 1861, this smuggling centre for slave trade was taken by the British, creating the colony of Lagos (Mann 2007, pp.

Table 2.2 The major Atlantic slave-trade centres during the final phase (1851–1867)

Years	*Coast of Angola*				*Angola*		*Mozambique*		*Bay of Benin*			
	Riv. Congo	*Congo (north)*	*Cabinda*	*Loango*	*Ambriz*	*Benguela*	*Moz. Island*	*Qulimane*	*Ouidah*	*Lagos*	*Keta*	*Popo*
1851–1860	28,264	2659	4397	2060	5237	4698	9030	1250	4961	1516	1173	1093
1860–1867	14,717	763	2504		584	3			2936			

Source Author's elaboration building from Slavevoyages.org

60–61, 82–83). Once the colonial rulers took power, they interdicted slavery but transformed it into compulsory and indentured work structures (McSheffrey 1983).

On the other hand, major resistance was found along the eastern coast and more broadly at the Sultanate of Zanzibar and Portuguese Mozambique. These slave centres joined the pro-slavery movements of the Soudanese and Ethiopian slave trade in the Red Sea (Médard 2013). This increasing trade was parallel to the Atlantic decline, causing geographical displacement throughout the nineteenth century. The production of clove spices from the Moluccas (via the Mascarene Islands) from 1820 onwards boosted the economic wealth of Zanzibar and its political importance. Due to this fact, the capital of the Sultanate of Oman was transferred from Muscat to the island. In addition, this cash-crop required a significant workforce. The solution was to import slaves. Slave traders chased them from the interior of the continent and chiefly around the Great Lakes. In the middle of the nineteenth century, fifteen thousand slaves were disembarked in Zanzibar. Many of them were then re-exported to the Red Sea and the Persian Gulf markets (Clarence-Smith 1989). It is important to note that the British government pressured the local institutions to hamper this activity, as seen in the Moresby (1822) and Hammerton (1845) Treaties. The latter formally prohibited the exportation of slaves out of the Sultanate. Nevertheless, the commercial flows continued, until the real threat came from the Royal Navy. In 1873, the Bargash Sultan (coming from his exile from Mumbai in 1870) officially ended the slave trade by law.

If we take into account the whole nineteenth century, some compelling evidence can be found regarding a significant increase in slave trade in the Indian Ocean (Lovejoy 2002, pp. 47, 61–62, 155–158). The overall figures, including Madagascar (accounting for 200,000 captive slaves) affected more than two million victims, where 440,000 were destined for the Americas (Table 2.3). Nevertheless, the 1850–1890 period also was marked by a rapid decline. The major change during this phase was the replacement of the American market by the Zanzibar Sultanate and the increasing importance of the maritime route concerning the Island and the port of Kilwa. In addition, the slave trade in the Red Sea has been estimated to have had a minimum of 500,000 victims during the whole nineteenth century. Around half of them were shipped to the Gulf of Aden and less than a quarter to Massawa and Suakin (Austen 1988, pp. 21–44). In contrast, the Persian Gulf received three thousand

Table 2.3 The slave trade in East Africa (annual average) (1820–1889)

Decades	*Swahili Coast*	*Arabia, Persia*	*Mascarenes Islands*	*Americas*
1820s	4000		6000	11,400
1830s	6000	3500		7800
1840s	14,700	4000		2000
1850s	11,100	6500	2500	1300
1860s	14,200	6500		
1870s	18,800			
1880s	2800			

Source Author's elaboration from Lovejoy (2002)

slaves per year, where seventy per cent of them were imported from the Swahili Coast. The Red Sea, which took slaves captured from the Soudan, Ethiopia and the Gulf of Aden, absorbed no less than 2500 slaves per year throughout the century.

2.3 Exporting Raw Commodities by Sea: Continuity and Innovation

The export of slaves was imposed as the most important African "commodity" during the eighteenth century. However, key exports such as gold were also added to this, which had encouraged exploration and the settling of Portuguese pioneers since the fifteenth century. Around forty-two maritime forts were found along the Gold Coast up to the late seventeenth century, which is representative of the intensity of European competition before the rise of Brazilian gold. On the other hand, this factor, which compensated for the recession in the slave trade, was hampered by the Californian gold rush in the mid-nineteenth century. In addition, the discovery of gold fields in the Transvaal (South Africa) in 1866 opened a new phase of mining exploitation for the continent.

African exports by sea also included other natural resources. The trade of gum and ivory was predominant, as well as those based on hides, ostrich feathers, wax, rhinoceros' horns, coral and sponges. Gum was dominant in northern semi-arid territories. One of the most important production centres was the Senegal Valley and sea exports were carried out at the port of Saint-Louis. The trade of Arabic gum in Senegal began to decline in the 1830s due to the increasing competition from Egypt and Zanzibar (copal gum). Nevertheless, the gum crisis was more or less

resolved through the expansion of groundnut crops in West Africa from the early 1840s (Pasquier 1987). For ivory, once again, Zanzibar benefitted from its strategic location, supplying the increased demand from the Indian, European and American markets. Portuguese Angola also increased the value of its natural resource exports, and by 1850, its value was bigger than the slave trade (Johnson 1986). However, the Sultanate of Zanzibar experienced a phase of economic expansion based on the slave trade, the imports of firearms and the continuing capture of slaves in the Great Lakes region (Alpers 1975; Sheriff 1987).

In terms of basic agricultural crops, it is important to note the historical exportation of grains (wheat and barley) from the Mediterranean seaports to European markets. Morocco, Algeria and Tunisia had been the wheat stores for Southern Europe for many years. However, a structural crisis heavily damaged this essential economic sector once the Ukrainian and later American grains flooded the world markets in the second half of the nineteenth century. To combat the crisis, the king of Tunisia forced the conversion of exports to focus on olive oil. Moreover, the export of wool also complemented the trade balance for the Maghreb countries and they experienced yet another crisis once South Africa began mass exports of wool for British industry from the early nineteenth century. Before the gold and diamond rush, wool exports constituted no less than sixty per cent of Cape Town's exports. The cargo mix of this port was also complemented by hides, wax and vegetables as well as the wines from the Stellenbosch region. In contrast, the settling of French colonizers pushed up the export of cheap wines from Algeria from the late 1830s onwards.

In terms of economic innovation during the nineteenth century, a number of commodities could be noted. The most important commodities were related to vegetable oils. The industrialization process in Western countries demanded an increased amount of lubricant for machinery, railways, steamers, candles, glycerine, soap and margarine (1870). The British demand was mostly met by the mass export of palm oil from West Africa (Lynn 1997). The Niger Delta (known as the Oil Rivers) was transformed into the first global producer from 1830 to 1920, with a predominant role played by Bonny, which replaced the former port of Calabar (Lovejoy 2004). This profitable activity extended to the former Slave Coast and boosted the renovation of seaports such as Lagos, Ouidah, Porto Novo and Petit-Popo (Strickrodt 2015, pp. 195–224). By the early 1850s, regular steamship lines connected the Nigerian seaports to the British and

European markets. Export figures are representative. British demand grew from 220 tons in 1800 to 36,600 tons in 1854. During the second half of the century, the demand reached an average of 38,000–49,000 tons per year. In addition to the British market, an increase in international competition reduced its share from sixty-four to fifty per cent of the global demand from 1860 to 1880.

Another interesting product was the exportation of palm nut and kernel oils from the 1850s onwards. This was a result of the increasing demand from industrial companies from Marseilles (soap) and Germany (cakes). The boom was rapid, but it did not represent the same capital value due to the fact that their prices remained much lower than palm oil (Mann 2007). The same applied to the groundnut revolution in West Africa from the 1840s onwards. The mass production of groundnuts rapidly expanded throughout Senegal (Senegal Valley, Fatick region, Casamance), Gambia, Portuguese Guinea and the northern regions of Sierra Leone (Daumalin 1992, pp. 26–60, 111–121; Marfaing 1991). The groundnut market drove port expansions in Senegal, where the small island port of Gorée remained the main regional hub ahead of Saint-Louis (Castillo Hidalgo 2019; Pasquier 1960). From 1859 onwards, the port of Rufisque began to concentrate its commercial activity on groundnut producer regions like the Sine-Saloum thanks to Bordeaux traders moving in there. The competition between British and French commercial agents was significant but the second had the advantage of colonial exclusivity.

The acclimatization and export of cloves on the island of Zanzibar represented the finest agricultural trade prospect of the nineteenth century, ensuring the fortune and supremacy of the sultanate on the East African coast (Cooper 1977). The success of Egyptian cotton (15,000 tons in 1820 and 300,000 tons in 1900) resulting from the transformation of the Nile Delta was one of the main bases for the spectacular development of the port of Alexandria, which also benefitted from the cotton crisis in the South of the United States during the Civil War (Owen 1969). The production of cotton was also unsuccessfully attempted in the Senegal Valley, reaching the High Volta (Burkina Faso) where production was expanded throughout the twentieth century. In contrast, Angola rapidly expanded their exports of cotton through the Luanda seaport. Lastly, the discovery of diamonds in Kimberly mines (South Africa) by 1867 led to inland migrations from the Cape Town

province to the northern side of the country. In 1880, the British colony of the Cape finally annexed the Afrikaner state.

In comparative terms, the production of other products was quite limited and their size was reduced to just local developments. This was the case for coconut, sesame and sugar cane in Zanzibar, or the gum for rubber in Angola in the second half of the nineteenth century, accounting for three quarters of the value of exports in 1885. The most spectacular, both for its results and for the abhorrent social conditions of its conduct, was the boom in cocoa plantations, followed by coffee at a much lower level, in the Portuguese archipelago of Sao Tome and Principe.

2.4 The Transition and Evolution of Exchange Terms

The introduction of Africa to a globalized economy was conditioned by the structure of imports, where Europe obtained the majority, not forgetting America and the Indian continent. In agricultural products, the slowness of the slave trade supported shipments of tobacco and alcohol, both from Brazil and North America, with a deep geographical redistribution towards the Indian Ocean coasts. Furthermore, Western fashions of new drinks and costumes seduced the African elites. Tea benefitted more than coffee, especially in the Maghreb, which led to the mass purchase of cane sugar. Semi-crafted products were also dependent on the modernization policy of the states, both African sovereign powers and the first colonizers. Iron imports dominated that of other metals such as copper wire in Zanzibar, but the essential change came from the fairly rapid adoption of the steam engine, which has led to other industrial machinery (flour mills and textiles) and railway equipment. Over the course of previous centuries, the introduction of manufacturing products ready for consumption remained a major factor, without upsetting the old structure. The demand for cotton or silk-like fabrics imported from India, North America and, above all, Western Europe, remained dominant, along with the supply of hardware and work tools, glassware and the decorative form of porcelain. Rising demand for guns represented a major shift, with the boom in ivory consumption hot on the heels of the captive slave seizure, increasingly for the African domestic market. It was first favoured by the flow of all the stock resulting from the revolutionary and imperial wars, and then prolonged by the specialization of industrial centres in gun trading, such as Birmingham or Liege. This trade

was then relaunched by technical innovation in manufacturing (shotgun steel in the 1870s, repeater rifle in the 1880s) which downgraded the old models sent to the African markets. The interpretation of a transition crisis from the slave trade to the legitimate trade of African products was abandoned in favour of the analysis of adaptation strategies adopted by African economic and political elites (Law 1993; Lynn 1995). The two trades did not follow one after the other, but rather were concomitant and intermingling (Mann 2007, pp. 117–129; Northrup 1976; Reynolds 1985).

This versatility is particularly evident in the second third of the nineteenth century, with pioneers such as in the Niger Delta (Dike 1956) and late-comers such as Ouidah (Soumonni 1995) and Zanzibar (Sheriff 1987). This gradual transition was facilitated by the maintenance of a favourable African balance of trade during three quarters of the century, sharply until 1850, and then weakened further. The prices of agricultural products and raw materials from Africa have tended to vary between rise and stagnation, while those of imported manufactured goods have been sinking due to technical progress and competition in a free trade regime during the Industrial Revolution. The adverse economic downturn in Africa was a consequence of the Great Depression affecting the Western economies from 1873 to 1895, leading to a protectionist escalation and ultimately the partition of Africa in the colonial rush.

2.5 Sociopolitical Conditions and Organization of External Exchanges

Along the Mediterranean coastline, the main shift came from the rise of Egypt under the authority of Mehmet Ali, governor then viceroy of this great Ottoman province from 1805 to 1848. It had built a militarized and centralized authoritarian power that enabled it to mobilize the Egyptian demographic force for the major works required for the modernization of the country, based on a transfer of Western technology, not forgetting the significant use of Sudanese slaves (Alleaume 2012; Montel 1998). This political strategy was extended by his son Mehmet Said Pasha (1854–1863) trained at the Saint-Simonian Economic School, and his grand-nephew Ismail Pasha (1863–1895), but with the growing pressure of European capitalist interests, in an Anglo-French rivalry (Saul 1997). In the Egyptian model, the holder of authority became the country's leading capitalist as a large owner and trader, and industrial

and financial investor, thus blending dynastic and state affairs. It was the same in Tunisia and Morocco, in a smaller but representative replica.

The return to a policy of open trade with the Moroccan sultan Moulay Abd al Rahman (1822–1859) corresponded to the desire to derive the greatest benefits for the state-*Makhzen* (sultan, dynasty and top-staff elites). Imports were placed under the state monopoly in order to establish the best profit margin by authoritatively fixing prices on the domestic market. Exports, heavily taxed, were suspended according to economic and social endowments. *Makhzen* used the services of the largest traders to secure the functioning of the system (Miège 1961, pp. 210–258).

In sub-Saharan Africa, the boom in the slave trade in the eighteenth century had strengthened the small coastal political entities, from chiefdoms with a lineage structure, city states to monarchies with councils of elders, sometimes gathered in confederations such as the Fanti cities on the Gold Coast or in the sacred society Epke of the cities of Calabar, facing the ambitions of more powerful states like the kingdom of Abomey on the Slave Coast or the Ashanti confederation behind the Gold Coast. The Atlantic slave trade most often provided the small coast units with the means to resist the imperial appetencies of the larger domestic states. The largely collective exercise of power prevented the concentration of resources in the main or royal lineage, which stifled any modernization policy. The Sultan of Zanzibar concentrated on other means, associating trade and plantations (Sanchez 2015), even if his authority was hampered by the rivalries between the old Swahili elites and the new Omani rulers (Middleton 2004), with the main point of attachment being the port city of Mombasa, where the opposition of the Mazrui family was reduced in 1837 after a century of resistance (Berg 1968). The abundance of slaves played against modernization.

2.6 The Effects of the First Colonization Phase

The permanent establishment of Portuguese settlers was the oldest. The Brazilian contribution had been major for the social and morphological shaping of port cities like Luanda and Benguela. The independence of Brazil in 1822 revived Portuguese imperialism in an attempt to penetrate the interior regions through a network of fortified markets, replacing the role played by former African vassals. However, the financial insufficiency of the monarchy stifled this attempt. The creation of the southern

pioneer front, based on the opening of the new port of Moçamedes, appeared to be a priority over port modernization (Brichta 2016).

The final installation of the British at the Dutch naval base in Cape Town in 1806 opened up a rivalry between the old and the new masters, reviving the dynamics of the border under the effects of migration by the Boers, of which the Great Trek of 1836 was the major expression. This competition, illustrated by the British annexation of Natal in 1843, found a point of transitional equilibrium in 1854 with the recognition of the Afrikaner states of the Orange Free State and the South African Republic (Transvaal). This upward climb from the Cape Colony to the northeast was against Cape Town by lengthening distances. The opening of Port Elizabeth on the Indian Ocean in 1820 followed by Port Natal (Durban) was the physical representation of those major shifts. The growing sluggishness of its trade did not encourage significant works. Only the threat represented by the breakthrough of the Suez Canal gave rise to an initial awakening, but this was accelerated by the diamond rush after 1867.

Along the Mediterranean coastline, the difficult French conquest of Algeria, marked by the resistance of Emir Abd-el-Kader until 1847 and a succession of revolts including that of Kabylie in 1871, meant that there was a long-imposed military priority. The result was a collapse of the traditional economy, illustrated by the dramatic famine of 1866–1868. Land confiscation fuelled redistribution to European settlers throughout the western Mediterranean. The political project of Napoleon III of an Algerian kingdom associated with France disappeared with the defeat of 1870–1871. Exploitation to the detriment of the native population would be able to trade with the publication of the code of the *indigénat* in 1881 and 1887 (Bouveresse 2010, pp. 7–24).

In Senegambia, subjected to rivalry between France from the Senegal River and Great Britain from the Gambia River, the three main initiatives were the installation of the British naval base at Bathurst (now Banjul), the French control of the Senegal River from Saint-Louis according to the programme of Governor Faidherbe and the seizure of the peninsula of Cape Verde, in front of the Gorée Island, in 1857.

The protectorate on Lagos Island in 1851 led to the settlement status ten years later. The king of Porto Novo, preferred to secure his interests by negotiating the French protection in 1863, confirmed in 1876. After a long time, for the continuation of a simple alliance with the Fanti confederation, Britain switched to the protectorate in 1874. In East Africa,

the emergence of German ambitions in the 1880s led to sharing with the British, who established their protectorate on the island of Zanzibar in 1890, while letting their rivals develop the new seaport of Dar el Salaam on the mainland.

2.7 European Economic Pressures and Imperial Competition

A European offensive seeks to impose a free trade policy on mercantilist African states. Economic diplomacy was not averse to the much-needed military threat. Faced with the bad will of the kings of Abomey regarding the abolishment of the slave trade, the Royal Navy replicated the blockade of Ouidah port in 1851, 1865 and 1876. By 1830, the *bey* of Tunis was obliged to give up its monopoly of foreign trade under French pressure. In Egypt, Mehmet Ali had to accept the principle of free trade imposed by the imperial powers to the Ottoman Gate in 1840. In the Sultanate of Zanzibar, the 1839 Treaty of Commerce with Great Britain fell in the middle of the installation of consuls from the United States, Great Britain and France. In Morocco, the treaty of commerce obtained by the British consul John Drummond-Dray in 1856 was a model that all competitors wanted to obtain: abolition of royal monopolies, reduction of customs duties to ten per cent, property rights granted to British subjects, tax exemptions and extraterritoriality and free movement within the country for British subjects (Saladhine 1986, pp. 34–39). In addition to this, Spain succeeded in 1861 by taking advantage of the military conflict, marked by the seizure of Tetouan. France also benefitted from the Bérard convention of 1863 (Miège 1961, pp. 261–409).

A vicious circle was then underway. The loss of the monopolies weakened the finances of the State, which tried to compensate by reinforcing taxation, which also opened up the risk of social tensions and revolts as happened in Tunisia in 1864. The infrastructure modernization policy was then forced to turn increasingly to foreign capitals, which also inflated the public debt excessively (Saul 1997, pp. 5–19, 49). Everything depended then on the ability of trade to rebalance that of the payments. When Morocco managed to pay back its British loan imposed by the war indemnity to Spain, Egypt skidded to bankruptcy in the 1870s, justifying the establishment of an international financial tutelage in 1878. An ensuing nationalist military uprising caused the bombardment of Alexandria in 1882, in reaction to the establishment of British

economic and political control, despite the fictional promise of its maintenance as an Ottoman province, until 1906.

From a structural point of view, the main shifts came from the disappearance of the old big charter and monopoly European companies in favour of the commercial and shipping companies, the industrial companies and the commercial banks which took a leading role. In the French example, this dynamic was also supported by the rivalries between Bordeaux and Marseilles. Senegal had become the promised land of Bordeaux once again in a competition dominated by Maurel et Prom over its rival Devès et Chaumet (Marnot 2012b, pp. 130–134). The political influence of Maurel et Prom was considerable, including the exchanges of services with the top staff of the colonial administration such as Faidherbe or Pinet-Laprade (Casey 1981, pp. 306–316). The Marseilles company of the Pastré brothers was also very influential in Alexandria and Tunis, benefiting from their personal connections with the Lesseps brothers. Beyond trade, Pastré invested in shipping and industrial companies such as the Moulins d'Egypte, a steam mill working on imported equipment, first established in Alexandria and then in Cairo in 1865. The company of the Régis brothers switched from underwater sailing in the Gulf of Guinea to the importation of palm oil, with its installation in the former French fort of Ouidah in 1841, after signing an agreement with King Ghezo, which was renewed in 1851. At the same time, the company sent an exploratory ship to Zanzibar for tramping (1847–1852), attempted to penetrate the Mozambican market in 1855 and led the exploitation of factories in the 1860s with the financial support of Fabre, one of the leading French shippers. It created a joint venture with Rabaud and Roux houses, creating a shipping line linking Zanzibar to Madagascar seaports (Daumalin 2016).

African sovereigns readily used European firms as relays for their own affairs and those of the state: the border between the two being very blurred. The Pastré brothers at Marseilles operated as shipbrokers for the lines sailing from Alexandria and Marseilles, carrying Mehmet Ali's cotton exports. They granted him a commission of 4.5% in addition to financial advances to the Viceroy. Under the reign of Mehmed Saïd, they were included in the first board of directors of the Suez Canal Company created in 1858, and they were also shareholders in Dussaud brothers, the company chosen for the breakthrough. In Tunisia, the same company benefitted from economic gains in the export of olive oil and they received the contract for the maintenance of the *bey* fleet in the shipyards

of Marseilles due to the fact that they provided financial services to the Regency, which allowed them to play a key role in the creation of a *Hôtel des Monnaies* in 1846–1848 (Daumalin 2016, pp. 94–95). On the other hand, the Omani sultans of Zanzibar regularly appointed the management of their customs within the Indian trading elite, mainly from Mumbai and Goa, this medium being the great financier of caravans bringing slaves and ivory from the Great Lakes regions to the mainland Swahili ports (Marissal 1978).

2.8 The Exchange Dynamics and the African Port-City Societies

The rise of international trade was attracting many migrants to the port cities, from the richest and most powerful to the poorest and more exploited, since the influx of slave and indentured workers mixed with the voluntary exodus in a variety of ways. The heterogeneity of the maritime places came out strengthened, with a cosmopolitanism that was fairly dense and differed in its composition according to the geographical position of the port. Ouidah offers a good example of this coexistence between various African and Atlantic migrations (Law 2004, 2013). The economic elites of some communities played a vital role in the organization of import–export trade. Rich Jewish merchants played a traditional role in Mediterranean cities. Alexandria allowed for flocking to all the foreign trade minorities in the Ottoman Empire: Greeks, Armenians and Syro-Lebanese, which were also emerging at the West African coast. They met migrants from the western Mediterranean basin, mainly Italians (Ilbert 1987, 1996). The old legacy of Euro-African or Afro-Brazilian brokers was more or less destabilized by the changes of the nineteenth century, depending on the degree of colonization progress. In those sub-Saharan states which retained their sovereignty for the longest time, they continued to play an essential role in hampering or accelerating commercial change. The *cha cha* Félix de Sousa, a Luso-Brazilian favourite of Ghezo, the king of Abomey, after he helped him to seize the throne in 1818, dominated Ouidah until his death in 1848 while remaining very focused on the slave trade (Law 2003). His successor, Domingo José Martins, who died in 1864, understood better the obligation of transition by intermingling both types of trade. Samuel Collins Brew (c.1840–1881), heir to an increasingly Africanized hybrid dynasty founded by his Irish ancestor at Anomabu, abandoned the slave

trade against gold and ivory issued by the Ashanti. Meanwhile, his father had devoted himself primarily to the slave trade (Priestley 1969). The same goes for George Lawson at Petit Popo (Gayibor 2014, pp. 153–175; Strickrodt 2015, pp. 210–224).

When European trading houses enlarged their presence with the support of imperial armed forces, most African brokers suffered from economic and social downgrading. From independent operators, they were progressively integrated as wage-earning employees of those trading houses which placed them as internal market middlemen. Similar processes are found among the *signares* of Saint-Louis and the rich Luso-African or Afro-Brazilian Luanda traders.

2.9 The Port Transformation: Creation, Reconversion and Improvements

2.9.1 The Typological Evolution of African Seaports and Their Adaptation to the Demands of International Shipping

In the legacy of maritime practice in the days of a navy with wooden boats and sails, a good port site had to add several advantages: an anchor harbour protected from the strongest winds, a muddy and sandy bottom facilitating anchoring, ending with a beach, an absence or a limited number of reefs, the protective heights not only of the wind, but also of the fevers of the low zone and favourable to the implantation of mostly fortified commercial equipment, and finally, the resources necessary to repair and refuel or refresh ships and crews: water, timber, fruit and food crops. The only form of transhipment used was that of the mooring off large units, requiring the use of small boats of various types depending on the site to make the connection with the coast, with hauling as a point of attachment. In the Gulf of Guinea, mainly in front of the low and straight coasts, the violence of the bar made the operations perilous, but African expertise was valued, particularly that of the Krumen of Sierra Leone or *piroguiers* of the Gold Coast. At the beginning of the nineteenth century, most African maritime sites looked more like havens than ports, in a contemporary western vision of infrastructure (Saupin 2020). During the nineteenth century, four major changes affected port transformations in Africa. The first was the transfer of wood and sail shipping to steam shipping with iron hulls and steam propulsion, which also massively increased tonnages. These technical improvements helped to

overcome the bars, but the key issue was the water depth and the safety of larger vessels anchoring. For example, the port activity of Lagos facing the lagoon façade switched to the sea shore of the inlet canal (Mann 2007, p. 250, Olukoju 2004). The second driving factor of change came from the establishment of regular steamship lines, from postal functions and passenger transport in addition to that of cargo. The early use of steam, first mixed with sailing, quickly imposed the issue of coal supply warehouses. The effect on the nature of traffic was sometimes radical, as it was for the ports of the Portuguese archipelago of Cape Verde. Their activity moved from hub ports for slave trade to stopover seaports for coal bunkering (Santana Pérez 2019). More broadly, for the long-distance traffic, the opening of the Suez Canal in 1869 redefined the equilibrium of regional port systems by promoting access to the Indian Ocean via the Mediterranean, to the detriment of the Atlantic bypass; however, this resisted the exploitation of sub-Saharan natural resources and the mining revolution in South Africa and the Copper belt. As an example, it still took forty days to get to Cape Town from London in the early 1860s. The 23-day record set in 1873 became the usual norm from 1876 onwards.

The third major shift was the increasing importance of commodities built on agricultural or mining resources. The physical transformation of port infrastructures was related to changes in the nature of seaborne trade. Ensuring the guarding and transhipment of human beings did not have the same technical nor infrastructural requirements as loading inert goods in rapidly increasing volumes. In fact, illegal trafficking delayed port modernization. Finally, we must not forget the differences in financial and technical resources between the places entering into the European colonial project, those belonging to large African states and all those remaining associated with coastal chiefdoms.

2.9.2 Port Transformations: Renovation and Creation

The old ports and the main slave-trade bays experienced little transformation during the first half of the nineteenth century. The European or American shippers were part of the continuity of the former mercantilist companies, dedicating the minimum possible investment due to a traditional exploitation of the site. It meant traditional techniques of hauling, building warehouses ranging from the European fort to African type stores and especially the intense mobilization of the available native

workforce. This organizational model was maintained for a long time on the sites of the smaller States and has even remained predominant under the mercantile power of Zanzibar where Sultan Bargash was more concerned with the opening of a new port in Dar es Salaam to escape the British anti-slavery surveillance. However, in the early 1880s, the French Hilarion Roux supported several unfinished projects in Tanganyika: the creation of a state bank, a modern port, a railway to Lake Tanganyika and the establishment of a mining company (Daumalin 2016, p. 109).

Thus, the main works accompanied an initial colonial push between 1840 and 1880, including the example of Egypt, caught in the grip of financial imperialism. The port of Alexandria first benefitted from the ambitious policy of Mehmet Ali to build a modern fleet and army (Burie 2003). The establishment of a cannon foundry in 1805, the construction of a national shipyard for river vessels, the opening of the Mahmudiyya Canal in 1821 and the creation of an arsenal in 1829, with the technical support of French engineers, laid the first foundations (Alleaume 2012). The latter equipment, with its 5500 workers, was the first engine of port development for the entire country. The boom in cotton exports and the breakthrough of the Suez Canal saw the expansion of commercial facilities to counter the potential competition from Port Said, which remained only a stopover port (Piquet 2008). In 1869, the construction of a large breakwater of 2340 metres from Ras-el-Point marked the port modernization at Alexandria. The breakwater was accompanied by other additional works permitting the safe calling of larger steam vessels. These works were entrusted to the British company William Bruce Greenfield & Co and were completed in 1880. The works offered a stretch of water divided into two sectors by the thirty-metre wide coal mound, called "outside" to the west and "inside" to the east because it reached up to the waterfront interface (Breccia 1926). The cotton activities took place on the former *onion pier* (specialized terminal for vegetables). The planning programme had also permitted the early establishment of railway connections linking Cairo in 1856, then Suez in 1870. The junction area with the Mahmudiyya Canal attracted the main industrial factories, creating a port sector similar to those existing in Great Britain.

On the other hand, the corsair refuge of Algiers was only a small shelter protected by two jetties, one connecting the Old Peñon to the mainland and the other advancing towards the south. The bay was subjected to the violence of the north winds, but had a good mooring bottom and a particularly good depth. The military priority of a difficult conquest

was imposed until the 1870s, to replicate an "African Toulon". The construction of a 500-metre protection jetty was begun in 1838 under the direction of the French Engineer Victor Poirel. This jetty was an impressive leap in port technology. Its prefabrication system, consisting of 2.2 tons of concrete blocks made from a mixture of volcanic pozzolan and lime, substituting the traditional stone blocks, was validated by the French Academy of Sciences in 1840. Despite difficult relations with his administration, which sanctioned him with a recall that same year, he was re-assigned in the direction of the yard from 1842 to 1846 thanks to the protection of Marshall Soult, the French Minister of War. He obtained the position after a competition with other five competitors. His new technical process would be known as the "French System" and it was employed in the enlargement of the ports of Marseilles and Cherbourg. The new port of Livorno also was built following the Poirel methodology and under his direction from 1852 to 1860. In 1848 the jetty reached six-hundred metres at the time that a port project of ninety hectares was adopted in water, partially completed. In 1870, two enlarged jetties enclosed a body of water to increase the safety of operations. Moreover, two refit tanks were also installed in the southern part. The layout of the wharves had been harmonized with the 1860 urban plan, the major structure of which was the construction of the Boulevard de l'Empress, tied to the port by two staircases and specifically horse-drawn ramps. An important number of stores and warehouses were established at the Boulevard and many former buildings located in the port area were underused. A railway station came into operation in 1865. The fall of the Empire in 1871 and the contraction of seaborne trade opened up a phase of relative stagnation in its maritime activity just before the take-off of the economic colonization of the territory. In 1892, the inner harbour of Agha was planned and works began in 1897 (Lespès 1921, plan p. 199).

In Senegal, the ensemble formed by the river port of Saint-Louis and the small hub of Gorée continued to operate using its old equipment: wood and stone old wharves, two-storey stone storehouses, anchorage in harbour or in the estuary and transhipments by lighterage services. From 1856 onwards, almost all the attention of the Second Empire was concentrated on the development of the Cape Verde peninsula, just in front of Gorée. The need for a naval base for the navy and a stopover port for bunkering for the *Méssageries Impériales* steamship company, which had been awarded the Bordeaux-Rio de Janeiro line in 1857, drove

the port's reform. The changes in international shipping demands were also a factor, as well as the expansion of groundnut culture in Senegal. These port infrastructures were inadequate and a first jetty was built in the Bay of Dakar between 1863 and 1865. A second jetty was completed in 1867, including the erection of three lighthouses. In addition to the port of Dakar, the modernization of Rufisque was chiefly led by private investors from Bordeaux. Four wooden wharves were built in order to facilitate the evacuation of agricultural products from the mid and southern regions of Senegal (Charpy 1958, 2011). However, the rise of Dakar did not begin until the construction of its arsenal in 1892 (completed in 1898) which allowed it to exceed its function as a bunkering port for the South America lines. On the contrary, the old port of Saint-Louis was the main victim of these developments. The opening of the railway line linking Rufisque to Saint-Louis (via Dakar) caused its economic shutdown (Castillo Hidalgo 2014, 2019).

In South Africa, the bay of Cape Town had not received any relevant improvements, despite the memory of terrible storms like those of 1799 and 1865. The advance of the frontier kept sheep farming away, opening up inter-port competition. The prospect of the Suez Canal, however, provoked a burst (Burman 1976). A port modernization plan in 1858 preceded the launching of a railway line to Wellington, completed in 1863. Commercial docks were enlarged in 1870 in order to support the increased trade flows caused by the diamond rush. In 1874, the Parliament approved a five-million-pound loan for the modernization of the railway network. The enlargement of Cape Town port infrastructures continued and a dry shipyard was built to repair steamships of up to 2000 tons. The entire port area was protected by a breakwater in 1905 (Van der Cruysse 2010, pp. 305–328).

2.9.3 Gridding the Hinterlands

The maritime outlets of the old caravan routes continued to benefit from this ancient traffic circulation, with a redistribution of roles according to the evolution of geopolitics. For trans-Saharan caravans, the Algerian French conquest reinforced flows to Morocco and Tripolitania. In southern Morocco, the port of Essaouira captured the essential flows ahead of Agadir. Angola's Portuguese ports tried to retain their centrality while they advanced to Central Africa, in the utopian thought of connecting Angola to Mozambique. It was a failure on all fronts as they collided

with the expansion of Zanzibar and the British interests. The solid advance of caravan traders at the service of the ports of the Sultanate of Zanzibar through the Great Lakes became the most important shift during the nineteenth century. Three main roads were used for the flow of ivory and evolved according to the significance of the demand for slaves. The main one linked the port of Bagamoyo to the regions around the Tanganyika lake and even the Victoria Lake. The southern road runs from the port of Kilwa to the Nyassa Lake and it was a key route for slave traffic. The northern route linked the bay of Pangani to the Masai countries, which were involved in ivory trade (Sheriff 2005). Their relative power and influence contrasted with the erosion of Mozambican trade networks, disrupted by the anarchistic and destructive autonomy of the mixed *prazeiros* of the Zambezi Valley and the ravages of the Zulu expeditions from the South.

On the other hand, the great African rivers have long been centres of attachment for African mercantile activities. There was little modernization in the methods of management and technical exploitation except for the two larger ones. From 1818 to 1821, Mehmet Ali had Rosette's western branch of the Nile Delta linked to the port of Alexandria, thus opening a strategic axis to Cairo, which was used by modern river barges. Moreover, the introduction of steam navigation on the Niger River was delayed until the second half of the century with serious setbacks among the pioneer companies. In 1876, John Goldie joined all the small companies together to create the United African Company, renamed the National African Company in 1886 after the granting of sovereign rights. In the Gulf of Guinea, the lagoon traffic did not lose its intensity, adapting to the new port hierarchy. On the Slave Coast, the ascendancy of Lagos was also boosted by the introduction of a complex inland transport network formed by interconnected land tracks and waterways (Mann 2007, p. 139).

The link between port development and the establishment of railways was obviously the most crucial action for the future, even though the first lines only appeared in the second half of the nineteenth century. Egypt was the pioneer with the Alexandria-Cairo line, which opened in 1856, then extended to Suez. The ramifications of the network rapidly advanced to the Delta. The Algiers-Blida (1858–1862) and the Cape Town-Wellington (1859–1863) lines were almost contemporary and the latter was extended to the Kimberley minefields in 1885. In that year, the Saint-Louis-Dakar railway was opened. Later, the Portuguese port

of Lourenço Marques (now Maputo) took advantage of its rail link with the South African Republic, newly rich with its gold mines. The establishment of railways, the arms-based international division of labour gave rise to fierce competition between European imperial powers. They were linear operating axes, far removed from the reality of the rail network according to the European standard (Marnot 2012a, pp. 195–196).

2.10 Conclusion

In the precolonial transition phase (1850–1880), African seaports had to adapt to a major transformation in African supply, leading from a domination of slave exports to that of primary products, mainly agricultural but also mining. This reversal, at the initiative of the Western powers, took place more quickly on the Atlantic coast and later on the eastern coast. It gave rise to unequal resistance from African sovereignty, was fairly rapid in its reconversion and was mostly operated without too much of a transition crisis by intermingling of both types of trade.

In addition, the transformation of long-distance maritime transport had an impact on port operation methods and infrastructure stock. The modernization policies pursued by some African Mediterranean States, the rise of foreign commercial and financial companies, which reduced the essential and old role of the Euro-African or Afro-Brazilian brokers and the first colonial upsurges, are more or less reflected in port developments.

The relatively uniform model of the natural harbour operating through the massive utilization of human force with limited construction facilities, where local construction techniques mostly prevailed over European contributions, broke before the convergence of all these mutations. Port creations or recreations according to European technical standards were then differentiated from other sites that remained close to the traditional models. Overall, the old port geographical distribution was not reversed, but rather a new port hierarchy redefined its profile.

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CHAPTER 3

Port Systems and Regional Hierarchies in Africa in the Long Term

Daniel Castillo Hidalgo and César Ducruet

3.1 Introduction

Academic studies on African ports have experienced a significant increase in recent years (Ng and Ducruet 2014). This is related to the consistent economic growth throughout the continent during the early years of the twenty-first century and the increased importance of seaborne trade worldwide. The evident links between external trade conducted chiefly by sea and GDP in most African countries (Jerven 2015) became a major factor in analysing the importance of port hierarchy evolution in the continent. As early as 1970, Brian Hoyle stated that "the capacity of seaports not only acts as an indicator of the prosperity of the area served, but may also directly affect its economic growth by permitting or

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hindering increased economic flow" (Hoyle 1970, p. 226). Recent studies have proved that this statement remains undisputed. Thus, Oliete and Magrinyà Torner (2018) recently argued that path-dependence patterns largely affected inland and coastal transport infrastructures. Their contribution focused on the role played by seaports as facilitators of trade and how they interacted with inland transport infrastructures. Their article also confirmed the hypothesis by Pedersen (2003) on port concentration schemes designed during the colonial era, which still affected regional economic integration, as Jean Debrie (2010) also suggested. Moreover, port creation and technological adaptation and transformation are closely tied to the changing volumes and structures of seaborne trade, as well as the progressive development of inland transport infrastructures and institutional framework (Monios and Wilmsmeier 2016, p. 247).

Nevertheless, in spite of its essential role for the economic development of the regions in question, there have been relatively few long-term analyses of port systems in Africa. It is true that academic literature noted the impact of path-dependence on inland African transport infrastructures, as Jedwab et al. (2014), Herranz-Loncán and Fourie (2018), and Chaves et al. (2015) recently stated. Port hierarchies represented path dependency trends due to the fact that current development is heavily based on past decisions and previous conditions in terms of infrastructures, institutions and socio-economic structures. However, little is known on the quantitative functioning of port hierarchies in Africa in the long term. Major contributions introducing this pioneering perspective came from the book edited by Hoyle and Hilling fifty years ago. Their series focused on a port-level analysis where comparative analysis was relatively non-existent. Moreover, a number of academics have studied the evolution of port systems for specific regions as a whole, such as West Africa (Debrie 2010; Lombard and Ninot 2012; Ribeiro da Silva 2017), North Africa (Mohamed-Chérif and Ducruet 2016), Southern Africa (Fraser et al. 2016) or East Africa (Hoyle 1967; Hoyle and Charlier 1995).

However, there is little evidence about the overall evolution of African port hierarchies from the late nineteenth century to the present day. In our experience, we believe that academics came across many obstacles to adopting a continental approach due to the dispersion and quality of sources and the extreme differences among maritime regions. These difficulties have meant that studies on an individual, country or regional-level have prevailed, where more detailed analyses could be explored as driving factors of port system evolution.

This chapter deals with an initial approach to the long-term evolution of African port hierarchies. Our analysis of port hierarchies is based on throughput volumes (import and export trade) taking into account the mix of cargo, in order to observe the relative position of each port. Secondly, we also consider the degree of centrality of seaports through the number of vessel calls thanks to data collected from the Lloyd index. We assume that both indicators are correlated and they gave rise to the self-reinforcement effects which provided stability and robustness for port hierarchies in the long term. In addition, our methodological approach is based on the analysis of individual data for African seaports from the Afriports (see Annex I) and Lloyd's List databases.

It is difficult to provide a full comprehensive explanation for each African region, but we aim to comment on some general characteristics we found as a key to explaining port development and how port hierarchies remain relatively stable throughout time. In fact, subsequent chapters in this volume will adopt individual and country-level analyses which complement this overall approach. We decided to use a chronological structure to provide a valid explanation on shifts in port evolution linked to major transformations on economic, institutional and technological factors. Each section in this chapter presents an overview of major historical driving factors of change (economic, political and technological). Then, we analyse port hierarchy evolution and concentration patterns. Finally, we shall observe the degree of centrality and how this indicator is correlated with throughput rank.

3.2 Data, Methodology and Preliminary Results

Based on the Afriports database, we have created a preliminary ranking of African ports from 1913 to 2016 in Table 3.1. Despite the lack of complete data on throughput, we consider the statistical corpus to be representative of long-term patterns. We have selected a number of test years which represent conjunctures of overall relative stability. This chronological selection covers a century (1913–2016) of structural transformations, from the steamship age up to the arrival of mega vessels along the African shores. With regard to sources, it is important to note that the Afriports database is an ongoing project and we suffer from missing data so our preliminary conclusions take this into account. This database is based on primary and secondary sources from historical

Table 3.1 20 major ports in Africa (by throughput in thousands of tons), 1913–2016

Rk	*1913*		*1929*		*1938*		*1955*		*1972*		*1990*		*2008*		*2016*	
	Port	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*
1	Algiers	3.5	Oran	3.805	Oran	4.487	Casablanca	7.85	Durban	30.115	Richards Bay	52.414	Richards Bay	84.534	Richards Bay*	99.777
2	Tunis	1.757	Algiers*	3.234	Algiers	3.459	Durban	7.2	Forçados	29.224	Durban	33.579	Saldanha Bay	46.533	Saldanha Bay*	69.945
3	Oran	1.575	Casablanca	3.047	Port Saïd	2.719	Cape Town	4.5	Bonny	28.239	Arzew*	23.312	Durban	41.402	Tangiers-MED	44.615
4	Sfax	1.356	Port Saïd	2.679	Annaba	2.646	Maputo	4.427	Zuetina	23.709	Alexandria*	20.647	Lagos	34.623	Durban*	41.656
5	Las Palmas	1.157	Annaba	2.295	Casablanca	2.511	Algiers	4.374	Arzew	19.508	Saldanha Bay	17.542	Casablanca	24.708	Arzew*	41.101
6	Maputo	992	Dakar	1.041	Dakar	2.39	Annaba	3.938	El Hariga	17.5	Casablanca	15.997	Port Harcourt	21.418	Lagos	34.704
7	Santa Cruz	850	Las Palmas	1.026	Maputo	1.866	Santa Cruz	3.754	Santa Cruz	15.096	Nouackhott	12.106	Abidjan	20.739	Alexandria*	28.326
8	Dakar	712	Maputo	968	Tunis	1.823	Dakar	3.556	Casablanca	15.095	Santa Cruz	11.986	Las Palmas	19.931	Casablanca	27.715
9	Mindelo	699	Beira	782	Sfax	1.445	Mombasa	3.123	La Shkira	14.346	Bonny*	11.799	Santa Cruz	18.211	Skikda	27.093
10	Annaba	516	Mindelo	545	Melilla	1.406	Beira	2.891	Escravos	13.58	Abidjan	10.248	Pointe-Noire	16.387	Mombasa	26.795
11	Lagos	390	Santa Cruz	541	Mombasa	1.262	Las Palmas	2.406	Bedjaia	12.56	Noadibou	9.382	Mombasa	15.996	Jorf Lasfar	26.091
12	Casablanca	349	Bizerte	497	Beira	1.201	Tunis	2.372	Monrovia	12.284	Mombasa	7.526	Jorf Lasfar	13.918	Port Harcourt	23.45
13	Bizerte	250	Matadi	416	Las Palmas	860	Lagos	2.362	Maputo	11.694	Las Palmas	7.385	Escravos	11.863	El Dekhla*	21.725
14	Beira	225	Lagos	406	Lagos	860	Sfax	2.145	Marshall	11.669	Algiers	6.366	Mohameddia	10.768	Abidjan	21.476
15	Skikda	157	Kenitra	276	Takoradi	776	Takoradi	2.126	Noadibou	8.89	Mohameddia	5.909	Dakar	10.59	Nacala*	20
16	Melilla	137	Port Gentil	234	Santa Cruz	767	Oran	2.121	Cape Town	8.814	Jorf Lasfar	5.646	Bonny	10.193	Pointe-Noire*	19.858
17	Burutu	117	Ceuta	233	Matadi	530	Port Elizabeth	2.1	Port Elizabeth	8.337	Dakar	5.578	Djibouti	9.33	Bedjaia*	18.788
18	Rufisque	111	Kaolack	200	Sousse	411	Monrovia	2.045	Skikda	7.234	Lagos	5.554	Tema	8.429	Dakar	16.718

(continued)

Table 3.1 (continued)

Rk	*1913*		*1929*		*1938*		*1955*		*1972*		*1990*		*2008*		*2016*	
	Port	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*	*Port*	*Tons*
19	Tangiers	88	Libreville	175	Saffi	388	Conakry	1.651	Cabinda	6.627	Cape Town	5.275	Dar es Salaam	7.316	Las Palmas	16.636
20	Opobo	85	Grand Bassam	170	Djibouti*	332	Matadi	1.492	Abidjan	5.925	Conakry	4.888	Port Sudan*	7.198	Algiers	15.941
Σ	Σ 46 = 16,496		Σ 45 = 20,933		Σ 64 = 34,276		Σ 67 = 84,315		Σ 88 = 413,257		Σ 61 = 354,041		Σ 68 = 558,690		Σ 78 = 883,430	
□	□ 46 = 358		□ 45 = 475		□ 64 = 552		□ 67 = 1258		□ 88 = 4696		□ 61 = 5803		□ 68 = 8216		□ 78 = 11,326	
n	n = 46		n = 45		n = 64		n = 67		n = 88		n = 61		n = 68		n = 78	

Note Figures reported in this table are preliminary, as additional research work is required to gather data for some countries. Data is currently still under construction for a most accurate quantitative analysis. This is especially relevant for South African seaports (i.e. Durban, Cape Town) and Egypt (Alexandria) before 1955. For missing dates, last available year (after-before) was interpolated and indicated with an asterisk (*). We used current names to identify ports
Source Author's elaboration building on Afriports database (see Annex I)

archives, port authorities, national statistics offices and international economic institutions (see Annex I). In addition, the ranking we have created should be considered as merely representative for some periods where data is not yet finalized. The same applies to Table 3.3, where we explore the introduction and midterm evolution of containerization in African seaports.

Missing throughput data is then completed with data extracted from the Lloyd's List database, in order to provide coherence to the overall analysis. Lloyd's List data has many advantages. Firstly, the private nature of the provider—for a long time it has been the world's leading maritime insurance company, making it relatively robust to local or conjectural changes and compensating for the varying availability of tonnage data obtained from historical archives. Secondly, it is centralized (London) and this obviates the need to collect data from multiple local archives. Vessel movements connecting African ports were printed in daily or weekly bulletins with a global coverage. However, Lloyd's List also has several drawbacks. A number of fleets are not covered, particularly those engaged in coastal or domestic shipping. Extracting thousands of rows and columns from documents of varying quality did not allow vessel tonnage to be taken into account with conventional Optical Character Recognition (OCR) methods, restricting traffic measurement to the number of ship calls. Small or large ships are thus treated as equal in our vessel movement analysis. All in all, extracting data from Lloyd's List printed records allowed to build a database covering the period of 1890–2008, including twenty-three years.

Based on these first-hand materials, it was possible to conduct a wide range of analyses. We first analysed traffic concentration patterns among African ports, either through the share of top ports (percentage, Herfindhal index) or using the GINI coefficient. Such a throughput analysis is an appropriate way to evaluate port significance and hierarchy from a comparative perspective (Ogundana 1970). Traffic concentration in port systems is indeed a fruitful approach to measure resilience, competition, and technological evolution, and had been employed in various regions using long-term series, such as in China between 1868 and 2010 using customs data (Wang and Ducruet 2013), but also in Northwestern Africa focusing on cargo volumes and shipping connectivity since the nineteenth century (Castillo Hidalgo and Ducruet 2018). Measuring the level of concentration is guided by the search for wider economic discrepancies among ports and their host territories. Domestic

and transnational port systems may evolve towards concentration or de-concentration as the result of a myriad of local and global forces, whether from a hinterland or a maritime perspective. Secondly, traffic data can be combined with other data. In this chapter, we propose to look at the correlation between port traffic and urban population, the latter being a good proxy of local economic importance. Nevertheless, the emergence of bulk-trade terminals is known to have distorted the initial synergy between port and city, as seen in many economies of the world.

This chapter's main hypothesis is that major national seaports, characterized by a variety of commercial functions and cargo mixes, remained stable at the top of the ranking from earlier periods up to the present day. Then, urban agglomeration trends and the gateway role played by some seaports also represent a key element in explaining the resilience of a number of historical leading ports.

Before diving into the analysis of successive historical phases, it is important to investigate the longitudinal evolution of traffic based on the aforementioned data sources. First of all, we measured that the linear (Pearson) correlation between port tonnage and vessel traffic regularly increased from 0.482 in 1900 to 0.924 in 1951, before its decline down to 0.412 in 2008. This trend confirms that the number of vessel calls, before the acceleration of world trade from the 1950s onwards, had been increasingly in line with overall port activity, with larger ports handling more numerous movements. However, ship and terminal specialization, particularly since the 1960s and 1970s, infringed on this relationship. Larger vessels were introduced in bulk markets and, later on, in container markets, transforming the function and organization of ports and port systems. The fading correlation between vessel calls and port throughput, however, does not erode the continuous activity of Africa's initially main gateways, which will be further examined below.

By merging various urban population data sources, it was possible to assign a demographic weight to African ports as a representation of their economic importance (see Ducruet et al. 2018 for more detail about data sources). We are aware of the gap between population size and economic size in any study comparing advanced economies and developing economies. To investigate new port development effects on the demise of initially dominant imperial gateways, we simply calculated the linear (Pearson) correlation between the number of inhabitants and the two traffic measurements, namely port throughput (Afriports data) and

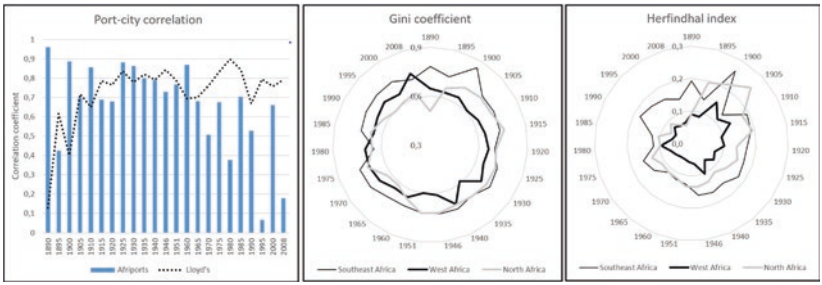

Fig. 3.1 Long-term traffic evolution of African ports, 1890–2008 (*Source* Author's elaboration building on Lloyd's List, Afriports and urban data [2019])

vessel calls (Lloyd's List data). Interestingly, and as shown in Fig. 3.1, the two correlations exhibit an opposite trend. Vessel calls, initially having low correlation with population in the 1890s, rapidly reach 0.7 in the early twentieth century, and remained oscillating around 0.8 for the rest of the period, with a slight decrease in 1960 and 1965, years marked by the introduction of large terminals specializing in bulks. Conversely, tonnage starts with a highly significant correlation, but from the 1960s onwards this correlation undergoes strong fluctuations and a downward trend, finishing the study period with relative insignificance. This analysis shows to what extent the number of vessel calls rather than the number of tons relates to the shape of urban systems—the latter being more stable than trade fluctuations. As in other parts of the world, the introduction of specialized terminals handling enormous quantities of raw materials (often for exports) dramatically altered inherited port hierarchies far beyond the local activity of adjacent economic centres.

In terms of traffic concentration by main African port range (or maritime facilities), we have based the analysis on Lloyd's List vessel calls per port, excluding Red Sea ports due to their low number. We have observed a tendency for the Southeast port system (from Namibia to Kenya) to be more concentrated than elsewhere, given the prominence of South Africa, as detailed in the following sections. This is followed by West Africa (Angola to Senegal) and North Africa (Mauritania to Egypt), with a clear tendency for these port systems to be less concentrated in the second half of the study period, namely after World War II. Traffic had become more evenly distributed within each range due

to the development of more numerous coastal settlements in a context of growing global trade, resulting in the development of new ports. This relative de-concentration echoes the phased model of Hayuth (1982)—the "challenge of the periphery"—as the initially dominant economic and political capitals lost traffic to other neighbouring coastal cities. Southeast Africa, for both Gini and Herfindhal, stands out given its internal economic imbalance as it remains highly concentrated up to 2008. All port systems still exhibit a growing traffic concentration in the period 1970–1980 due to the emergence of new bulk ports.

3.3 The Evolutionary Path of Maritime Transport Systems in Africa

3.3.1 Seaports and the Consolidation of the Colonial State, 1880–1913

In a broad sense, the roots of port modernization in Africa are closely tied to the settlement and consolidation of the colonial State. Most African countries (with notable exceptions north of the Sahara) lacked in maritime entity infrastructures before the late nineteenth century. Nevertheless, it is important to note that the existing infrastructures were sufficient to permit the functioning of seaborne trade in a limited way, as Hoyle stated for the East African seaport system (1967). Slave trade for earlier periods, and the transitional period to legitimate trade during the second half of the nineteenth century, did not require major transformations in terms of port infrastructures. Thus, country-level demand on port services was quite limited and supply chains were relatively well warranted.

Nevertheless, major advances occurred in shipping technology during the second half of the nineteenth century, which boosted the global expansion of seaborne trade (Williams and Armstrong 2012). Yrjo Kaukiainen (2012) has stated that the African continent was rapidly introduced into the steamship age and steamship index following the global trend by the early twentieth century. Hence, Africa was rapidly thrown into the globalization wave by the sea and the foreign steamship lines. Therefore, the increased presence of Western shipping lines in Africa from the mid-nineteenth century onwards demonstrated how the colonization processes evolved. As early as 1852, the first regular steamship line

began to operate in the Gulf of Guinea (Davies 2000). In the same way, British, French, German, American and Dutch regular steamship lines began to operate along the continent (Leubuscher 1963).

This process was extremely closely linked to the settlement and consolidation of the colonial state. As Young (1994) stated, the establishment of "Bula Matari" (colonial state) required the formal and informal establishment of political and cultural hegemony, which also required military control of the land and the introduction of an institutional framework devoted to the economic exploitation of land and people. To some extent, early settlement colonies (i.e. South Africa or Algeria) differ from those where the European presence was very limited in number, but the process of economic exploitation was similar: a minority elite extracting wealth and depriving the majority of the population (Acemoglu et al. 2001). Thus, the construction of the colonial state was also affected by these factors, but in general, the economies of both models of colonial territories were extroverted and heavily dependent on the evolution of seaborne trade. The restrictive regulations in terms of trade and the imperial rivalries promoted colonial exclusivity, which hampered regional economic integration. These factors clearly affected the configuration of inland transport infrastructures, planned to connect the inland producer regions (cash-crop and mining commodities) to the coastal trade centres. Despite some exceptions (i.e. South Africa), the territorial integration that encouraged clustering and economic growth was quite limited.

As we will discuss later, in most of countries, the colonial state created major colonial seaports where seaborne trade was concentrated. The way in which infrastructures were funded partially explains this planning strategy. Major colonial empires devoted self-autonomous budgetary schedules granted by the metropolitan States. Broadly speaking, "Bula Matari lacking in regular revenue and major investments should be carefully planned (Frankema and van Waijenburg 2014). The choice for imperial gateways was partially motivated by this relative lack of economic resources. Hence, it is important to note that infrastructures and basic services were chiefly paid by the colonies themselves with sporadic loans provided by the colonizer nations (Huilery 2014). Then, concentration policies in major seaports were partially explained by pragmatism and budgetary performance. On the other hand, geographical issues and coastal conditions heavily influenced the construction of colonial seaports. Considering the significance of seaborne trade on budgetary

revenues through trade taxes, the construction of new ports was always motivated by the potential capacity of those infrastructures to handle increased volumes of cargo. Increased volumes of cargo meant increased incomes and a better organization of the colonial state structures. In fact, the colonial structure of a major imperial seaport absorbing the lion's share of seaborne trade deeply affected not only the long-term trajectories of maritime networks but also urban development.

Despite the absence of complete statistical series for South Africa and Egypt (chief maritime regions), by 1913 major development in terms of throughput volumes is clearly found in the Mediterranean area. Historical patterns of development linked with the proximity to European markets and the development of short-sea shipping partially explain the volume of cargo handled by Algerian and Tunisian seaports (Castillo Hidalgo and Ducruet 2018). On the other hand, we noted significant volumes of general cargo and bulk-break (vegetables, grains) handled at Cape Town and chiefly at Durban (massive export of coal and ores) as well as the main gateway for general cargo imports to the Transvaal region. The same goes for Algoa Bay in 1890 (Table 3.2) and for general cargo handled at Alexandria as the main gateway for the leading urban agglomeration of the continent (Cairo). This is confirmed by the strong *hub* status of these ports (Fig. 3.2), Durban being the cornerstone of a main African subcomponent, followed by the rising Alexandria and declining Cape Town. Transit seaports of Suez and Port Said also account for notable volumes of throughput, chiefly tied to bunkering (Port Said) and transhipment (Suez). Thus, this first ranking for (1913) presented in Table 3.1 should be considered as an approximation for observing the relative position of imperial gateways. Nevertheless, in spite of the regional predominance of Algiers (importing general cargo and exporting foodstuffs and grains), we noted the relevance of bulk-trade seaports such as Sfax (Tunisia) or Annaba (Algeria) which were specialized in the mass export of phosphates. Algiers reinforced its *hub* role between 1890 and 1910, as well as Oran, although this function remains dominantly domestic (Fig. 3.2). As for Sfax and Annaba, the Spanish possession of Melilla mainly exported iron ores from the Rif region. The volume of throughput handled at the international port of Tangiers was quite limited compared to the neighbouring seaports of Gibraltar and Dar el Beida (Casablanca). In East Africa, the port of Beira, managed by an Anglo-Portuguese joint venture, the *Companhia de Moçambique and Beira Works Co.*, from 1892 until 1948 handled a

Table 3.2 20 major ports in Africa (by vessel calls), 1890–1940

Rk	*1890*		*1900*		*1910*		*1920*		*1930*		*1940*	
	Port	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*
1	Cape Town	1.758	Cape Town	5.65	Durban	2.284	Durban	2.266	Alexandria	1.742	Alexandria	1.392
2	Durban	1.669	Durban	2.576	Alexandria	1.542	Alexandria	2.241	Durban	1.364	Durban	1.2
3	Algoa Bay	1.236	St. Vincent	1.424	St. Vincent	1.317	Cape Town	1.252	Dakar	946	Cape Town	1.185
4	St. Vincent	615	Alexandria	1.354	Algiers	1.085	Dakar	1.187	Beira	854	Dakar	870
5	St. Helena	514	Algoa Bay	1.297	Cape Town	672	Algiers	1.162	Oran	844	Freetown	862
6	Alexandria	434	East London	795	Maputo	668	St. Vincent	940	Algiers	812	Casablanca	825
7	Dakar	335	Algiers	506	Oran	370	Oran	829	Casablanca	685	Beira	639
8	Algiers	306	Maputo	421	Rufisque	330	Cape Spartel	793	Cape Town	550	St. Vincent	556
9	Luanda	281	Sapele	359	East London	327	Casablanca	693	St. Vincent	519	Oran	554
10	Maputo	276	Cape Spartel	337	Dakar	320	Maputo	552	Annaba	465	Algiers	516
11	Larache	259	Zanzibar	291	Beira	291	Port Louis	548	Douala	367	Abo	423
12	Mazagan	250	St. Helena	285	Tunis	237	Beira	492	Sfax	359	Annaba	380
13	Port Nolloth	231	Rufisque	273	Cape Spartel	204	Sfax	414	Maputo	292	Mombasa	353
14	Zanzibar	199	Oran	259	Sfax	198	Abo	360	Tunis	289	Maputo	314
15	Beni Saf	198	Reunion	241	Namibe	177	Rufisque	353	Matadi	288	Massawa	244
16	Oran	189	Beira	231	Annaba	158	Beni Saf	275	Kaolack	199	Sfax	219
17	Annaba	178	Luanda	229	Takoradi	155	Tema	268	Port Gentil	192	Tunis	211
18	Saffi	163	Tunis	177	Luderitz	155	Tunis	267	Rufisque	187	Lobito	211
19	East London	155	Banjul	171	Algoa Bay	149	Mombasa	250	Mombasa	179	Matadi	204
20	Toamasina	134	Annaba	153	Cotonou	143	Zanzibar	225	Kenitra	149	Takoradi	197
Σ	Σ 96 = 12,106		Σ 98 = 20,059		Σ 110 = 14,507		Σ 105 = 20,231		Σ 126 = 15,317		Σ 111 = 15,033	
□	□ 96 = 126		□ 98 = 204		□ 110 = 131		□ 105 = 192		□ 126 = 121		□ 111 = 135	
n	n = 96		n = 98		n = 110		n = 105		n = 126		n = 111	

Source Author's elaboration building on Lloyd's List data

significant share of iron ores from the Copper Belt as well as Maputo (Lourenço Marques). These ports competed against Durban to attract transit traffic from landlocked countries. This is well reflected in the emergence—albeit limited in scope and stability—of a Southeast African subnetwork centred in Maputo. In addition, the natural hinterland of the former Portuguese seaport also included the urban agglomerations of Pretoria and Johannesburg. We should note that a relative cooperation between the South African and Portuguese political institutions was developed in terms of railway development and freight stability. These transport coordination schedules were led by the *South African Railways and Harbours Corporation*, an institution devoted to establishing and managing the entire transport infrastructure network in Southern Africa (as a direct antecedent of the current Transnet).

On the other hand, insular ports located in the main Atlantic shipping routes were essential as stopover hubs. Bunkering services (coal and water supplies) primarily explain the importance of Las Palmas, Santa Cruz de Tenerife (both in the Canary Islands) and Mindelo (Cape Verde) (Suárez Bosa 2004). At these ports, a logistical shipping community was developed during the second half of the nineteenth century. Bunkering, ship repairs, insurance and related services boosted by foreign capital (chiefly British) marked their port development path from that point in time until the present day. Moreover, major colonies in West Africa generated relatively limited volumes of cargo. The same stopover function can be seen at St. Vincent (Fig. 3.2), which stands out due to its high number of dominated hubs compared with its absolute traffic size. St. Vincent reinforced this activity between 1890 and 1910, mainly focusing on nearby redistribution towards West African ports. At this earlier stage, the regional predominance of Dakar—in terms of throughput compared to Lagos—is also explained by the expansion of the coal market at the Senegalese port. During the interwar period, the port of Dakar replaced Mindelo as the main bunkering regional port, starting a long-term battle of competitiveness against Las Palmas, which was to be transformed into the main service station between Gibraltar and Cape Town (Castillo Hidalgo 2014). Therefore, Dakar was conceived as the spearhead for French colonization in West Africa, promoting economic, military and institutional concentration policies (Seck 1970).

Moreover, it is important to note the importance of secondary ports supporting the functioning of the whole colonial economy (Jackson 2001). Minor seaports nourished main seaports through local

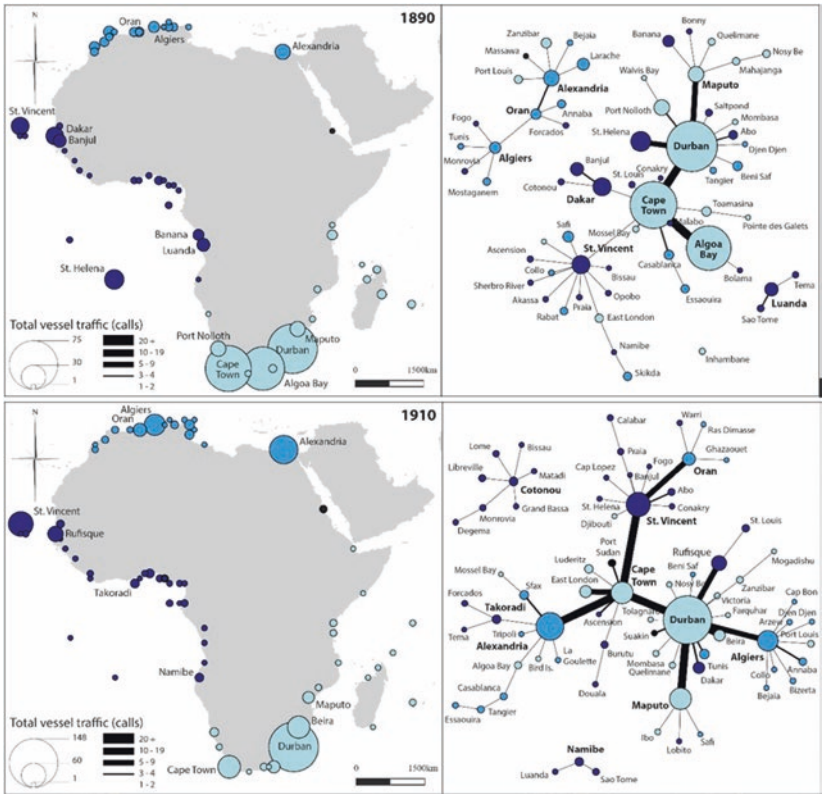

Fig. 3.2 Port hierarchies and subnetworks in Africa, 1890–1910 (*Source* Author's elaboration building on Lloyd's List data)

lighterage and short-sea services (i.e. dhow trade in East Africa). Those seaports permitted export movements from relatively isolated seaports to major ones, or transhipments to on-route vessels. It was a key factor to promote cash-crop economies and market dynamics for maritime communities in Ghana (former Gold Coast) (Dickson 1965), the Ivory Coast and Nigeria. Perhaps one of the best examples of this interaction between major seaports and secondary ones was Rufisque (Senegal). This port facilitated the exportation of the lion's share of cash-crop productions from Senegal and French West Africa (groundnuts) from the

late nineteenth century to the 1930s. By the mid-century, this little port town close to Dakar was fully integrated into the regional inland transport network. This port city had a remarkable entrepreneurial community and was the regional headquarters for major imperial companies, for example the *Compagnie Française d'Afrique Occidentale*, which was established there rather than in Dakar. Nevertheless, concentration policies developed during the interwar period increased the role of major seaports when Rufisque virtually disappeared from the regional port network.

If we consider estimations through partial reports on port activity for Egyptian and South African seaports, the top-10 ranking for 1913 would represent a market share of at least sixty per cent of seaborne trade (in volume) for the whole African continent. Vessel calls are also representative of the existence of major hubs, both in Egypt and South Africa (Table 3.2). As we will see in the following sections, the stability and continuity of this concentration trend contribute to explaining how port hierarchy dynamics did not change so much in the long term.

Furthermore, if we compare specific data on vessel calls from the late nineteenth century, we can see that Cape Town, Alexandria, Durban and Saint Vincent occupied relatively similar positions at the top of the ranking. In addition, stopover seaports as Dakar, St. Helena and chiefly the Canary seaports of Santa Cruz de Tenerife and Las Palmas (not included here) also remained at the top, which can also be seen in the case of throughput.

3.3.2 From the Great War to World War II, 1914–1945

The outbreak of the Great War represents a milestone in the evolution of the African colonial states. Crawford Young indicates that the cyclical crises of the interwar period were developed in a changing context where the pillars of colonial hegemony began to be eroded. On the one hand, the economic, military and taxation pressures increased, as well as the extractive dynamics represented by the consolidation of inland transport infrastructures. On the other hand, social and political resistance against colonizers hit the institutional stability of the colonial states. The economic and social impact of the Great Depression pushed up the political claims among the impoverished. It is not the aim of this chapter to provide a full explanation of the interwar crises and their impact on seaborne trade in Africa. Some specific features on shipping connectivity for the

major maritime routes have been noted. As an example, the outbreak of both World Wars heavily affected maritime communication at its core: Suez, Atlantic African Islands and Southern seaports. It is true that many differences existed between both World Wars in terms of port dynamics in Africa. Depending on the context, some ports "benefitted" from this situation, as happened at Dakar and Freetown during the Great War. Hence, the key issue is to observe how instability affected port hierarchy.

In a broad sense, Table 3.1 shows a modest but sustained growth in terms of average throughput from 1913 to 1938. Average throughput moved from 358,000 to 552,000 tons. As data for South African seaports is not already completed, we have looked at the influence of Mediterranean African seaports, with the emergence of Casablanca. The latter had become a well-developed second-tier hub under the dominance of Alexandria (Fig. 3.3). It is important to note that massive exports of phosphates began in the early 1920s at the Moroccan seaport that also exported the rich agricultural produce from the Chaouia region (Suárez Bosa and Maziane 2014). The Algerian seaports of Oran (coal bunkering) and Algiers remain at the top in terms of volume of cargo handled, as well as Annaba as a leading phosphate exporter for the country. This is apparent in the configuration of maritime subnetworks (Fig. 3.3), with a strong divide between North and South Africa, each system having an equivalent level of importance. On the other hand, it is important to note the rise of Maputo (former Lourenço Marques) but also Beira (Table 3.3) in East Africa. The improvement of railways connecting it to the Copper Belt (ore exports) and the effect of demand from the South African urban agglomerations boosted the commercial activity of the port. It is also important to note the regional emergence of Mombasa during the 1930s. The modern port of Mombasa was built in 1896 and first railway connection to Kisumu was opened in 1901. It represented the struggle against the Germans in East Africa to reach the Great Lakes to handle transit cargo (inwards-outwards) to the Indian Ocean (Hoyle 1967). The effect of demand from Nairobi and the Great Lakes enhanced the key role played by Mombasa, which would rapidly become the major regional gateway during the second half of the twentieth century. In West Africa, seaborne trade notably grew as we stated for Lagos, doubling from 406,000 to 860,000 tons of cargo. The same goes for Dakar, which benefitted from the decline of the Canary seaports as a result of the Spanish Civil War and the breakdown of the liberal institutional framework in the Spanish islands. Dakar clearly emerged

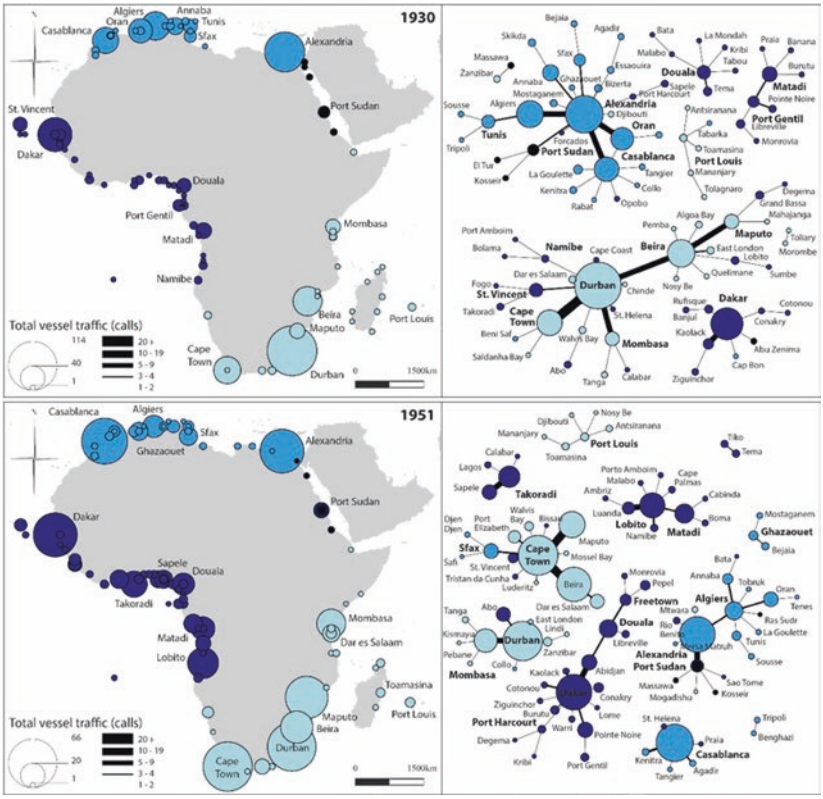

Fig. 3.3 Port hierarchies and subnetworks in Africa, 1930–1951 (*Source* Author's elaboration building on Lloyd's List data)

as a dominant West African hub port in 1930 (Fig. 3.3), with the rest of the region remaining less developed and split among small subnetworks dominated by Douala and Port Gentil. In addition, it is important to note the appearance of Takoradi (Ghana). This port was designed to replace the old-fashioned port infrastructures of the colonial capital at Accra. The new seaport was built during the 1920s in the coastal settlement of Sekondi, a former trade post. The infrastructures were officially opened in 1928 and their main function was the evacuation of cash-crop productions (chiefly cocoa) and ores (bauxite and manganese). Its export

Table 3.3 20 major ports in Africa (by vessel calls), 1951–2008

Rk	*1951*		*1960*		*1970*		*1980*		*1990*		*2000*		*2008*	
	Port	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*
1	Alexandria	989	Alexandria	1.305	Cape Town	2.293	Lagos	2.811	Durban	576	Durban	676	Durban	482
2	Casablanca	852	Beira	1.252	Durban	2.21	Alexandria	2.119	Alexandria	353	Alexandria	463	Lagos	416
3	Durban	594	Casablanca	1.199	Alexandria	1.704	Durban	1.841	Ceuta	324	Cape Town	390	Alexandria	344
4	Beira	559	Dakar	1.027	Casablanca	1.539	Casablanca	1.476	Lagos	247	Richards Bay	378	Richards Bay	301
5	Cape Town	544	Durban	915	Dakar	1.368	Abidjan	1.111	Casablanca	222	Lagos	377	Abidjan	279
6	Dakar	488	Cape Town	656	Maputo	1.08	Algiers	948	Richards Bay	218	Casablanca	328	Cape Town	250
7	Mombasa	421	Douala	603	Beira	1.023	Mombasa	828	Dakar	189	Abidjan	267	Casablanca	224
8	Algiers	415	Algiers	541	Lagos	993	Cape Town	776	Abidjan	188	Dakar	180	Luanda	212
9	Takoradi	327	Maputo	535	Abidjan	989	Dakar	766	Algiers	141	Algiers	155	Damietta	204
10	Maputo	308	Djibouti	488	Douala	835	Richards Bay	654	Tema	123	Mombasa	146	Ceuta	178
11	Lobito	281	Takoradi	467	Port Sudan	802	Port Harcourt	653	Douala	120	Damietta	125	Dakar	159
12	Abo	267	Sapele	466	Mombasa	793	Dar es Salaam	624	Mombasa	105	Douala	124	Algiers	137
13	Matadi	267	Freetown	461	Ceuta	660	Maputo	621	Luanda	97	Skikda	116	Cotonou	122
14	Ceuta	262	Port Sudan	432	Pointe Noire	618	Port Sudan	610	Monrovia	97	Port Sudan	112	Mombasa	111
15	Oran	260	Lobito	414	Dar es Salaam	595	Douala	568	Maputo	93	Bedjaia	107	Arzew	111
16	Annaba	248	Ceuta	408	Monrovia	488	Ceuta	566	Pointe Noire	88	Cotonou	105	Tema	106
17	Sfax	234	Pointe Noire	404	Luanda	437	Pointe Noire	461	Skikda	87	Arzew	104	Saldanha Bay	106

(continued)

Table 3.3 (continued)

Rk	*1951*		*1960*		*1970*		*1980*		*1990*		*2000*		*2008*	
	Port	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*	*Port*	*Calls*
18	Port Sudan	213	Mombasa	388	Takoradi	410	Port Elizabeth	405	Annaba	86	Tema	101	Lome	98
19	Sapele	176	St. Vincent	359	Lobito	403	Monrovia	383	Dar es Salaam	82	Saldanha Bay	99	Maputo	81
20	Douala	157	Annaba	343	Algiers	353	Benghazi	376	Arzew	82	Conakry	91	Skikda	79
Σ	Σ 88 = 11,167		Σ 61 = 19,925		Σ 78 = 29,239		Σ 88 = 29,130		Σ 61 = 6,022		Σ 68 = 7,376		Σ 78 = 6,669	
□	□ 117 = 95		□ 129 = 154		□ 137 = 213		□ 117 = 211		□ 129 = 41		□ 127 = 48		□ 137 = 37	
n	n = 117		n = 129		n = 137		n = 117		n = 129		n = 127		n = 137	

Source Author's elaboration building on Lloyd's List data

function increased during the 1950s as a result of the global boom in commodities demand.

In terms of concentration, our sample for 1938 is most accurate (data for 64 seaports). The top-10 would account for no less than sixty per cent of seaborne trade. However, this assumption requires some comment. Firstly, the bulk-cargo effect, where we must bear in mind the role played by seaports with a varied cargo-mix due to the importance of aggregated value handled (i.e. general cargo and hardware imports). Thus, regional gateways to landlocked countries and the effects of demand from the most highly populated agglomerations such as Dakar, Maputo, Mombasa, Alexandria, Casablanca or Lagos would exert a further impact on the economic functioning of regional structures dealing with the higher added value of imported cargo. The predominance of bulk-cargo terminals then should be cautiously observed as we prove when self-reinforcement effects are introduced for the following period.

The same trends are also observed in Table 3.3 looking at vessel calls. Major seaports handling the lion's share of the continent's throughput was also the most active in terms of calls.

3.3.3 Growth and Institutional Movements Towards Independence, 1946–1960

The expansion of African economies after the World War II followed the pattern of global economic growth. The increasing post-war demand on commodities boosted seaborne trade around the world. The advances in shipping technologies and increasing cargo capacity of vessels pushed up port throughput (Kaukiainen 2014). On the African continent, the average port throughput multiplied from 552,000 to 1,258,000 tons between 1938 and 1955. This expansion was possible due to huge investments made by the colonial state during the late *developmentalism age*, partially motivated by post-war international consensus concerning colonialism among the colonizing powers. In the case of the former French colonies, the FIDES plan represented an example of massive investments in transport infrastructures (Huillery 2014). This plan provided huge grants from France to colonial budgets (not loans) for the improvement of inland transport networks (paved roads and railways) as well as the enlargement of existing port facilities at Dakar or Conakry. However, the importance of the FIDES plan for port infrastructures is represented by the construction of Abidjan seaport. This port was

devoted to boosting the Ivorian economy by replacing the old-fashioned harbours of Grand Bassam, Port-Bouet, Tabou and Sassandra. As Abidjan emerged, secondary ports virtually disappeared with the exception of San Pedro (enlarged during the 1970s). Abidjan rapidly modified the overall structure of regional trade, absorbing traffic for landlocked countries such as Burkina Faso or Southern Mali, which historically used to be handled by Dakar. Abidjan facilitated the economic expansion of the country through the evacuation of cash-crop production (coffee, cocoa) and other commodities such as ores or timber. Such investments and developments are directly reflected in the massive growth of West African vessel traffic (Table 3.3), giving African coasts a more balanced profile than in previous periods dominated by the South and North.

On the other hand, the post-war commodities boom also pushed up the mass export of ores, coal and phosphates as stated at Casablanca, Durban, Maputo or Annaba, as well as Dakar, which began to export phosphates from the Touba and Thiès region through its recently built phosphates terminal. Regarding the figures concerning Santa Cruz de Tenerife, it is important to note that the rising throughput can be explained by the enlargement of the capacity of its oil refinery and the demand caused by the international shipping calls to the Canary Islands. Again, with regard to port concentration, the top-10 African seaports handled no less than 60.66% of cargo (figures underestimate the Egyptian contribution). In fact, major seaports continue to concentrate throughput in a similar way to how they did in the past.

Increased foreign influence upon these territories had the effect of further splitting the African maritime network into more numerous and smaller subnetworks (Fig. 3.4). Each network is dominated by a large gateway exerting its hub function over adjacent neighbours, namely with a local/regional scope. The intensification of external interests, before independence, created powerful North-South arteries which did not connect African regions well with each other. Former hubs maintained their higher rank, notwithstanding the reinforcement of Dakar and Casablanca.

3.3.4 Continuity with the Past, 1961–1972

The decade following political independence for most African countries represented a turning point in terms of port development. On the one hand, we have observed impressive growth in terms of average

throughput in our sample of eighty-eight ports. Average figures moved from 1,258,000 to 4,696,000 tons. However, we should note the oil-boom effect behind this. The inland and off-shore extraction of crude oil and gas increased the role played by specialized port terminals such as Bonny, Forçados, Escravos (Nigeria), Arzew (Algeria) or El Hariga (Libya). Export of oil and gas boosted economic expansion among these countries. Nevertheless, Durban remained at the top of the list, as well as other seaports like Casablanca and Santa Cruz, for tonnage but also for vessel calls (Table 3.3). It is important to note the presence of Noadhibou (former Port Etienne, Mauritania) in the ranking and the mass export of iron ore from the Tiris Zemour region by the MIFERMA mining company (nationalized in 1974). These mining activities led to the construction of basic railways infrastructures from Kédia d´Idjil to the Central Point terminal at Noadhibou. On the other hand, other bulk-trade export terminals such as Monrovia, Marshall or Buchanan (Liberia) also appeared on the list. In this case, the mass export of iron ore from Bomi Hills made by the Liberian Mining Company in cooperation with the Bethlehem Steel Corporation boosted the country's external seaborne trade (Schulze 1970). Prior to this, seaborne traffic was quite limited in terms of cargo volume, as well as international maritime connectivity.

In spite of the emergence of new specialized terminals (bulk-trade), it is important to note the stability of major historical seaports with a diversified cargo mix (i.e. Abidjan, Cape Town, Casablanca or Durban). The same ports are the main hubs of the African maritime network (Fig. 3.4), centralizing flows to and from their adjacent neighbours for redistribution via coastal shipping. These seaports also introduced the great logistical revolution in the twentieth-century shipping sector: the box, which explains their status at the head of the hub-and-spokes network configuration. It is true that the specific nature of African seaborne trade delayed the expansion of this technology, but the initial steps can clearly be seen from the beginning of the 1970s (Guerrero and Rodrigue 2014). In spite of the absence of specific data for Egyptian seaports for most of the analysed period, we can see that major regional seaports which handled the majority of the country's seaborne trade also introduced containerization fairly early on (Table 3.4). Ports like Alexandria and Lagos are backed by large cities and hinterlands (cf. Figure 3.1) and at the same time, exhibit a similar function to the aforementioned historical seaports, despite a lower vessel traffic in absolute terms.

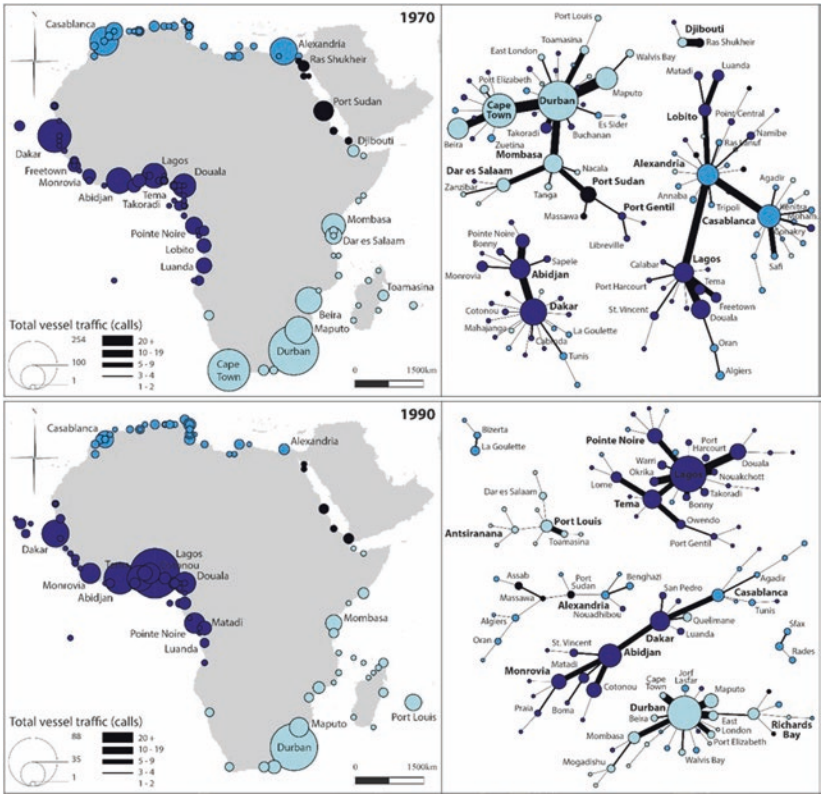

Fig. 3.4 Port hierarchies and subnetworks in Africa, 1970–1990 (*Source* Author's elaboration building on Lloyd's List data)

In terms of cargo concentration, in 1972 the figures present a trend that seems to follow previous patterns. The top-10 seaports absorbed no less than 68.70 per cent of seaborne trade, with a slight increase in the top-5 ports up to 43.53%. The GINI index remains stable at 0.62. On the other hand, trends in containerization show higher levels of concentration that are explained by the absence of data for Egyptian seaports and the slow introduction of a new technology that was bound to demand reforms at both levels (infrastructure and institutions). Moreover, the shipping industry was rapidly changing as Kaukiainien

Table 3.4 20 Major container ports in Africa (by TEUs), 1972–2015

Rk	*1972*		*1980*		*1990*		*2004*		*2009*		*2015*	
	Port	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*
1	Benghazi*	23.475	Durban	643.872	Cape Town	493.031	Durban	1,668,554	Durban	2,395,175	Tangiers-Med	2,961,837
2	Las Palmas	23.409	Cape Town	413.813	Durban	465.117	Las Palmas	1,105,176	Cape Town	1,382,052	Durban	2,770,335
3	Santa Cruz*	22.610	Lagos Complex	238.926	Mombasa	221.516	Cape Town	573.021	Las Palmas	987.711	Mombasa	1,076,118
4	Durban	14.404	Port Elizabeth	187.248	Lagos Complex	208.144	Abidjan	571.674	Alexandria	799.736	Alexandria	1,027,950
5	Abidjan	9.900	Abidjan	133.858	Las Palmas	182.238	Casablanca	560.682	Lagos Complex	725.540	El Dekhla	913.818
6	Casablanca	9.000	Santa Cruz	80.426	Abidjan	181.037	Lagos Complex	512.610	Casablanca	685.423	Djibouti	910.165
7	Cape Town	5.813	Las Palmas	64.224	Casablanca	173.332	Penington	440.000	Abidjan	677.029	Cape Town*	907.796
8	Duala	5.466	Casablanca	56.643	Port Elizabeth	133.351	Mombasa	438.597	Mombasa	618.826	Lomé	905.700
9	Matadi	4.762	Mombasa	53.584	Dakar	118.555	Santa Cruz	431.999	Luanda	581.940	Casablanca	853.008
10	Tamatave	4.295	East London	49.036	Dar es Salaam	106.118	Tema	342.882	Tema	525.694	Algiers	851.743
11	Dakar	4.143	Duala	32.250	Duala	91.379	Dakar	331.191	Sokhna*	481.000	Lagos Complex	818.786
12	Port Elizabeth	4.019	Dakar	29.000	Santa Cruz	80.426	Port Elizabeth	313.923	Port Elizabeth	441.456	Las Palmas	817.523
13	Monrovia*	1.932	Lomé	18.587	Matadi	70.573	Port Louis	290.118	Djibouti*	424.888	Tema	782.502
14	Libreville-Owendo	1.786	Pointe-Noire	13.543	Tamatave	68.053	Dar es Salaam	244.000	Rades*	423.817	Luanda	753.286

(continued)

Table 3.4 (continued)

Rk	*1972*		*1980*		*1990*		*2004*		*2009*		*2015*	
	Port	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*	*Port*	*TEUs*
15	East London	1.325	Algiers*	11.107	Port Louis	62.272	Port Sudan	205.511	Santa Cruz	346.254	Ngqura*	713.306
16	Lomé	612	Dar es Salaam	10.814	Conakry	58.899	Duala	190.858	Dar es Salaam	341.000	Dar es Salaam	646.561
17	Walvis Bay	583	Cotonou	9.928	Tema	46.003	Lomé	184.998	Lomé	319.927	Abidjan	640.863
18	Lobito	548	Tamatave*	9.819	Lomé	40.199	Cotonou*	97.801	Dakar	312.885	Pointe-Noire	571.860
19	Buchanan	82	Tema*	5.017	Tunis-Goulette	33.609	Tamatave*	92.535	Port Louis	301.033	Dakar	529.724
20	Takoradi	10	San Pedro	2.858	Algiers	23.216	Conakry*	85.290	Cotonou	300.000	Nacala	450.000
Σ	Σ 20 = 138,174		Σ 23 = 2,087,850		Σ 29 = 2,963,698		Σ 38 = 9,084,632		Σ 61 = 15,507,105		Σ 65 = 25,110,133	
□	□ 20 = 6,909		□ 23 = 90,776		□ 29 = 102,196		□ 38 = 239,069		□ 61 = 254,215		□ 65 = 386,310	
N	n = 20		n = 23		n = 29		n = 38		n = 61		n = 65	

recently noted (2014). The shipping market factor also played a key role in terms of port resilience. Global events like the closure of the Suez Canal (1967–1975) modified the usual trade networks in the African continent, partially benefiting stopover seaports in the Atlantic's maritime facilities.

3.3.5 Structural Crises, 1973–1995

The economic performance of African countries from 1973 to the late 1990s is a major issue among development economists. Those years represented a historical breakdown in terms of sustained economic growth in overall terms. The global crises heavily impacted most African countries, which remain highly dependent on the evolution of external sectors. The contraction of international trade and the global depression in commodities prices exerted a devastating effect over the social, political and economic structure of those "young" countries (Jerven 2015). The balance of trade was heavily damaged as well as the state revenues. Hence massive public debt hampered port reform and the improvement of infrastructures (both inland and coastal). In addition, the economic crisis eroded the financial balance sheets of public–private African shipping companies, which were partially involved in the seaborne trade of their countries thanks to the 1974-UNCTAD code (40-20-20). Moreover, political instability (i.e. coups d'état, civil wars) and healthcare issues (i.e. spread of HIV in Southern Africa) also exerted a very negative impact on the socio-economic structure of many African countries. In terms of port throughput, these years represented a significant slowdown.

We have collected data for 1990 where most of the major seaports and gateways were represented. The average throughput volume "only" grew by 23.57% from 1972 to 1990, highlighting the intensity of the crisis. In addition, specialized oil and gas terminals tended to reduce their exports (in a relative way as they did in the past) as a planned strategy by the OPEC to keep oil prices high. In spite of this negative situation, emergent specialized ports appeared among the top. Specialized terminals concentrated on commercial functions chiefly related to bulk-trade exports. As an example, Richards Bay (South Africa) climbed to first place in the rankings and it retained this position right up to the present day. This port was opened in 1977 through an agreement between the Transvaal Coal Owners Association and Japanese steel mills companies. In 1979, the port exported twenty-three million tons

of coal. In 1994, the figures almost reached fifty-four million tons. The concentration of ore exports at Richards Bay also affected neighbouring seaports like Maputo, affected by the civil war that devastated the country. Maputo remains a relatively large port, but lost out in terms of connectivity (Fig. 3.4) compared with the sustained dominance of Durban. The latter had become a main port in the now highly concentrated African port system, split into two main components. In addition, the port of Saldanha Bay (Atlantic-side facilities) was built during the 1970s and it specialized in the export of ores from the northern iron fields in the Sishen region (Northern Cape). Initial exports began in 1976 and figures reached seventeen million tons exported by 1979. In 1994, the port handled twenty million tons of iron ores. In northwest Africa, Jorf Lasfar (Morocco) emerged as a multi-bulk-trade terminal. It began to operate in 1982 and it was fully operative by 1990 when it handled more than five million tons. The port imported a range of chemical commodities such as sulphur, ammonia and coal (from 1998 onwards). There was in its hinterland a chemical industry belt specializing in the production of fertilizers, phosphates and phosphoric acids. In a similar way, Nouackchott (Port de l'Amitié) began the mass export of iron ore during the 1980s, reaching eleven million tons in 1990. This port was also the main gateway for the country, absorbing imports and general cargo previously handled by Dakar (then transported by land). In general, West Africa had been the most successful region in terms of traffic, hosting the largest port by the number of vessel calls (Fig. 3.4) and constituting a hub for the largest maritime subnetwork, mainly composed of West African ports (Fig. 3.4). Aside from the decline of Alexandria and Casablanca, the Abidjan-Dakar component and another emerging one centred upon Port Louis increase their importance compared with 1970.

On the other hand, if containerized cargo is considered, figures show how multifunction seaports stayed at the top (Table 3.4). South African seaports (despite the lack of Alexandria) appeared in prominent positions between 1980 and 1990. Thus, country gateways (i.e. Mombasa, Lagos, Abidjan and Dakar) were also located among the top-10. It is also important to note that concentration trends show an important increase for 1990. Figures for the top-10 moved from 68.70 to 76.74%. On the contrary, the TEU market appears relatively less concentrated in 1990 than 1980 as a result of the dissemination of container technology and its introduction at an increased number of seaports. Nevertheless, the top-10 container seaports handled no less than sixty-nine per cent

of containerized cargo for the whole African continent. The diffusion of containerization has been highly selective and mainly in line with the established hierarchy of large economic centres, following the typical ideal models cited above (Taaffe et al. 1963) and their followers.

3.3.6 African Seaports and the Second Wave of Globalization, 1996–2010s

This last period represents significant economic, institutional and social transformations worldwide. The second wave of globalization has been tied to the spread of containerization and an impressive growth in seaborne trade. The emergence of global supply chains and the increased demand for raw commodities from Africa boosted economic growth and structural changes at the shipping sector level. This process was accompanied by improvements in regional port facilities and institutional versatility under port devolution schemes. The public–private partnership strategies involved huge investments from global operators interested in the management of key terminals (Pedersen 2001). In addition, the emergence of transport corridors benefiting landlocked countries and the subsequent intra-regional institutional cooperation have also promoted the expansion of seaborne trade (Oliete and Magrinyà Torner 2018). Midterm figures show a robust trend of sustained growth in average throughput for major seaports (Table 3.1). Average figures grew forty-one per cent from 1990 to 2008. The last phase of the period (2008–2016) shows a faster rate of growth, moving from eight to eleven million tons on average (37.85%). It is very representative that these growth trends are highly affected by the bulk-trade effect and the increased demand for raw materials from emergent industrial economies such as India or China. The bulk-trade terminals at Richards Bay and Saldanha led the top-20 ranking between 2008 and 2016. Figure 3.5 demonstrates this trend well, with Richards Bay already appearing as second-tier hub in 2008, dominated by Durban.

However, it is important to note the continuity of historical patterns in port hierarchies among major regional gateways. Seaports like Durban, Lagos Port Complex, Casablanca, Abidjan, Alexandria or Mombasa stayed at the top of the rankings, reinforcing their position as major commercial centres. This is true for throughput but also for connectivity, as all these gateways also act as the largest hubs within the African maritime network (Fig. 3.5). Seaports like the Port

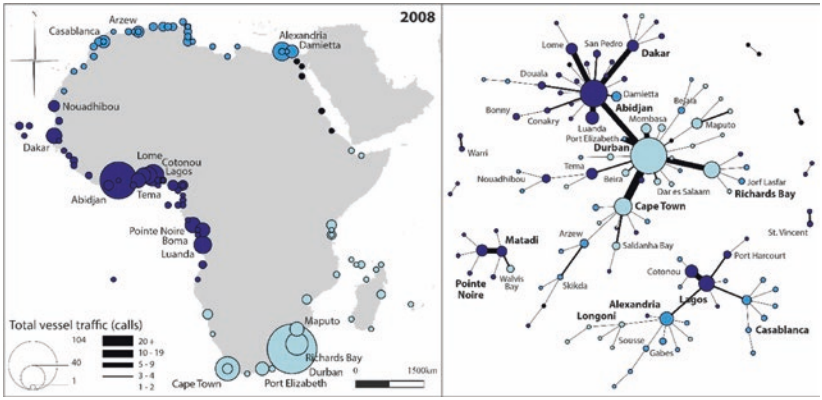

Fig. 3.5 Port hierarchies and subnetworks in Africa, 2008 (*Source* Author's elaboration building on Lloyd's List data)

Harcourt-Onne Complex or the Lagos Port Complex (Nigeria) also emerged as strategic hubs for major urban agglomerations (i.e. Lagos or Onitsha). On the other hand, the relative decline of Maghreb major seaports is partially explained by the failures of inland transport networks, including institutional constraints for regional integration; the lack of investments for port development and the increased competitiveness from Europe's Mediterranean hubs, which boosted hub-and-spoke maritime networks (Mohamed-Cherif and Ducruet 2016).

Conversely, leading regional seaports have enlarged their infrastructures in order to attract traffic and stakeholders. Thus, foreign investment (i.e. container terminals) and cooperative entrepreneurial strategies among logistical operators and global shipping liners enhanced seaborne trade and a slight but constant reduction in maritime freights. Furthermore, we can see that the degree of stability in the African port hierarchies remains robust over time. Nevertheless, path-creation planning strategies seem to modify this historical trajectory in the medium term. The emergence of Tangiers-Med (Morocco) as a major hub seaport in the South Mediterranean reveals how a new age of port development has begun on the continent. This is a result, on the one hand, of national development strategies and the private interest of global operators to establish an improved supply chain in the continent. The example of Tangiers-Med is paradigmatic due to the fact that the

different cargo terminals are included in a regional industrial cluster. In fact, rapidly developing policies centred on the role of "developer" seaports seem to have returned to the political scene in spite of the environmental effects they caused (Olukoju 2004). Global entrepreneurial strategies, inter-port competitiveness and the struggle against the hub terminal of Algeciras (Spain) are key elements to understanding the role played by Tangiers-Med, where transhipment traffic represented 96.21% of its throughput between 2010 and 2017. Hence, in spite of the radical emergence of Tangiers-Med, the old Casablanca continues to be the major gateway for the Moroccan economy. The same goes for ongoing major hub terminal projects such as Bargny (Senegal). Conceived under the long-term structural plan *Sénégal Émergent* (2016–2035), heavily supported by foreign investors, this container terminal aims to create a great container terminal able to berth the last generation of fully cellular vessels. In addition, this new seaport would help to decongest Dakar in a broader sense. It may be ironic, but the projected location for Bargny is almost the same as for the old wharves of Rufisque, for whom commercial activity was heavily affected by wind, waves and sea tides! Other expansion projects are now under construction across the continent: Walvis Bay, Durban, Mtawara, Tema and Lagos. The population growth and an overall relative increase in income have pushed up the demand of goods traded by sea.

The general cargo revolution has expanded over the past two decades on the African continent. The TEUs operated rapidly throughout the main gateways linked with major urban agglomerations. It is important to note that TEUs traffic included a significant proportion of empty ones which have clearly been declining in recent times. The container terminals of Alexandria and El Dekhla (Egypt) are closely linked to Cairo (urban demand) in addition to its shared hub function for the Eastern Mediterranean. In South Africa, the regional market share for TEUs is clearly concentrated at Durban despite the recent emergence of the Ngqura terminal (close to Port Elizabeth). This concentration trend encouraged hub-and-spoke transport networks where Durban played a key role as the main regional hub in Southern Africa (Fraser et al. 2016). In addition, the increasing connectivity between Africa and the Asian markets in the past decades has reinforced Durban's hierarchical position (Metge and Ducruet 2017). This second wave of globalization expanded the operational capacity of seaports and its essential role as a hub. The expansion of Djibouti (as a transit port for Ethiopia) and its key location

close to the Suez Canal routes also demonstrates the importance of additional ports inserted in global transport networks. Otherwise, the average TEUs moved by seaport rose from 239,069 to 386,310 units from 2004 to 2015.

In terms of port concentration, preliminary figures run towards dispersion trends. The top-5 handled 53.40 per cent of overall throughput in 2008 and 46.26% in 2016. The GINI index for the top-20 was 0.61 in 2016, close to the 1955 figure (0.60). This dispersion trend can also be seen with regard to TEUs traffic. The top-10 seaports handled 71.75% of containerized cargo in 2009, dropping to 66.21% in 2015. Likewise, the GINI index for TEUs demonstrates a fall from 0.64 to 0.58 during the same period. This means that both indicators (throughput and TEUs) reveal how dispersion trends have evolved since the beginning of the century. Thus, we suggest that path-creation processes (i.e. construction of new specialized terminals) would exert an important influence over these structural changes.

3.4 Conclusion

The evolutionary path of African port hierarchies reveals an important degree of robustness and concentration involving the larger seaports and imperial gateways throughout the analysed period. Hence, the path to port dispersion precluded by Taaffe et al. (1963) does not seem to be completed yet, but relatively recently emerging seaports could boost it. Dispersion patterns will be chiefly caused by proactive development strategies from the 1960s more than new economic and industrial development, in spite of some exceptions we have previously noted (Monios and Wilmsmeier 2016, p. 248). Despite the lack of complete data, we found that the main gateways built during the colonial period have retained the lion's share of the continent's seaborne trade in the long term. Path-dependence, institutional choice and market forces exerted self-reinforcement effects on the robustness of historical port hierarchies. Moreover, gateways introduced new economic functions, and emergent seaports and specialized terminals also contributed to the expansion of maritime sectors during the second half of the twentieth century.

However, other local and regional factors should be analysed to observe their influence over the functioning of port networks in the long term (i.e. road and railway network, fiscal policies, investments in port infrastructure, robustness of business sector, relative value of external

trade, etc.). This approach would require an individual or comparative country-level analysis to find more specific insights on self-reinforcement effects.

On the other hand, we have found evidence with regard to the consistency of port hierarchies in the long term and how top seaports retained prominent positions in the top-20 from the early twentieth century to the present day. If we discard specialized bulk-trade (ores, oil and gas) terminals, which retain a significant share of low-value throughput volume, then we find that major gateways climb to the top of the list. These ports were and still continue to be establishing a large share of the external trade for their respective countries. For most of them, the one-port structure involved the establishment of an extraverted inland transport system that survived the colonial age. On the other hand, emergent seaports built between the late 1950s and the early 1970s rapidly absorbed a significant share of seaborne trade, and in some cases (i.e. Tema), they were transformed into the major gateways for their countries. These seaports boosted path-creation processes as well as the recent ongoing greenfield port developments in some countries. Will those incumbent seaports transform the historical pattern of the evolution of port hierarchies in Africa in the medium term? Further research is required to be certain.

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Annex 1

Sources for Tables 3.1 and 3.4

Figures for these tables have been collected from several primary and secondary sources. Sources for the colonial age up to 1960 have been collected from Statistical Yearbooks (i.e. blue books of the colonies, *annuaires statistiques des colonies*) compiled by the colonial governments or the port authorities. Figures for former French Colonies are also taken from the "Archives Nationales d'Outre-Mer" (Aix-en-Provence). In addition, academic literature also provides insightful raw data for early periods. This was the case for Maghreb seaports. For South

African seaports, the full collection of data from the Railway and Harbour Corporation is an ongoing project to complete the data set. Nevertheless, secondary sources for this region introduced qualitative and quantitative data for specific cases such as Durban. For the period between 1971 and 1995, we used data from the "Revue de la Marine Marchande" where throughput and disaggregated cargo is included. In addition, we completed data for most of countries for the aforementioned period from the French Diplomatic Archives (Nantes). For the period from 1990 onwards, data is mainly collected from the national Statistical Offices (Yearbooks) and statistical reports from the Port Authorities and port regulators (i.e. Transnet). For some countries (i.e. Kenya), statistical reports are available online from 1938 onwards. We have also collected data for some years and ports for recent periods from other sources such as Review of Maritime Transport, reports from the "Union Monétaire d'Afrique de l'Ouest" or the statistics collected by the Port Management Association of West and Central Africa. Specific sources for each figure included in these tables can be found on the AFRIPORTS database. Specific sources for these figures will be available on demand until the online publication of the database. Please ask author: daniel.castillohidalgo@ulpgc.es.

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CHAPTER 4

Modernization and Development of the Moroccan Port Model During the Protectorate (1912–1956)

Miguel Suárez Bosa

4.1 Introduction

During the (1912–1956) Protectorate, the French and Spanish colonial powers that occupied Morocco rolled out an ambitious programme to modernize the transport and communications systems, as key elements for the occupation and exploitation of the country's riches. However, over and above the rhetoric of modernization, they sought to find the best way of implementing a system of colonial exploitation. The building or improvement of ports lay at the forefront of this plan, as most exports and imports were shipped by sea. In fact, "Ports are the *windows* for the Moroccan economic openness" (translated from Hoffherr 1932, p. 65).

Thus, the most significant investments carried out by the Administration in transport infrastructure aimed to facilitate foreign trade, which grew continuously throughout the whole period; the

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connection of ports and inland areas was a strategic element in colonization. Emphasis was therefore placed on improving the system of paths, roads and railways in order to be able to export agricultural raw materials as well as those from the mines (phosphates and other minerals). At the same time, this infrastructure was also to serve as support for military intervention. However, the result did not effectively amount to an effective communications system, and it was the old paths and roads that were used the most, particularly in the Spanish zone.

In developing countries, ports tend to respond to the needs of their economies, to the chances to exploit both identified and potential resources. So studying ports in new countries consists of demonstrating the general development factor that they represent. Port infrastructure facilitates exchanges and mobility of people, as well as promoting the development of productive sectors, raising aggregate supply and demand as freight costs fall, often giving rise to economies of scale.

Although the ports across Morocco had some characteristics in common, there were numerous differences between those located in the French zone, i.e. most of those sited on the Atlantic coast, and those in the north, under Spanish Administration. The French model was structured around a hegemonic "national" port, in this case Casablanca, together with numerous secondary, auxiliary ports. By contrast, ports in the Spanish zone along both the Atlantic and Mediterranean coasts, played a much less prominent role, hampered by low investment levels, as Spain preferred to promote its existing national ports of Ceuta and Melilla, as hegemonic elements, relegating the remaining ports to a secondary role.

Following this overview, the main aim of this contribution is therefore to carry out a comparative analysis of the port model implemented in Morocco pursuant to the 1912 Protectorate proclamation, taking into consideration the actions carried out in the port areas, as well as the similarities and differences in their functions, and evaluating port activity in both areas. Secondly, we also aim to provide a preliminary view of ports' contribution to the country's development, insofar as the data available permit.

In order to tackle this challenge, a wide range of documentary sources have been consulted (Miège 1992). Bibliography from France views the occupation of the territory in a positive light, and most of these sources praise the work carried out under the Protectorate (Vidalenc 1928; Célérier 1934; Eyquem 1933; Celce 1952; Cherfaoui and Doghmi

2005; Mohamed-Cherif and Ducruet 2016). On the other hand, there are few studies published in Spanish, and references have to be sought in work of a more general nature (Castillo Hidalgo and Mohammed-Cherif 2017). They tend to overestimate the work and role of Spain, or attribute the ports in the north a subordinate role by comparison with the national ports, indicating that they were contemplated as points from which to launch Spain's penetration inland. Original documentation enables us to look in further depth at the ports as a whole. As such, the reports drawn up by the French statistics services (*Rapports Annuels des colonies*, *Annuaires Statistiques*) and, for the area under Spanish control, a number of publications of the Spanish Statistics Institute (Salueña 2013, p. 103), are essential starting points. Data are also available from public or private local bodies, such as the Chambers of Commerce (the *Bulletin de la Chambre de Commerce et Industrie de Casablanca*, for example), as well as the port Administration itself, as each port authority has conserved documentation regarding its own port. Of particular interest is the *Bulletin Économique et Social du Maroc*, as are the "fin de stage de contrôle civils" dissertations, written by students during the Protectorate period.[1]

The main problem encountered with the documentation is that it is not homogenous, and this makes it impossible to draw up continuous time series or to carry out reliable statistical calculations. As an example, port movements are sometimes presented by weight, and others, by monetary value. However, the data available have enabled us to reach some acceptable, albeit provisional, conclusions.

This chapter is structured as follows: this presentation is followed by Sect. 4.2, in which the main characteristics of the port system are analysed, with special attention paid to its contribution to the economy, investments and management. Section 4.3 includes our analysis of the results, in the light of port activity, and Sect. 4.4 presents our conclusions.

[1]The following monographic volumes can be consulted in microfiches in the *Archives Nationales de Nantes* (*Diplomatic and Consular Archives*), among others J. Bois (1930). *La port de Mehedya-Kénitra. Mémoires de fin de stage des contröles civils*; M. Coricon. *Le port de Fédhala. Mémoires de fin de stage des contröles civils*; M. Armand Antona (1931). *La region des Abdas. Memoire de fin de stagen des contröles civils.* Imprimerie Officielle. Rabat; M. Boniface (1930). *Agadir. Memoire de fin de stage des contröles civils.*

4.2 The Characteristics of the Port System

4.2.1 Ports in the Moroccan Economy. The Importance of Protectorate Ports

The academic literature highlights the fact that, in the colonial regime, ports and railways constituted key elements in the transformation of regional economic structures. Ports in particular acted as spearheads of the colonization process, as they linked regional productive structures to international markets (Olukoju 2004). The increase in the amount of traffic in Casablanca and other ports (Celce 1952; Suárez Bosa and Maziane 2014) was related to the exploitation of their respective hinterlands. They also played an important role as communication hubs in international trade, as they enabled the regional economy to connect to the global commercial dynamic of the colonizing power.

Once the Protectorate had been proclaimed by virtue of the Fez Treaty in 1912, the administrators of the occupying powers, France and Spain, proceeded to invest in the renovation of the ports, in order to improve the channels of exportation of raw materials, minerals or agricultural products. And in exchange, the importation of goods was promoted. As a result of these trade flows, Morocco became dependent on the central powers. Although bays suitable for the creation of ports do not abound along the Moroccan coast, particularly along the Atlantic coast south of Cape Espartel, new technologies and materials made it possible to build ports even where natural conditions were not favourable. This is thus an interesting case for the study of the application of technological innovation in the sector.

By comparison with other colonized countries, at the end of the colonial period Morocco was reasonably well endowed with good communication routes, particularly in the south of the country. If we look at the final years of occupation, transport and transmissions constituted just over five per cent of Morocco's Gross Domestic Product in 1957. In the same year, the final figure contributed to national accounting corresponding to household consumption of transport and transmission amounted to twenty billion francs (Service Central des Statistiques 1960, p. 155). These data show that the country enjoyed a solid communications infrastructure: a well-maintained road network, railway lines, numerous modern ports, airfields and a well-developed flow of goods. In 1955, there were 6044 kilometres of main roads and 6219 kms of roads

that could be used throughout the year, and thirty thousand kilometres that were usable in good weather. As far as the ports are concerned, it is significant to observe that a leader of the secessionist movement said "ces instalations portuaires dont notre pays est doté, qui ont été financiés par le budget marocains sous le Protectorat (…)"[2]; this enabled him to ensure a total amount of traffic in excess of ten million tons, a higher figure than those registered in other African countries: for example, it was fifty per cent higher than that of Egypt or the Belgian Congo, etc. (Cerych 1964, p. 133). There were fewer railway lines than roads, particularly in the north of the country, and yet there were 1700 kms in 1955, carrying a traffic of 1529 million tons per kilometre and 541 millions of passengers.[3]

The increase in interaction between the different transport systems (mainly ports and railways) was key elements in this technical, economic and institutional revolution, linked to the industrial revolution. The dense network of roads available in Morocco afforded it a prominent position among new countries (Eyquem 1933, p. 83). The different parts of the country were well interconnected and ensured the swift movement of people, goods and merchandise.

Construction of the railway network in Morocco started in the 1920s, although short stretches of lines had been installed since 1910 for military purposes, particularly in Chaouia, which connected Casablanca to Rabat and Settat in 1913. In the French zone, all the railway lines either met or forked there, the objective being to enhance its role as a "national port", as the colonial authorities had planned. The strengthening of the policy to concentrate transport lines played an important role in this port, which exerted a pull factor on the goods produced in its hinterland and in those of neighbouring ports, to which they could send said goods.

The railway network was coordinated by *La Compagnie de Chemins de Fer du Maroc* (CFM), created in 1922, with significant private sector participation in both ownership and management. The first commercial Moroccan railway line linked Tangiers with Fez; its major shareholders were the *Compagnie Générale du Maroc* (CGM), a holding company belonging to the *Banque Nationale de Paris et des Pays-Bas* (PARIBAS)

[2]The nationalist leader El Mehdi ben Barka made this affirmation in his book entitled Probléme d'edification du Maroc et du Maghreb. Quatre entretiens avec El Mehdi ben Barka. p. 8 (quoted by Cerych 1964, pp. 130–131).

[3]*Annuaire statistique du Maroc*. 1955–1956 quoted by Cerych (1964, p. 133).

and the *Compagnie Générale Espagnole d'Afrique*. This railway line specialized in the transport of general goods and passengers[4]; other branch lines covered routes to Tétouan and Larache, stopping at other smaller inland towns, which generated a relatively dense railway network. The main electrified railway line linked Marrakech and Fez, and joined up with the Algerian line at Uchda; work started on the Rabat-Fez line in October of the same year, running through Kenitra, Sidi Kacem and Meknes. This line was finished in 1925.

Other ordinary lines were built out to the mining regions, including the line from Casablanca to the phosphate mines of Khouribga, opened 1923, and subsequently the line from the port of Safi to the mines of Youssoufia. In the north, the port of Melilla was linked with its mining zone, although it did not form part of the Protectorate. Further to the east, plans were drawn up to link Saida with the mining basin of Muluya. Railway lines and roads terminated in the ports. For example, in Casablanca, the maritime station of Roches-Noires was built, constituting a distribution and connection hub where 80% of the tonnage entering or leaving the port was handled, as well as a passenger station. But the juxtapositioning of the two means of transport relied on good coordination to ensure that it functioned properly, hence a state body, the *Bureau Central des Transports*, established the rules governing the division of goods between the different means (Celce 1952, p. 67).

4.2.2 Actions and Debate as to Port Planning: Centralization vs. Decentralization

In the years running up to the proclamation of the Protectorate, Sultan Moulay Abd Aziz had the foresight to consider ports not just as a place in which to levy duties, following local tradition, but also as a set of bays, endowed with the necessary infrastructure and equipment to receive large vessels. It was the Sultan who ordered the quays to be built in Larache and Tangiers, together with the jetty at Saffi (in 1902) and the provision of an additional jetty in Casablanca. Agadir and other ports in the north would have to wait some decades before development arrived. The aim of these activities was to boost growth in the regions surrounding and connected to these ports. At the same time, awareness

[4]According to the article "L'economie des ports marocaines", Published in the BESM. no. 75. vol. XXL. 3rd term. 1957. pp. 290–304.

was growing regarding the fact that, in order to attract shipping lines, costly stopovers had to be avoided, in order to improve performance and reduce the customs duties.

In the years prior to occupation, in order to finance investment in infrastructure, the Moroccan Administration requested loans on the international markets at high interest rates, generating succulent profits for the lenders. However almost all the transport infrastructure was funded and promoted by the public sector, which granted large loans to this end. These investments were motivated and backed by the control of the territory by the army and by trade, the endowment of enhanced export conditions in particular, and facilities for foreign trade in general.

Before colonial occupation, there was a closely connected network of small ports, among which none stood out over the others. This situation changed in the last third of the nineteenth century, when France modified its intervention policy in Africa in the face of the British strength and increased German competition by concentrating the economic activity of its colonies and protectorates in some specific locations. In 1905, the Moroccan government obtained a loan of 62.5 million francs, known as the *Emprunt Marocaine*, signed by Sultan Abd El Aziz with a consortium headed up by *Banque de Paris* and PARIBAS. Repayment of both the principal and the heavy interest due came out of port customs' levies; the agreements reached at the Conference of Algeciras (1906) stipulated that customs' income would guarantee loan repayments.[5]

Once the Protectorate had been proclaimed, the French investment programme for the French zone comprised the creation of a port of general interest (or "national port") and improvements in the regional ports in general. The total budget allocated, between 1904 and 1949, was 4,055,500,000 francs (Eyquem 1933, p. 57; *Budgets annuels de l'Empire Chérifien* 1950). In a first stage, up until the 1920s (see Table 4.1), the actions mainly consisted of carrying out small-scale work to provide harbours for barges or to reduce or eliminate the sandbar that formed along

[5]The successful bidders were often specialized foreign companies. The amounts paid in interest were significant: the annual repayment on the 1904 loan was 3,950,000 francs; those corresponding to the 1910 loan stood at 3,200,000 francs, to be paid out of customs duties levied, including the five percent (1700 million francs) for the Makhzen. Other guarantees amounted to 835,000 francs. The main question was to determine how to fund these major public infrastructure works, given the relatively weak tax position of the Sultanate.

Table 4.1 Investment in Moroccan ports during the first phase of the Protectorate (in thousands of current francs)

	Period 1914–1927			*1928–1936*		
	Overall investment	*Annual average*	*% of the total budget*	*Overall investment*	*Annual average*	*% of the total budget*
Investments in Ports	596,485	42,606	3185	725,058	80,582	1865
Expenses corresponding to the total budget	1,878,201	1858	100	3,887,579	481,985	100

Source Author's elaboration from BESM, No. 12, April 1936, p. 91

the coast. Subsequently, from the 1930s until the end of the occupation period, the foundations were laid for the building of modern deep-water ports using the necessary technical means (Table 4.1).

The location of the so-called national port gave rise to an interesting debate as to whether it was preferable to divide investment between several regional ports or concentrate it on one main one. Representatives of the French Administration, based on the experience of continental France (Plan Freycinet, 1871–1921),[6] emphasized the importance of consolidating the economies of scale in one sole port, which would concentrate most trade. This would entail undeniable advantages in response to the demands of the modern economy, as it would permit the best and cheapest equipment in order to make it possible to channel and export products. In fact, one of the concerns of the Resident General, Marshall Lyautey, was the modernization of Morocco, to which end an efficient communications network, including ports, played a crucial role. In short, from 1912 onwards, Casablanca enjoyed all the favours of the Administration and hence an incomparably improved development compared to other coastal centres that did not receive the same subsidies.

[6]The Freycinet Plan (1878) and the Baudin Plan (1901) contemplated a port network, improving infrastructure and integrating intermodal industrial connections in port areas (Marnot 2011).

After the French intervention, Casablanca was established as the fundamental central axis of the Moroccan economy (Celce 1952, p. 41). Its port quickly became one of the main ports of the French colonial regime, on a level with Algiers, Oran or Dakar, on a par with the main ports of mainland France in terms of the goods transported on its quays. The building of a dense network of more than 5200 kms of roads (1930 data) where previously only a few pathways had existed, made connection with the rest of the country possible. Likewise, the new and progressively electrified railway system replaced the old imperial track that ran from Marrakech to Fez. Thus, the Moroccan maritime front was linked to the various inland regions, as per the ideas of Hoffherr (1932, p. 65).

The technical achievement represented by the port of Casablanca required a considerable level of investment, but no effort was spared. A total of 563,500,000 francs were invested in the building and infrastructure, which constituted eighty per cent of the total budget for ports. To this, the sums corresponding to the building of silos, that of the phosphate quay or the installation of the fishing port, which were not included in the loans together with other amounts included in the Budget Général du Protectorate, giving a total of some seven hundred million francs *poincaré* deflated in line with 1928 values (Celce 1952, p. 41).

The choice of Casablanca and the debate as to the exact site constitute an exceptional, elegant exercise regarding the theory of port sites. The specialists argued that a good port should feature a number of technical conditions not necessarily found in a natural harbour[7]: water depth of fifteen metres, an almost constant water level, large enough quays to be able to receive large ships and considerable amounts of cargo, a large enough bay to provide space for ships not to get in each other's way; and sufficient space for mooring, together with the necessary tools for loading and unloading operations, and sufficient appropriately trained or experience workers.

But the massive investment in the port of Casablanca was contested by some sectors of society and by strong voices from other locations. Leading intellectuals also questioned the validity of this excessive centralization, affirming their preference for a broader spread of investments

[7]Opinion expressed by M. Maurice Gafiot, a lecturer in political economics, in The Introduction to the book by J. Eyquem (1932, p. iii).

to build a network of regional ports. In order not to increase transport costs of products sent to or from regions in the north or south of the country, those in favour of decentralization considered it important to send the goods originating in regions far away from Casablanca directly to smaller ports. Their logic was that costs would be reduced by shortening the distance from the point of production to that of loading on board, as transport overland was much more expensive. Low-value voluminous export goods constituted the main component of Moroccan trade, and multiplying the number of places they could be loaded on board along the Atlantic coast seemed to be logical. Lastly, they argued that the lack of appropriate ports, together with the deficient state of the rail network, was the cause of the increase in the cost of living, which stood at fifteen to twenty per cent higher in Morocco than in the rest of North Africa (Eyquem 1933, p. 482).

Finally, although Casablanca was given preferential treatment, the authorities realized that investment in regional ports, albeit it in smaller quantities, was also needed, as we can see in the following text:

> Si Casablanca doit être le port principal du Protectorat il ne doit pas en rester le port unique; il serait sans doute très regrettable que l'on cherchât. comme on la fait à certains moments chez nous, à créer le long de la côte marocaine des abris trop nombreux que leur aménagement. forcement sommaire rendait peu utilisable; mais encore faut-il respecter les situations acquises et les intérêts existants. maintenir en les améliorant leurs débouchés actuels aux divers régions du Maroc et ne pas leur rendre presque impossible en imposant à leurs produits des parcours par terre trop longs leurs relations avec extérieur […].[8]

4.2.3 Weakness of the Spanish Port System Model

At the beginning of the twentieth century, the ports in the northern zone registered a low level of activity, although the situation was reversed somewhat when the Protectorate was established (1912), and thanks to the investment initiated in the 1920s. In any case, activity levels were low, hampered by the lack of resources and conditioned by the interests of the military control. There were even some unfortunate initiatives,

[8] Chambre des Députés. Onzième Législature. Session de 1916. Annexe au procès-verbal de la séance du 10 février 1916. Rapport fait au nom de la Commission des Affaires Extérieures. no. 1774, 1916, pp. 59–61.

such as the location of the port in Alhucemas or the dredging of the Lukus river in order to fit out the port of Larache. Once peace had been achieved in the territory, these works proved to be useless, either because they did not match the demands of commercial traffic, or because a lack of maintenance had caused them to fall into disrepair (Albet i Mas 1999, p. 419). As of 1923, with the proclamation of the dictatorship of Primo de Rivera, a certain degree of autonomy was allowed in the expansion of port infrastructure in the northern zone. The Spanish Administration's activities were framed in the Public Works Plan, most of which were of a military logical character.

After the dissolution of the special stipulations of the Algeciras Act in 1923, public sector work in the Spanish area intensified as of that very year, with the creation of a Public Works Plan for Morocco to the tune of fifty-four million pesetas (11,149.4 million pesetas, as of 2014). 47.7% of this amount was dedicated to building the train line from Ceuta to Alcazarquivir, and 7.2%, to the extension of the Nador line in the east. The thirteen per cent allocated to port infrastructure is noteworthy, corresponding to fifty-four million pesetas of the time in the 1923 Public Works Plan (RD de 23-11-1923).

In parallel to these initiatives, the role of Ceuta and Melilla was also strengthened. They were considered axes of the port network in the northern zone, which partly explains the weakness of the other ports. Small-scale initiatives in Nador, Arcila, Larache and Alhucemas (Villa Sanjurjo) were also undertaken, but they encountered problems relating to natural characteristics, such as clogging up with sand (Charfaoui and Doghmi 2005; Villanova 2004, pp. 80–83).[9]

The cornerstone of port reform in the Spanish zone was the passing in 1943 of the Port Planning Plan for the Protectorate Zone (*Plan de Ordenación Portuaria de la Zona del Protectorado*).[10] This programme can be framed in the policy of indicative planning that was normal at that time; the strategic objective was to reduce the cost of transport, while also improving the railway and road networks. In this plan, the three

[9] "Las obras públicas en Marruecos. Su estado actual y proyectos para el Porvenir". Conference delivered by Sr. Arango, engineer. 1928. *Revista de Obras Públicas*76 (1): 426–427.

[10] *El Plan de Ordenación Portuaria* was drawn up in 1943. A summary can be found in the Spanish High Commission in Morocco (1948). See chapter "Los transportes y las comunicaciones de transbordo. Los puertos". pp. 491–534; Ochoa Benjumea 1945).

main ports of the north (Melilla, Ceuta and Tangiers) were considered to be sufficient to handle foreign trade. It was therefore decided to boost the scope of the sovereign ports and improve the rest, in line with the specific functions carried out by each one.

The continuation of the first five-year plan (1946–1950) included work in the smaller ports of the Protectorate for a value of 4597 million pesetas (14.7% of the total), while 7274 million pesetas (23.3%) were allocated to extending the road network. The proposals included building a commercial port in Larache (23.3%), a dock in Villa Sanjurjo (59% of the total), another dock in Río Martín-Tétouan (13%), with the aim of converting them into commercial ports. The port of Arcila was to be fitted out for fishing (1.8%); Puerto Capaz and Nador (2.2%) were considered safe havens. Work was also scheduled to plan shore use, to facilitate the relationship between ports and their hinterlands; to this end, road or rail plans were proposed (Alta Comisaría de España en Marruecos 1948 [Spanish High Commission in Morocco]; Villanueva 2004, pp. 95–96). The second five-year plan (1951–1955) was less ambitious in terms of port works, contemplating only the continuation of the works underway in Villa Sanjurjo and Río Martín.

The port of Tangiers played a significant historical role in the city, which was the diplomatic capital of Morocco up until the beginning of the twentieth century (Gauthronet 1913). It had also been one of Morocco's main commercial ports during the nineteenth century, until improvement work on the port of Casablanca began (Ducruet et al. 2011). The initial objective was to build a safe haven together with another port for 340-metre barges that was operational until 1925. The cost, 175,000 francs of the time was borne by the Makhzen. In 1914, the work was entrusted to the *Société Internationale de Tanger*, but was interrupted by the war, whereupon the Sultan reassigned it to the *Société du Port de Tanger* (53% French-owned), although this re-assignation would be cancelled as a result of the claim made by Spain and England.

Work on the maritime front was then complemented with the building of the 315-kilometre-long railway line that linked Tangiers and Fez between 1914 and 1927. It is worth noting that most of the rail traffic from the region of El Ghar was oriented towards the port of Tangiers after the reunification of the country in 1956.

Table 4.2 offers a summary of the characteristics of the Moroccan port system just before independence, including the quays (*quais*, *môles*) at each port and the services available (hangars, silos or refrigerated facilities).

Table 4.2 Infrastructure and facilities of the ports of the north of Morocco in the Protectorate (1953)

	"Postes" for sea-faring vessels (trade)	*Quay lengths*	*No of cranes*	*Map of sheltered water (in hectares)*	*Wharves and storage areas (in 1000 Km²)*	*Hangars and warehouses (in 1000 m²)*	*Dock-cereal silos (in 1000 q)*	*Refrigerated* Entrepôts *(in m²)*
Kenitra	10	774	16	225	85	16	120	800
Rabat	4	300	2	4	44	8	–	–
Mohamedia	3	150	4	24	77	3.22	–	–
Casablanca	34	4874	93	122	550	113	300 + 1000 (fishing)	2200 + 1000 (fishing)
ElJadida	1	72	6	7	25	5.5	–	–
Safi	8	980	17	25	140	9.4	48	180
Essaoouira	–	–	3	2.5	15	1.77	–	–
Agadir	9	1.3	10	35	300	6.8	–	2
Tangiers	8	1.24	10	170	10.6	15.99	–	–
Larache	2	200	3	30	9.7	3.2	–	190
Alhoceima	4	490	5	11	50	0.5	–	–
Alcazarseguir	1	66	–	–	3.8	–	–	–
Martil	3	300	–	1.12	17	1.4	–	–

Source Author's elaboration from Central Statistics Service 1960; Notice sur le Port d'Agadir; Notice sur le Port de Safi

4.2.4 Modernization of Management

Until the end of the nineteenth century, port management in the Cherifian empire was very rudimentary and inefficient. The imperial Administration (the Makhzen) implemented the *oumana* (*Amîn Al-Umana*) guild of customs controllers in those ports open to trade. They were headed up by the harbour master (*raïs el marsa*), while a secretary (*fquih*) was in charge of the budget. However, the numerous foreign traders established in the country since the signing of trade agreements with the European powers (Miége 1963) required changes in the way the ports were managed, in order to adapt to modern commercial activities in line with the interests of the major shipping and trade companies. In the French zone, these innovations were based on the principles contemplated in the major French port reform at the end of the nineteenth century, the so-called Freycinet Plan (1871–1921), drawn up specifically to suit the demands of the globalization of transport. The structure was modified in 1904, with the revenue transferred to a bank consortium headquartered in Tangiers, the Service of Debt Control (*la Dette*), to offset the loan given to the Cherifian empire. In practice, this institution was in charge of the Administration of all the ports until it was abolished definitively in 1923. International powers with interests in the port participated in its senior management and Administration.

The management model followed in most Moroccan ports included the combination of private or public interests, that is a mixed and relatively similar to currently *landlord* management model. Once the Protectorate had been established, a transition to an Administration model similar to that used in mainland France took place, with the process culminating at the end of the First World War. The ports belonged directly to the State, which was in turn responsible for building infrastructure, providing material (such as docks, hangars and cranes) as well as for running the port. It was also in charge of setting the taxes or duties levied on the boat or goods. Under the 1920 Law (Dahir of 24 July, 1920), the ports in the French zone came under the Administration of the *Direction Générale des Travaux Publics*, whereas its counterpart, the Delegation of Public Works (subsequently the Delegation of Public Works and Communications), was in charge of the running the ports in the northern zone. Meanwhile, the private or semi-public companies, once they had been granted a concession from the Administration, created wharves, provided equipment and installations

and lent services directly to the port's clients, that is boats, passengers and goods. Nevertheless, a leading role in port management was given to independent entities and public law bodies: the Chambers of Commerce or Business Associations, which acted like lobbies. The public Administration granted concessions to private companies, under certain conditions. For example, the Spanish Port Works Boards (*Juntas de Obras del Puerto*) (JOP) enjoyed considerable independence in the management of each of the ports, with some exceptions of scant importance. The French zone, by contrast, was dependent on the French mainland and its corresponding institutions.

The system of concessions adopted for the building and management of ports was firmly rooted in the Moroccan port model. Dating back to the reign of Sidi Mohammed ben Abdallah (in the eighteenth century), Moroccan ports had been managed under a financial leasing system, which enabled revenue to be received all at once and controlled more efficiently. In this system, the profits were made by a small number of financiers, who had made foreign investment possible and who did not even live in Morocco (see Table 4.3). For example, the consortium made up of Gantasch, Schneider & Cie et Hersent J, and G. Creuset obtained the concession to build and equip the port of Safi; the Société Internationale d'Études et de Travaux au Maroc (Societé d'Entreprises du Maroc Occidental (SIETM-SEMO) was awarded the concession of El Jadida and Essaouira; the works in Larache were contracted to a German company in return for the port management. All these companies were foreign, and it is worth noting that no Moroccan Company was awarded even a small concession. Most of these companies belonged to the financial groups that dominated the Moroccan economy. Of particular importance in the French zone were the Compagnie Marocaine, the Compagnie Schneider & Cie or Hersent Fréres, which formed a consortium to undertake work in equipment.

The proceeds from the customs levies played a fundamental role in funding the Moroccan economy. Port tariffs were set at ten per cent *ad valorem* plus a surcharge of 2.5%, a third of which had to be allocated to infrastructure works, including those carried out in ports. The proceeds were the responsibility of the *Caja Especial de los Trabajos Públicos*, set up under the Algeciras agreements, and was part of the Service du Contrôle de la *Dette*. This Treaty played a decisive role in the policies of the powers that administered the Protectorate. A colonial type of political and economic structure was designed (Ayache 1956; Belal 1968),

Table 4.3 Equipment and management (concessions) in the Protectorate ports: investment groups

Ports	*Built/equipped by (Company)*	*Nationality*	*Year*	*Management of Port Activity*
Agadir	Zanen	Dutch	1912	A.T.P.[1]
Tangiers	Adolf Rens Chausen	German		*Dette. Transferred to (1924) Société Internationale de Tanger and Société du Port de Tanger* (SPT)
Casablanca	Schneider-Hersent	French	1915	Goods: Manutention Marocaine (S.A.C.A)[2]; Company of Dockers and shipping companies; Chambre de Commerce (Silos); OCP[3] SCON
Essaouira-Mogador				
Fédala-Mohammedia	Compagnie Franco-Marocines de Fédala-Hersent	French		SAPMM-K/R-S[4] S.M.CH.B[5]
Kénitra	Société des Ports Marocians-Paribas	French		
Rabat	Société des Ports Marocians-Pafibas	French		SAPMM-K/R-S[6]
Larache	Sager & Worner	German	1905	Private management from 1940
Tetuán				Private management from 1940
El Jadida-Mazagan				
Safi	Gantasch Schneider & Cie et Hersent J. et G. (1921)	French		Auxiliaire Maritime du Port de Safi. OCP; S.T.P.[7]
Tánger	Paribas	French	1921	STP. (publicly-listed company on the Paris stock exchange)

Notes [1]A.T.P.: Auxiliar Marítima del Puerto de Agadir; [2]S. A. C.A. (Rothschild) y Cie Générale Transatlantique. Hersent; [3]OCP: Office Chérifienne des Phosphates; [4]SCON: Soiété Chérifienne d'Exploitation d'Ouvrages Maritimes; [5]S.M.CH.B: Societé Marocaine de Charbonnage et Briquettes; [6]Société Anonyme des Ports Marocains de Mehdya-Kénitra et Rabat-Salé (SAPMM-K/R-S) was set up by a private group comprising the Compagnie Générale du Maroc, Société Générale d'Entreprises au Maroc and Omnium d'Entreprises (Dahir Chérifien of the 14 June, 1917) Cherfaoui and Doghmi 2005, p. 310); [7]S.T.P: Service des Travaux Publics (1949), left the State or local groups with no option to receive a concession

Source Author's elaboration from Eyquem (1933), Celce (1952), Ayache (1956), Cherfaoui and Doghmi (2005), and Ministère des Travaux Publics (1956a, 1956b)

according to which the practice of a concept of "open port" was regulated, characterized by low duties on imports.

In Tangiers, the *Dette* was in charge of running the port in 1906, but almost a year later, it was transferred to the Département des Travaux Publics (1 July, 1924), and, finally, to the SPT in 1934. Subsequently, this entity took charge of planning the infrastructures and management of all the ports, ensuring port operations related to boats, travellers and goods, in exchange for duties that were sent to the Administration of Tangiers, except for the health services and customs. The *Dette* administered the warehouses, a workshop for vessels, as well as regulating the tobacco distribution trade, which was a monopoly of the Cherifian government. The profits generated from the exploitation of said body had to be prorated among the various shareholders, the concession of the exploitation for seventy-five years (agreement signed in 1921) was initially distributed among French interests (30%), Spanish and British interests (20%), those of other countries (10%) and 40% to the Cherifian government. As of 1925, pursuant to the International Statute of Tangiers, the SPT reorganized the management and areas of competence in the exploitation of the port. The former was in charge of the financing and execution of the improvement works in quays, dykes and embankments, while the SPT handled commercial exploitation, that is, the tracks, warehouses, workshops and machinery.

In short, in the French zone, the ports of Kenitra, Rabat and Fedala were managed under concession, while those of Mazagán (El Jadida), Mogador (Essauira) and Agadir were run directly by the Protectorate; and Casablanca, Tangiers and the ports of the Spanish zone had a mixed system, combining private initiatives with the public Administration. Table 4.3 summarizes the major concessions in terms of corporate identity and nationality.

4.3 Evolution of Port Activity

4.3.1 The Predominance of Casablanca

From the First World War onwards, Casablanca became the heart of the Moroccan economy, absorbing between seventy-five and eighty per cent of the country's port traffic (Castillo Hidalgo and Mohamed-Cherif 2017). The fact that it acted as a barometer for the whole country means

that a study of its evolution offers a synthesis of the economy. To some extent, it is the image of the modern sector of Morocco at the time.

This port carried out the functions we would expect of a modern port. It became the meeting point of the neighbouring territories (acting as a national port), and its influence reached as far as the Rif and the Middle Atlas. It also acted as a connection node for different means of traffic, be they maritime or terrestrial. Goods from different parts of the world were shipped to Casablanca for transhipment to its hinterland. It also served as the point of embarkation for goods from that same region that were sent on to their final destinations (fulfilling the function of a trade port, or *entrepôt*). This activity was facilitated by the implantation of a dense communications system. Likewise, it formed part of the port network of the Northwest Mid-Atlantic, as it was also connected to some Mediterranean ports (Marseilles or Oran), which in turn were linked by numerous shipping lines. Lastly, since it was created, it monopolized Morocco's industrial activity. The country's major industries established themselves in the port area itself and in the environs, an area that lent itself to housing industries, thereby simplifying transport issues and keeping prices down.

But this traditional vision, based on the port's triple function is too schematic and does not do the port justice, as ports are not just a series of quays or wharves, cranes and hangers. On the contrary, in most cases they constitute a gigantic enterprise with a life of its own, with its Administration, the concessionaries, finances and personnel, all making up the so-called port community.

The fact is that it quickly became Morocco's main port and the leading port in the region and of the port network. To the north, two regional ports were built: Kenitra (Port Lyautey, so named in honour of its promoter) in the mouth of the Oued-Sebou and Rabat in that of Bou-Regreg. A further auxiliary port was created at Fedala, just three kilometres away. The siting of the first two responds more to political than to economic reasons, as the natural characteristics were not favourable and the riverbeds required dredging. These river ports had serious problems for navigation, with limitations such as submerged sand producing sandbars and the riverbed clogging to an extent that was beyond the technical solutions of the day. Thus, the safety of the harbour was offset by difficulties of access.

The port of Kenitra, sited in the mouth of the river Sebou, was the preferred option of the Resident General, Marshall Lyautey. In 1914,

despite the opposition of his technical department, he launched the project to endow the city with a port to boost the commercial activity of the north of Atlantic Morocco, competing with the international port of Tangiers and that of Larache, the latter under Spanish control. The specific objective was to have a point of exit for the products from the regions of Meknes and Fez. It grew from a turnover of 6000 tonnes in 1913 to 290,000 in 1930, and ended up in second place, with 583,094 tonnes in 1956. French civil servants considered that the external port of Méhédya offered direct access to the north of Morocco, and thence to Algeria. But problems relating to access to its installations were far from solved (Eyquem 1933, p. 485). Activity in Rabat was less constant and tended to become stagnant: traffic fell from sixty-seven thousand tonnes in 1913, to around forty thousand in the following decade and rising to only ninety-two thousand tonnes in 1930.

At the same time, the need for some specialized ports located far from the city for security reasons became clear. Fedala offered the conditions needed for an auxiliary port, specialized in the traffic of hydrocarbons. The major oil companies set up there, starting with Vacuum Oil Co. In 1923, a throughput of some 440,454 tonnes of goods was registered, and since 1945, a significant amount of fishing activity has been carried out (Surleau 1957).

Further south, the ports present a very different physiognomy, with a regional sub-network connected by sea with the port of Casablanca for the exchange of goods. Growth in the volume of traffic took place much more slowly, and even stagnated. Its figures reflect a significant imbalance between exports and imports, with the latter prevailing. The movement of goods in 1956 stood at just 80,261 tonnes for El Jadida, a long way from its heyday when it was the main port on the Atlantic coast (Jmahri 2000). But once the choice was made in favour of Casablanca, the activity registered in El Jadida represented barely 4.6% of the country's total.

During the early years of the Protectorate, the southern ports played a secondary role and were not consolidated until after the Second World War. They were a long way away from railway connections, registered low levels of activity and variable levels of commercial exchanges, in line with fluctuations in harvests, mineral production and fishing. The economy served two main sectors: exports, on the one hand, and, at a slower pace, the inland market. The ports' main function was to facilitate the

exportations of raw materials and the agricultural and livestock products of their respective hinterlands.

Up until the First World War, activity in the ports of the south was similar and there was no real difference in the volume of traffic, but they evolved differently: while Saffi and Agadir made progress, thanks to the export of minerals and fishing product, Essaouira and El Jadida came to a standstill due to the competition and predominance of the "national" port of Casablanca. They continued as small infrastructures, the main activity of which was the exportation of products from the region, complemented by artisan fishing, and even incipient tourism activities. However, traffic in goods rose again at the end of the 1920s, only to slow once more to represent just 4.6% of the country's total activities, with exports prevailing over imports. It is worth pointing out that the traditional barge activity persisted, and played an important role in loading and unloading goods thanks to twenty-two units of between fifteen and forty metric tons in 1926; although activity subsequently fell back, in 1956 some fourteen barges continued operating. From 1933, a large 535 metres quay provided the installations necessary for their activities to be carried out.

Essaouira also suffered from competition from Agadir, once the latter opened up to international trade in 1920. By this time, little of its former splendour remained as it only served as a port for coastal traffics and for the exportation of local products, such as eggs or almonds. However, some modernization was undertaken in 1914, with the building of a barge port. Artisanal fishing continued, carried out by some eighty rowing boats, although the exact number of boats varied over time. The movement of goods declined progressively, standing at two per cent nationally in 1926, and in value terms, it fell from 126 million francs in 1928 to 50,000 million in 1930, just 1.95% of Moroccan traffic, and one per cent in tonnes (Hoffher 1932, p. 75).

Saffi is an interesting case given that it is the natural exit point for the hinterland of the Marrakech region, the phosphate mines of Youssoufia and other minerals, which led it to become the major mining port of the south of Morocco as of the second half of the 1930s. It exported a quarter of Morocco's production during that decade (Cherfaoui and Doghmi 2005, pp. 171–193). The discovery of the phosphate mines conditioned the transformation of the port and its infrastructures, requiring the building of a terminal dedicated solely to the export of this mineral,

which was operational as of 1937. The fish processing industry increased considerably, as was also the case in Agadir; both ports ended up specializing in this area, although Agadir was also the exit point for activities in the Souss region.

During the Protectorate, the traditional rivalry between ports observed previously continued. The modernization of Agadir in the 1930s alarmed the bourgeoisie of Essaouira, who thought their interests were at risk, and thus "a vrai guerre éclata alors entre les investiseurs souiris (de Essaouira) et gadaris (de Agadir) que finit par la victoire de ces derniers" (Roussafi et al. 2013, p. 108). Likewise, the construction of a large cereal silo in Saffi led to cereals being centralized here, to the detriment of El Jadida and Essaouira. The rivalry can be viewed as even stronger if we consider that the opening up of the French colonial ports in the Sahel (including Saint Louis and Dakar) would attract deep-sea vessels to these ports, to the detriment of Moroccan ports.

Agadir and Saffi came out ahead during this process. The construction of modern infrastructure using new techniques (including tetrapods and breakwaters) made it possible to overcome obstacles such as sandbars and endow these locations with deep-water ports that could handle the exportation of the minerals and raw materials extracted in their hinterlands. A significant characteristic of the change in port mode was the onset of modern industrial activity, focused mainly on fishing and the processing of some minerals.

Safi became the natural point of exit for the hinterland of the rich agricultural regions of Abdas and Haouz, in which Marrakech acted as the major pole of attraction. During the period, activities in the port fluctuated: at the beginning of the century, the figures relating to activities in the port were inconsequential, but increased from 26,220 tonnes in 1915 to around 104,180 tonnes in 1928, and reached 1,533,620 tonnes in 1956, thus ranking as the second biggest Moroccan port after Casablanca. This dynamism was based on the export of phosphates and other minerals and fishing products, for which it had some sixty factories in 1960. The discovery of the phosphate mines transformed the port and its infrastructure; the terminal dedicated to phosphate exports was completed in 1937. A quarter of all Moroccan phosphate production was exported through Saffi in this decade, as was fourteen per cent of all Moroccan port traffic in 1954. The volume

of exports of this raw material rose from 16,889 tonnes in 1932 to 1,067,940 tonnes in 1950.[11]

As far as Agadir is concerned, in the early twentieth century, its past splendour was but a vague memory. It had remained insignificant and was used only for coastal fishing by some five hundred fishermen using a hundred or so vessels, characteristically adorned who spoke the typical sailors' lingo from the area. Each boat was captained by an able, experienced seaman, the *raïs*. The Germans had been interested in occupying this location since the late nineteenth century, believing it to be rich in minerals; a German subject even founded the Maroc Mannesmann Company in order to exploit the raw materials found in the *arrière-pays*. In 1911, the German government sent the Panther cruise-ship to waters close to the bay, which caused a crisis with France that was resolved by the signing of a treat that same year.

Agadir was reborn under the Protectorate as the port of exit of the Souss Valley, although initially its main function was military, as it was used by the colonial groups to disembark, and as a place from which to control the territory. French troops sent to pacify the uprising in the Berber area in the south and, at the beginning of the century, a wharf was built to unload military material. However, the port was closed to traffic in order to avoid rebel action on the part of local tribes.

Once the 1911 German foray had been overcome, the port remained closed until 1817, and no access was allowed for trade purposes or to Europeans. Although building on the modern port began at that time, activities only restarted in 1920, and its renaissance can be dated to when the Resident Lucien Saint and the Makhzen announced their decision to reopen it to international trade on 9 June, 1930 (Ministère des Travaux Publics 1956b). The growth in activity was mainly due to the fact that it was the port of exit for agricultural production from the Souss valley and for fishing.

Fishing activities in the southern ports deserve a special mention, as they took place in all of them and they occupied the top positions corresponding to this type of activity in Morocco. Moreover, they generated their own industrial activity in the modern ports included in the second phase of port models. This activity was widely entrenched in almost all the ports, but Casablanca, with some fifty salting factories, is particularly

[11] Phosphate export data collected from, Les phosphates marocains. Étude Technique. commerciale et sociale. 1951. *Bulletin Economique et Social du Maroc* 50V–XIV: 403–412.

Table 4.4 Main functions of the Protectorate ports

	Commercial	*Fishing*	*Mining*	*Bunkering*
Larache	X	X		
Arcila		X		
Tangiers	X	X		
Tetuán	X	X		
Alhucemas		X		
Kenitra				
Rabat	X			
Fedala				X
Casablanca	X	X	X	
El Jadida	X	X		
Essouira	X	X		
Safi	X	X	X	
Agadir	X	X	X	
Saida				

Source Author's elaboration

noteworthy; Agadir progressed from twenty factories and the same number of salting workshops in 1940 to sixty factories and two workshops in 1953, in which the most important raw material was the sardine. Saffi, meanwhile, was the leading fishing port in 1960, with thirty canneries, employing twelve thousand people, but the development of ports further south brought about a subsequent reduction in this activity. Although the ports in the Spanish zone could not compete with the levels of activity of these ports, considerable progress was made in fishing, with seven canneries and fourteen salting factories, mainly located in the port of Alhucemas (Table 4.4).

4.3.2 Low Levels of Activity in the Northern Ports

Apart from Ceuta, Melilla and Tangiers, the ports in this area were not fit for deep-sea vessels or short-sea shipping. The Spanish Comission in Morocco did not consider any such port necessary, as Ceuta and Melilla were to be the nexus points with deep-sea vessels. This comment illustrates the port policy carried out by Spain in this territory (Spanish High Commission in Morocco 1948, pp. 493–494, 496, 497), where the military function played a fundamental role. At the same time, direct short-sea shipping with Spain was more important, with very few

connections between the local ports. So there was no real port network as such in this area (Ochoa and Benjumea 1945, pp. 16–17).

A comparison of the average total goods moved in the 1935–1941 period for the ports in this area (34.5%) with those of Ceuta and Melilla (65.5%) reveals the dominance of the latter two ports. Among the remainder, the highest level of goods transported belonged to Larache (52% of imports, 22.8% of exports), as opposed to Arcila (2.6 and 9.5%, respectively), Río Martin (21.9, 24.5%) and Alhucemas (23, 43.1%).

Tangiers stood at the head of the Tangiers-Fez railway line, with a branch to Tetuan, Larache and the major cities in the north. But its location on the edge of the continent limited the extent of its *arrière-pays*, and thus also its function as a regional port, as the connection with the Sebou basin was tricky. It also suffered from the growing competition from the Spanish port of Ceuta.

In general terms, the movement of goods in Tangiers grew slowly up until the outbreak of the Second World War, from 54,588 tonnes in 1925 to 72,182 in 1936, and suffered a considerable fall when the Spanish Civil War broke out. A significant amount of the goods shipped through Tangiers was made up of products destined for the local population. Between 1923 and 1940, an average of 91.80% of the traffic through Tangiers comprised relatively high-value imported goods, revealing its role as an importation port, both for regional cabotage and for overseas trading. On the other hand, a considerable number of passengers from Spain travelling south went via Tangiers, a choice shared by many heading for the northern towns, who disembarked there subsequently to take the train or road transport, which was cheaper and more comfortable. It thus constituted one of the main ports of entry for tourism.

We have summarized port throughput for the overall Moroccan port system in Table 4.5.

4.4 Conclusion

In response to the questions posed in the introduction, the comparison of the actions taken in the two zones yields significant results. Firstly, although we are looking at the whole territory as one, there is no getting away from the fact that overland communication between the two zones was not fluid, and neither were maritime relations.

Table 4.5 Throughput in Moroccan ports. Cargo loaded and unloaded by port in thousands of tons, 1911–1958

	Ports in the south														
Cargo loaded								*Cargo unloaded*							
	Agadir	*Casablanca*	*El Jadida*	*Essaouria*	*Fédala*	*Kenitra*	*Saffi*	*Rabat*	*Agadir*	*Casablanca*	*El Jadida*	*Essaouira*	*Fédala*	*Kenitra*	*Saffi*	*Rabat*
1911		51.5	6.7				13.3	10.1		77.7	43.4			7.0	57.7	1.3
1913		227.5				5.8	48.7			14.9					8.4	
1915		107.2	12.6		1.8	23.2	15.4	37.9		48.6	27.4		2.5	3.5	45.3	3.9
1920	–	74	32	14	2	2	39	46.1	–	254	13	8	11	44	11	2.4
1925	16	838	28	19	2	16	41	30.2	–	298	20	16	16	106	9	13.9
1930	25	1921	24	10	8	49	5	58.5	8	548	17	11	50	216	23	27.5
1935	3	1640	53	19	8	100	80	36.2	17	527	10	12	56	110	16	32.1
1940	–	1117	58	447	5	135	169		4	407	1	2	60	36	13	
1945	6	1881	4	12	14	3	420		44	1.439	16	14	170	15	71	
1950	17	4576	18	52	82	176	1102		69	1.578	–	–	277	133	22	
1955	64	5811	66	66	90	407	1386		76	2.21	–	–	231	208	28	
1958	94	6097	44	20	36	42	1725		53	1.45	–	–	233	104	23	

	Ports in the north														
Cargo loaded								Cargo unloaded							
	Tangiers	Larache		Arcila	Tetuán	Alhucemas	Nador	Tangiers	Larache	Arcila		Tetuán	Alhucemas	Nador	
1925	4							54.5							
1929	5140.8							40.8							
1930	3.2							60.2							
1935	4.3							72.1							
1936	68.7							3.8							
1935–1941 (Average)		1.94		0.20	0.81	1.89			28.59	0.55		6.45	11.90		

(continued)

Table 4.5 (continued)

	Ports in the south																	
	Cargo loaded								*Cargo unloaded*									
	Agadir	*Casab-lanca*	*El Jadida*	*Essao-uria*	*Fédala*	*Kenitra*	*Saffi*	*Rabat*	*Agadir*		*Casab-lanca*	*El Jadida*	*Essaouira*	*Fédala*	*Kenitra*	*Saffi*	*Rabat*	
1940																		
1941		1.55									16.93							
1942		26.0									1.7							
1945		37.7									4.8							
1948		103.7																
1950			6.0				0.4		9.7		15.0	22.5			0.1	7.5		
1955		138.2	5.0				0.1		8.2	5.2	49.0	24.0			0.9	15.0		1.4
1958			7.0				1.3		1.5	2.4		8.0			2.1	7.5		1.4

Source Author's elaboration from Service Central des Statistiques (1960), Eyquem (1933), Cherfaoui and Doghmi (2005), and Protectorat de la République Française au Maroc 1953

If we look specifically at port models, profound differences can be identified between the two zones. The actions of the French Protectorate had an undeniable influence on the planning and execution of what was obviously a significant port network. This happened because the political, social and economic structure that they wanted to implant needed infrastructure in order to organize communications. The ports, and particularly that of Casablanca, played a key role in this strategy; in fact, the port of Casablanca constituted an essential piece of Morocco's economic policy. By contrast, in the north, the Spanish decision to opt for sovereign ports constrained their intervention in the other ports under their Administration. At the same time, the lion's share of the investment allocated was destined to cover military costs, although it appears to be the case that in the end, this had positive effects on the local economy as demand increased.

We could also compare the evolution of the economy of the two Protectorates, in parallel to that of their ports. Economic change was much slower in the Spanish zone, although statistics are scarce in this case, but those available for some parameters at the end of the period, such as those relating to energy production, installed capacity, the number of cars or telephones, bear out this conclusion. Generally speaking, levels in the French zone were double those in its Spanish counterpart. Other elements are more categorical; for example, the Spanish zone hardly had any paved roads, "ses intallations portuaires et son industrie de transformation, étaient, par rapport à la zone française, insignifiants, si non inéxistants" (Cerych 1964, p. 193).

The port network was obviously built to serve a colonial economy, specializing in the export of raw materials and the import of manufactures. In terms of a geographical port region, it represented the provision and facilitation of maritime communications and trade. However, the ports, and in particular the larger ports, served the interests of multinational groups. Likewise, international capital benefited from the building of this infrastructure, most of which were built by business groups headquartered in the mainland colonial power.

Finally, it is worth indicating that the Protectorate ports enjoyed a modern administrative system, in some cases similar to that of the respective colonial power, but also featuring specific characteristics of local traditions, such as the way in which the labour force was sometimes handled, along local community tradition lines. In short, the aim was always to improve efficiency.

In this sense, some questions remain, for example, regarding who established the equipment programme or exactly what work was carried out, who paid for it, and which population group ended up benefitting. There is no question but that ports, roads and railways were built to transport troops on expeditions, to facilitate the export of raw materials and also because importers were interested in consumer goods. Investment continued to flow in over time, and levels even increased after the Second World War, particularly in the four-year plans that constituted part of the indicative planning policy of the time, the first of which covered the 1949–1952 period. These endeavours were clearly a response to nationalist demands, given the fear of a growing demand for independence.

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CHAPTER 5

Seaports of the Gulf of Guinea, C.1970–2018: Developments and Transformations

Edmund Chilaka and Ayodeji Olukoju

5.1 Introduction

The Gulf of Guinea stretches from Cape Palmas on the southern tip of Liberia to Cape Lopez in Gabon in a northwest–southeast arc (see Fig. 5.1). It covers a total of 2.35 million kilometres. The Gulf occupies a strategic position, a veritable chokepoint, along the sea lanes between polar ends of the Atlantic westwards towards the Americas. It comprises a western section from Liberia to Benin and an eastern section from Nigeria to Gabon. There are more than one hundred ports of various types across the region but the most significant seaports from the perspective of global shipping and maritime trade are Abidjan in Côte

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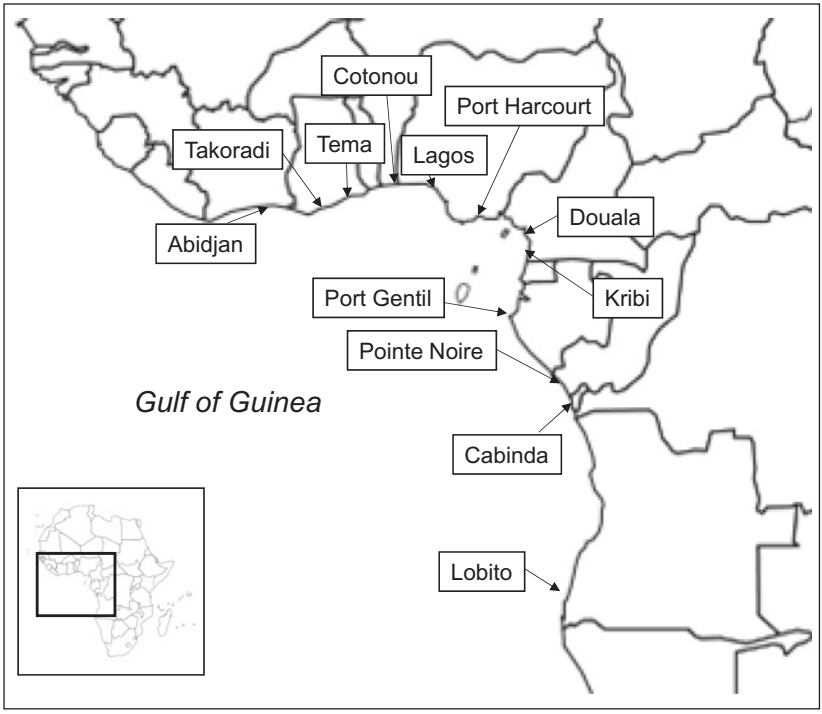

Fig. 5.1 Ports of the Gulf of Guinea (*Source* Authors' elaboration)

d'Ivoire, Tema in Ghana, Lome in Togo, Cotonou in Benin Republic, Lagos, Warri, Onne and Port Harcourt in Nigeria, Douala in Cameroon, Malabo in Equatorial Guinea and Port-Gentil in Gabon.

In 1975, the littoral states in the zone formed the Ministerial Conference of West and Central African States on Maritime Transport (MINCONMAR) which, in 1999, became the Maritime Organisation on West and Central Africa (MOWCA) or Abuja Memorandum of Understanding (Abuja MoU). Among other things, these collaborative efforts were to find solutions to the problems of poor liner shipping connectivity index and the improvement of intra-regional shipping traffic (Audigé 1995). In 1987, the World Bank in collaboration with the ECA, UNCTAD, IMO and other donors promoted the setting up of the Sub-Saharan Africa Transport Policy Programme (SSATP) which aims

to help the participating governments improve transport services efficiency through appropriate policy reforms. Furthermore, in July 2001, Angola, Congo, Gabon, Nigeria, and São Tomé and Príncipe established the Gulf of Guinea Commission by a Treaty signed in Libreville, Gabon. Cameroun and Democratic Republic of Congo joined the Commission in 2008. The Commission was instituted to transform the eastern section of the sub-region into a "Zone of Peace and Security" for peaceful and mutually beneficial development and exploitation of their natural resources, especially hydrocarbon deposits. Members pledged to adopt peaceful resolution of conflicts, not least because of overlapping maritime frontiers, and to tackle common challenges, such as unregulated fishing by foreign countries, especially Russia (Gulf of Guinea Commission 2019).

In this chapter, we analyse developments and transformations in the Gulf of Guinea seaports since 1970, with reference to their site and situation, historical development and long-term economic roles in the region. We focus on the most significant seaports in the region, highlighting the emergence of Lagos as the dominant seaport and the competition with Abidjan, Cotonou, Tema and Lome, and developments in the hinterlands of these ports. The discussion also covers the roles of state and non-state actors, domestic and global dynamics, the colonial impact, the transformation of the regional maritime sector, with reference to demographic growth and general cargo revolution, on the one hand, and subsisting maritime challenges, on the other. Nigeria receives prominent attention because it has the longest coastline, the greatest concentration of population, the biggest economy and the highest number of seaports in the Gulf of Guinea.

5.2 Historical Development and Long-Term Economic Role of West African Seaports

A striking feature of the coastline of the Gulf of Guinea is the paucity of natural harbours, given the lack of natural indentation. With the exception of Lagos in Nigeria, the ports in the Gulf are characterized by shallow draughts and narrow approach channels (White 1970). That said, the region's lagoon, surf and seaports have been significant gateways for commercial and diplomatic relations with European countries at least since the fifteenth century. Coastal communities, especially between Ghana and Nigeria, were early points of contact between indigenous

communities and various European sailors, fishermen and adventurers (Ryder 1969). As well, the rich fishing grounds of the Gulf have been exploited over the centuries by artisanal fishermen, such as the Ewe of Ghana and Togo, the Ilaje and Izon of Nigeria and the Angolar of São Tomé and Príncipe (Olukoju 2000, 2018; Chauveau et al. 2000). The region is also home to the Kru, the famed mariners of Liberia, whose port of recruitment was Freetown, Sierra Leone.

In spite of local, national and sub-regional peculiarities, many commonalities characterize the history, development and challenges of the littoral nation-states and societies of the Gulf of Guinea. Thus, the historical interactions between the seaborne traders mainly from Europe, on the one hand, and the Africans in the Gulf of Guinea, on the other, influenced socio-economic, cultural, political and religious changes in West and Central Africa subsequently (Hoyle and Hilling 1970, pp. 1–9). This relationship spanned several historical epochs since the fifteenth century, each characterized by changing export commodities—spices, slaves, vegetable oils and minerals—in which the indigenous communities of the Gulf were in a subordinate or dependency status vis-à-vis their European counterparts. The ports and the coastal communities as the gateways to the hinterlands were directly impacted by these developments, especially the trans-Atlantic slave trade, the abolition of which during the nineteenth century culminated in the establishment of European colonial regimes which instituted "legitimate" trade in cash crops and minerals.

However, no greater factor affected port development in the Gulf of Guinea than European colonialism. Britain, France, Germany and Spain, which colonized various coastal communities and their hinterlands, acquired coastal settlements from which they expanded into the hinterland territories. From the late nineteenth century, they embarked on the development of the few natural harbours and created artificial ports, notably Port Harcourt in Eastern Nigeria (Olukoju 1996a). In all cases, the ports were the lynchpins of their imperial enterprises. The emergent port cities in time developed into administrative and commercial centres, from which the reach of the imperial powers extended into the remote locations in the hinterlands. In all cases, the port cities of the region have also been the capital cities from the era of colonial rule till date (Castillo Hidalgo and Ducruet 2018). The only exception was Cameroun, with its capital in Yaounde. Côte d'Ivoire and Nigeria created new capital cities in the hinterland from the 1980s.

Railway lines and roads fanned out from the ports, having been constructed to facilitate the import and export trade of the colonies channelled through the ports to the metropolis. In spite of their skeletal services, the railways from the ports connected strategic cities, towns and economic centres, and enhanced economic life in the countryside. In French West Africa, the railway line from Abidjan, the construction of which began in 1903, got to Bouake in 1912, Ferkessedougou in 1926 and Bobo Dioulasso in 1934. The Pobe-Porto Novo line in Dahomey, which was laid between 1905 and 1913, reached Cotonou port in the late 1920s and was extended to other agricultural and mineral centres such as Save, Parakou, Segboroue, Grand Popo, Athiene and Lokosa by the mid-1930s (Thomas 1957; Olukoju 1996d, pp. 152–153). In Togo, the Germans constructed three railway lines named after the products hauled over them—cocoa, cotton, iron and palm oil—from Lome to Atakpame and Blita by 1934.

In British West Africa, railway lines were also extended from the port towns to the hinterland. In the Gold Coast (Ghana), they ran from Accra to Tarkwa and Obuasi in 1901 and 1902, respectively, and to Kumasi and Sekondi in the mid-1920s while another line connected Sekondi to Kumasi in 1903 (Olukoju 1996d, pp. 152–153). In Nigeria, the Lagos railway line whose construction began in 1896 reached Ibadan in 1901 and Kano in 1911 while the eastern network extended from Port Harcourt through Enugu to Jos by 1926 (Olukoju 1996d, pp. 152–153). All the lines were constructed to facilitate the evacuation of raw materials to Europe. They have been improved only skeletally since post-independence due to paucity of funds. Except in Côte d'Ivoire, where major investments were made in rail transport extension, only patchy changes have occurred in Nigeria or elsewhere to increase the tonnage or efficiency of rail services from the ports to the hinterland.

Another policy impact of colonialism was the establishment of colonial boundaries, which partitioned the communities of the Gulf into enclaves. These colonies did not have much formal lateral commercial relations across the imposed borders. In the same vein, the ports were positioned to compete with those in proximate colonies and the railway lines never crossed inter-imperial boundaries. The colonial boundaries also affected the seaports by balkanizing their hinterlands. Thus, the Nigeria-Cameroon boundary, especially since the 1961 Plebiscite which took Southern Cameroun out of Nigeria, separated the port of

Calabar from its natural hinterland. This, coupled with its locational (Ogundana 1971) and logistical challenges—vis-à-vis Port Harcourt, which has rail and road links that Calabar lacked—consigned it to insignificance in the national and regional port hierarchy (Akintoye et al. 2014, pp. 10–11). In the same vein, the ports of Gabon, especially Port-Gentil, are cut off from a proximate hinterland in the Republic of Congo. Thus, the Sangha region in northern Congo is closer to Gabonese ports than to the Congolese port of Pointe Noire. All that was needed was a hundred-kilometre railway line to connect Franceville in Gabon and its natural hinterland in the Congo (Assey Mbang 2013, pp. 2159–2160). It is significant that, unlike other former colonial territories, Gabon's first railway line was constructed in the 1970s and 1980s.

To be fair, port development up to the 1970s was also affected by other dynamics, such as global warfare or civil wars, and economic dynamics, such as boom and depression. During the two World Wars (1914–1918, 1939–1945) and the Nigerian civil war (1967–1970), as well as the interwar global economic depression, the state of insecurity and decline in commercial activities had a negative impact on foreign trade through the ports of West and Central Africa. Conversely, the brief economic boom that followed the two world wars (1918–1920 and 1945–1950) was reflected in the volume of traffic handled by these ports (Olukoju 1992a, 2004b). This phenomenon has been aptly captured in Ogundana's construct of oscillation between port concentration (in adversity) and diffusion (in boom time) (Ogundana 1970).

Another major dynamic in the evolution of West and Central African ports was steam shipping (Leubuscher 1963; Davies 2000). Its development from the mid-nineteenth century riveted the Gulf of Guinea ports to the metropolitan ports and economies of their imperial overlords. It also boosted trade by reducing the length of voyages and facilitating the movement of merchandise and colonial officials in war and peacetime. As the shipping lines docked at the various ports, the sailors left varying impact on the port cities. The Kru left their imprint on the musical scene ("Krubass" and "palm wine" or "sea breeze" music), and the demographic, social and cultural landscape of coastal West Africa, especially Liberia, Ghana and Nigeria (Olukoju 2006, p. 140).

Port development during the period 1850–1970 took place in two dispensations: colonialism and independence. As indicated above, most of the ports were lagoon and surf ports, which required substantial investment in capital and port engineering to upgrade them for

international trade. Hence, it was imperative to continuously improve them by dredging, modern wharf construction, protection from the Atlantic swells, hardening of their quay walls, building warehouses and sheds, modernizing cargo handling equipment and updating customs procedures to speed up cargo release (Ogundana 1970, 1976). This was the case of Douala, Cameroun's leading port, an estuary port, fifty kilometres from the sea, that had to be constantly dredged "every year in order for even moderately large ships to dock. Many ships cannot enter at all, which means they have to anchor offshore while their contents are ferried to the Port" (Fisken 2013, p. 4). This necessitated the construction of a deep seaport at Kribi, which was designed to achieve regional development in the tradition of "developer ports". It is also projected to be "a hub of trade for the entire region, and will also serve Chad and the Central African Republic", each of which has a terminal at Douala port (Fisken 2013, p. 5).

Although this development was synchronous throughout the Gulf zone, the pace was uneven due to differences in colonial policy thrust and resource endowment. Consequently, a number of ports became dominant within the national and regional hierarchies even during the colonial period. In spite of the investment in port and harbour works, it has been observed that the colonial port "system was set up with marginal investments, in order to maximize profits. Therefore, after the colonial period the region was left with only a number of small ports with weak facilities" (Boermann 2015, p. 12, citing Debrie 2012).

The independence era did not witness significant changes in the port system up to the 1970s. The physical development of each port system continued, more or less, in line with the colonial principles of hydrographic feasibility, traffic demand and availability of financial resources (Hoyle and Hilling 1970, pp. 1–9). Aside from the Sierra Leonean natural port at Freetown, the major ports in the Gulf, being lagoon and river ports, relied on periodic dredging to maintain navigable draughts year-round for oceangoing shipping (Olukoju 1992a, 2014). Uniform features of cargo handling in these ports reflect certain fundamental characteristics of their domestic economies. The colonial-era orientation of their export and import trade via the world market largely remained: agricultural raw materials, forest products and minerals continued to be exchanged for manufactured consumer goods. However, a new development was the export of semi-processed products such as aluminium ingots from Tema,

Table 5.1 Gulf of Guinea Ports Throughput Volumes by countries, 1970–2015 (metric tonnes)

Year	*Ivory Coast*	*Ghana*	*Togo*	*Benin*	*Nigeria*	*Cameroon*
1970	5,080,691	4,514,000	326.3	559	3,416,000	1,820,000
1980	11,213,142	N.A.	2,621,746	952.999	N.A.	3,366,745
1990	11,190,031	5,037,396	1,990,009	1,119,174	6,390,773	3,790,622
2000	13,520,000	6,139,191	2,080,338	2,968,048	22,054,000	N.A.
2010	23,632,000	4,852,535	8,005,904	6,960,000	N.A.	7,665,191
2015	N.A.	16,768,744	15,413,487	8,177,779	64,180,084	N.A.

Source Authors' elaboration of data collected from Afriports dataset. See Annex in Chapter 3

steel billets from Warri, fertilizer and chemicals from Onne, and cocoa butter from San Pedro, Tema and Apapa (Chilaka 2015b, p. 107).

Crude oil was exported by almost all the Gulf of Guinea countries, except Togo and Benin Republic, whose export and import trades in crude and refined petroleum products were sourced for re-export to third parties (Workman 2018; see Table 5.1). Gems and rare minerals, such as gold, diamond, uranium, manganese and precious metals, were exported by Ghana, Côte d'Ivoire, Togo and Gabon, while smaller quantities of associated minerals continued to be exported by all the countries in the Gulf. Even so, their total combined throughput remained a small proportion of global trade.

5.3 Developments in the Ports Sector Since 1970

A major development in 1970, the starting point in the discussion in this section, was the cessation of the Nigerian civil war. Given the exigencies of the war, a policy of port concentration prevailed in Nigeria. However, post-war developments, including the programme of reconstruction and the massive growth of crude oil exports, affected the fortunes of Lagos, the leading port. The 1970s also witnessed the global oil crisis, which enriched Nigeria as a major oil-exporting country while also making it an import-dependent and mono-cultural economy (over-dependent on a single major export—crude oil). While unprecedented oil revenues expanded the Nigerian economy, it also fuelled massive importation, especially of cement for post-war reconstruction, and to satisfy the culture of conspicuous consumption as well as official graft that accompanied the sudden wealth (Chilaka 2017).

For the port sector, the massive importation of cement overstretched the limited port capacity, causing both ship and cargo congestion in Lagos. Consequently, the Nigerian government resorted to operating more ports outside Apapa (Dickinson 1984). Tin Can Island port was hastily constructed in 1976 to relieve the "cement armada" congestion at Apapa. However, it has no rail network connection till date despite the existence of active container, Ro-Ro, break bulk and bulk terminals on site. The ship and port congestion in Nigeria had a spillover effect on neighbouring countries, especially Ghana, whose ports relieved the overburdened port of Apapa, Lagos. It is significant to stress that even in the post-1970 era, the entire West and Central African region remained marginal in the global economy. Between 1970 and 1992, the African continent accounted for an average of nine per cent of the throughput of the world's seaports. In 1992, "West African countries accounted for about thirty percent of all goods handled in African ports, thirty percent of crude oil and oil products, and twenty-nine percent of dry goods" (Audigé 1995, p. 6).

Another development with knock-on significance for the port industry of the Gulf of Guinea was the 60,000-km UNECA-sponsored Trans-African Highway Project started in 1971 (Hall 2018). Originally designed to enhance port-hinterland transportation networking, its implementation has been stalled by pervasive political instability, which interrupted the steady progress of its construction, and funding constraints. Thus, although the Gulf of Guinea hinterland was amply covered by the planned nine highways running through the "major trading cities" of Africa, the facility was yet to be completed forty-eight years later. This compounded the problems of cross-national road journeys which were historically characterized by difficult customs and immigrations procedures, bureaucratic border-crossing processes as well as bad roads. Yet, substantial donor capital continued to flow into transportation infrastructure development to stimulate more employment, reduce poverty levels and improve living standards for economies deemed to have suffered much "colonial disarticulation" (Ake 1981, p. 43). In March 2014, for example, after the Presidents of Nigeria, Benin, Togo, Ghana and Côte d'Ivoire signed a treaty to establish the 1080 km Abidjan-Lagos Corridor Highway, the European Union (EU) and the African Development Bank contributed $22.7 m to facilitate the contract for feasibility preparations made up of socio-economic, environmental impact assessment and detailed engineering design studies (Asu

2019). According to the EU's justification for the project, "[t]he stakes for the region are high, as this corridor links five West African countries, connecting the main ports of the region and two railway lines. It also connects several North-South corridors, as well as serving directly four further countries in the hinterland" (Asu 2019). In addition to direct benefits for 40 million people living along the corridor, the highway improves connectivity for transhipment services to landlocked Burkina Faso, Mali and Niger Republic, further improving integration prospects.

That said, there was incremental growth in the pattern of Gulf of Guinea exports and imports, expressed in throughput volumes for selected years between 1970 and 2015 (Table 5.1). One of the implications of this tendency was the general lack of advanced port infrastructure installations or modern cargo handling facilities such as rubber tyre gantry cranes (RTGC) unlike European, Asian and North American ports. Since containerization was lightly needed for agricultural or commodity exports, and imports of heavy industrial goods and machinery were low, the profile of port development or modernization here tended to be primary, rudimentary or forced by exigencies such as port congestion.

A second major development was in the shipping sector, which impacted the world's ports. The most significant changes in this sector were the phenomenal increase in the size of ships; the onset and dramatic rise in volume of containerization; and the spectacular increase in the size of shipping firms. Advances in shipbuilding technology had led to the construction of bigger ships, which, combined with containerization, changed the mode of port-working and put pressure on the traditional ports. This led to the creation of container ports across West and Central Africa, heightening competition within and across national boundaries. The rise of mega firms in the shipping sector through mergers and acquisitions has altered the balance of power in the ports-shipping sector as they gained advantage over the other stakeholders, national governments and shippers, in the decision-making process. "[T]he position of port authorities", it has been observed on a global scale, "seems to weaken because of the growing decisional-power of large multinationals such as the maritime companies and the terminal operators" (Boermann 2015, p. 11, citing Sánchez and Wilmsmeier 2010). This is no less true in the case of the Gulf of Guinea ports in the era of port concession.

The post-1970 era in port development in the Gulf of Guinea witnessed the changes in port administration in response to the pressure

of economic recession, necessitating the introduction of Structural Adjustment Policies (SAP) from the mid-1980s onwards. Port administration had been under state control since the colonial period. This was dictated by the investment of colonial governments in port engineering works and the imperative of coordination of transport policy, all in the imperial interest. Port administration in Nigeria, for example, was bedevilled by the multiplicity of authorities—port engineering and harbour works, customs, railway and marine—which jostled for control, and the duality of control by the government and big firms. This necessitated the establishment of the Nigerian Ports Authority to harmonize competing interests and authorities (Olukoju 1992b). Yet, port administration has remained problematic till date, not least because of the complexity of customs clearance, the multiplicity of government agencies at the ports, very poor port-hinterland transport links and a deep-seated culture of graft (Olukoju 1996b). Like Nigerian ports, the Camerounian port of Douala has been described as "one of the least efficient of the region", in terms of port-working (World Bank 2015). Cargo dwell time for containerized imports in the port has exceeded twenty days in the past decade (Refas and Cantens 2011, p. 27). In addition, corruption is so rampant in Douala, like Nigerian ports, that the landlocked countries of Chad and Central African Republic have threatened to seek alternative outlets (Kindzeka 2019).

Domestic political developments also affected the fortunes of ports in the region. Insecurity occasioned by civil wars in Liberia and Sierra Leone in the late 1980s and early 1990s, as well as political and policy instability also affected the fortunes of ports in the region. Protracted political crisis in Côte d'Ivoire in 2002 diverted traffic meant for Abidjan to Ghana, Togo and Benin (Harding et al. 2007, p. 24). The country's election-related civil war of 2011 affected both the world's largest cocoa exporting port, San Pedro, when it was captured by the opposition forces, as well as the main port, Abidjan. Operations in both ports were consequently temporarily disrupted. The cessation of mining at Marampa between 1975 and 1983 effectively shut down Pepel, Sierra Leone's iron ore-exporting port. The port was reopened in 1983 when mining resumed at Marampa (Hoyle and Hilling 1984, p. 7).

Overall, port development policies in the Gulf of Guinea varied widely according to politics and geography. In some instances, national governments in the region undertook port development as spearheads of regional development. Such projects have been identified elsewhere

as "developer ports" (Olukoju 1996a, 2004a, 2020). For example, Abidjan port was designed to concentrate industrial activities spatially into a growth pole for the country's large industries and firms. In the same vein, San Pedro was opened in 1971 with the aim of fostering the development of south-western Côte d'Ivoire, which had suffered neglect under French colonial rule, compared to the Abidjan-Bouake region (Hoyle 1981, p. 293). On the other hand, Nigeria operated an eight-port system clustered around the Lower River Niger. However, majority of the non-oil large firms preferred to operate in Lagos for proximity to effective shipping facilities for receiving imported chemicals, machineries and spares. The ports of the Niger Delta flourished during the 1970s to 1990s mainly to service the oil wells, crude oil loading jetties, and the construction of petrochemical and fertilizer complexes. From the 1980s, the decline in lumber, rubber and cocoa exports affected Sapele, Koko and Burutu ports in Nigeria; Sassandra in Côte d'Ivoire; Sekondi and Accra in Ghana; and Kribi in Cameroon, while the fading trade in palm oil and palm kernel took a toll on the minor ports of Abonnema, Akassa and Opobo in the Niger Delta. In the present era of containerization and cargo unitization, such ports dealing in break bulk cargoes increasingly face irreversible decline.

5.4 Regional Competition, Hinterland Development and the Transformation of the Regional Maritime Sector

From the late 1990s, domestic and global dynamics have fuelled keen inter-port competition within and across national lines in the Gulf of Guinea. As stated above, the flow of export and import cargoes, for the most part, tended to follow the linkages established during the colonial period. This is in spite of the rise of China and the spike in exports to Asian countries, especially China and, to a lesser extent, India. Thus, throughput records for 2016 and 2017 show that, with the exception of Togo and Benin Republic, where exports to the former colonial powers were low (5.2% and 9% respectively), European countries remained the dominant destinations of West and Central African exports as follows: Côte d'Ivoire (30.5%), Ghana (31%), Nigeria (43.9%), Cameroon (54.5%) and Angola (25.3%) (see Table 5.2). Asian countries' share of Gulf of Guinea exports was highest for Angola (61.3%) and Benin

Table 5.2 Typical Distribution of Major Exports and Imports in the Gulf of Guinea Countries, 2016–2017

	Export products	*Importers*	*Total income*	*Imports*	*Expend*
1	Cote d'Ivoire (Port of Abidjan and San Pedro Port) /Country's population: 24.3 m				
	Cocoa, 38.7%; Mineral fuels including oil, 15.9%; Fruits, nuts, 11.7%; Gems, precious metals, 6.8%; Rubber, rubber articles, 6.4%; Others: Cotton, Perfumes & cosmetics, fats and oils, Plastics, Coffee, tea, spices	Netherlands, 11.5%; USA, 9.1%; Vietnam, 6.8%; Germany, 6.3%; France, 5.4%; Burkina Faso, 5.2%; Others: Mali, India, Malaysia, Belgium, Switzerland and Ghana	$11.8 b	Fuel, capital equipment, foodstuffs	$8.6 b
2	Ghana (Tema Port and Takoradi Port) (2017) /Country's population: 29.6 m				
	Gems, precious metals, 34.4%;	(2016 data)	$10.2 b	Non-crude oil, Vehicles, Fabrics, Cane sugar, Medicines, Food supplies	$13.1 b
	Mineral fuels including oil, 25.4%; Cocoa, 24.4%; Ores, slag, ash, 3.8%; Others: Fruits, nuts, Wood, Meat/seafood preparations, fats, oils, waxes, Aluminum, Rubber, rubber articles	Asian countries $5.2 billion or 48.6%, European countries (31%),			
		African countries 16.3%, North America 2.2%			

(continued)

Table 5.2 (continued)

	Export products	*Importers*	*Total income*	*Imports*	*Expend*
3	Togo (Port of Lome) /Country's population: 7.6 m				
	Salt, sulphur, stone, cement, 22.2%; Plastics, plastic articles,10.9%; Cotton, 9.9%; Perfumes, cosmetics, 7.2%; Beverages, spirits, vinegar, 6.9%; Vehicles, 5.7%; Others: Gems, precious metals, fats, oils, waxes, Dairy, eggs, honey, Feathers, artificial flowers, and hair	African countries $514 million or 68.6%,	$749.3 m	Petroleum oils,	$1.62 b
		Asian countries 20.8% Europe 5.2% Oceania 3.2% (mostly Australia) North America 2.2%		Other products, Motorcycles Palm oil (excl. crude, Automobiles	
4	Republic of Benin (Port of Cotonou) /Country population: 11.4 m				
	Cotton, 49%; Fruits, nuts, 13%; fats, oils, waxes, 5.9%; Oil seeds, 4.5%; Others: Machinery including computers, Meat, Gems, precious metals, Salt, sulphur, stone, cement, Mineral fuels including oil, and Iron and Steel	Asian countries (62.6%) African countries 25.2%	$731.6 m	Foodstuffs, capital goods, petroleum products	$2.78 b
		European countries 9% North American countries 3.1%			

(continued)

Table 5.2 (continued)

	Export products	*Importers*	*Total income*	*Imports*	*Expend*
5	Nigeria (Lagos Ports and Niger Delta Ports) /Country Population: 190 m				
	Mineral fuels including oil, 94.1%; Ships, boats, 2.4%; Others: Cocoa, 0.6%; Oil seeds, 0.5%; Fruits, nuts, 0.4%; Fertilizers, 0.3%; Tobacco, manufactured substitutes, 0.2%; Raw hides, skins not furskins, leather, 0.2%; Aluminum, 0.1%; Plastics, plastic articles, 0.1%	European countries (43.9%),	$52.9 b	Machinery, heavy equipment, consumer goods, and food products	$42.1 b
		Asia countries 27.7%, North America 13.2%, African countries 9.2%, Latin American countries 4.9%, Oceania 0.4%.			
5	Cameroon (Port of Douala) /Country Population: 25 m				
	Mineral fuels including oil, 41.3%;	European countries 54.5%	$3.6 b	Cereals, fish, capital equipment, fuel, food and electrical equipment	$4.3 b
	Cocoa, 18%; Wood, 17%; Fruits, nuts, 9.1%; Aluminum, 3.7%;	Asian countries 23.6%			
	Cotton, 2.5%; Others: Rubber, Coffee, tea, spices, Electrical machinery, equipment, computers.	African countries 17.1%			
		North American countries 4.7%			

(continued)

Table 5.2 (continued)

	Export products	*Importers*	*Total income*	*Imports*	*Expend*
6	Gabon (Port Gentil) /Country Population: Petroleum products (80 percent of total exports), manganese, uranium and timber	USA, Netherlands, China and Malaysia	$4.89 b	Machinery, construction materials, cereals and other foodstuffs	$2.1 b

Source Authors' elaboration from World's Top Exports and Imports, various websites

(62.6%), while Ghana (48.6%), Nigeria (27.7%) and Cameroon (23.6%) showed a rising trend (see also Table 5.2).

"In recent years", it has been noted:

> West Africa's oil and mineral exports have increased incomes across West Africa, driving container volumes of consumer goods to some of the region's ports. As a result, Asia has surpassed Europe as West Africa's main trading partner; during 2005–14 there was a five-fold increase in the total capacity of containers from West Africa to Asia. (Streatfeild 2018)

Conversely, bilateral inter-port traffic was comparatively smaller, if not negligible, within the Gulf of Guinea ports, except for Togo and Benin Republic, where exports to African countries were 68.6% and 25.2% respectively. In fact, the joke that Cotonou was the busiest port in Nigeria arose from the near-total re-export of most of Benin Republic's imports to Nigeria through her land borders (Akinola 2019). Exports to African countries as proportion of total exports stood at Côte d'Ivoire 13%, Ghana 16.3%, Nigeria 9.2%, Cameroun 17.1%, and Angola 4.2%. Thus, paradoxically, whereas international shipping agencies such as iContainers USA Inc. quoted the freight rate for one 20-ft container and one 40-ft container from New York to Apapa at $1180 and $1450 respectively, they had no service nor similar quotes for shipping the same containers from Lagos to Tema, Abidjan or any other Gulf of Guinea port (Spot quotation from https://www.icontainers.com/).

Industry sources said that the available option for such a shipment was cross-border road haulage (Interview with Azubuike Ikemefuna, June 2019). The lack of bilateral shipping amongst the African countries meant that the foreign lines did not have shipping programmes for inter-port trading within the Gulf of Guinea. Such orders, if received, would first be transferred to their hubs at Algeciras, Durban or Rotterdam, for routing to the consignee's destination in West and Central Africa. Maersk Line's proposed hub at Tema could change the story and lower the rates for intra-regional shipments.

A major development in the ports sector of the Gulf of Guinea has been the abandonment by the national governments of the comprehensive port model for the landlord model of port operation. Governments ended the practice of building and running the seaports and resorted to auctioning long-term port concessions to international port operators, some on build, operate and transfer (BOT) agreements. This has resulted in the installation of the most modern equipment and automation systems

Table 5.3 Port Concessions in West Africa, 2004–2011

Ports	*Terminal Operators*	*Terms of Concession*
Dakar	Dubai Worldwide Ports	2008 (25-year concession)
Conakry	Bolloré	2011 (25-year concession)
Abidjan	Bolloré/AP Möller (Maersk)	2004 (15-year concession)
Tema	Bolloré/AP Möller (Maersk)	2007 (20-year concession)
Lome	MSC/GETMA	2009 (35-year concession)
Cotonou	Bolloré	2009 (25-year concession)
Lagos (Tin Can)	Bolloré	2005 (20-year concession)
Lagos (Apapa)	AP Möller (Maersk)	2005 (25-year concession)
Monrovia	AP Möller (Maersk)	2010 (25-year concession)

Source Authors' elaboration adapted from Debrie (2012), figure 2

in the Gulf ports (Rogers 2017). Consequently, the major European multinational terminal operating companies, the Bolloré Group, Mediterranean Shipping Company and AP Moller Terminals, dominate the port concessions of the region. The terminal concessions instituted in West Africa between 2004 and 2011 are presented below (Table 5.3).

Thus, in the absence of bilateral shipping, competition amongst the Gulf of Guinea ports for trade with North and South America, Europe and Asia was keen. However, Lagos and Abidjan captured the highest volumes of port traffic based on natural advantages and historical factors, such as large hinterland populations and the oil and gas industry (Nigeria), yet unbundled colonial trading networks and natural resources (Côte d'Ivoire), or perceived better administrative environment for regional cargo consolidation, logistics and networking (Ghana and Togo). Côte d'Ivoire had an edge in its considerable railway network which supported both national and transhipment cargo deliveries: 60% of Ivorian industries and factories were originally accommodated within the large Abidjan port precincts constructed in 1950. However, the top candidate for regional hub port status, Lagos, had a challenge with railing or trucking cargo to the hinterland.

The comparative advantages and shortcomings of West African seaports were demonstrated in a 2015 study of Tema, Abidjan and Lagos under the rubrics of container throughput; efficiency; infrastructure; political stability; location/hinterland and potential classification (Boermann 2015, p. 28, Table 13). In terms of container throughput,

Nigeria was overwhelmingly superior with a figure of 1.5 m TEUs, compared to 800, 000 TEU for Tema and 600,000 TEUs for Abidjan. But, while the two others were rated "very good" for efficiency, Lagos was merely "sufficient". The disparity in infrastructure was startling. Tema had "poor, bad hinterland connectivity", lacked rail access and could not receive the largest vessels. Abidjan's infrastructure was rated "good" though this was tempered by congestion in the port. Its greatest attribute was rail service to the hinterland. Conversely, Lagos' edge in its "very large terminal capacity" coupled with road and rail access was negated by the inability of the port to receive the largest vessels and the poor state of its rail and road transport access. Tema was rated "good" for political stability and Lagos "bad". Abidjan was rated "good" with "a moderate risk". The three ports scored well for "strategic location" in relation to the hinterland, with Tema having the least distance. Nigeria had an edge with "high connectivity to global shipping network." Consequently, both Lagos and Abidjan were classified as "global pivot" and Tema as "regional port".

The throughput of the Port of Abidjan in 2013 was 21.5 m tons while San Pedro, the second Ivorian port recorded 1.4 m tons, inclusive of transhipment to its deep hinterland stretching to Niger and Burkina Faso by rail (Castillo Hidalgo 2020). In contrast, Apapa port in Lagos and Port Harcourt in the Niger Delta were connected to the hinterland within Nigeria by road and rail, and by road across the northern borders. Of the two rail lines, the one from Lagos was skeletally used. Tin Can Island port has no rail network connection despite the existence of active container, Ro-Ro, break bulk and bulk terminals on site with a throughput of 17.5 million tonnes in 2014 (NPA 2016). Consequently, the port-hinterland road access for the two Lagos ports, the busiest in the country, succumbed to the burden of trucking the combined 34.7 million tons throughput in 2017. The ensuing traffic gridlock at Apapa and environs defied all the quick fixes by the government and frustrated inland cargo deliveries (Chilaka 2019b). Otherwise, the Lagos port system handled substantial transhipment for the landlocked countries of Niger, Mali and Chad up to the 1980s.

Seaports of the eastern marches of the Gulf in Cameroun and Gabon lagged behind those of the western section profiled above. For example, Gabon's container throughput rose from a low figure of 132,348 TEUs in 2009 to 518,000 in 2016 and 550,000 in December 2017 (UNCTAD 2017, p. 17). This modest showing is understandable given

the small size of the population and the economy in spite of crude oil revenues. Moreover, inland transport facilities are rudimentary, exemplified by lack of road connection, until recently, between the two biggest cities of Libreville and Port-Gentil. The ports of Owendo and Port-Gentil handle eighty per cent of Gabon's external trade: Owendo handles the import trade while Port-Gentil is the outlet for the country's exports, mainly hydrocarbons. Owendo is the most important commercial port, handling 75% of commercial exports but it has only a draught of 11 metres. Since 2007, the port has been under a 20-year concession by Société des Terminaux de Conteneurs de Gabon (STCG), a joint venture between Bolloré Africa Logistics and Necotrans Gabon, and the Gabon Ports and Harbour Authority (Oxford Business Group 2014).

One of the reasons for the continuity in the colonial-era pattern of exports and imports was the failure of state-led industrialization efforts. Agricultural productivity in much of Africa was largely by unskilled labour. Although Nigeria's Third National Development Plan promised to upgrade primary products before they were exported, mechanization efforts and large-scale farming programmes such as "Operation Feed the Nation" and Green Revolution failed to break new grounds for increased agricultural exports. Most of the Gulf of Guinea countries shared the same fate. In fact, the Nigerian national carrier, the Nigerian National Shipping Line (NNSL), experienced the effect of the "oil curse" in the decline of agricultural produce cargoes "[f]rom an export peak of 600,000 tonnes UK/Nigeria annually in 1968 [to] … less than 100,000 tonnes per annum [in 1985]" (Chilaka 2015b, p. 107). Even the projected high job figures from the agricultural sector, the mainstay of Nigeria's largely rural economy, were not sustained. Instead, thousands of job-seeking youths were lured to the cities by expectations of blue- and white-collar jobs.

Youth employment and seaport throughput were rather boosted by the recourse to import substitution industrialization (ISI) embarked upon by African governments from the 1960s. In Nigeria, the military governments of the mid-1960s to the late-1970s sought to diversify the economy by establishing light industries, such as vehicle assembly plants: Peugeot (Kaduna), Volkswagen (Lagos), Steyr (Bauchi), Mercedes Benz (Enugu); start-up steel manufacturing ventures at Aladja and Ajaokuta, and steel rolling mills at Jos, Oshogbo and Katsina; the Aluminum Smelter Company at Ikot Abasi; newsprint manufacturing at Oku Iboku; and paper manufacturing at Iwopin. These industries were evenly spread

across Nigeria, and they employed thousands of Nigerians in skilled, semi-skilled and unskilled jobs. However, the quantity of their output expected to flow through the ports as exports was negligible. The ISI scheme failed to ramify as sustained industrialization projects as in the advanced economies.

Nevertheless, the process of their establishment, construction and operation resulted in huge volumes of cargo shipments for the Nigerian National Shipping Line (NNSL), which positively affected the hinterland economies. For example, the NNSL shipped 10,000 laden containers of completely knocked-down (CKD) Peugeot parts during the 1980s. A loaded NNSL vessel sailed from the port of Rouen in France to Lagos every week (Chilaka 2015b, p. 107). This generated rail freight for the Nigerian Railway Corporation: 400 laden and 400 empty containers were railed to and from Lagos and Kaduna, respectively, every week. Furthermore, NNSL also carried substantial project cargoes for Ajaokuta Steel Rolling Mill from the former Russian Baltic port of Tallin to Warri, in a programme called the "Russian Run" which involved 434,073 tons in total from 1980 to 1983 (Chilaka 2015b, p. 107).

Like Nigeria, Ghana also embarked on state-led ISI by establishing light industries, from which the Black Star Line (BSL) benefitted by shipping cargoes. From 1957 up to the 1980s, the BSL freighted Ghana's project cargoes, including those for the construction of the Akosombo Dam and monthly shipments of 9000–12,000 tons of aluminium ingots from Tema to Rotterdam on behalf of Valco/Kaiser Aluminium (Interview with Kwasi Misa, October 2012). All Gulf of Guinea ports experienced similar cargo throughputs composed generally of the traditional imports and exports augmented intermittently by spikes in the traffic generated by state-led industrialization projects.

5.5 Containerization and Competition for Hub Port Status

The Lagos port system has been dominant in West and Central Africa since the late nineteenth century. Indeed, by the 1880s, Lagos earned the appellation of "Liverpool" of West Africa (Olukoju 2004b). In Nigeria itself, the pre-eminence of Apapa port in the early 1920s vis-à-vis the Niger Delta ports was facilitated by the opening of the Lagos-Kano railway line by 1914. This was after concerted effort by

Lord Lugard and other colonial rulers of Northern Nigeria to achieve a Kano-Baro-Forcados multi-modal line was frustrated by the poor draught of the Niger up to Baro (Olukoju 1996c). In practical terms, many factories and large firms chose to be in Lagos for easier and quicker access to the port through which their imports of chemicals, machines and industrial raw materials were delivered. Lagos also benefitted from its status as Nigeria's capital city till 1991, as well as its emergence by the late 1990s as a mega city with population in excess of 15 million and an economy ranked fifth in Africa. Moreover, with Lagos entrenched as Nigeria's premier port, its pre-eminence in West and Central Africa was sealed by access to a widening hinterland which extended to Nigeria's land-locked neighbours, Chad, Niger, Mali and Burkina Faso. The latter were served through trans-shipment for which there were dedicated berths and sheds at Apapa port up till the 1980s when Lome, Cotonou, Tema and Abidjan overtook the former partly through smarter customs procedures, cargo tracking haulage logistics and faster delivery times.

The second commercial head of Nigeria's seaport system at Port Harcourt also faced road and rail transport challenges as well as the non-development of its container market over the years. Its 2016 throughput of 23.5 m tons was composed largely of crude oil export cargoes which amounted to 21.8 m tons. The Federal Ocean Terminal and the Federal Lighter Terminal at Onne, mainly concerned with oil- and gas-related cargoes, serve the niche oil industry exclusively. The old Abonnema Wharf berths, presently demarcated into concessions under private terminal operators, handle bulk cement and general cargo packets while the coal and bulk vegetable oil berths have been converted to other uses.

Since the 1990s, fierce competition promoted by national and global forces has ensued in the Gulf of Guinea for regional port status. The dynamics involved in this regional competition, already noted above, are the rise of containerization (Tetteh et al. 2016), the massive increase in ship sizes, the emergence of mega shipping firms, and the changes in port management regimes, notably, concessioning. The container traffic in the region has risen significantly since 1970. In the West African section of the Gulf of Guinea, Abidjan, Tema and Lagos commanded over 90% of the traffic, with Lagos alone responsible for not less than 65% of the shipping movements (see Table 5.1).

Though Takoradi and Tema handled modest throughputs of 13.4 m tons and 4.7 m tons in 2015 and 2016, respectively, Ghana's perceived

geo-strategic positioning and high ease-of-doing-business rating appear to have given them a head start over other regional rivals to be considered as a logistic hub by Maersk Line. Although Nigeria accounted for over 65% of West Africa's export and import trade, she, nevertheless, suffered a high level of smuggling, especially through porous land borders with Togo, Benin Republic, Niger and Cameroon. In 2014, 2015 and January–September 2016, for example, the average number of anti-smuggling seizures made by the Nigerian Customs Services was 5724 with a total duty-paid value of N22.3 billion (Elusoji 2017).

Moreover, the effects of containerization in the region are peculiar. Whereas the north and south poles of the continent have hub ports maintained by the mega carriers (Algeciras in Spain, Tangier Med in Morocco and Durban in South Africa), the Gulf of Guinea has had no established box hubs. This is probably due to lack of well-equipped large ports with up-to-date facilities for mega ships carrying 6000 TEUs and above, historically low traffic volumes, and insufficient modal transport infrastructures for port-hinterland communication (World Bank 2016). However, with the wave of private terminal concessions which have swept the Gulf ports and the rising profile of containerized cargoes since the new millennium, moves were recently fast-tracked to upgrade port facilities for the hub port competition. To this end, a reported $1 b investment in Tema port by APM Terminals and its partners, Meridian Ports Services (MPS), Bollore Africa Logistics and Ghana Ports and Harbours Authority meant that the country had subsequently been selected as Maersk's hub for West Africa. Accordingly, seven ship-to-shore and twenty rubber tyre gantry cranes had been delivered to Tema port for inauguration in June 2019 and the access channel dredged to prepare two deep-water berths capable of receiving Super Post Panamax container ships. This special upgrade has seen the highest ever level of port development in West Africa. The components of the project are detailed as follows:

> [t]he 7 new Super Post Panamax ship-to-shore cranes are not only some of the largest Ship-to-Shore cranes in the world, but also amongst the most advanced. Standing at a towering height of 89 meters, and 134 meters high with the boom raised, this is equivalent to (a) 40-50 story building. They offer a 50.8 m lift height (above rail) and a 66-meter outreach capable of handling containers on board vessels up to 23 rows, and over 10 on deck. They have a maximum lift of 65 Ton (Twin Lift). The Port has

> also taken delivery of a fleet of 20 eRTG (Electric Rubber Tyre Gantries) capable of stacking containers 7 wide and 1 over high in the container yards. (Fischer 2019)

Naturally, such a leap in macro-economic development generated other community benefits. Maersk Line boasted that the new port investment would generate 5000 jobs to the Ghana economy and aid Ghanaian companies to do better business in the country and surrounding localities.

With the array of proposed deep-sea and deep-water port developments in Lagos, her chance to be selected as a hub could materialize with CMA CGM which signed a memorandum of agreement in April 2019 to operate a container terminal at the Lekki deep-sea port when completed in 2020 (Lucas 2019). Undoubtedly, this decision and other sequels would affect future cargo flow patterns and long-term shipping viability strategies in the region since Nigeria is the major destination of most goods handled there, the Maersk investment plan in Tema notwithstanding. The spate of container terminal concessions in the region indicates an intensification of the trend probably spurred by the huge success of the 16 m-draught Lome deep-water port completed in 2015, which took over the lead in container throughput growth from Lagos in 2016 (Juhel 2017; Streatfeild 2018). The list of deep-sea and deep-water ports in the region include Takoradi (16 m); Tema (19 m); Kribi, Cameroon (16 m); Abidjan (13 m); Lekki (16 m); Badagry (18 m); Ibaka (unspecified draught) and Cotonou (13.5 m). However, the major significance of the channel and berth depth was tied more to their capacity to receive deeper-draught mega ships than for the hub port status which seemed all tied up to date. Primarily, the new generation ports afford large ships sufficient depth to navigate into berths and the extra-large space to offload thousands of containers and other cargoes meant for many feeder ports in the region in a single voyage, thereby cutting costs in bunker, crew wages, port charges and all other voyage overheads. In effect, there is an ongoing scramble among the seaports and countries of the Gulf of Guinea. “This means”, it has been noted, “that any country that doesn’t expand its port will be forced out of the game – hence the rush to dredge access channels, deepen and extend berths and fill the quays with gantry cranes” (Rogers 2017).

After all is said and done, seaports in the Gulf of Guinea compare poorly vis-à-vis other shipping corridors of the world. Whereas the largest Ultra-Large Container Carriers, such as the 21,000 TEUs-carrying *OOCL*

Hong Kong, ply the busiest routes (East Asia-Northern Europe), the biggest mega carriers to call the West African range so far did not carry more than 6500 TEUs, even though the voyage was made by 12,500 TEUs-class vessels (Porter 2016). Other examples include the MSC ships running the *Africa Express* service from the Far East to Lome; the *Maersk Cadiz* from the Far East to Lagos and Onne Port; and the MSC's *Mare Atlanticum*-class vessels calling at Lagos from other parts of the world. The call at Lagos since 2011 followed the deepening of the channel and berth to 14 m while the Lome run began with the opening of the new 16 m-depth port in 2015 (Chilaka 2015a; see also Leach 2011). If the Badagry port being promoted by Maersk and its associates materializes at the proposed design depth of 18 m, the deepest in the region, then more notable shipping movements such as the call of Post-Panamax vessels bearing 18,000 TEUs could be on the horizon.

In sum, the trend of deep-water and deep-sea port development was the climax of millennial era solutions such as port reforms, improvement of port infrastructure, terminal concessions to world-class operators and smarter customs procedures which were aimed at addressing long-standing congestion issues, stevedoring, delivery and transportation logistics challenges as well as other modernization demands. Nevertheless, the upshot spelt keen inter-port competition. With Maersk Line's and MSC's choices for Tema and Lome ports, respectively, the CMA CGM MOU's venture at Lekki port largely sealed the fate of container shipping dynamics in the Gulf of Guinea for the foreseeable future. The major remaining hub port candidate, Abidjan, has been promised an investment portfolio by the Bolloré Group to deepen the port to 18 m which would entail further improvements to tap its fuller traffic potential (Streatfeild 2018).

A recent survey of West African ports from the perspective of shipping lines' preference tipped Abidjan as "the most attractive" with regard to the following criteria: "port infrastructure, international network, congestion, port security, service speed, cargo handling safety, problem handling in the port, geographical advantage, terminal handling charges, port tariff, and privilege terms to carriers". This was attributed in part to the "comparatively long peaceful climate" in which the Ivorian economy operated between the country's independence in 1960 and the civil war of 2003. This enabled the Ivorian government "to invest significantly in port infrastructure, which turned the port into the largest container port in West Africa and the second largest in Africa after the port of Durban

(South Africa)". The study concluded that attributes such as international network and market size/cargo are significant "only when a port's infrastructure, draught, and its nation's political stability satisfy shipping lines' basic requirements". In effect, "port infrastructure, port draught, and political stability, having over 58 per cent importance among the sixteen criteria, largely determine the port attractiveness in West Africa" (Gahomene et al. 2015, pp. 9–10).

In all of these developments, the increasing involvement of foreign interests deserves mention. A recent study indicates that Chinese entities have been involved as operator, funder and builder in six major seaport projects across the Gulf (Devermont et al. 2019, pp. 5–6). A commentator has noted that "those former European colonies with oil and strategic minerals to sell have become coupled to the Chinese locomotive". He added that though the Tema deep seaport project is "a joint venture between Bolloré of France and Dutch operator APM Terminals (APMT), called Meridian Port Services", the construction work is being undertaken by China Harbour Engineering (Rogers 2017). The apparent distancing of these countries from their colonial masters in the ports sector has injected much-needed capital from China, in particular. The construction boom in West Africa was reflected in the rise of the value of projects from $49 billion to $116 billion (Rogers 2017). Ownership of the Lekki Deep Sea Port project is vested in the Lekki Port LFTZ Enterprise, a special purpose vehicle in which a Singaporean conglomerate, Tolaram Group, has 62% stake (Rogers 2017). Chinese interests, represented by Hong Kong's China Merchant Holdings 50% stake, are involved in the Lome Container Terminal (Togo), which has been completed (Rogers 2017). Chinese entities have funded, constructed or are reportedly currently involved in other port projects in the region (Devermont et al. 2019). This illustrates the diversity and intensity of global interest, albeit for strategic or pecuniary reasons, in the maritime sector of the Gulf of Guinea countries.

5.6 Demographic Growth and Maritime Challenges

Most of the Gulf port cities had the highest in-country profiles of population and urbanization growth rates, attributed to the occupational rural–urban migration prevalent in Africa. Demography, thus, determined

the potential size of the hinterland while the population of ports affected by diffusion declined as the ports enjoying concentration witnessed increased immigration. On the other hand, the mismatch of population growth with infrastructure accretion had the tendency to breed city traffic gridlocks which hampered quick deliveries to the hinterland as experienced in Apapa since the second decade of the new millennium (Chilaka 2019b). Being the generator of employment and diverse business opportunities, the vibrant port cities experienced higher population increases than ports suffering diffusion effects which had falling population figures. For example, whereas in 1950 the population of Lagos was 288,895; Abidjan, 63,811; Tema, 158,196; and Doula, 113,700, by 2010 Lagos had grown to 10,778,000; Abidjan, 4,108,908; Tema, 3,882,529; while Douala had 2,221,007 inhabitants (Africapolis 2019).

Conversely, port cities where declining shipping activities were replaced by growing industrialization profiles seemed to have steady population growth. This is exemplified by Port Harcourt. Whereas the palm oil, palm kernel and coal traffic kept the Abonnema Wharf in high activity in the 1950s and 1960s, the city continued to ride the crest of the booming oil and gas industry in the 1970s and afterwards. The population of Port Harcourt rose from 68,052 in 1950 to 1,845,232 in 2015 (Africapolis 2019). Other Niger Delta port towns where declining shipping activities were not compensated by industrialization, such as Opobo, Calabar and Sapele, had much lower population increases from 23,085; 44,370 and 31,956, respectively, in 1950 to 51,300; 516,941 and 185,952 in 2015, respectively. The larger increase in Calabar's population is attributable to its emergence as the capital of South Eastern State in the 1967 State creation exercise by the Yakubu Gowon administration. Only Calabar, Port Harcourt and Lagos double as port cities and administrative capitals, the latter status bestowing in the Nigerian context the benefits and potential of government and private sector investment in commerce, industry and infrastructural development, which generate demographic growth and employment. The Nigerian situation is replicated in other Gulf of Guinea countries in the context of the concentration or diffusion of their ports.

Another impact of human populations around port environments is the incidence of violent crimes against trading ships or their crews. The Gulf of Guinea since the 1980s became increasingly infamous for piracy and armed robbery attacks, which peaked in the 1990s prior to

the implementation of the ISPS Code (Chilaka 2014). In 2018, the zone was the world's worst hotspot for piracy with seventy-two reported attacks, although the scourge declined for the first quarter of 2019, to be replaced by kidnapping incidents (The Economist 2019; Chilaka 2019a; ICC 2019). In the face of mass poverty and youth employment, such acts mirror the trend of crimes in the wider society. For example, in the first quarter of 2019, twenty-one seafarers were reported kidnapped in five port incidents in Benin, Cameroon, Ghana, Côte d'Ivoire, Liberia, Nigeria and Togo in tandem with the increased incidence of kidnapping in the hinterland (ICC 2019; VOA 2019; Okoli 2019). "The effect of piracy on crew and their safety", it has been observed, "continues to be a cause for concern and transiting West African waters remains particularly difficult. In the first half of 2019, 73% of all kidnappings at sea and 92% of hostage-takings took place in the Gulf of Guinea" (Gard 2019). Consequently, the government of Cameroun decided in August 2019 to place armed security teams onboard all vessels for the duration of their stay.

5.7 Conclusion

The Gulf of Guinea ports have been transformed since the era of European colonial rule by domestic and global forces. They have now been thrust into the vortex of the dynamics of twenty-first-century international shipping networks, which are mostly managed by multinational terminal operating companies. To that extent, much of the domestic sociopolitical constraints of Gulf of Guinea nations are being transcended through the coterie of international legal agreements which compel them to comply with global benchmarks of operational efficiency and security.

Overall, such transformations proved beneficial for the national economies in terms of invisible earnings, jobs and foreign direct investment. Thus, evolving from colonial primary exporters of raw materials in the twentieth century, they have become modern ports, transhipment centres and emerging hubs in the new millennium. However, inter-port competition within and across national borders has been intensified by changes in shipping and port management, driven by technological developments in the sector. This has however been moderated by political integration policies and interventions from development partners such as United Nations agencies and global donor entities.

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CHAPTER 6

Ports's Performance: The Case of East African Ports

Lourdes Trujillo, Ivone Pérez and Casiano Manrique-de-Lara-Peñate

6.1 Introduction

In recent years, the economy and population of Africa have grown considerably and it appears that this trend will continue over the next decade. On the other hand, the pattern of economic progress on the continent seems to follow a long-term trajectory linked to its institutional, social, economic and historically diverse background.

Ports are a key part in the development of international trade and, therefore, in the economic growth of countries. According to UNCTAD (2018), over eighty per cent of the world's cargoes are transported by sea

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and more than seventy per cent of the value of global trade passes through ports, enabling imports, exports, globalization and development.

Africa relies heavily on ships and ports to service its intercontinental trade. While it accounts for approximately 2.7% of global trade by value, the continent contributes a greater proportion of global seaborne trade (7 and 5% of maritime exports and imports by volume, respectively (UNCTAD 2018). As one-third of African countries are landlocked, maritime transport is the main gateway to the global marketplace.

However, despite Africa's integration in the international market, its trade volume remains small. This lower volume might be explained by the high service costs due to lack of infrastructure, long waiting times, downtime, low productivity, poor and inefficient services (Trujillo et al. 2013) and also by countries and specifically ports with low connectivity. Therefore, the objective is to stimulate trade and improve port performance in order to increase the volume of trade.

One of the main characteristics of the port industry is its ability to adapt to the evolution of cargo. In this sense, the appearance of the container stands out in terms of technological advances, due to its capacity, traffic growth, financial performance and competitiveness (Slack and Frémont 2009). The first steps in containerization were taken in the early 1970s, but it is important to note that the 'great containerization revolution' in Africa developed during the early years of the twenty-first century. Undoubtedly, this adaptation to cargo growth still represents a strategic opportunity for the African port industry.

This chapter is organized as follows. The next section presents the different indicators that will be combined to measure performance in ports; while Sect. 3 presents a very brief overview of the Eastern African port sector.

The analysis in Sect. 6.4 is based on the operational and economic performance of ports. The focus is intertemporal on productivity, efficiency and their drivers. Therefore, this section focuses on the operational and economic performance of ports in Eastern Africa by container traffic. Specifically, it shows the technical efficiency for Eastern African ports estimated in Humphreys et al. (2019) which employs Stochastic Frontier Analysis. Therefore, the objective is not only to establish a ranking of ports according to their efficiency, but also to identify the factors that influence the generation of inefficiency. The study relates to container terminals that are aggregated within each port. The analysis covers the time period 2008–2017.

One of the main aims of this chapter was to put forward performance indicators that could be produced by port authorities (PAs) in the future. For this reason, Sect. 5 seeks to identify indicators to analyse the financial viability of PAs. Thus, this chapter presents a measurement of financial performance that is closely related to the concepts of profitability and solvency, which are the main financial objectives of corporations. In particular, the analysis of financial performance is central to the survival of any entity that carries out an economic activity: as it relates to its economic and financial viability.

Nevertheless, as the UNCTAD stated, a number of structural challenges remain for African maritime sectors, such as relatively low international shipping connectivity and meeting the demand for larger freights in comparative terms. For this reason, Sect. 6 provides an analysis of the connectivity of the Eastern coast of Africa. In this context, the connectivity indicators of UNCTAD, which are defined by countries, are also examined. Finally, Sect. 7 provides the main Conclusions and reviews the key issues raised in this chapter

6.2 Port Performance

The first question to be answered is to clarify what a port is. Defined in broad terms, a seaport can be considered as a single organizational unit that provides 'vessel related services' and 'cargo related services'. The 'port area' is defined as a complex of berths, docks and adjacent land where ships and cargoes are served. Figure 6.1 shows a scheme of the different types of infrastructures required by a port. To reach the 'port area', infrastructures related to 'land access' (connections to roads, rail network, and inland navigation) and 'maritime access' (channels, locks, aids to navigation, etc.) are required in order to connect the port with others ports, hence the importance of port connectivity. For these reasons, this study presents Indicators of Port Connectivity.

Therefore, the 'port area' is where multiple seaport activities take place, which encompass both the infrastructure within the port (berths, quays, docks, storage yards, etc.) and the superstructure. Among the elements forming the superstructure, it is possible to distinguish between fixed assets built on the infrastructure (sheds, fuel tanks, office buildings, etc.) and fixed and mobile equipment (cranes, van carriers, *transtainers*, etc.) (Trujillo and Nombela 2000). Table 6.1 illustrates a number of key port services that are provided in the port area.

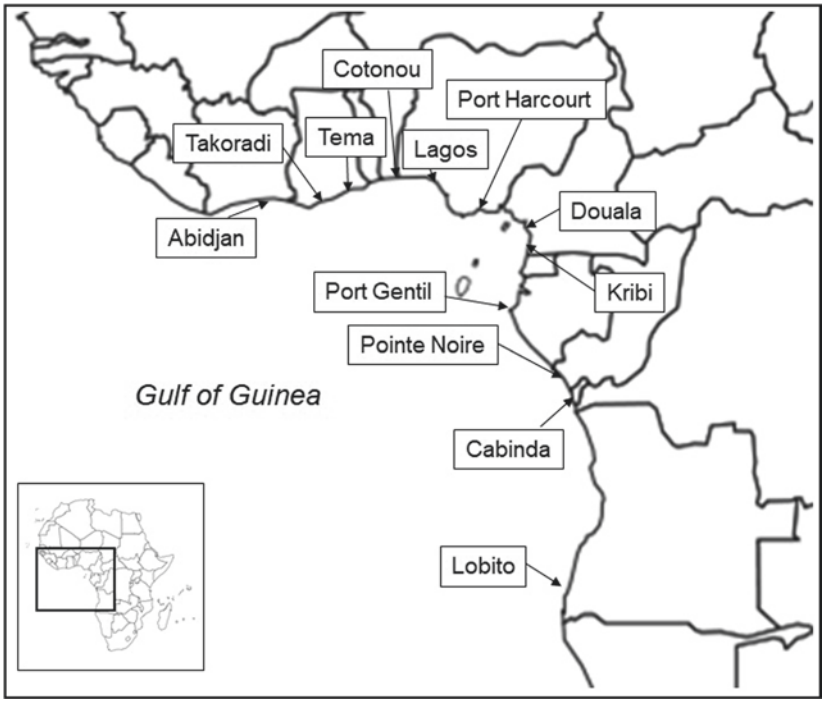

Fig. 6.1 Port Infrastructure (*Source* Authors' elaboration from Trujillo et al. 2018b)

Any type of inefficiency in some of these activities included in Table 6.1 can create bottlenecks that interfere with the proper functioning of the port. Hence, it is necessary to study a range of Indicators of Port Services Efficiency.

In general, the most important activities in ports are, firstly, the loading and unloading services, since they account for about eighty per cent of the ship call account (De Rus et al. 1994) and, secondly, the infrastructure provision service carried out by the PAs. This service does not represent a very high percentage of the ship call account, but, directly and indirectly, the infrastructure is financed through it (see Fig. 6.2).

In general, PAs coordinate all these activities and, in addition, they are the infrastructure providers that offer three basic sources of income

Table 6.1 Port Services: provision of infrastructure services

Vessel related services	Berthing services	Pilotage
		Towage
		Tying
	Other vessel services	Ship maintenance
		Repairs
		Supplies
		Ancillary services
	Vessel dispatches	Administrative tasks
Cargo related services	Cargo handling	Stevedoring
		Terminals
	Other cargo services	Warehousing
		Storage
		Freezing
	Cargo dispatches	Administrative tasks

Source Authors' elaboration from Trujillo et al. (2018b)

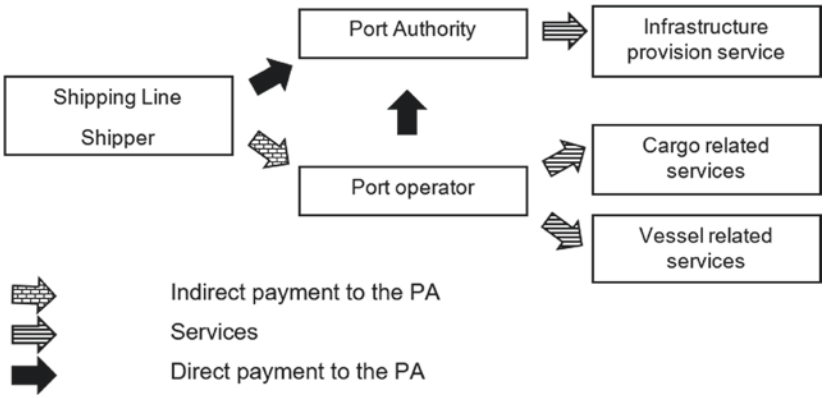

Fig. 6.2 Port Authority Financing (*Source* Authors' elaboration from Trujillo et al. 2018a)

(Fig. 6.2). Therefore, analysing PAs Financial Indicators are essential to ensure the viability of the port.

In virtually all countries of the world, the trend of port organization (governance) is a landlord model characterized by the following features. While the infrastructure is public and managed by a PA, the remaining

port services are run by private port operators that obtain licences or concessions from PAs to work in ports.

In Africa, in particular in Eastern African ports, a global trend towards a landlord port structure is followed. However, some ports have not yet reached an appropriate size and maintain the structure of a Tool Port.

As a consequence, there are a set of private companies that provide port services and a public company, for each port or group of them, which acts as a PA, in the sense that it manages the port infrastructure and coordinates the private operators that provide the port services. However, on some occasions these PAs still provide port services. One of the main aims of this study was to put forward performance indicators that could be produced by PAs in the future. For this reason, indicators to analyse the financial viability of PAs have been included.

In short, port performance evaluation research is basically aimed at measuring the efficiency of some of the port services. However, the criteria for evaluating efficiency do not address the performance of all agents that play a role in the port environment and, for this reason, this study aims to combine several port indicators in order to analyse different components of port performance.

Therefore, once it has been proven that the port is efficient and has positive financial indicators, it is essential to know whether the port is well connected, since this helps to make decisions about the need to invest in that port. Accordingly, this study analyses different factors that have developed efficiency, financial and connectivity indicators in ports, with the aim of establishing a ranking of ports in Eastern Africa that helps to give an image of the port reality in the region, in order to identify which ports could be a hub, and then act on the internal connectivity of the region.

6.3 Eastern Africa Port Sector

Seventeen of Africa's fifty-four countries are landlocked, with geographical disadvantages that contribute to poor results in economic, social and even political growth. Despite the fact that one-third of African countries are landlocked, shipping remains the continent's main gateway to the world market. According to Bird (1980, 1983), ports act as gateways and nodes within the international transport network, depending on their prosperity and development of their hinterland area and mainland (Charlier 1983).

We are going to focus this analysis on Eastern African ports (Fig. 6.3). Thus, the study covers the seventeen main ports of this region: Beira,

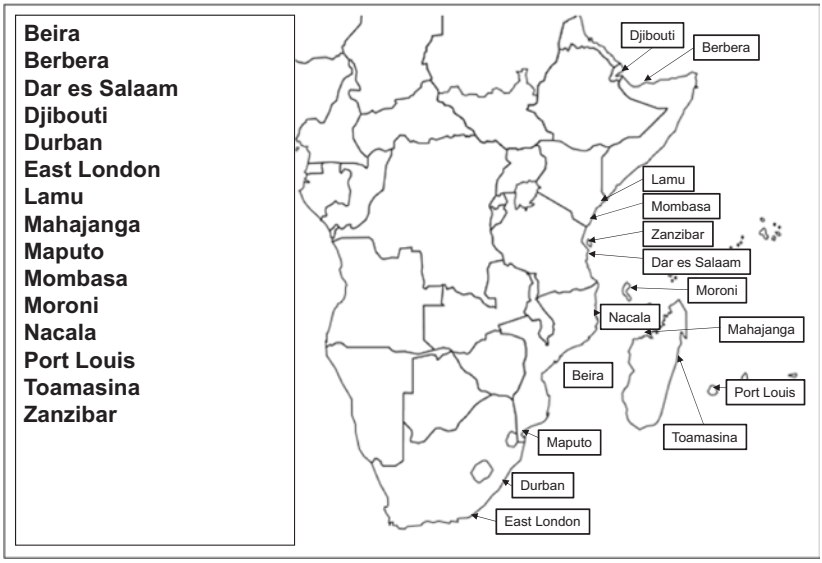

Fig. 6.3 Chart of Eastern African Ports (*Source* Adapted from Trujillo et al. 2018b)

Berbera, Cape Town, Dar el Salaam, Djibouti, Durban, East London, Lamu, Mahajanga, Maputo, Mombasa, Moroni, Nacala, Port Louis, Port Elizabeth, Toamasina and Zanzibar.

In this context, ports in East Africa play an important role. They are: the gateway to the Indian Ocean for the inland countries of Africa; generators of economic resources for the countries in which they are located; a link to the world's shipping lines; and the pillar of China's new silk route. The ports of Durban, Mombasa, Djibouti and Dar es Salaam are the most important because of their infrastructure, geographic location and performance with almost 1 million TEU (Global Construction Review 2017). Many existing port facilities and operational practices have now proven to be inadequate, with capacity constraints.

Most ports in Eastern Africa (from Djibouti to South Africa) are connected to the railway system. This has made the development of these ports different from that of West African ports. According to Kany and Chen (2017), the challenge is not simply to achieve large and deep ports, but to maintain rail links with the interior and across national borders to the landlocked region.

In order to meet demand and develop as a regional hub, major ports are implementing or planning expansion. However, not all can be regional or global centres. Not all ports can grow. Some ports will become larger, taking advantage of economies of scale, but others will need to specialize, either in a sub-region, in specific products, or as a feeder at the end of one of their influence area.

Currently, despite efforts to improve the capacity and performance of ports (such as port management partnerships in ports such as Dar Es Salaam, Mombasa or Djibouti), none has emerged as a hub for East Africa. Despite the excellent situation and potential of some ports (such as those in Kenya and Tanzania), East African ports generally show average stay times of approximately twenty days, which is too high compared to other international ports (three–four days). All this highlights the need to assess the extent to which resources have been used and thus to improve the performance of each of these ports.

As is the case with other ports on the African continent, East African ports are largely deregulated and integrated into the global network of shipping lines, replacing direct line calls with transhipment from elsewhere. To give an example, the Port of Salalah (Oman) is used by Maersk as the centre for East African trade, as are Algeciras (Spain) and Tangier-Med (Morocco) for West African trade. Therefore, in some areas, the number of direct calls is insignificant and the container service to East African ports is relatively small.

Following the global trend, several African countries have reformed their ports. The reforms have mainly involved the deregulation of publicly owned ports to transform them into ports where the private sector is playing an increasingly important role through the concession of cargo terminals, as mentioned above. This, together with investments in infrastructure, has made it possible to modernize some African ports.

6.4 Efficiency Studies in Port Activity in African Ports

The first efficiency studies in the port industry were carried out in the 1990s, focusing on ports in European countries such as the United Kingdom and Spain. Ten years later, the studies were extended to ports located on other continents, with African ports being the least studied.[1]

[1] See ULPGC (2018) for detailed information on the different efficiency studies on African ports.

Analysing efficiency means studying the concept of frontier (Farrell 1957). Frontier production shows the maximum quantity of product that can be obtained, given a specific amount of resources. Each company is evaluated in relation to others belonging to a representative and homogeneous group. In this way, efficiency is relative: that is, the efficiency of a certain company corresponds to the observed deviation between its performance and that of the best companies, which are those that define the 'efficient frontier' (Álvarez 2001).

Two approaches have been developed to study efficiency. In the non-parametric approach, the Data Enveloping Analysis stands out (Charnes et al. 1978) and in the parametric approach, Stochastic Frontier Analysis (Aigner et al. 1977; Meeusen and van den Broeck 1977). In the latter, while the production function studies single production, the distance function has been used to reflect the multiproductive nature of port activity.

Depending on the objectives of the research, the data needs, the advantages and limitations offered by each method, the application of one approach or another is considered (Coelli et al. 2003). However, the results obtained in both methods have been shown to be similar (Coelli and Perelman 1999). With the stochastic approach, it is possible to analyse the structure of the ports and investigate the determinants of the results of these. This approach makes it possible to distinguish between the effects of technical inefficiency and the effects of noise.

The linear programming approach, being a non-stochastic method, considers noise and inefficiency together, defining both as inefficiencies. However, since the first approach is parametric, the effects of poor functional specification (of both technology and inefficiency) may be confused with inefficiency. The linear programming approach, not being parametric, is less sensitive to this type of error. The continuity of the first method may also lead to approximation errors.

According to ULPGC (2018), the majority of the works that have measured the efficiency of the African ports are characterized by employing different approaches of DEA, with Trujillo et al. (2013) and Akinyemi (2016) being unique in estimating port efficiency through a stochastic frontier analysis, and comparing efficiency of ports in several countries, mainly Nigeria, Mozambique and Angola. The authors emphasize that few studies have focused on a single port, in this case Nigeria (Okeudo 2013; Nwanosike et al. 2016; Akinyemi 2016; Wanke et al. 2017) and highlight the use of panel data to take into account

dynamic aspects, with the exception of Carine (2015) who quantified the efficiency of the port in a cross-sectional sample.

As mentioned above, port activity has a multiproductive nature (it offers various types of services to cargo, ship and passenger, handles different loads, etc.). It is therefore possible to study both the handling of a single type of good or a specific service, and the port as a whole. In Africa, although most studies have examined the PA, some have analysed the efficiency of container terminals as a whole.[2] This is mainly due to the way port information is published in general. The information sources provide data on the handling of containers without differentiating by terminal, which makes it impossible to study the performance of each of the companies involved.

In the analysis of the cargo handling service, the most relevant and widely accepted output is the movement of containers measured in TEUs, in the study of container terminals. Evidently, the output depends on the service or activity to be studied. This is a very important issue. Failure to adequately define the activity or service to be studied could lead to confusion and the use of incorrect data and inconclusive results.

With respect to inputs, the most used variables have been the number or metres of the docks and the area. The equipment and the work factor were included in some works, but with certain limitations. The typology of the equipment is not always specified and the labour factor does not specify the type of worker. Including mechanical equipment and storage in an efficiency study raises further problems.

Growth in container use and the constant increases in ship size have led to investments in new equipment in response to the new needs of this sector. Therefore, it is essential to include all these technological advances in the study although its calculation, homogenization and aggregation are complicated.

Regarding the labour factor, there are a large number of workers in a port. Each is associated with a specific activity, and therefore, the efficiency study needs to include the appropriate type of worker. In certain countries at international level, given the complex structure of this workforce and reforms in the port sector, no information is available. Trujillo et al. (2013), for example, allude to the fixed relationship between the number of stevedores and container cranes to justify omission of the

[2] Trujillo et al. (2013), Carine (2015), Van Dyck (2015), and ULPGC (2018).

labour factor.[3] However, this relationship might be affected by a number of issues including, for example, technological issues.

In addition to productive factors, some authors emphasize the fact that there are other variables that affect port efficiency that should be included in the studies (González and Trujillo 2008). Among others, the studies have included the type of ownership, management model, port reforms and location.[4]

Including the appropriate variables in efficiency modelling is as important as data access and its quality. If there are frequently problems finding information and quality data at international level, in Africa the problem is more acute.

On the one hand, although most ports publish statistics on the cargo handled, these are not available for long periods of time, and this fact limits the study. On the other hand, information on inputs is heterogeneous (some ports detail information and others do not) and sometimes presents irregularities and ambiguities. This leads to the need to consult other sources that focus on very specific aspects of port activity. This in turn means contacting a number of agencies in order to complete the databases; however, these entities often provide unstructured information and in formats that require treatment.

Frequently, data limitations force researchers to make decisions on how to best develop their studies. In the case of ULPGC (2018), it was decided to analyse the handling service by adding the terminals of each port. Since information about handled containers is obtained only at port level, researchers had to use the aggregated data of the inputs, as it is the unit of analysis at container ports. Although container terminals can also handle general merchandise, Wilmsmeier et al. (2013) state that the percentage of general cargo in container terminals is quite low.

The sources of information used to create the database provide data at different levels. But, while the inputs of the terminals are known, the handled output for each of them is unknown. Taking this into consideration, the results shown in this chapter quantify the technical efficiency

[3] Outside of Africa, there are other studies that use cranes as a proxy for labor by making reference to the fixed relationship that exists between both (De Neufville and Tsunokawa 1981; Notteboom et al. 2000; Cullinane et al. 2004, 2005a, b; Pérez et al. 2016).

[4] See Al-Eraqui et al. (2008), Barros and Peypoch (2012), and Wanke et al. (2017) for other possible variables that affect port efficiency, like those related to cargo, time, occupation of berths, channel and operator.

Table 6.2 East African Countries and ports analysed

Port	*Country*
Beira	Mozambique
Cape Town	South Africa
Dar es Salaam	Tanzania
Durban	South Africa
East London	South Africa
Maputo	Mozambique
Mombasa	Kenya
Nacala	Mozambique
Port Djibouti	Djibouti
Port Elizabeth	South Africa
Port Louis	Mauritius
Toamasina	Madagascar

Source Authors' elaboration from ULPGC (2018)

of the main ports in East Africa. They also identify the factors that influence the efficiency of these ports during the period 2008–2017 (ULPGC 2018).

In an efficiency study, it is important not only to know the ports that are developing their activity in a better way (e.g. the Top 10) but also to identify the variables that are producing higher levels of efficiency. These are factors that in the long term can be modified and show the best port practices. Table 6.2 shows the ports included in the sample. The table shows a balanced data panel of 120 observations for the period 2008–2017.

There are significant differences between these ports, as despite the average, one moved over 2.7 million TEUs in a year (Durban in 2015), while another has more than 1 million square metres of area (Durban) and 940 tons of cargo capacity (Port Louis). Ports benefit from two to four trade agreements and the ships that call at the port can be in the berth between 8.5 hours and 209 hours, with Beira being the port with the longest average berthing time (131 hours) and Port Elizabeth the port with shortest average berthing time (21 hours).

The variables used in the study were as follows. The output of the terminals was approximated by the handled containers measured in TEUs. As inputs, they used (a) berths (metre), being the sum of the length of all container berths and multipurpose ports; (b) area (square meters), which includes the total area of the port container terminals; and (c) cranes (ton), which includes not only the number of cranes available

to load and unload containers but also the carrying capacity of each of them. Information relating to the labour factor is unavailable.

Regarding inefficiency variables, these included trade agreements and port berth time. According to Pérez et al. (2016), trade alliances can lead to higher efficiency levels for various reasons. On the one hand, ports secure trade with certain countries by ensuring a certain volume of cargo and generating economies of scale. On the other hand, they can attract higher levels of cargo by eliminating or reducing tariff and customs barriers (leading to less time in ports). With regard to berth time, a longer period at the quay means more payment for port charges and more time between the origin of the cargo and its final destination. Shipping companies seek to minimize costs and times. This is a vital issue at international level; it attains higher intensity in Africa.

Trade agreements refer to the number of agreements signed by the country where the port is located. The trade agreements are: the Arab Maghreb Union (AMU), the Common Market for Eastern and Southern Africa (COMESA), the Community of Sahara-Sahel States (CEN-SAD), the Economic Community of Central African States (ECCAS), the Intergovernmental Authority on Development (IGAD), the Economic Community of West African States (ECOWAS), the Southern African Development Community (SADC), the Free Trade Area (FTA), the East African Community (EAC) and the Port Management Association of Eastern and Southern Africa (PMAESA). Berth time is the arithmetic mean of time (hours) that a container ship is in berth. All of these variables were obtained from secondary sources including the Containerization Yearbook, Shipping Guides, Lloyd's List Intelligence and HIS Markit.

The results show that the average technical efficiency of Eastern Africa ports over the period 2008–2017 was 41% (with a virtually stable trend). The highest level of efficiency took place in 2008 and 2011 (43%) and the lowest in 2016 (40%). Figure 6.4 shows the average efficiency by port. Djibouti and Mombasa are very efficient ports (99%), while the other ports are far below these levels. In third place is Dar es Salaam with 37%, while Beira (19%) and East London (26%) are in the last position (Humphreys et al. 2019).

In conclusion, this chapter provides an overview of the port industry in East Africa, by analysing the technical efficiency of the main container ports in the region estimated in ULPGC (2018) and the factors involved in port inefficiency. This allows the study of potential challenges and opportunities related to trade and competition within a global market.

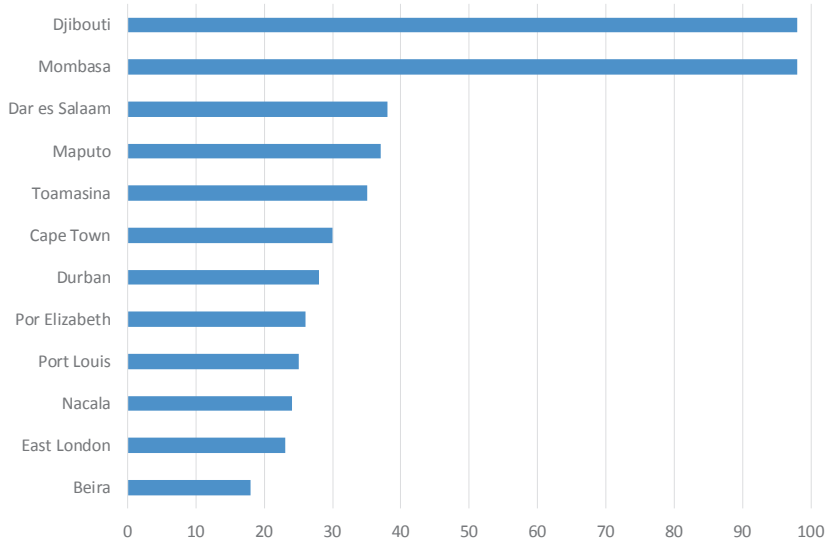

Fig. 6.4 Average efficiency by port in East Africa (%) (*Source* Adapted from Trujillo et al. 2018b)

There are several studies that examine port efficiency in Africa, but few studies assess the determinants of inefficiency. Conducting a study at this level is important to developing port activity and encouraging competitiveness.

On the other hand, it is also significant that the factor that determines port efficiency is the berth time. Clearly, the longer time the ship spends at the dock, the more inefficient is the port. It is important to highlight the problems that these types of studies face, especially when they focus on developing countries. Ideally, primary sources of information should always be sought, because secondary sources provide confusing information, mainly in input data. Furthermore, analysing long time periods is a complicated task due to data irregularities and, in some cases, a lack of information. Therefore, one key conclusion of efficiency studies is the need to improve port information. Consequently, the idea is to establish agreements with port service providers to make available regular information from every service and with the level of disaggregation necessary to carry out comprehensive studies with the aim of making specific recommendations for economic regulators.

Finally, in order to obtain more robust results, it would be interesting to have information on a specific aspect of cargo handling services, that is, the labour variable (stevedores) and detailed information on the cranes (see Bichou 2013 for more details on crane characteristics).

6.5 Financial Studies on Port Activity in African Ports

Financial analysis of any company or institution plays a key role for managers and investors. In the port industry, this type of analysis is increasingly relevant as can be seen in the annual reports of several port authorities such as the US Maritime Administration (MARAD) and the Spanish port system.

In order to produce a financial analysis, it is necessary to draw on PA financial statements in the port industry. In addition, PAs finance port infrastructure through charges to Shipping Lines, Shippers and Port Operators, as shown in Fig. 6.2.

This analysis focused on two key aspects: profitability and solvency. Its objective is to verify the economic and financial viability. While profitability measures a company's ability to generate profits in relation to the investment, solvency measures the company's ability to meet its financial obligations. As there is no established standard, as with efficiency measures, in order to interpret the results, it is necessary to compare the results of a port with itself over time or with others with similar characteristics (homogeneous group).

6.5.1 Profitability Analysis

Profitability studies analyse a port's capability to generate profits in relation to its investments. The main profitability indicators are a) Return on Capital (ROE) and b) Return on Assets (ROA), with the being latter the main factor in the calculation of the ROE.[5] Table 6.3 shows definitions and a calculation of profitability indicators. The interpretation of the profitability ratios is direct, with a higher value indicating greater profitability.

[5] ROE* = ROA + Leverage effect = ROA + ((ROA − DC) x LEV1) and ROA = Margin x Turnover.

Table 6.3 Profitability Indicators and Drivers

Acronyms	*Definition*	*Calculation*
ROE*	Return on equity	Earnings before tax/Equity
ROA	Return on assets	Earnings before interest and tax/Total assets
DC	Debt Cost	Financial expenses/Total debt
LEV1	Leverage1	Total debt/Equity
Margin	Margin on sales	Earnings before interest and tax/Total income
Turnover	Assets turnover	Total income/Total assets

Source Authors' elaboration from ULPGC (2018)

Table 6.4 Solvency Indicators

Acronyms	*Definition*	*Calculation*
LEV2	Leverage2	Total debt/Total assets
DM	Debt maturity	Long term debt/Total debt
CR	Current ratio	Current asset/Current liabilities
DSC	Debt service coverage	(EBIT + depreciation)/(Current liabilities – Traded debt)

Source Authors' elaboration from ULPGC (2018)

6.5.2 Solvency Analysis

Solvency studies analyse a port's capability to face its obligations in terms of its equity and assets. They illustrate two perspectives: patrimonial and viability.

From the patrimonial point of view, it is considered that a port can face its debts with its assets. This includes three measures shown in Table 6.4.

From the viability point of view, it seeks to measure the ability of a port to meet its financial commitments with the resources that the firm generates in the year, that is, a firm's capability to face its obligations in its maturities with its equity.

This type of solvency includes (a) debt service coverage index (DSC) (Table 6.4), (b) the ratio of resources generated in one year and (c) the sum of financial expenses, plus debt not traded in the short term. As in the previous case, values below one show low solvency, and higher levels otherwise.

6.5.3 Financial Performance of Eastern Africa Port Authorities

To carry out the study, ULPGC (2018) obtained financial information from the port authorities of Kenya, Mauritius, Tanzania, Mozambique and South Africa, which coordinates nine ports, for the period 2010–2015. In particular, the annual reports and financial statements of each were consulted.

PAs directly or indirectly manage port activities. This means that financial information is at the PA level and not at the port level.

Table 6.5 shows the comparative analysis of profitability and solvency financial indicators. The ranking of profitability has been made based on the ROA period 2011–2013, since in 2015 there is a lack of data for some PAs and in 2014 there is a change. LT (Long-term) Solvency ranking was done in reverse order to leverage debt ratio (debt/asset). The ranking of ST (Short-term) solvency has been made from the current ratio (active current/current liability).

The ROA presents acceptable (positive) values in all the PAs in the period, highlighting Tanzania; although there are some notable differences and a decrease in 2014 and 2015, more evident in Kenya PA, Mauritius PA and Transnet (South Africa). PAs present high margins, although they have decreased during the period. PAs also show low levels of debt, and for this reason, they can finance future investments with debt. The debt usually expires in the long term. Mozambique has a negative leverage effect for some years, due to the high cost of debt.

In conclusion, PAs are characterized by the direct management of infrastructure, while private companies manage the superstructure through concessions. In order to carry out their activity, PAs incur expenses and obtain revenues both from the use of the infrastructure and from the concession of the superstructure. Thus, they obtain funding from both public and private entities.

The PAs were analysed with respect to their profitability and solvency; the profitability (ROA) is positive in all PAs, although it has reduced in recent years. In 2015, Kenya (2%), Mauritius and Transnet (3%) had the PAs or companies with the smallest values. PAs show low levels of debt (short-term solvency) with values below 17%. This allows them to finance future investments with debt. In general, leverage (long-term solvency) is low (no more than 45%). For the company CFM, the same cannot be affirmed, as it shows a high leverage effect.

Table 6.5 Ranking of Comparative Financial Indicators in East Africa

Profitability		*LT Solvency*		*ST Solvency*	
Dar el Salaam	Tanzania	Port Louis	Mauritius	Port Louis	Mauritius
Zanzibar		Beira	Mozambique	Dar el	Tanzania
Beira	Mozambique	Maputo	(CFM)	Salaam	
Maputo	(CFM)			Zanzibar	
Nacala		Nacala	Kenya	Beira	Mozambique
		Lamu		Maputo	(CFM)
		Mombasa		Nacala	
Lamu	Kenya	Dar el	Tanzania	Lamu	Kenya
Mombasa		Salaam		Mombasa	
Cape Town	South Africa	Zanzibar			
Durban	(Transnet)	Cape Town	South Africa	Cape Town	South Africa
East London		Durban	(Transnet)	Durban	(Transnet)
Port		East London		East London	
Elizabeth		Port		Port	
Port Louis	Mauritius	Elizabeth		Elizabeth	

Source Authors' elaboration from Trujillo et al. (2018a)

6.6 Connectivity Studies on Port Activity in African Ports

According to Martínez-Zarzoso and Hoffmann (2007), economic policies that encourage and improve port connectivity will lead to reductions in transport costs and, consequently, to increases in the international trade of goods. Specifically, they observed that a 1% improvement in connectivity in Latin American countries would reduce transportation costs by 1.90%, in addition to increasing trade by 1.33%.

Following this argument, the efficiency analysis can be complemented with the preparation and review of certain port performance indices. In this section, we shall proceed to describe one of these indices, the connectivity index. This analysis also helps us to identify clusters of ports that should be considered when defining the infrastructure policies in this field.

The level of connectivity between countries and ports indices can be represented through the calculation of indices. One example of these indices is the Liner Shipping Bilateral Connectivity Index (LSBCI), developed by UNCTAD. The LSBCI has been designed to identify the role of maritime connectivity and trade flows between countries for

container traffic. It can actually be described as an update and extension of the previously defined Liner Shipping Connectivity Index (LSCI). The most relevant characteristic of the LSBCI consists in the fact that the information gathered for its construction has a clear bilateral perspective, that is, it refers to specific country pairs. The following comments refer to the LSCBI data of 2016. Fugazza and Hoffmann (2017) describe the five components of this index as follows:

Component 1: Number of transhipments required to get from j to k (NumTrans)
Due to the large amount of possible country pairs, most of the combinations need more than one transhipment to move one container between both extremes of the country pair. This is the only component that shows lower connectivity the higher it is. Djibouti and South Africa show the greatest concentration around 0 and 1 transhipments. The continental countries located between these two countries reduce the relative importance of connections without transhipments, while the combinations with 2 and more transhipments are the most frequent. The peculiar characteristic of Mauritius as a transhipment port may explain why most of its connections incorporate just one transhipment. In terms of world regions, the connections with other African countries themselves and with Asia appear as being more relevant.

Component 2: Number of common direct connections (DirTrans)
The more common connections a country pair has, the greater the possibilities that they are connected with just one transhipment. On the other hand, countries that share the coastal line tend to be more connected among themselves since they also potentially share many maritime transport services. Djibouti, South Africa and partly Mauritius show the widest distribution of different number of direct connections, while the rest—especially the island states—appear to be more concentrated in smaller levels of direct common connections with other countries.

Component 3: The geometric mean of the number of direct connections (Direct)
This indicator provides a measure of the degree of centrality of each pair of countries. Although it cannot be described as a purely bilateral measure, it is assumed that the centrality of any country pair is directly related

to the centrality of each of the separate countries. This measure appears to be more evenly distributed than the previous ones.

Component 4: The level of competition on services that connect country pairs (Maxmin_carriers)

This component aims at identifying the level of competition prevailing in each country pair. In order to calculate this level of competition, the different alternative routes capable of connecting two countries are considered. For each, the number of competing carriers is calculated at each leg of the route, and the leg with the smallest number of operators is identified as the thinnest leg of the route. The highest value among the different 'thinnest legs' is selected as the maximum of the minimum number of carriers of this pair of countries.

There is a clear polarization in terms of competition measured with this index. The lack of competition in the small island states is extreme. Kenya and Tanzania now seem to be nearer to Djibouti, Mauritius and South Africa. Among the different world regions, there seems to be no relevant differences in the level of this indicator.

Component 5: The size of the largest ship on the weakest route

This item is calculated in a similar fashion as the previous one, the maximum level of the smallest ship size at all alternative legs is being used to identify economies of scale on the routes affecting different countries. Since bigger ships also need bigger infrastructure, this index can be considered an indication of the level of infrastructure of the country pairs involved in the calculation. This last measure tends to confirm the existence of the same groups among our countries of interest.

The LSBCI is constructed for each pair of countries as the simple average of the normalized values of the different components considered. For the first component, the final value used is 1-Normalized_Value. The normalization procedure used is Normalized Value = (Raw-Min(Raw))/(Max(Raw)-Min_Raw). Therefore, the lower bound of the index is zero and the upper bound is 1, a value that would represent the highest level of connectivity.

Figure 6.5 shows the average LSBCI for the Eastern African countries, weighted by the value of the trade flows. South Africa, Djibouti and Mauritius clearly constitute the group of most connected countries, while Madagascar, Somalia, Seychelles and Comoros form part of the least connected Eastern African countries. Kenya, Tanzania and Mozambique

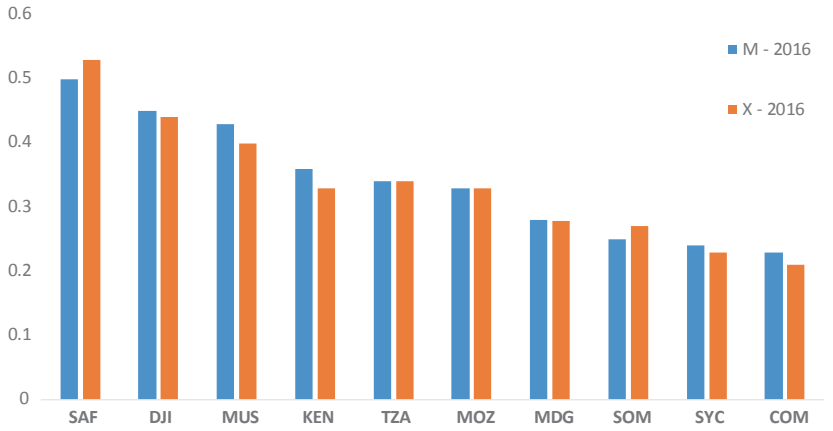

Fig. 6.5 Average LSBCI for Eastern African Countries (2016) (*Source* Authors' elaboration based on LSBCI data [UNCTAD] and UN trade data [COMTRADE])

configure an intermediate group of countries with connectivity values between the two other groups, with Kenya being the best placed of them. Within the more connected group of countries, the hierarchy can be best observed, while in the intermediate group of countries the positions are more similar.

The best complement to the connectivity index by countries is an index elaborated at port level. ULPGC (2018) prepared a report for the World Bank including connectivity indices for Eastern African countries calculated at port level. This research was partially incorporated in Humphreys et al. (2019).

6.7 Subjective Indicators on Port Activity in African Ports

It should be noted that the indicators analysed, in the previous sections, to compose the performance of the ports are objective indicators, as they are calculated from port data.

There are other types of indicators that can be classified as subjective because they are based on the opinion of users, for example, the Quality

of Port Infrastructure Indicator, shown in Table 6.6, calculated by the World Bank (2018). These two types of indicators can help assess the performance of ports.

6.8 Conclusion

Port performance evaluation research is basically aimed at measuring the efficiency of some of the port services. However, the criteria for evaluating efficiency do not address the performance of all agents that play a role in the port environment, and for this reason, this study aims to combine several port indicators in order to analyse different components of port performance.

Therefore, once it has been proven that the port is efficient and has positive financial indicators, it is essential to know whether the port is well connected, since this helps to make decisions about the need to invest in that port.

Analysing the indicators shown, it can be seen that in terms of efficiency, Mombasa and Djibouti are the best positioned (Fig. 6.4). Regarding the financial indicators, it is clear that Djibouti is not part of the sample, however Mombasa, within the PA of Kenya, is also in a good position (Table 6.5). With regard to connectivity by countries, Djibouti and Kenya (Mombasa) are in a good place in the ranking (Fig. 6.5).

The case of South Africa is also notable. According to the connectivity indicators, it is the best connected country in Africa. However, its ports are not the most efficient, and the PA of this country does not stand out in financial terms. In fact, according to the financial solvency indicator, it is the worst located PA in the sample (on this topic, see also Chapter 7).

The Quality of Port Infrastructure indicator, shown in Table 6.6, points out that the ports in South Africa are very highly valued, as is the port of Mombasa in Kenya.

In conclusion, the indicators analysed above give an idea of the performance of the ports. This analysis in turn can inform decisions about port policy. For example, in South Africa it can be seen why the efficiency of the ports is low, despite how well connected they are and their value according to the Quality of Port Infrastructure indicator.

Table 6.6 Relative quality of port infrastructure in East Africa, 2008–2017

Country	*Port*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Djibouti	Port Djibouti	Na	Na	Na	Na	Na	Na	Na	Na	Na	Na
Kenya	Mombasa	3.5	3.6	3.8	3.8	3.8	4.1	4.3	4.2	4.2	4.5
Madagascar	Toamasina	2.6	3.0	3.4	3.3	3.2	3.5	3.4	3.2	3.2	3.6
Mozambique	Beira, Maputo, Nacala	2.8	3.2	3.5	3.4	3.4	3.5	3.7	3.6	3.6	3.6
Mauritius	Port Louis	4.4	4.3	4.5	4.7	4.8	4.9	5.0	4.7	4.7	4.2
Tanzania	Dar es Salaam	2.8	2.8	3.0	3.3	3.3	3.2	3.3	3.4	3.4	3.4
South Africa	Cape Town, Durban, East London, Port Elizabeth	4.4	4.7	4.7	4.7	4.7	4.7	4.9	4.9	4.9	4.8

Na: Not available

Note 1 (extremely underdeveloped) to 7 (well-developed and efficient by international standards)

Source Authors' elaboration from World Bank (2018). Quality of port infrastructure. https://data.worldbank.org/indicator/IQ.WEF.PORT.XQ. Accessed October 2019

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CHAPTER 7

The Development of the Container Port System in Southern Africa

Theo E. Notteboom and Darren Fraser

7.1 Introduction

The container port system in Southern Africa includes all container ports in South Africa, Namibia, Mozambique and the island nations of Madagascar and Mauritius (Fig. 7.1). In the past thirty years, Southern African countries have experienced significant political and economic

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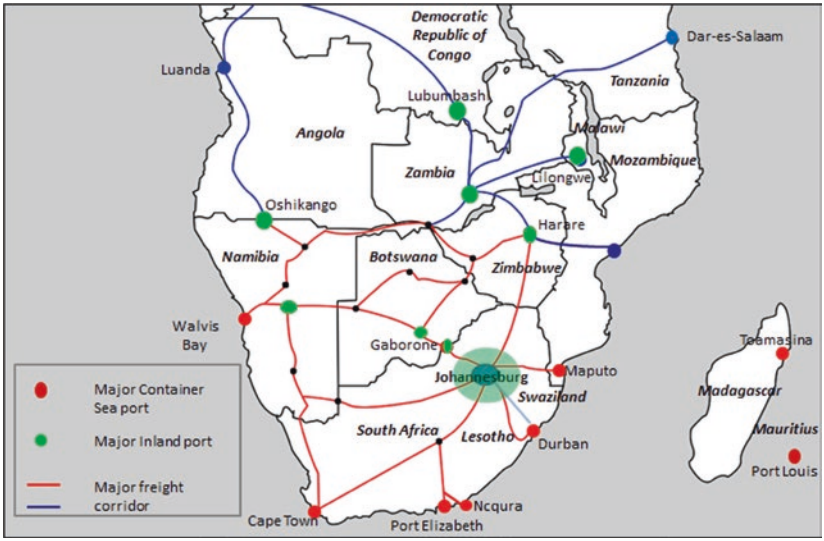

Fig. 7.1 The Southern African container port system and main freight corridors (*Note* Authors' elaboration. Map not drawn to scale, corridors and ports are approximations for illustrative purposes)

changes which have directly impacted the growth of container traffic to the region. In 2010, Southern Africa's container traffic accounted for 21.5% of the continent's volumes, measured in twenty-foot equivalent units (TEU) (left part of Fig. 7.2). The Southern African share declined to 19.8% in 2017 despite a containerized volume growth from about 5 to 6 million TEU in the period 2010–2017. The port system represents only 0.8% of the world total. The right part of Fig. 7.2 compares the total container volume handled in the Southern African container port system with the TEU throughput in the most important national port systems in the rest of Africa. Strong growth can be observed in Morocco due to the rise of the transhipment hub Tangiers-Med at the Straits of Gibraltar, while also Kenya recorded a steep volume rise in the past decade due to investments in its major port of Mombasa. Egypt remains the most important African country in volume terms thanks to the presence of a number of transhipment hubs near the Suez Canal, i.e. Port Said, Damietta and Alessandria.

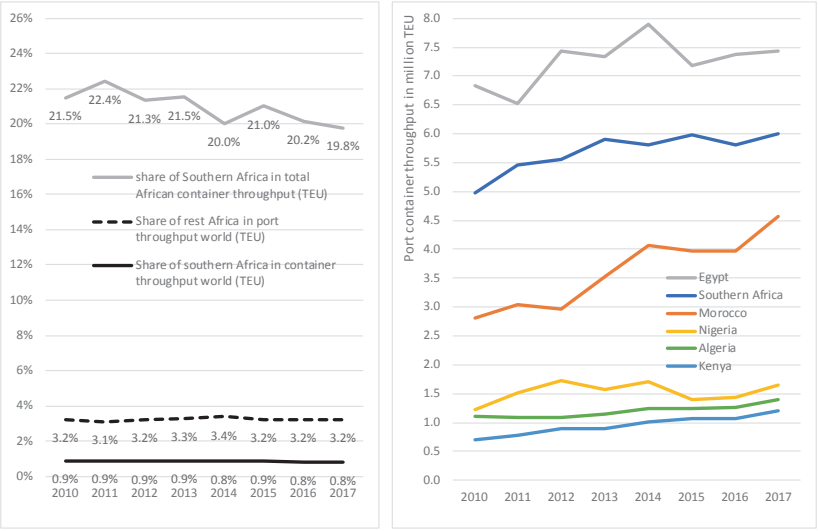

Fig. 7.2 Position of the Southern African port system in the world and Africa (based on TEU) (*Source* Authors' elaboration based on UNCTAD dataset)

North African countries such as Egypt and Morocco are located close to strategic passageways on the important east-west mainline routes (i.e. Straits of Gibraltar and the Suez Canal). Their favourable locations in the global shipping network act as magnets for the development of sea-sea transhipment activities. While the maritime route via the Cape at the southern tip of the African continent is also a strategic passageway, at present it does not play a very significant role in the global container shipping network. The geographical location and the comparatively limited cargo potential of southern Africa seem to make the ports in the region no match for the traditional relay/interlining centres located at the crossroads of east-west and north-south trade. This is confirmed by the superior Liner Shipping Connectivity Index (LSCI) of countries such as Egypt and Morocco, compared to countries in southern Africa but also in East and West Africa (Fig. 7.3). However, Notteboom (2012) demonstrated that a highly dynamic market environment and the search of shippers and shipping lines for cost efficiency, manageable risks and increased routing flexibility might give some room for alternative routes, such as the Cape route, to take up a more significant position

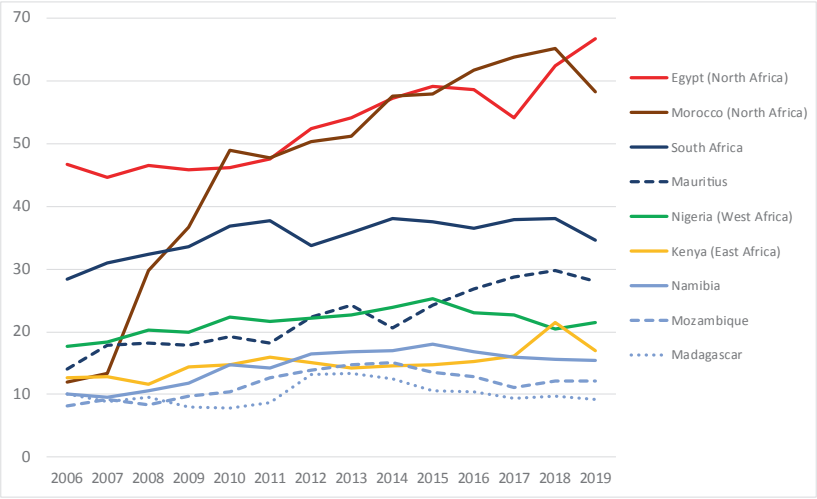

Fig. 7.3 Liner shipping connectivity index, annual (Index, maximum 2006 = 100) (*Note* The top ten countries in 2019 were China (LSCI of 151.9), Singapore (108.1), South Korea (105.1), Malaysia (93.8), United States (90.0), Belgium (88.4), the Netherlands (88.0), the UK (84.9) and Spain (84.2). *Source* Authors' elaboration based on UNCTAD dataset)

in the global container shipping network. Southern African ports could therefore take up a more prominent role as turntables on the trade routes between Asia and West Africa as well as Asia and South America. Currently, these flows predominantly pass via hubs near the Straits of Gibraltar and large north European container centres such as Antwerp and Rotterdam.

Notwithstanding the remoteness of the region to the main maritime container network (Fraser et al. 2016), these ports are served by global container carriers such as Maersk Line, MSC, Evergreen and CMA CGM. Various internal and external factors are driving traffic to the region. Internally, these factors include increased investments in nautical port accessibility and port terminal infrastructure, improved shipping links with Asia and increased terminal productivity. Externally, the GDP growth outlook, integration of regional economies with Asian suppliers, greater regional political stability and the increase/emergence of the urbanized African middle class have also spurred on maritime traffic growth to Southern Africa. Positioned at the tip of the African continent, Southern

African ports are ideally situated to serve as economically viable commercial ports for both the South African Development Corridors (SADC) Western and Eastern seaboards and the landlocked countries in between. The region has seen strong port development in the last thirty years with new ports entering the market or existing ports expanding their supply.

While Southern Africa certainly is a player on the global container port scene, competitive dynamics in the Southern African container port system are not well researched. This chapter seeks to unravel port system development dynamics and container port competition in Southern Africa. Furthermore, we elaborate on port governance issues and capacity investments in the region.

The chapter is organized as follows. The first part of the study provides a brief literature review on regional port system development. Next, we introduce a quantitative analysis of container throughput and traffic dynamics. Third, the chapter addresses gateway and transhipment hub rivalry and zooms in on hinterland corridors supporting hinterland capture areas and trade routes. We conclude the discussion with an analysis of (port) governance-related developments and port investment projects and strategies in the region.

7.2 Theoretical Discussion on Container Port System Development

A container port system can be defined as a system of two or more container ports, located in proximity within a given area (Ducruet 2009). It can relate to a complete coastline (e.g. the West coast of North America), a 'range' (Vigarié 1964; e.g. Hamburg-Le Havre range in Europe) and a 'multi-port gateway region'. A multi-port gateway region refers to a smaller geographical scale than a container port range. The term was first coined by Notteboom (2009, 2010a). Typical examples include the Rhine-Scheldt Delta (Belgium and the Netherlands) and the Yangtze River Delta and Pearl River Delta in China. A container port range can be home to several multi-port gateway regions.

The spatial study of container port systems and particularly the analysis of cargo concentration and de-concentration in port systems is a central theme in port economics and port geography. In their content classification of port studies, Pallis et al. (2011) list 40 papers dealing with the spatial analysis of ports published since 1997. Ducruet et al. (2009) identify no less than thirty-four academic studies on port system concentration published between 1963 and 2008. These empirical

studies highlight that some port systems are getting more spatially concentrated while others are evolving to a more evenly distributed system. For example, Notteboom (1997) concluded that the European container port system is getting more deconcentrated with an update of these conclusions provided in Notteboom (2010a). Along similar lines, the analysis of McCalla (1999) points to container traffic dispersion in North America partly as a result of greenfield port development, while Wilmsmeier and Monios (2016) analysed spatial diversification of port system evolution in Latin America. Other interesting studies in this regard include Medda and Carbonaro (2007) on the spatial distribution of container traffic in the Mediterranean basin and Notteboom (2006) on the use the GINI decomposition analysis for a better understanding of the spatial dynamics in port systems.

The discussion on port systems' spatial development saw a new impetus with the introduction of the 'port regionalization' concept by Notteboom and Rodrigue (2005), implying a gradual process where efficiency is derived from higher levels of integration with inland freight distribution systems. Market forces and political influences gradually shape regional load centre networks with varying degrees of formal linkages between the nodes of the networks. Rodrigue and Notteboom (2010) proposed an extension of the port regionalization thesis to include a foreland component specifically focusing on the role of the sea-sea transhipment business in shaping container port system development.

Early literature and models on port system development appear to follow a similar evolutionary and development path. This implies that port development on a regional scale would follow a similar path or milestones in their spatial development. Several studies question the high degree of path dependency in the development of ports at a regional scale. For example, Notteboom (2009) argued that port development processes also show a certain degree of contingency. As international operators, shipping lines and freight forwarders begin to integrate vertically or horizontally, these 'contingency factors' begin to deviate a port system from developing along similar lines. This results in some level of disparity among development patterns in port systems around the world. In other words, it is the combination of path dependency and contingency that explains why port systems around the world do not necessarily develop along the same lines or follow the same sequence of stages as suggested in the models on port system development. Jacobs and Notteboom (2011) show how port development patterns can also be

affected by the strategic actions of actors on the opening and closing of 'windows of locational opportunity' for port investments. There is also an increasing interest in academic literature on the role of political, institutional and regulatory factors in shaping port system development (see, e.g., Ng and Pallis 2010; Notteboom et al. 2013) as these factors have to some extent been undervalued by existing models.

Following the above theoretical review on port system development, the next section provides an overview on the volume throughput dynamics analysed first, holistically for the region. This will include market share positions and volume growth observations. In Sect. 7.4, we will point to some specific dynamics driving port system development in Southern Africa.

7.3 Container Throughput Evolution in Southern Africa

The southern African container port system has essentially evolved in three phases: the (1) colonial, (2) independence and (3) regional global integration phases. From as early as the late seventeenth century (the colonial phase) southern Africa served as an important maritime space, primarily a halfway refreshment station to service Dutch vessels *en route* to the east. The second (independence) phase was a period of ports being managed by newly independent states establishing their authority in the management of port state assets. Finally, in the current regional and global integration phase (3), ports face increased pressure on port capacity arising from the impact which globalization has had on trade. Alleviating this pressure exerted on existing port capacity is achieved mainly through port expansion projects (see Sect. 7.4.4 later in this chapter). At some ports, this necessitated port institutional changes (ownership structure changes—see Sect. 7.4.3), as a precursor for alternative (non-government) funding or private partner port investment.

This section focuses on volume growth and port competition in the southern African container port system. The analysis on throughput dynamics is based on container throughput figures measured in twenty-foot equivalent units (hereafter referred to as TEU). We first analyse the changing market positions of the individual container ports in the region and then focus on the dynamics between the four multi-port gateway regions in Southern Africa.

7.3.1 Market Position of Individual Ports

Figure 7.4 is a graphical representation of the total container throughput volumes in each port in the region from 1985 to 2018. Since 1985, the South African container terminals in Durban and Cape Town have dominated the market share of container volumes in the region. In more recent years, the newer port of Ngqura joined the top league. In 2018, Ngqura (829,813 TEU) even surpassed Cape Town (825,194 TEU) to become the second largest container port in Southern Africa. Still, the dominant position of South African ports has been affected by economic and political shocks. In September 1985, South Africa felt the impact of the imposition of trade and economic sanctions by the European Community and Commonwealth countries (by October of the same year). The sanctions caused an overall reduction in container volumes of −2.3% (1986) in all of the South African container terminals. The decline was however short-lived. South Africa developed extensive measures to circumvent the sanctions. According to Levy (1999) this was through costly import-substitution and the transhipment of cargo through countries that were not participating in the embargoes. From 1985 to 1989, export volumes rose by 26% (Levy 1999) and overall average container growth in South Africa during this period was 4%. The economic sanctions had a greater impact on capital flows than it did trade. During the period 1994–2000, South African container terminals realized significant growth in container throughput following the unbanning of the African National Congress in 1990. The subsequent first democratic election in 1994 spurred further growth. In the period

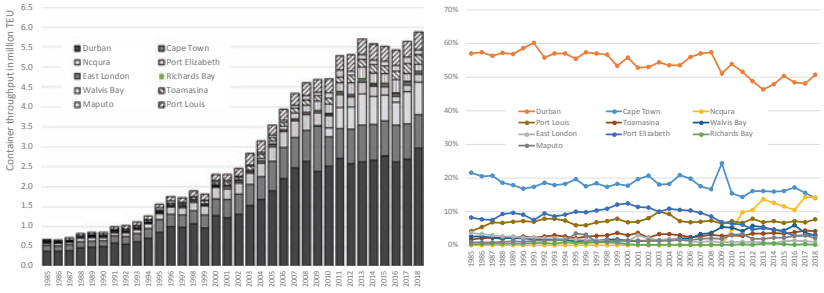

Fig. 7.4 Container throughput evolution in Southern African ports, 1985–2018, in TEU (left) and market share (right) (*Source* Authors' elaboration based on individual ports statistics)

1990–1998 container volume growth in South African ports recorded an average of 14.7% per annum. Peak container traffic growth was realized in 1995 at Cape Town, Port Elizabeth and Durban growing 33, 36 and 20%, respectively. In the period 1998–2008, average annual TEU growth in South Africa continued at an average of 14.2% per year. The start of the economic crisis in 2008 led to a stagnation of volumes in most South African ports. The average annual growth fell to only 0.8% in Cape Town and 1.3% in Durban in the period 2008–2018. However, overall TEU growth in South Africa in the same period reached 2.6%, thanks to the emergence of Ngqura. Durban remains by the far the largest container port of Southern Africa. Its market share gradually dropped to 45% in 2003, but recovered in more recent years to reach 51% in 2018.

Given its location *vis-à-vis* key hinterland markets, Maputo (Mozambique) has developed into the main competitor of South African ports (Durban in particular), despite its much smaller volume representing only 121,000 TEU or 2.1% of total port system throughput in 2018. Located on the eastern side of Southern African, Mozambique rapidly developed economically and socially after fifteen years of intense civil war (1977–1992). The Maputo container terminal has recorded a strong annual growth of 20.8% in the period 1990–1998 and 28.5% in the period 1998–2008. After the economic crisis average annual growth reached a more modest 3.1% per annum.

The port of Walvis Bay in Namibia is located on the west coast of Southern Africa. The country gained independence from South Africa in 1990. Between 1985 and 1998, container volumes at Walvis Bay appeared to be very unstable and for some periods within that time frame, some negative growth was recorded. After the harbour at Walvis Bay was deepened in 2000, the port began attracting greater cargo container shipping. In 2000, Walvis Bay's market share was at 1.5%, by 2008 it had more than doubled to 3.7%. In 2018, it held 3% of the total region's market after a peak share of 5.7% in 2013.

The islands of Mauritius and Madagascar, although not land-based parts of the Southern African region, have an important role being strategically positioned at the crossroads of vital trade routes between Europe and Asia, Africa and Australia. The Indian Ocean island container ports of Port Louis (Mauritius) and Toamasina (Madagascar) have realized both container volume and market share growth since 1985. Madagascar felt the full impact of the political instability following the 2009 coup that ousted President Marc Ravalomanana and was compounded by the impact of the 2008–2009 global slump. The Port of

Toamasina now handles 90% of Madagascar's container traffic and more than 80% of all trade traffic on the island. Toamasina has increased its position from a very modest 1.7% market share in the region in 1985 to its current 4.2% share in 2018. Average annual container growth rates for the island ports during South Africa's period of sanctions (1985–1990) reached 18% (Port Louis) and 15% (Toamasina) confirming Levy's (1999) findings of increased South African transhipments during the period of sanctions. Port Louis has more than doubled its market share from 4.2% in 1985 to 9.9% in 2003. After a decade characterized by a weakening market position, the port reached a similar share again in 2014. At present Port Louis handles about 450,000 TEU or 7.7% of the region's total volume. It is important also to note that the transhipment incidence relative to captive volumes at Port Louis increased (in 2001 and 2002) from 5 to 30% of total throughput. Port Louis has since maintained a transhipment incidence between 40 and 50% of the terminal's throughput. Frankel (2010) credited Mauritius's economic success to the following policy-related factors: creating a well-managed Export Processing Zone, conducting diplomacy regarding trade preferences, avoiding currency overvaluation and facilitating business.

7.3.2 Multi-port Gateway Regions in Southern Africa

In order to obtain a more detailed spatial insight in throughput dynamics, it is useful to examine volume shifts among port groups. This implies distinguishing multi-port gateway regions within the region. In line with Notteboom (2010a), we apply two criteria for the grouping of ports. The first is the locational relationship of the grouped ports relative to identical hinterlands effectively clustering the ports in one multi-port gateway region. The second is the calling patterns in the liner service networks of shipping lines together with the competitive relationships among the ports. Thus, the Southern African container terminals have been grouped in four multi-port gateway regions based on shared hinterland and liner service call patterns and geographical positioning: North East comprises Maputo, Richards Bay and Durban; East encompasses Port Elizabeth, Ngqura and East London; Indian Ocean is composed of Toamasina and Port Louis; West consists of Walvis Bay and Cape Town. The throughput evolution of each of these groups and their respective market shares are depicted in Fig. 7.5.

The graphs reveal that the Northeast gateway region dominates the Southern African container port system handling 53% of the total

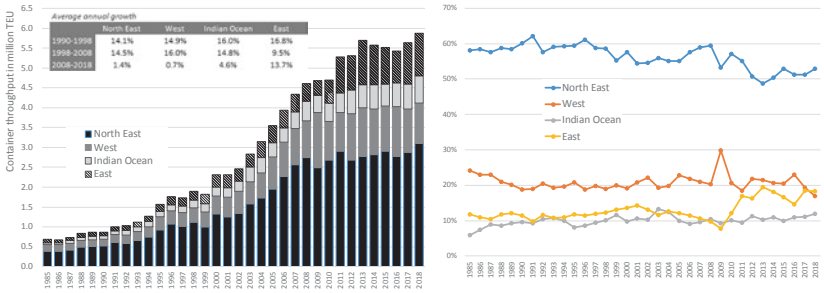

Fig. 7.5 Container throughput evolution in multi-port gateway regions in Southern Africa, 1985–2018, in TEU (left) and market shares (right) (*Source* Authors' elaboration based on individual ports statistics)

volume. Given its scale, the port of Durban largely influences the relative position of this multi-port gateway region. Despite its much smaller size, Maputo remains a key competitor of Durban. From a hinterland perspective, Maputo provides shorter road and rail distances to the Gauteng area, the economic heart of South Africa, compared to the hinterland routes from the port of Durban, as we will demonstrate later in this chapter. Furthermore, there has been a considerable amount of structural development, co-ordination and co-operation among the key infrastructure role players (road, rail and port) of the Maputo development corridor. Finally, bilateral removal of visa requirements for Mozambique and South African nationals and the extension of the border posts of both countries to twelve hours a day for people and sixteen hours a day for goods also gave an additional stimulus to Maputo (Ntamutumba 2010).

The position of the East region got stronger in the 1990s, but a below average growth in the period 1998–2008 resulted in a market share drop below 10% by 2008. In the past decade, the East range managed to present the strongest growth figures due to the development of Ngqura. The port of Ngqura was inaugurated in October 2009. The start of operations in Ngqura resulted in high volume shifts away from Port Elizabeth and to a lesser extent also East London. These volume shifts were due to a combination of a business decision by Transnet (i.e. the operator of all South African container terminals) for certain cargo to be diverted from Port Elizabeth to Ngqura and the development of the east coast corridor into the hinterland from the port of Ngqura. Thanks to the development of Ngqura, the East range became the second largest

multi-port gateway region in Southern Africa in 2018 handling 1.07 million TEU or 18.3% of the total.

The market share of the West range remained fairly stable at around 20% since 1985 with only two outliers: a temporary rise of the market share to 30% in crisis year 2009 (caused by a steep year-on-year volume rise of +49% in Cape Town and +47% in Walvis Bay), and a drop to 17% in 2018 (caused by a 6.4% year-on-year traffic decline in Cape Town and even −14.4% in Walvis Bay). An important expansion project in Cape Town to double the terminals capacity to 1.4 million TEU commenced in 2007 with disruption to the operation.

The Indian Ocean islands port range remains the smallest port group in Southern Africa in volume terms, i.e. about 0.7 million TEU or 11.9% of the region's total. The two ports in the Indian Ocean range are involved in an intense competitive rivalry resulting in non-linear or periodic swings to either port with no trend towards a single consistent winner. The footloose nature of the volume shifts is largely due to the following factors: (1) high incidence of transhipment cargo due to limited hinterland capture area; (2) rivalry and fierce competition for transhipment volumes due to the relatively close proximity of the two islands; and (3) Madagascar's political instability following the 2009 coup.

7.4 Current Issues and Trends Impacting on the Southern African Container Port System

In the previous section, regional container port throughput dynamics were analysed. In this section, we consolidate these findings with the view of understanding their impact on current issues affecting the development of the Southern African container port system and its related multi-port gateway regions. These issues include: rivalry among ports within the same port range for gateway status or rivalry among ports for a transhipment hub identity. The position of the individual ports and port groups will also be assessed against the backdrop of investments and governance/regulatory frameworks.

7.4.1 Port Competition for Gateway/Hinterland Cargo

Major freight corridors connect the ports to the hinterland (see Fig. 7.1). Central to the corridors is Johannesburg situated in the

Gauteng province of South Africa. It is considered the main consumption and production zone of the region. This small region generates 10% of the entire continent's GDP. Given this fact, and the location of the largest inland container depot in this region, Gauteng is positioned as a critical node in the container logistics chain.

Both the Ports of Durban and Maputo are the main and nearest nodal points linked to Gauteng. Given that cargo is transported from these two ports onto continental areas inland effectively defines Durban and Maputo both as gateways. The two north-east range corridors orientated towards Gauteng are NATCOR (Durban to Gauteng) and Maputo Corridor (Maputo to Gauteng). The Maputo Corridor is well positioned along one of the most industrialized and productive regions of Southern Africa. However, the Maputo Corridor relies on some level of co-operation in the region across borders (South Africa/Mozambique) and across organizations (Transnet Freight Rail and DP World Maputo). Two gateways in such close proximity, however, result in intense rivalry for market share. Comparatively, from both a rail and road perspective, Maputo is a shorter distance to Johannesburg and Pretoria (Table 7.1). This has both cost and time implications for freight customers. The shorter distances from Gauteng to Maputo (compared to Durban) clearly illustrate the competitive advantage the Maputo Corridor has over NATCOR. However, Durban remains by far the biggest container port. Any further gains for Maputo will be limited to the port's increased capacity to handle any further incremental volumes. Given the port of Maputo's ambitious capacity expansion project (see Sect. 7.4.4), Durban will need to find initiatives to defend its status as the primary gateway port into Southern Africa. In addition to capacity improvements, the port needs increased

Table 7.1 Comparative distances of Maputo and Durban to industrial hubs

From	*Maputo*	*Durban*
*Comparative **rail** distances in km*		
Johannesburg	581	720
Pretoria	574	786
*Comparative **road** distances in km*		
Johannesburg	469	598
Pretoria	444	656

Source Authors' compilation (adapted from AA.co.za and the Transnet Freight Rail distance calculator)

focus on improved operational efficiencies, more competitive tariffs and a more reliable service offering.

Competition between Cape Town and Walvis Bay also largely focuses on gateway cargo. The Walvis Bay Corridor consists of three trade routes connecting the port of Walvis Bay to six SADC member countries namely, South Africa, Angola, Zambia, Botswana and the Democratic Republic of Congo. These destinations are all well served by the following corridors established by the Walvis Bay Corridor Group (www.wbcg.com.na):

- Walvis Bay—Ndola—Lubumbashi Corridor serving Zambia, Malawi and DRC;
- Trans-Cunene Corridor serving Lubango in Southern Angola;
- Trans-Kalahari Corridor serving Botswana, Zimbabwe and the Gauteng industrial hub in South Africa;
- Trans-Oranje Corridor serving the Northern Cape mines and agricultural industries in South Africa.

Port management company Namport plays an important role in facilitating these trade corridors to ensure improved border crossings, facilities and infrastructure benefits to transporters by engaging all stakeholders across all the relevant countries to ensure proper regional integration for the benefit of its customers. The Trans-Kalahari Corridor is a combination of rail (Walvis Bay to Gobabis via Windhoek), where, after containers are transported via road, they continue on rail from Lobatse in Botswana to Johannesburg. From a hinterland perspective, currently Cape Town is the port in the West range with the shorter distance to Gauteng compared to Walvis Bay. Despite the distance from Cape Town (the most southern point in the region), the port of Walvis Bay stated its strategic intent as 'A natural gateway for international trade' with the ability 'to reach the Gauteng market via the Trans-Kalahari Corridor instead of going via Durban or Cape Town, saving seven to eleven days of transit time' (Port Technology International 2011). Practically pursuing this ambition, in 2019 Namport inaugurated its newly constructed USD 200 million container facility which doubled the port's capacity (see further in Sect. 7.4.4). This will further intensify the competitive dynamics between Namibia and the South African gateway ports of Cape Town and Durban. Given that Ngqura has been identified to act mainly as the transhipment hub for the region, Cape Town is best positioned as

a gateway for the western regions of Southern Africa as well as a secondary gateway for Gauteng (after Durban).

The islands of Madagascar and Port Louis service for captive cargo are limited to the size of the islands (population served) and productive capacity to export commodities. The Indian Ocean range is therefore seen more as a transhipment hub region than a gateway port region. A detailed discussion on transhipment rivalry will follow in the next section.

7.4.2 Port Competition for Transhipment Cargo

Sea-sea transhipment involves a container handled twice within the same terminal deriving revenues from each transaction/move, i.e. unloading from a container vessel (mainline vessel or feeder vessel) and loading onto another vessel. Notteboom (2010b) examined the tension between multi-porting and a transhipment hub configuration in the South African container port system. Through the use of a generalized cost model applied to the two alternative network configurations, it was demonstrated that South African import and export flows are likely to face small cost increases when the port system moves to a hub port configuration. However, from a ship operator's perspective, the hub configuration is more attractive given considerable cost reductions in marine charges, port dues and ship costs. The study also revealed that Transnet as the sole operator of all container terminals in South Africa plays a key role in making the hub model successful, e.g. by lowering the rates for transhipment cargo and by making the rail rates out of Ngqura and Durban to Gauteng more attractive. Transnet is in a unique position since it can decide on both the terminal handling costs for transhipment containers and rail rates. Also, the hub configuration's success depends on the efficiency, cost-effectiveness and maritime and land connectivity of the chosen hub(s).

In the past decade, Southern Africa has managed to position itself as a modest transhipment hub region. Firstly, increased container vessel sizes and shipping line mergers and alliances gave rise to economic benefits from reducing the number of port calls. Secondly, increasing Asia-Africa and Asia-South America trade, high transit fees of the Suez Canal and increased piracy at the Gulf of Aden provided opportunities to the Cape route to position itself as an alternative for transhipment hubs along the Suez Canal/Straits of Gibraltar route. Notteboom (2012) analysed the

market potential for transhipment services via the Cape route as an alternative to the dominant Suez route. At present, the remoteness and the limited cargo potential of southern Africa seem to make the ports in the region no match for the traditional relay/interlining centres located at the crossroads of east-west and north-south trade. For example, most cargo between Asia and West Africa and between Asian and South America still is transhipped in ports near the Straits of Gibraltar (such as Algeciras, Tangiers-Med, Valencia and Sines) or in North European ports such as Antwerp and Rotterdam. However, a highly dynamic market environment and the search of shippers and shipping lines for cost efficiency, manageable risks and increased routing flexibility might give some room for alternative routes, such as the Cape route, to take up a more significant position in the global container shipping network. The southern route offers ample capacity to accommodate ship movements. The presented scenarios in the study showed that interlining via a hub near the Cape is expected to become more competitive compared to the Suez route due to a combination of higher Suez Canal transit fees, better vessel economics, higher bunker costs, slow steaming practices and subject to a more competitive terminal pricing strategy of southern African transhipment facilities in view of attracting interlining flows. In some scenarios, the Cape route outperforms the Suez route on the routes West Africa—Oceania, West Africa—East Africa, South America East Coast—Oceania and South America East Coast—East Africa. All other routes will be positioned within or close to the competitive range, i.e. the cost differences and time differences between the two transhipment options are small so that intense competition between the two routes can be expected. The future positioning of transhipment activity near the Cape compared to the Suez route will be determined by port-based factors (i.e. the availability of supporting services, port productivity and reliability, the volume of local cargo, the ability to handle large vessels and liner connectivity through an extensive mainline-feeder network), factors related to the market structure, terminal-based factors (i.e. rates, reliability, draught and vessel turnaround time) and logistics factors related to value-added services.

At present, the main rivals for transhipment cargo among hub ports in the Southern African port system are Ngqura and Port Louis. Both ports are geographically positioned along main trade routes. Durban remains the largest transhipment port in volume terms, but its transhipment incidence is much lower than in Ngqura or Port Louis. The Port

of Ngqura was from the investment planning stage, positioned as a deep-water transhipment hub. Although the facility experienced tremendous growth post commissioning (TEU traffic grew four times from 74,000 to 408,000 between 2010 and 2011), the facility remains underutilized. With installed capacity of over 1.3 million TEU, Ngqura has still not realized its full potential from an actual TEU throughput perspective. Port Louis since 2002 has realized a significant increase in transhipment over captive cargo and remains Ngqura's fierce rival for east-west transhipment cargo.

7.4.3 Port Governance

Next to competitive pressures from neighbouring ports, Southern African ports are also heavily affected by governance issues at a national and supranational level. Governance issues in combination with port reforms have played and still play an important role in the development of the Southern African ports.

7.4.3.1 General Governance Indicators

Tupy and Rohac (2014) indicate that some of the most significant bottlenecks to Africa's economic and infrastructural development are in fact internal to Africa. These include poor governance, inefficient bureaucracies and corruption. Political stability, transparency and an effective government administration are some pillars towards achieving credible improvements in policies and government institutions, thereby increasing confidence to foster investment and drive economic growth. The World Bank publishes governance indicators such as political stability, the absence of violence, government effectiveness and the control of corruption in the region. Table 7.2 shows that Mauritius leads with the highest scores in all governance indicators compared with the rest of the region. This is followed by Namibia and to some extent South Africa. Notably, South Africa had a considerably low score in the area of political stability. The riskiest Southern African countries are Madagascar and Mozambique. Not only do these countries record very low values on almost all governance indicators, but the situation even deteriorated when comparing 2017–2000. The poor performance in terms of governance can hamper the ports to attract cargo and to develop a long-term sound and durable position in the Southern African port system. Overall, from the governance indicators, we observe that countries with high

Table 7.2 World Bank Governance indicators (presented in percentile rank 0–100)

	Mauritius		Madagascar		Mozambique		South Africa		Namibia		*Germany*		*USA*	
	2000	2017	2000	2017	2000	2017	2000	2017	2000	2017	*2000*	*2017*	*2000*	*2017*
Control of Corruption	69	62	39	13	39	19	74	57	73	65	93	94	92	89
Government Effectiveness	68	78	32	12	41	18	76	65	63	61	94	94	92	93
Political Stability & Absence of Violence/Terrorism	74	82	53	33	41	14	38	36	36	69	95	67	83	59
Regulatory Quality	72	80	33	26	44	25	67	63	64	47	91	95	95	93
Rule of Law	81	76	43	20	28	15	58	52	59	61	94	91	93	92
Voice and Accountability	77	73	53	35	45	33	71	69	59	66	90	96	89	82

Note Figures for Germany and the United States were included for reference purposes only

Source Authors' compilation based on World Bank Governance indicators. https://databank.worldbank.org/reports.asx?source=worldwide-governance-indicators. Accessed 26 June 2019

governance indicator percentile rankings also have ports which perform better than those with lower rankings. For port infrastructure development, trade and growth within the region (landlocked and coastal) to be sustained, its governments need to simplify bureaucratic procedures, seek solutions to the political conflicts impacting on regional stability and have the will to root out corruption.

7.4.3.2 Port Governance and Institutions in Southern Africa

Table 7.3 shows that a large variation exists in the way ports in Southern Africa are organized and in terms of the nature of port authorities and terminal operators. The following paragraphs elaborate further on the overview presented in Table 7.3. A more detailed analysis building further on institutional concepts and insights can be found in Fraser and Notteboom (2015a).

The Transnet National Port Authority (TNPA) is the managing organization established and incorporated in Chapter 2 (3) of ACT 12, 2005 (The National Ports Act of South Africa). Currently, TNPA is structured as a division of a large cargo logistics public enterprise of the South African government, Transnet Soc. Although the national ports Act gives effect to the commercial separation of TNPA from Transnet Soc (effectively establishing the National Port Authority Pty (Ltd) (NPA) as a corporatized government entity), this however has not occurred till date. The rationale behind this separation aims to increase the autonomy of the port authority function (particularly as it relates to oversight and port investment) in South Africa. Transnet Soc has endured criticism from industry, which allege that the state-owned entity facilitates cross-subsidization and provides an unfair advantage to the other operating divisions (such as Transnet Port Terminals—TPT) in the Transnet group. In addition to holding the NPA, some other Transnet divisions include all of the dedicated container port operators nationally, TPT as well as the rail operator (Transnet Freight Rail). In terms of the narrow ownership structural categorization of the World Bank reform tool kit, the TNPA can be categorized as a Service Port-Tool Port Hybrid. The state-owned TNPA serves as the landlord and is also responsible for marine services, port control and marine engineering. The container operations of the country's four dedicated container terminals are leased to TNPA's 'sister division' TPT at Durban, Cape Town, Port Elizabeth and Ngqura. Consequently, the commercial separation of the TNPA from Transnet Soc remains a contentious issue within the

Table 7.3 Southern African port authorities and container terminal operators

Country	*Port authority*	*Container ports*	*Port type and ownership*	*Container terminal operator*
South Africa	National Port Authority, a division of Transnet Soc (TNPA)	Durban	Service Port Tool Port Hybrid	Transnet Port Terminals (TPT), the terminal operating division of Transnet
		Cape Town	The port Authority is a division of the separate legal entity Transnet, a public company with the South African government as the only shareholder. Transnet also holds the container operations (via TPT) and rail operations (via TFR)	
		Port Elizabeth Ngqura		
Namibia	Namport, a state-owned entity founded in 1994.	Walvis Bay Lüderitz	Tool Port, state owned enterprise	Namport. The new Walvis Bay container terminal project was built by China Harbour, and handed over to the Namibian Port Authority in August 2019
Mozambique	The Port Authority (PA), Division of Maputo Port Development Company (MPDC)	Maputo Matola	Private Port	Dubai-based global terminal operator DP World has a stake of 60% in MPDC. Under the master concession, DP World Maputo has the concession to manage, develop and operate the Maputo container terminal until 2043

(continued)

Table 7.3 (continued)

Country	*Port authority*	*Container ports*	*Port type and ownership*	*Container terminal operator*
Madagascar	Société de Gestion du Port Autonome de Toamasina (SPAT)	Toamasina	A National private company Landlord Port (PPP)	Global terminal operator International Container Terminal Services Inc. (ICTSI) has a concession for a period of 20 years (started in 2005). ICTSI is in charge of operating, managing, financing, and developing the Madagascar International Container Terminal
Mauritius	Mauritius Port Authority (MPA)	Port Louis	Tool/Service Port hybrid, government owned	Mauritius Container Terminal (MCT) is operated by publicly owned company Cargo Handling Corporation Limited (CHCL) following a 30-year concession agreement with MPA

Source Authors' compilation based on port authorities and terminal operators' info

South African port fraternity with advocates and opponents of each position.

The port of Toamasina in Madagascar is managed and operated by the Société du Port à Gestion Autonome de Toamasina (SPAT). In June 2005, container operations were concessioned to International Container Terminal Services Inc (ICTSI) for a period of twenty years. ICTSI is in charge of operating, managing, financing and developing the Madagascar International Container Terminal.

The Mauritius Port Authority (MPA) was set up under the Ports Act of 1998 and is the governing authority in the port of Port Louis. MPA acts as a landlord port authority. Container, general cargo, and bulk operations (excluding products through pipelines) are handled by the publicly owned company Cargo Handling Corporation Limited (CHCL), which has a thirty-year concession agreement with the MPA. This includes also the Mauritius Container Terminal (MCT).

The port of Maputo in Mozambique is managed by the Maputo Port Development Company (MPDC), a Mozambican-registered joint venture. The company consists of the Mozambican Ports and Railways Authority (CFM, 40% stake) and Dubai-based global terminal operator DP World (60%). MPDC has a master concession that runs until 2033, and with a possible ten-year extension until 2043. Under the master concession, DP World Maputo has the concession to manage, develop and operate the Maputo Container Terminal until 2043.

The port of Walvis Bay is managed by Namport, a state-owned entity founded in 1994 after Namibia's independence in 1990. In 1998, the Namibian Ports Authority embarked on the first substantial expansion plan in forty years by refurbishing the quays in Walvis Bay and deepening the port to −12.8 metres. This has subsequently been increased to −14 m depth and the quay lengthened.

Table 7.3 does not refer to any other government agencies that play a role in the port industry. For example, fair competition and ethical price/tariff determination have necessitated regulatory bodies such as port and competition regulators which aim to ensure fair competition and economically justifiable prices charged to customers. Such regulatory bodies include, for example, the ports regulator and competition commission in South Africa and are important in environments where natural competition between (domestic) container ports does not exist and/or intra-port competition is weak or lacking.

7.4.4 Port Capacity Investments

From as early as the seventeenth century, Southern Africa served as an important maritime space in the global network. The ports in this region have transformed from colonial halfway refreshment stations to viable container and bulk ports following various port investment initiatives. Today, however, due to greater social and economic stability, regional integration and globalization, Southern African container ports in particular face increased pressure on account of demand exceeding available port capacity. This growing misalignment between container demand and container port capacity impacts the quality of service experienced at the ports (Fraser and Notteboom 2015b). Therefore, ports increase capacity by investing in port infrastructures such as canal enhancements, additional berths or additional port handling equipment. Ceteris paribus increasing port capacity should help to enhance service quality and reduce time costs for ships and cargoes, and should therefore attract and accommodate more traffic to the port. The demand for additional capacity was particularly high in the 1990s and 2000s given the strong volume growth in the region (see Fig. 7.5 earlier). In the post-2008 era, container handling demand grew at a slower pace, which led to a rescaling, postponement and/or cancelling of some earlier capacity extension projects in the region's container ports. Still, capacity extensions are underway in most of the region's ports. The following paragraphs discuss the past, current and planned capacity investment programmes in each of the container ports of Southern Africa.

7.4.4.1 South African Ports

In South Africa, TNPA and TPT, both part of Transnet, have in the last fifteen years initiated significant capital investment programs at each of the ports. In 2007, the redeveloped Durban Container Terminal Pier 1 facility was inaugurated and South Africa's first rubber-tired gantry operation was launched. Pier 1 and Pier 2 of Durban Container Terminal (DCT), both established in 1977, have been upgraded several times to bring the combined capacity to 3.6 million TEU per annum, which will increase to 4 million TEU after the berth extension. Work is in progress to deepen terminal draught to 16 m. DCT can handle new generation vessels with twenty-four containers stowed across the deck. Large funds have been set aside for the terminal's re-engineering and boosting of existing equipment fleet. Durban handled 2.975 million TEU in 2018.

The Ngqura Container Terminal started operations in 2009 and is positioned as a transhipment hub in the terminal portfolio of Transnet/TPT. With a draught of 16 m, it is the deepest container terminal in Southern Africa. A total of R4.1 billion has been invested in NCT to date. The construction of the second phase is underway aimed at increasing capacity from 800,000 TEU to 2.3 million TEU. NCT handled 829,813 TEU in 2018.

Cape Town Container Terminal (CTCT) operations date back to 1977. The container terminal underwent extensions of the quay walls and conversion of the operation from straddle carriers to rubber-tired gantry cranes (RTG). Phase 1 of the multi-phased terminal upgrade plan has already been completed. This phase included the extension of the quay wall by 10 m over the entire 1137 m length of the quay, at a depth of 15.5 m. It also allowed the terminal to receive 8000 TEU vessels which are handled by six new super post-Panamax ship-to-shore gantry cranes. Phase 2 will increase capacity from 1 million TEU to 1.4 million TEU. CTCT handled 825,194 TEU in 2018.

Port Elizabeth (PE) Terminal started operating in 1963. The terminal houses a container terminal, a Ro-Ro facility supporting original equipment manufacturers such as Volkswagen SA and a manganese bulk handling operation. The container facility has seen hardly any upgrades in the past decade as most of the container business moved to Ngqura after the latter became operational. The East London Terminal (MPT) was established in 1963 and currently is a mixed terminal with Ro-Ro activities, a large grain silo, break-bulk and containerized cargo facilities. Recent investments in equipment vary from straddle carriers to mobile cranes and forklifts.

In the past decade, Transnet has undertaken feasibility studies with a view to identifying viable long-term development options for additional terminal capacity in the South African container port system. These development options also considered large-scale terminal capacity plans beyond the existing approved expansion plans. For example, two planning alternatives have been considered to add significant terminal capacity to the port of Durban in the longer term: (1) the Durban container north quay expansion project (i.e. quay lengthening and berth deepening) within the Pier 2 facility which will increase the capacity to from 2.3 to 2.9 million TEU; (2) the phase 2 Pier 1 container 'infill' project envisaged to increase Durban Pier 1 from 0.7 m to 2.5 m TEU; (3) the Durban Dig-Out Project (DDOP) on the current site of the old Durban

airport located south of the city. The DDOP, although deferred, is still in Transnet's long-term capital plan. The project entails the construction of a large dock following Transnet's purchase of the old Durban International Airport site in KwaZulu-Natal. The idea is to develop the site in phases comprising container berths, automotive berths and liquid bulk berths. To carry the heavy investment burden of such a major port infrastructure development, Transnet has already investigated the business rationale of funding arrangements for the proposed dig-out port, also including different options in terms of public-private partnerships (PPP). The long-term plans for Ngqura could encompass a further land reclamation in the sea in combination with an extension of the breakwater, west of the existing terminal construction area. Even Richards Bay has been briefly considered as a possible location for the creation of a large-scale container terminal capacity (Notteboom 2011).

In the past decade, Transnet together with South African policymakers have approached the issue of port investments within wider nation-wide targets of lowering the (logistics) cost of doing business, the development of the sea-sea transhipment business in relation to sub-Saharan countries and inland corridor development (see, e.g., Notteboom 2010b, 2012; Fraser and Notteboom 2014 for a more detailed discussion on these issues). Although TNPA and TPT exist as ring-fenced divisions of Transnet providing each with a certain level of autonomy in decision making with respect to business and operational decisions, the funding strategy (source and use of funds) ultimately resides in the hands of the holding corporate office, Transnet. Effectively, 'mega projects' are defined outside of the delegation of authority of the two-port divisions and require group board project and funding approval. The current institutional position of the container sector in terms of funding sources for the container expansion endeavours of Transnet thus implies a self-funding (balance sheet) strategy for the capital investment endeavours of TNPA and TPT.

7.4.4.2 Maputo in Mozambique

DP World Maputo is expanding the container terminal's capacity from 0.35 million TEU to 0.5 million TEU by 2020 (expansion phase 3A) and further to 1 million TEU by 2022 (phase 3B). The quay length will be enlarged from 308 m to 655 m, and the terminal size from 15 ha to 17 ha (2020) and 30 ha (2022). The draught alongside increases from 12 m to 16 m. The maximum ship length will be 330 m (approximate

capacity of 8000 to 10,000 TEU vessels). The current terminal equipment of three mobile harbour cranes and six RTGs will be upgraded to six super post-Panamax ship-to-shore cranes and 24 RTGs. These investments imply that the Maputo facility will grow from a small container terminal handling only 121,000 TEU to a large state-of-the-art terminal with a capacity of 1 million TEU. This development is expected to further intensify competition between Maputo and Durban.

7.4.4.3 Indian Ocean Island Ports

The Madagascar International Container Terminal Services (MICTS) is the only container terminal in the port of Toamasina. MICTS handled 246,645 TEU in 2018. Société du Port à Gestion Autonome de Toamasina (SPAT) is undertaking an extension of the C4 container quay of 470 m with a draft of 16 m, the reclamation of 10 ha to 15 ha for container stacking, the rehabilitation of container quays C1, C2 and C3, the expansion of the storage areas and the installation of related equipment. The project also involves the expansion of the breakwater. The project is being developed with the support of the Government of Japan. The project is being funded by SPAT, the Government of Madagascar and the Japan International Cooperation Agency (JICA). The groundbreaking ceremony for the project took place on April 23, 2018. Project completion is scheduled for 2026.

As regards Port Louis, the extension of the quay length at the Mauritius Container Terminal (MCT) to 800 m was completed in August 2017. The facility of 34.5 ha and equipped with seven ship-to-shore cranes can now accommodate two large container vessels of about 360 m each. With the deepening of the navigation channel from 14.5 m to 16.5 m, MCT is one of the deepest ports in the South-West Indian Ocean, capable of handling container vessels with a draught of about 15 m and a capacity of 13,000 TEU. With the extension and upgrading of the MCT, the capacity of the terminal has been increased from 550,000 TEU to around 1 million TEU. MCT handled 451,446 TEU in 2018 of which 190,970 TEU was sea-sea transhipment (42%).

7.4.4.4 Walvis Bay—Namibia

In August 2019, the new Walvis Bay container terminal project in Namibia, which was built by China Harbour, was handed over to the Namibian Port Authority. This solution not only enabled China Harbour

to complete a project according to the contract, but also led to a successful technological breakthrough for Namibia. The new container terminal began construction in 2014 and entailed the creation of forty hectares of new land reclaimed from the bay within Namport's current port jurisdiction. It adds an additional 600 m of quay wall length to the existing 1800 m, which will enable a major rehabilitation of existing quay walls to occur with minimal disruption to operations. The berthing structure is designed to accommodate vessels of up to 8000 TEU, and corresponding railway, power supply and other supporting facilities, as well as four advanced ship-to-shore cranes. Through the construction of the project, the annual throughput of the container terminal at the port has increased from 300,000 TEU to 750,000 TEU.

It is worth noting that the Chinese government signed the memoranda of understanding on the Belt and Road Initiative (BRI) with the Namibian government in September 2018. Chinese companies have proven to be very instrumental in the realization of key port expansion and rehabilitation projects across Africa which facilitate trade by reducing port and logistics inefficiencies. Still, Chinese investments in Africa are being scrutinized by (Western) countries. Devermont et al. (2019) argue that some Chinese port investments pose a direct security risk to Western or African interests as the Chinese investments concerned go beyond pure commercial motives by including broader military and/or geopolitical objectives. Other sources criticize China's role in setting credit terms linked to project funding which could function as huge debt traps to bring African developing countries under stronger political control of China. In other words, some claim that China has used debt pressure to establish control over key assets (such as ports) in strategically located countries. A much-cited case relates to Djibouti which is projected to take on public debt worth 88% of its GDP, the majority owned by China (Hampstead 2018). However, the presence of Chinese companies in the Southern African container port system is small compared to the investments and operations in East and West Africa. This is partly the result of the port governance structure in South Africa, but also because of the BRI's main focus on East Africa, as this region is located along the 'maritime silk road' part of the BRI introduced in 2013 by China's President Xi Jinping.

7.5 Conclusion

Till date, the competitive dynamics in the Southern African container port system have not been well researched. Accordingly, this chapter provided an assessment of the development paths of the ports and related multi-port gateway regions in the Southern African container port system. The drivers behind these development dynamics were further examined by elaborating on inter-port competition for hinterland cargo and transhipment flows, terminal capacity investments and the evolving governance/regulatory frameworks. The analysis demonstrates that the Southern African container port system consists of a heterogeneous mix of different port types and sizes, guided by diverse governance and investment modalities. These different organizational settings have resulted in a vibrant competitive scene in Southern Africa mainly centred around four distinct multi-port gateway regions. Even within the centrally led South African container ports (i.e. Transnet), seaports have somewhat adopted different roles in accommodating the region's gateway and transhipment flows.

The future outlook for the region offers both opportunities and challenges. From an economic perspective, the southern African region's economy has remained sluggish with GDP growth rates remaining below 3% according to the African Development Bank. Of particular concern is South Africa, where economic growth has not exceeded 2% since 2014. The IMF's Southern African GDP growth outlook however is positive with an expected 4% growth rate in the region. Although relatively stable, Southern Africa is still significantly affected by some political tensions such as the Madagascar coup, Zimbabwe and Mozambique land expropriation as well as a transition of power within the Government of South Africa. This has brought with it some uncertainties with respect to trade and Foreign Direct Investment (FDI)—key drivers of container traffic. In addition, in order to accommodate fifth and sixth generation vessel calls, the ports in the region will need to accelerate investments to accommodate incremental container volumes, which are also necessary to fund the increased port capacity requirements. These investments have come at a significant cost particularly for the more recent development such as Walvis Bay and Ngqura. Both of these ports currently have excess capacity which ideally needs to be utilized in order to recoup the massive costs incurred for these developments. The challenge will be the ability of each of the region's ports to attract and sustain container traffic. This

is in the face of ongoing shipping line mergers and alliances that continue to optimize vessel calls and consequently increase the competitive forces between the ports contesting container traffic in this region. The major upscaling in vessel size in Southern Africa to an increasing number of post-Panamax units clearly favours the ports that offer deep draught access channels, sufficient terminal capacity and quick vessel turnaround time. This issue is expected to lead to more cargo concentration towards these ports. This will come at a significant cost amidst increased regulatory compliance (environmental, competitive) as well as land space constraints.

Considerations for future research of ports in the region could include: (1) gateway and hub corridor strategies and competitiveness given the SADC integration process and (2) the emergence of Southern Africa's position for South-South transit routes along the Cape of Good hope at the level of transhipment flows given upscaled vessels (i.e. an extension of the work of Notteboom 2012) and (3) the impact of regulations and governance (competition and environmental) on Southern African container port development.

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CHAPTER 8

Maritime Networks of Africa and Asia

César Ducruet and Kenmei Tsubota

8.1 Introduction

At least since the sixteenth century, African external trade has been orientated towards Europe and America. Given this orientation, many studies devoted much attention to the trade structure linking Africa and the West, to the neglect of Africa's intra-regional trade and the admittedly minor trade with other continents. This chapter is devoted to exploring the African maritime trade links with non-European continents. We use a recently constructed historical trade database by Fouquin and Hugot (2016) for the long-term connectivity of Africa with the rest of the world. Thanks to their database, we have much more comprehensive views of the direction of trade from the late nineteenth century. Starting from the observation of historical trade statistics, we confirm that the major trading partner of Africa has always been European countries and African countries. Yet, from the late twentieth century,

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the composition of African trade has gradually shifted to non-European markets. In order to closely observe this trend, we focus on the minor intercontinental trade with America, Asia and Oceania. We find that particularly after the decolonization of African countries, the trade with the countries other than those of Europe and Africa had increased in volume and in route. Thus, we confirm that the diversification in direction of trade has been sustained and the share of non-European and non-African trade has been increasing. Furthermore, by utilizing unique data of container vessel movements, we show the changing and growing connectivity of Africa and Asia.

The rest of the chapter is structured as follows. Section 8.2 shows the changing dimensions of African connectivity by exploring the historical trade database. In Sect. 8.3, we discuss African connectivity via container vessel movements. Then, we conclude the discussion in this chapter in Sect. 8.4.

8.2 Historical Connectivity Analysis of African Trade

African trade played an important role in the conduct of maritime trade in history. This is buttressed by studies on pre-colonial periods such as Hopkins (1973) and Curtin et al. (1995), especially the continent's role in the slave trade to the American continent.

Newly available data constructed by Fouquin and Hugot (2016) is a compilation of most of the available historical trade statistics published by governments, which we refer to as CEPII-TRADHIST. In terms of coverage in time and countries, this data set is massive and is the most comprehensive, as of 2019. From the early nineteenth century, trade statistics got largely recorded, comprehensively documented and consistently published. Yet, such data compilation required advanced bureaucracy and technocracy, which are the basis of the modern nation states. However, non-European countries lacked such capacity in government until the onset of European colonization from the early nineteenth century. From the late nineteenth century, European colonial governments published trade statistics in respect of their Asian and African colonies. With these sources, we can explore the direction of trade flows at the time.

To start our discussion on African trade, we firstly look at the significance of Africa in world trade. Figure 8.1 shows the share of African trade from 1830 to 2014 based on CEPII-TRADHIST. It was about

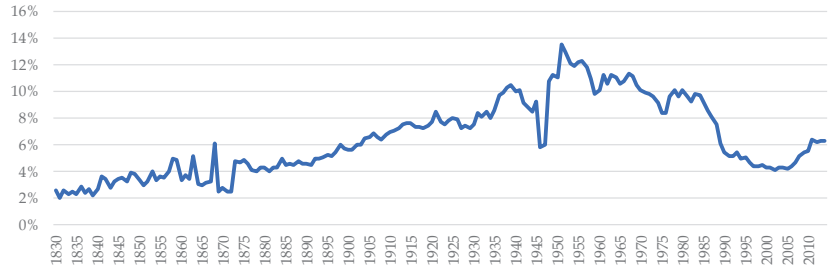

Fig. 8.1 Share of African trade in the world, 1830–2014 (*Source* Authors' compilation from CEPII-TRADHIST [1827–2014])

two per cent of the world trade in the 1830s. Though it fluctuated, there was a steady increasing trend up to 1950, particularly after the 1870s. Interestingly, in the sluggish world trade period in the 1930s, African trade increased its presence, suggesting the expansion of African trade during the period. The world trade in value was continuously rising except some turbulence in the 1920s to 1940s. Compared to 1950, the total nominal trade value of world trade was 0.02% in 1850, 0.12% in 1900, 0.34% in 1925, 19.65% in 1975, 214.4% in 2000 and 542.6% in 2014. Thus, the increasing trade between Africa and Asia was much faster than the increase in world trade before 1950. However, from 1950 to 2000, the share of African trade in the world trade has continuously declined, suggesting the growth of African trade has been slower than the world average. Though nominal trade values were mostly increasing in continental trade, trade with Europe continuously declined, and trade with Asia continuously increased. This changing composition of African trading partners may be partly explained by the experience of decolonization in the 1960s and the 1970s and the economic growth in Asian countries, demanding more primary mineral resources.

In terms of the composition of trading partners in the African trade, as is found in Fig. 8.2, African trade was mainly with Europe in the eighteenth century. From around the mid-nineteenth century, African trade with other continents began appearing in the governmental trade statistics. However, interpretation of the data requires us to understand the limitation in obtaining the overall picture of the world trade at the time because the coverage of the government trade statistics publications

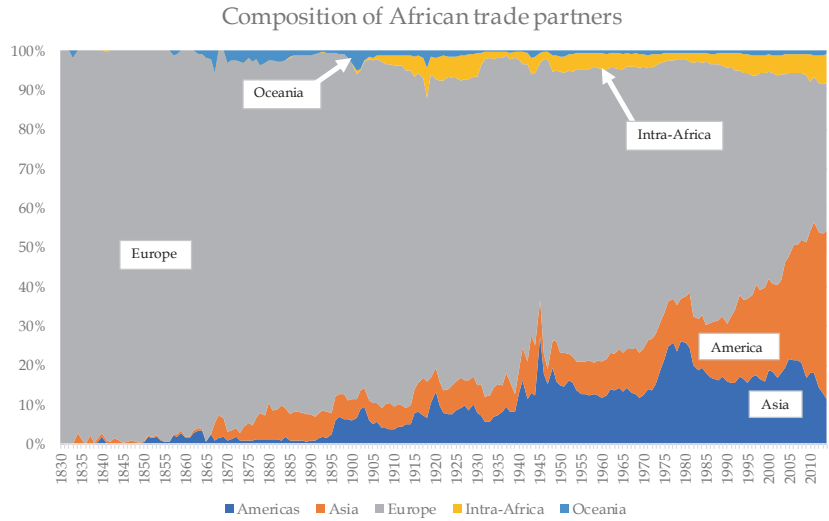

Fig. 8.2 Composition of African trade: increasing non-European trade (*Source* Authors' compilation from CEPII-TRADHIST [1827–2014])

had not yet become comprehensive. It was around 1905 when African colonies appeared in the data set, and they were mostly British and French African colonies. In general, as the data is constructed based on the import and export of then-developed countries as reporters, there is a systematic bias of under-reporting on the trade among then-developing countries and the trade by small vessels and of low valued commodities. However, since the major trading countries were then-developed and published the trade statistics, the coverage of the world trade is expected to be high.

From Figs. 8.1 and 8.2, we confirm the significance of European countries as the trading partners of Africa. For a much closer look at the direction of trade, excluding the Europe-Africa trade and intra-African trade, we list the top 15 trading links from CEPII-TRADHIST for 1875, 1900, 1950, 2000 and 2014 in Table 8.1. The name of the links shows the direction of the trade from the former to the latter. Interestingly, in 1875, the trade between British India and Mauritius consisted of about 37.4% combining imports and exports. Following in magnitude was the trade between Egypt and the Ottoman Empire at about 13.1%. Other

Table 8.1 Major directions and their shares of African trade excluding European and intra-African trade, 1875–2014

Rank	*1875*		*1900*		*1950*		*2000*		*2014*	
	Link	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*
1	British India_Mauritius	19.3	USA_British Africa	16.7	South Africa_USA	9.1	Nigeria_USA	8.6	South Africa_China	7.1
2	Mauritius_ British India	18.1	Australia_Cape Colony	12.1	USA_South Africa	7.2	South Africa_USA	3.6	Angola_China	4.9
3	Egypt_Ottoman Empire	11.2	USA_South Africa	11.5	Ghana_USA	3.9	USA_Egypt	3.1	China_Nigeria	2.7
4	Mauritius_ Victoria	8.3	Ottoman Empire_Egypt	11.5	Egypt_USA	3.5	Angola_USA	3.0	China_South Africa	2.7
5	British India_Egypt	4.7	Egypt_USA	8.5	Egypt_India	3.3	USA_South Africa	2.9	Nigeria_India	2.5
6	Cape Colony_USA	4.4	Mauritius_ British India	8.0	DRC Congo_USA	3.0	South Africa_Japan	2.5	Nigeria_Brazil	1.7
7	Mauritius_New-South Wales	3.6	Australia_Natal	5.5	USA_DRC Congo	2.9	Algeria_USA	2.3	South Africa_USA	1.3
8	Southern Australia_Cape Colony	3.6	British India_Mauritius	4.2	Canada_South Africa	2.3	Japan_South Africa	2.0	China_Algeria	1.3
9	USA_Cape Colony	3.4	British India_Egypt	3.6	Nigeria_USA	2.2	Saudi Arabia_ South Africa	1.9	Saudi Arabia_ South Africa	1.3
10	Mauritius_New Zealand	2.8	Egypt_ Ottoman Empire	1.5	Australia_ Egypt	2.2	Gabon_USA	1.8	China_Egypt	1.2
11	Mauritius_ Southern Australia	2.5	New Zealand_Natal	1.4	Kenya_India	2.2	Angola_China	1.5	USA_South Africa	1.2

(continued)

Table 8.1 (continued)

Rank	*1875*		*1900*		*1950*		*2000*		*2014*	
	Link	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*
12	South Africa_Canada	2.0	Canada_British Africa	1.2	USA_Egypt	2.2	Algeria_Brazil	1.4	China_Angola	1.0
13	Ottoman Empire_Egypt	1.9	British India_Natal	1.2	Zambia_USA	2.0	Iran_South Africa	1.1	USA_Nigeria	1.0
14	Mauritius_ Tasmania	1.7	USA_Egypt	1.1	Iran_South Africa	1.9	South Africa_India	1.1	South Africa_India	1.0
15	China_South Africa	1.3	British Africa_USA	1.1	Japan_South Africa	1.8	Algeria_Turkey	1.0	Angola_USA	0.9
Total share of top 15 links (%)		89.1		89.2		49.5		38		32
African trade value excluding European and intra-African trade[a]		0.00 (7.1%)		0.02 (14.4%)		0.60 (24.8%)		79 (43.1%)		383 (55.3%)
African trade value with Europe and intra-African trade[a]		0.05 (92.9%)		0.12 (85.6%)		1.81 (75.2%)		104 (56.9%)		310 (44.7%)
African trade[b]		0.05 (4.1%)		0.14 (6.0%)		2.40 (12.1%)		183 (4.3%)		692 (6.4%)
World trade value		1.32		2.32		19.92		4272		10,810

[a]The numbers in the parenthesis indicate the share in African trade in the year
[b]The numbers in parentheses indicate the share in the world trade in each year
Note All trade values at the bottoms of the table are in billions of British Sterling Pounds
Source Authors' compilation of CEPII-TRADHIST (1827–2014)

destinations included the United States (USA), Canada, Australia and New Zealand, suggesting the source is available only from British publications. In 1900, the trade links with the USA were ranked several times. Major links were British India-Mauritius, USA-British Africa, South Africa-Australia, Ottoman Empire-Egypt. In 1950, the USA was the destination of nine out of fifteen links. The largest trading link was between South Africa and the USA, accounting for about 16.3%. Moreover, the link between Egypt and the USA was 5.6%. The total share of the USA in the top 15 links was 35.8%. Japan appeared as a trading partner of South Africa, consisting of 1.8%. In 2000, the presence of the USA as the destination or origin was still high, as much as 25.5% of the top 15 links. However, the share of the major trading link between the USA and South Africa declined to 6.5%. From the Asian continent, Japan and China also featured. As of 2014, China was ranked seventh out of 15, which consisted of 21% of the total. The share of the USA declined to 4.4%, and Japan was out of the ranking.

The breakdowns of trade values are also listed at the bottom of Table 8.1. The trade values of African trade and African trade excluding European and intra-African trade are also listed. The share of African trade in the world trade ranged between 2 and 13.5% from 1830 to 2014, with its average at 6.48%. As indicated, the share of trade between Africa and Asia has been increasing in African trade as well as in absolute terms, amounting to about 55% of African trade in 2014.

To further focus on the Asian rise in African trade, we focus on the trading links between Africa and Asia. Table 8.2 shows the major trading links in CEPII-TRADHIST for selective years. In 1875, making allowance for a limitation in the coverage of governmental trade statistics, British India was listed as the largest trading partner in Asia, whose share was 75.7%. The largest trading link was between Egypt and the Ottoman Empire, and the second was between India and Egypt. As discussed earlier, Mauritius is ranked high, suggesting it functioned as a hub for trade. Interestingly, China was listed at six as the trading partner of South Africa. In 1900, though the share of British India slightly declined, its share was about 62.1%. The top 2 major trading links remained the same, and their share increased. In 1950, the significance of India declined to 26.6%, and Egypt also fell to 22.0%. As a newcomer, Japan got listed three times, and its total share was 10.1%. In 2000, China got listed four times, and its overall share was 7.5%. In 2014, the significance of China increased substantially, as it was ranked nine times out of 15, with a share of 29.1%.

Table 8.2 Major directions of Africa-Asia trade, 1875–2014

Rank	*1875*		*1900*		*1950*		*2000*		*2014*	
	Link	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*
1	British India_Mauritius	32.4	Ottoman Empire_Egypt	31.8	Egypt_India	9.7	South Africa_Japan	4.6	South Africa_China	9.2
2	Mauritius_ British India	30.4	Mauritius_ British India	22.2	Kenya_India	6.4	Japan_South Africa	3.6	Angola_ China	6.4
3	Egypt_Ottoman Empire	18.9	British India_Mauritius	11.5	Iran_South Africa	5.4	Saudi Arabia_ South Africa	3.4	China_ Nigeria	3.5
4	British India_Egypt	7.9	British India_Egypt	10.0	Uganda_India	5.2	Angola_China	2.8	China_ South Africa	3.5
5	Ottoman Empire_Egypt	3.3	Egypt_Ottoman Empire	4.2	Japan_South Africa	5.2	Iran_South Africa	2.0	Nigeria_ India	3.2
6	China_South Africa	2.2	British India_Natal	3.4	Japan_Nigeria	2.8	South Africa_India	2.0	China_ Algeria	1.7
7	British India_Reunion	1.8	Egypt_British India	2.7	Iran_Egypt	2.8	Algeria_ Turkey	1.8	Saudi Arabia_ South Africa	1.6
8	British India_ Cape Colony	1.4	British India_ Cape Colony	2.6	India_Egypt	2.8	South Korea_Liberia	1.8	China_ Egypt	1.6
9	Egypt_British India	1.0	British India_Kenya	2.5	Sudan_India	2.5	Congo_ Taiwan	1.7	China_ Angola	1.3
10	British India_Natal	0.4	British India_ Mozambique	2.2	Sri Lanka_Egypt	2.5	China_South Africa	1.7	South Africa_India	1.2
11	British India_St. Helena	0.1	Kenya_British India	1.6	Egypt_Japan	2.1	South Africa_China	1.6	South Africa_Japan	1.2
12	Reunion_British India	0.1	British India_Reunion	1.1	Sri Lanka_ South Africa	2.1	South Africa_ South Korea	1.4	Angola_ India	1.2

(continued)

Table 8.2 (continued)

Rank	*1875*		*1900*		*1950*		*2000*		*2014*	
	Link	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*	*Link*	*%*
13	Cape Colony_ British India	0.1	British India_ German West Africa	0.8	Saudi Arabia_ South Africa	2.1	China_Egypt	1.4	Congo_ China	1.1
14	Madagascar_ British India	0.0	British India_British Somaliland	0.8	South Africa_Israel	2.0	Saudi Arabia_Egypt	1.3	India_South Africa	1.0
15	Natal_British India	0.0	British India_Ethiopia	0.7	Saudi Arabia_Egypt	2.0	Japan_Liberia	1.2	China_ Ghana	0.9
Subtotal (%)		100.0		98.1		55.7		32.4		38.6
Total trade value (millions of GBP)		2.28		7.23		205		43,054		296,409

Source Authors' compilation of CEPII-TRADHIST (1827–2014)

8.3 Connectivity Analysis of the Africa-Asia Route: Container Data from 1977

As shown by our previous results, the share of Asia in African trade continuously increased from the late twentieth century. This confirms numerous network-analytical works on world regions connected by container shipping (Tran and Haasis 2014; Li et al. 2015; Xu et al. 2015), showing that Asia as a whole becomes prominent in basically all international trades. What remains missing is a deeper understanding of the Africa-Asia route with the port as the unit of analysis. While Ducruet and Notteboom (2012) demonstrated already that between 1996 and 2006, large parts of Africa became largely influenced by Asia through the shipping network, most studies looking at ports along this route had focused on the now popular One Belt, One Road initiative or on the new Maritime Silk Road (MSR) discussing, for instance, the connectivity of the region covered by the MSR (Wang et al. 2018) or the strategies of Chinese container operators in MSR ports (Wang et al. 2019). Another recent study looked at the differentiated port networks of major shipping lines connecting Africa with the rest of the world, including Asia, spotting the pivotal hubs within company's portfolios as well as market outliers (Metge and Ducruet 2017).

In this section, we opt for a different perspective that is the consideration of the entire African-Asian container shipping network. We expect to highlight which of African and Asian ports most specialize in Africa/Asia-related traffic. Another goal is to untangle, whenever possible, the respective role of trade networks and liner shipping networks, which may not always overlap due to shipping lines' strategies and operational requirements. The focus on the period 1977–2016 is dictated by data availability but also by the fact that this period coincided with important changes in container shipping evolution, from low diffusion and moderate growth to global diffusion and exponential growth, the latter mainly pushed by economies of scale and increasing ship sizes. Such factors strongly influenced port evolution by fostering competition and concentration along maritime ranges.

Two dimensions of Africa-Asia flows may be taken into consideration when basing the study on vessel movement data, space-L and space-P. Among all Africa-Asia flows, the space-L dimension only considers direct, one-stop trips between African ports and Asian ports. While this ignores the continuum of vessels' voyages and trade routes,

it is useful to detect possible hub ports, namely those that are primary ports to connect the continent to/from the outside world. Hub ports are intermediary nodes with the main function to ensure the link between intra-regional and interregional connectivity (Rodrigue and Notteboom 2010; Mareï and Ducruet 2015). By contrast, the space-P dimension does include the subsequent movements of vessels connecting both continents, and Fig. 8.3 is shown as an example. The space-P dimension thus implies that all ports called at by the same vessels are interconnected, along the line bundling route. In both dimensions, however, transhipment flows are not included, because they constitute intra-regional operations but also because they are not—in the figure—connecting directly or indirectly Africa and Asia. Containers aboard mother vessels are transhipped to/from feeder vessels to connect hub ports (where the transhipment takes place) with feeder ports (origin/destination markets). Our study focusing on interregional flows therefore excludes all intra-regional movements. The hub-feeder system distorts the trade continuum so that it is impossible to analyse the linkages between origin and destination markets like with trade data. A good example is Algeria, served by feeder vessels transhipping cargo at the hub port of Marsaxlokk in the island of Malta, which is located on the major Europe-Asia trunk line. The same phenomenon occurs in different

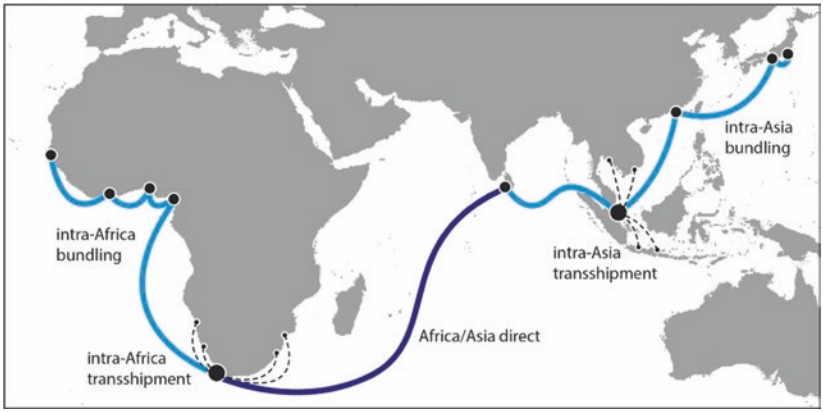

Fig. 8.3 Imaginary model of an Africa-Asia shipping route (*Source* Authors' elaboration)

places across Africa and Asia, hub ports being more or less intra- or extra-regional.

Our mapping of the Africa-Asia maritime container flows thus consisted in assembling vessel movement data into port-to-port matrices, for both space-L and space-P dimensions. In the space-L matrix we excluded Suez and Port Said in Egypt, due to their status in Lloyd's data as passage nodes, and reconnected the previous and next ports to allow connectedness between Asia and the Mediterranean. For the sake of eliminating too much noise in the data, ports belonging to the same urban area were aggregated with each other, following the methodology proposed by Ducruet et al. (2018).

In the space-L network shown in Fig. 8.4a, we observe an expected proximity effect as only the eastern part of Africa handles Asia-related traffic through direct flows. Within this part, two concentrations of traffic occur, namely in the Red Sea and in Southern Africa. The importance of Red Sea ports may be an artefact as those ports are well located on the Europe-Asia route, and so their role for Africa-Asia flows would mainly rest on an intermediate, geographically favourable, function, from Eilat and Aqaba to Djibouti and Somalia. The same applies to the intermediate hub port of Shalala (Oman), which functions between Europe/Med and Asia including the growing container market of the Middle East, but also to Tangiers-Med (Morocco), rivalling other formerly established Mediterranean hub ports.

As seen in Table 8.3, the size of the network had grown in line with increasing trade between the two world regions. Interestingly, however, the size of the space-L network increased faster between the last two periods for its nodes (doubled) and its links (tripled) than for space-P, where the number of nodes remained relatively stable, and the number of links nearly doubled. This surge in direct linkages is revelatory of closer ties between African and Asian port cities.

At the same time, the density of the network (Gamma index) tells us a lot about the underlying architecture of those distribution systems. More than two times lower in space-L than in space-P, the Gamma index is the proportion of observed links in the total, maximum possible number of links. The lower the Gamma index the more likely it is to have a centralized architecture due to the presence of hub ports. As expected, this density is lower for the space-L network due to the absence of line bundling flows in the network. Yet the absence of intra-regional flows as well does not prevent the density from being rather low, due to the fact that an African port may be a hub for Asian ports and vice versa.

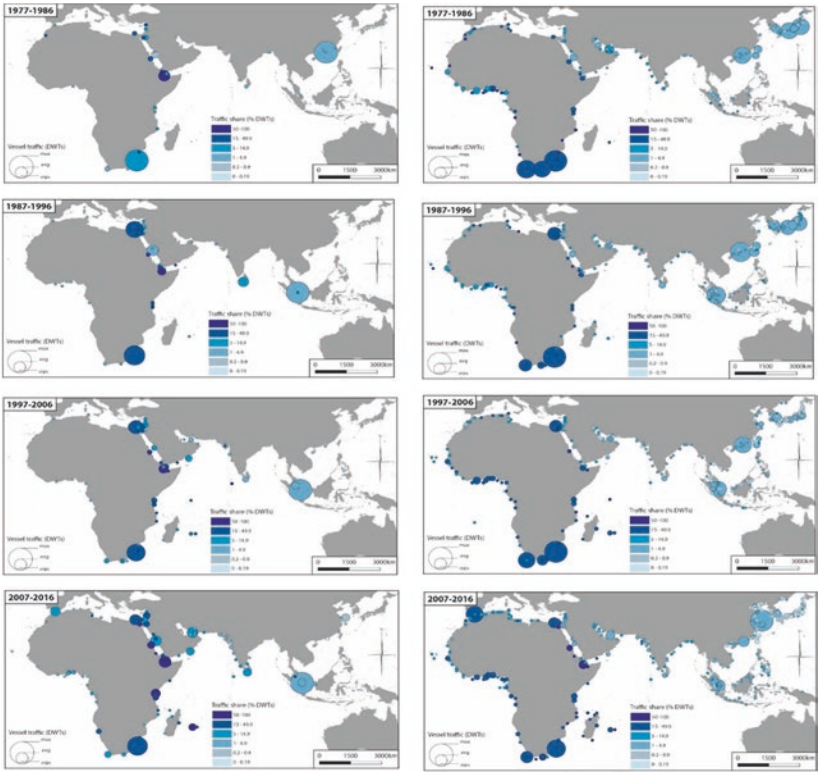

Fig. 8.4 Weight and share of Africa-Asia traffic, 1977–2016 (*Note* Left column represents Space-L [direct calls only] (**a**), and Right column represents Space-P [direct and indirect calls] (**b**). *Source* Authors' elaboration from Lloyd Connectivity Index)

As seen in Fig. 8.4b, as we already underlined, certain ports stand out by their strong specialization on Africa-Asia flows, such as Djibouti, Tangiers-Med and Durban in Africa, and Dubai, Shalala, Colombo and Singapore in Asia. The centralization of the network on these hubs palliate the lack of financially profitable trades and, at the same time, reveals the commonality between Africa and Asia that is, a high internal discrepancy in terms of port infrastructure modernity and wider economic development. Despite economic growth and the rise of Africa-Asia trade in the last period under investigation, the reinforcement of

Table 8.3 Network structure of Africa-Asia traffic, 1977–2016

Dimension	*Measure*	*1977–1986*	*1987–1996*	*1997–2006*	*2007–2016*
Space-L network	Number of nodes	86	59	96	177
	Number of links	233	124	298	940
	Gamma index	0.064	0.072	0.065	0.06
	Average shortest path length	2.946	2.783	2.72	2.771
Space-P network	Number of nodes	252	280	323	362
	Number of links	3580	4732	7161	10570
	Gamma index	0.113	0.121	0.138	0.162
	Average shortest path length	2.232	2.207	2.121	2.148

Source Authors' elaboration

centralization (i.e. lower space-L density) means that both regions' ports have been selected by shipping lines to ensure efficient cargo transfers between the two regions. This also explains why the Average Shortest Path Length (i.e. the average number of inter-port links needed to connect Africa and Asia on shortest lines) had risen in the last period, as cargo is increasingly shipped via those hubs. These dynamics put high pressure on supply chain actors in both regions and especially on Africa, which is not always prepared to offer such port environments. The gap between supply chain requirements and trade growth is somewhat compensated by a growing investment of global transport actors at a handful of well-equipped ports.

One should mention, in addition, a very clear traffic shift from Japan and the 'Asian Dragons' (i.e. South Korea, Hong Kong, Taiwan and Singapore) towards mainland China, especially in the last period of Fig. 8.4b, with Shanghai as the leading port. Despite the absence of international transhipment in China, this exemplifies the growing trade with Africa.

8.4 Discussion and Conclusion

In this chapter, we have explored the dynamics of African trade from the nineteenth to the twenty-first century. We have found that (1) the presence of African trade in the world trade was in a continuous rise from the nineteenth century to the mid-twentieth century with a peak at around 1950, (2) the presence of African-Asian trade was increasing from the early twentieth century and until the twenty-first and (3) the shipping

networks of the African-Asian trade consisted of many indirect links which are a variation of hub and spoke type.

Due to gaps in the available data, we cannot analyse the contents and commodities of trade. With a focus on some particular links, it would be interesting to know trade patterns evolved. Also, it was beyond our scope to analyse the trends of African American trade. However, it should be noted that a closer look at Fig. 8.2 suggests some increasing trends in African American trade in the later twentieth century. Though major links for this may be dominated by the USA, it is worth exploring all the same.

Based on such results, a promising research pathway would be to further explore the regionalization of trade and shipping networks. This would help us to answer novel questions at the disaggregated level such as which parts of Africa have links with other parts (and nodes) of the world? Are there preferential linkages emerging (such as with China), and how are they constant over time? Is the modification of the global supply chain a path-dependent process or does it create new forms of connectivity, sometimes not in line with Africa's trade patterns?

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CHAPTER 9

Afterword: The Past and Future of African Seaports

Ayodeji Olukoju and Daniel Castillo Hidalgo

Building on a similar effort fifty years ago (Hoyle and Hilling 1970), this collection of essays has examined aspects of port development in Africa across national, spatial and temporal boundaries. With the exception of Miguel Suarez Bosa's chapter on Morocco, the authors dealt with clusters of ports in different sub-region of Africa. As might be expected, gaps remain in the coverage of the themes and regions. To be sure, this book did not set out to be the last word on the subject of African seaports. Hence, this concluding chapter reflects on a number of issues raised by or arising from the case studies in this book. Among these are the interlocking issues of geography, technology, foreign capital, global and local political economy, and transport.

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The primary role of geography in the fortunes of African seaports is a recurring theme in the literature and is underscored in several chapters in this book. This is epitomised by the lack of natural indentation of the African coastline, which also highlights the continuing importance of technology in both the development and the maintenance of access to African ports. Studies of port engineering in the local and comparative contexts are therefore required to map change and continuity over time. The paucity of natural harbours keys into the prevalence of artificial ports, including deep seaports, especially in the Gulf of Guinea. This suggests that more artificial ports will be created in the near future. It remains to be seen whether those ports can play the expected developmental roles in Africa's sub-regions and countries akin to Japan's "developer ports" (Olukoju 2004a).

The symbiotic relationship between ports and their host cities is a major theme that requires further attention. As noted in this book, most African seaports are either national capitals, industrial and commercial hubs or, in some cases, megacities (such as Lagos, Abidjan, Alexandria or Dakar). The rise of huge concentrations of population around seaports with their attendant social problems—crisis of housing, unemployment, poverty, and higher rates of crime—cast doubts on the supposed developmental impact of seaports. Rather than growth poles, they could also be seen as vectors of perverse development. They could engender lopsided resource allocation and aggravate rural-urban drift in particular countries. Yet, it must be conceded that, as national capitals or economic centres, port cities have aided the process of national integration as meeting points or melting pots of nationals of Africa's multi-ethnic countries.

Shipping is a major dynamic in the rise and decline of African seaports. As shown in several chapters in this book, the dynamics of the global shipping industry exert considerable influence on competition among African seaports. These include technological changes leading to the construction of bigger vessels, and the alliances and mergers by operators in the industry. More mergers could occur in the future and this would affect competition either way in the industry. A conjunction of these forces could seal the fate of uncompetitive ports and virtually extirpate the indigenous shipping industry in Africa.

Transport policy, especially in relation to inland transport development, or lack of it, is another critical factor in the changing fortunes of African seaports. This dynamic, especially poor coordination of transport modes, ties in with the uneven spread and impact of containerization

across Africa and failure to achieve the full potential of Inland Container Depots (ICDs) and dry ports. The underdevelopment of inland transport corridors, especially rail transport, already noted in several chapters in this book and other sources, is largely responsible for the underdevelopment and under-utilization of ICDs. This bleak outlook is likely to persist as long as the admittedly underdeveloped railway systems are poorly connected across national boundaries.

Changes in the global economy have serious implications for African seaports. A striking illustration of this is the clamour for the change to clean and renewable energy in the face of climate change and its consequences, including global warming, sea level rise and extreme weather conditions, causing flooding and droughts. The move towards alternative energy sources poses a mortal threat to fossil fuels in the immediate future. Yet, oil exports constitute the economic bedrock of several of the African seaports and their national economies. The possible decline of oil-based national economies and seaports will ensue if they are unable to adapt to such global changes. African seaports also need to be transformed into industrial hubs from their current gateway status as mere conveyor belts of primary produce. Global economic cycles also have implications for port concentration and diffusion in Africa.

Issues of local and global political economy deserve attention in future studies of African seaports. As demonstrated in most chapters in this volume, port administration has shifted decisively in favour of the Landlord port model, which has gained wide acceptance across Africa. The question remains as to whether the model, as demonstrated in several chapters in this volume, would engender more efficient ports and whether more concessions would be granted to foreign terminal operators, and with what consequences for indigenous agency and initiative.

The efficiency or otherwise of seaports in national or sub-regional settings has been raised in several chapters but one specifically addressed the evaluation of port performance. More studies on port performance would shed light on the comparative efficiency of port services in Africa. The criteria for evaluating efficiency should incorporate all agents that play a role in the port environment. More studies in the mould of the East African study in this volume should combine several port indicators to analyse different components of port performance. Such findings would aid the choices of ports to invest in.

Given the weakness of national capital in most African national economies, the recourse to Foreign Direct Investment (FDI) is inescapable.

FDI is required to make African seaports competitive and drive up the container traffic. Such investments are targeted at increasing port capacity to accommodate fifth and sixth generation vessels and anticipated increases in container throughput. However, there is the danger of excess port capacity, fuelled by over-optimistic forecasts, which is already prevalent at some African ports (see chapter on South Africa). In this connection, the competition for traffic would put pressure on individual ports to devise strategies for attracting and sustaining container traffic. Yet, as indicated in this volume, the matter is not entirely in the hands of port authorities or even national governments. The more important role will be played by the shipping companies, which might continue to merge and form alliances aimed at optimizing vessel calls. Paradoxically, such developments will intensify competition among African seaports.

The recourse to FDI inevitably calls attention to the role of foreign interests in port management and shipping in Africa. Indigenous stakeholders, especially national governments, have exploited this funding avenue, especially in West and Central Africa, by promoting various schemes of deep seaport development. Not only does this aggravate foreign participation in the construction and management of maritime infrastructure, it could lead to overcapacity in the ports sector and politicization of infrastructure development. As seen already in the Gulf of Guinea, political considerations and maritime nationalism, rather than economic rationality, have driven multiple deep seaport projects within a single country (Nigeria) or a narrow coastal range (Gulf of Guinea). The quest for hub status among African seaports has led to stiff competition among the leading ports, especially Lagos and Abidjan in West Africa, and this contest may not be resolved over the next few years. Significantly, the decision on hub port(s) would be made by external interests, especially mega shipping firms, rather than the national governments or indigenous business communities.

A major concern is the involvement of national and sub-national governments, such as in Nigeria, with the deep seaport projects, even though in partnership with foreign private sector operators. The dismal record on transparency in the procurement process in the execution of mega infrastructure projects could mean that the deep seaport projects might be conduits for primitive accumulation and capital flight. However, some assurance is provided by the recourse to private-public sector partnership, which has been the dominant model of financing and governing infrastructure development. That said, the weakness

of the African private sector means that as more foreign capital comes into the continent's maritime sector, African countries will exercise less control over their political economy. The Chinese have proven to be the most active and biggest foreign investors in infrastructure development in Africa. It remains to be seen whether this is not a short-cut to neocolonialism.

Further questions of political economy within and across national boundaries relate to insecurity and political instability. Pertinent issues that arise in this regard include domestic and regional political tensions, leading to political instability, piracy along the coast, militancy in resource-rich localities and sub-regional instability caused by international terrorism in the Sahel. The challenge of maritime insecurity, examined in some chapters in this volume, concerns piracy in the Horn and Gulf of Guinea. Although this threat appears localized, it has wider continental significance given the global network in which shipping operates: insecurity in one zone has broader ripple effects. Sub-regional security challenges call for concerted intervention by regional economic communities to collaborate on security matters and to dismantle barriers to free movement of persons and goods across Africa. A tangible sub-regional initiative could be building virtual and physical bridges—transport corridors—across national boundaries, to boost for intra-African trade and regional economic development. In effect, a major challenge for maritime and economic development is transcending the colonial-era political, economic and transport systems, which have been retained till date.

On the whole, future research will have to grapple with a number of recurring and emergent issues, addressed or raised in this volume. One relates to emergent seaports constructed between the late 1950s and the early 1970s, such as Tema in Ghana and Ngqura in South Africa, which became major gateways for their countries. These seaports and ongoing greenfield port development projects across Africa could challenge established seaports. Only future research will determine whether these new developments would transform the historical pattern of the evolution of port hierarchies in Africa in the medium or long term.

Future research in the contexts of specific regions of Africa should also contend with the gateway and hub corridor strategies and competitiveness of national ports within sub-regional (SADC and ECOWAS) integration processes. In the case of Southern Africa, future research would also consider the sub-region's emergent position in the transit routes along the Cape of Good Hope. Researchers might also examine

the impact of regulations and governance on sub-regional container port development. On the other hand, further shifts in the evolution of transport networks would also be influenced by the outcomes of the African Continental Free Trade Agreement (signed in 2018 and effective by May 2019). This continental-level commercial agreement has the potential to reconfigure long-term trade structures, fostering intra-African trade. Thus, expected changing patterns of intra-African trade would also modify the role of seaports and the structure of port networks.

Research could also be focused on the regionalization of trade and shipping networks, grappling with such questions as to which specific parts of Africa are linked to what parts (and nodes) of the world; which preferential linkages are emerging (such as with China), and their progression over time; and whether the modification of the global supply chain is a path-dependent process or whether it creates new forms of connectivity, a departure from Africa's established trade patterns.

In the final analysis, in methodological terms, this volume makes a case for context-based case studies, as well as multi- and trans-disciplinary perspectives on African seaports. Such studies would provide material for more rigorous conceptualization and generalizations. Generalizations in sub-regional contexts, such as Notteboom's in Southern Africa, need to be tested in wider contexts. Another pertinent lesson derived from this collection of essays is the need to locate ports in their interlocking contexts. Seaports do not exist, and cannot be studied, in isolation but should be considered in the contexts of the hinterland and foreland forces, and at the intersection of the local and global dynamics (cf. Olukoju 2003, 2004b, 2006). In the same vein, the effect of global forces—both constructive and disruptive—should be duly acknowledged. These include economic and business cycles, technological developments in shipbuilding and port construction, the rise of China, the increasing role of FDI and the imperatives of climate change. In the end, we may conclude that it is those African seaports that offer deeper access channels, better terminal facilities, more efficient services (leading to quicker vessel turnaround), space for port expansion, and efficient transport links to bigger and richer hinterlands within and across national boundaries that will have an edge as we go deeper into the twenty-first century.

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