Performance Evaluation Final Report

Evaluation Design and Implementation of Benin Port Project

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Acronyms

ANLC	National Anti-Corruption Authority
BOT	Build Operate Transfer
BUP	Single Payment for Pre-Clearance
CEM	Country Economic Memorandum
CET	Common External Tariff
CMA	Common Monetary Area
DEA	Data Envelopment Analysis
DG	Director General
DGDDI	General Directorate of Customs and Indirect Rights
DOTS	Direction of Trade Statistics
DWT	Dead weight ton
ECOWAS	Economic Community of West African States
EPA	Economic Partnership Agreement
ETLS	ECOWAS's Trade Liberalization Scheme
EU	European Union
FCFA	Franc CFA
GoB	Government of Benin
GSP	Global Location Service Provider
GUFE	Guichet Unique de Formalisations des Entreprises
HHI	Herfindhal-Hirschman Index
ICD	Intermodal Container Depot
IVS (IVP)	Integrated Video Services
IFC	International Finance Corporation
IMF	International Monetary Fund
IMO	International Maritime Organization
INSAE	National Institute of Economic Analysis and Statistics
IRR	Internal rate of return
IUCN	International Union for the Conservation of Nature and Natural Resources
LOA	Letter of Award
LOS	Level of Service
LPI	Logistics Performance Index
LSCI	Liner Shipping Connectivity Index
M&E	Monitoring and Evaluation
MCA	Multiple Criteria Analysis

(MCA-Benin)	The Millennium Challenge Account-Benin
MCC	Millennium Challenge Corporation
MFN	Most favored nation
MOU	Memo of understanding
MTPT	Ministry of Transport and Public Works
NTB	Non-tariff barriers
PAC	Port Autonome de Cotonou
PEDR	Performance Evaluation Design Report
PIDG	Private Infrastructure Development Group
P&L	Profit and loss
PoAI	Port of Amsterdam
PPP	Public-private partnership
PSI	Pre-shipment inspection
RoRo	Roll-on/Roll-off
RTG	Rubber-tired gantry
SEGUB	Société d'Exploitation du Guichet Unique du Bénin
SOE	State-Owned Enterprise
STTB	Solutions Technologiques des Transports du Bénin
TEU	Twenty-foot-equivalent unit
UNCTAD	United Nations Conference on Trade and Development
USD	U.S. Dollars
WITS	World Integrated Trade Solution

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Executive Summary

The Millennium Challenge Corporation (MCC) contracted NORC at the University of Chicago and its subcontractors Nathan Associates Inc. and Agland Investment Services to design and implement performance evaluations of the Benin and Cabo Verde Ports Projects. This report presents the findings of the performance evaluation of the Benin Port Project.

Overview of Compact and Intervention

In 2006, the Millennium Challenge Corporation (MCC) signed a five-year, $307 million Compact with the Government of Benin (GoB). The Compact aimed to reduce poverty through economic growth by increasing household incomes through investment and private sector activity. The Compact improved key institutional and physical infrastructures through four projects: "Access to Land," "Access to Financial Services," "Access to Justice," and "Access to Markets." The Access to Markets project aimed to enhance the efficiency of the port, increase the volume of goods flow, and reduce vehicle operating costs, as well as reduce instances of corruption.

The MCC's expected outcomes of the Access to Markets activity were: reduced ship wait time, streamlined customs clearance, increased port-user satisfaction, and reduced average duration of the stay of trucks within the port. The underlying assumptions to the program logic were that improved port infrastructure would raise productivity and reduce shipping costs to port users and thereby increase the speed of goods moving through the port and value added of transactions to port users. In turn, the improved physical infrastructure at the port would lead to increased collateral investment and private-sector activity, and ultimately reduce poverty through economic growth.

The Access to Markets Project can be broken down into four main project activities:

- **Feasibility Studies/Assessments Activity**: Feasibility study activity commenced with initial technical studies (engineering, economic, environmental) followed by the conduction of Environmental and Social Impact Assessments for port landside rehabilitation, waterside improvements. This first activity concluded with the development of a revised master plan for the port's rehabilitation, which was developed in 2008.
- **Port Institutional and Systems Improvements Activity**: The port institutional and systems improvements consisted of a fine tuning of legal and fiscal frameworks, including the restructuring of concession agreements as well as enhancing the efficiency of customs procedures.
- **Port Security and Landside Improvements Activity:** The port security and landside improvements intended capital injections aimed to enhance or implement information communication technologies and capacity-building training programs. On the landside, the road rehabilitation, construction of fish/seafood-handling area, and additional physical capital were intended to serve as the catalyst for greater efficiency, but the seafood-handling area was not constructed.
- **Waterside and Other Improvements Activity:** The waterside improvements included the construction of a new South Wharf; extension of a sand-stopping jetty to save on dredging;

provision of a tugboat; construction of 2,462 meters of road, 1,584 meters of rail,[1] and five access gates upgraded to better control security of personnel and vehicles accessing the port and circulation around the port; installation of new fire protection and security systems; modernization of customs operations and improved port procedures supported by investments in new hardware, software, communications and training personnel; implementation of a management information system and a centralized automated customs system to monitor all customs operations in real time; and the acquisition and implementation of pollution control equipment.[2]

Evaluation Type, Questions, Methodology

The NORC team focused its efforts on the set of key questions effecting investment formulated by the MCC in the areas of competiveness, trade volume, operational efficiency, costs, integration of internal markets, employment, corruption, unanticipated impacts, monitoring and process questions, and lessons learned and recommendations. The team applied research methods that entailed collecting qualitative and quantitative empirical evidence to assess each of the selected performance parameters.

Most of the quantitative assessments entailed "before" and "after" comparisons. Others involved comparisons to relevant regional or global benchmarks. The team also applied qualitative assessments in order to contextualize, explain, and elaborate using subjective but expert assessments gleaned through two modes of inquiry: key informant interviews and focus group discussions.

To assess changes in operational performance and efficiency, the NORC team analyzed how productively the Port of Cotonou utilized its assets. To this end, we measured ship productivity and berth throughput productivity. The team also assessed the quality of service provided by the Port by measuring ship delay. Port capacity was assessed through an analysis of berth capacity to determine if the investments increased enough cargo-handling capacity to serve future demand effectively. Additional operational analysis included qualitative assessments of the impact of customs processing, as well as port security on truck throughput.

In order to analyze changes in port costs, the NORC team analyzed both total direct costs as well as costs to users. From the Port Autonome de Cotonou's (PAC) financial statements the NORC team was able to determine whether the port authority realized cost savings and revenue increases since project completion and, importantly, whether the savings realized were actually passed through to port users in the form of lower tariffs. The team also analyzed broader costs (port plus trucking plus other administrative fees) for importing/exporting goods through Cotonou and compared these with PAC's neighboring ports in order to assess if the average rate of cost increases/decreases changed for shippers before and after the investments.

PAC operates in a highly competitive regional market for port services - a market which has only become more competitive since the MCC project was initiated by virtue of large investments in container terminals and efforts to convert from service-port to landlord-port status for at least three of its regional competitors. In this context, investment in port infrastructure also is clearly not

[1] When the NORC project team visited the Port in 2015 no improvements had been made to rail lines within the port terminal.

[2] Benin Compact MCC Benin IST Post-Compact Completion Report (Redacted to remove all information not pertaining to the Access to Markets Project), Millennium Challenge Corporation, May 2012.

sufficient to realize competitive advantage. In order to assess PAC's ability to remain competitive, the NORC team examined several dimensions of value/cost from a shipper's perspective, including a comparison of PAC offerings to those of other regional ports.

The NORC team also analyzed changes in trade volume and trade types before and after the investment. We completed an assessment of market integration impacts, which included: (i) an assessment of integration in transport markets that has taken place in Cotonou since the MCC investment and (ii) an assessment of product market integration and in particular regional product markets that link Cotonou-based traders to counterparties in Nigeria and Niger. These two markets—transport and real sector—are interrelated. Efficiency in transport and cargo handling directly affects the scope and efficiency of cross-border trade.

Regarding employment, the NORC team reviewed PAC's workforce by labor category during the Compact period in order to identify changes in employment at the Port of Cotonou and assess whether changes were connected to improvements made to port infrastructure and operations. The NORC team also analyzed PAC financial statements in order to determine whether labor and other human-resource-related costs decreased following completion of the project.

Additionally, the NORC team made an assessment of corruption. This assessment was based primarily on published survey data, as well as on the results of the pre- and post-investment surveys conducted by MCC. In addition, the NORC team collected data from the port authority on incidents of on-terminal cargo losses and incidence of on-terminal corrupt practices. We augmented these data with interviews and focus-group data collected during its mission.

Based on the NORC team's analyses of the aforementioned topics and research questions, we assessed, from an institutional, economic, social, and environmental perspective, both the positive and negative unanticipated impacts of MCC's investment at Port of Cotonou. Through this assessment, the team attempted to determine whether the investment was sustainable, and if not, why, and what corrective measures might be available to PAC and the Beninese government and its partners to remedy perceived deficiencies.

Findings and Conclusions

Program Logic

The MCC logic was based on the assumption that strong and direct causal linkages exist between the efficiency of a port's cargo-handling capacity and the ability of an import/export-dependent economy to accelerate its growth and, specifically, to develop its export sector.

Importantly, the MCC relied on a supply-side logic. It assumed that enhanced cargo handling capacity would induce additional demand for port services. This logic assumed too easily that competitive advantage within an increasingly competitive chain of West African ports could be secured simply by making additional investments in basic port infrastructure. This top-down logic may have been correct in an earlier era when ports enjoyed monopoly status with regard to markets that they served. However, the project investment logic adopted by the MCC has much less relevance in the context of contemporary Benin where port services are primarily from supplier to consignees located outside of Benin, where shipper/consignees have multiple competing options

available to them, and where the attractiveness of service offerings provided via PAC are determined in large part by external factors well beyond the ability of either the PAC or the Government of Benin (GoB) to control.

In its project preparation MCC could have done more to focus on underlying port service issues that are ultimately driven by shipper-to-consignee (end to end) logistics costs, corruption-augmented transaction costs and certainty in delivered cost and delivery time for transit traffic, and security in end-to-end shipments. All of these demand-side issues materially and directly affect project success. However, few of these issues were sufficiently analyzed in advance of the MCC's investment or were explicitly factored and documented in the project logic.

The MCC project could have also done better to more fully consider the details involved in the engagement of a private-sector concessionaire to ensure that the full potential benefit of the MCC's investment in the concession's water-side improvements would translate into net social benefits for the Beninese economy.

Finally, the program logic did not explicitly account for the capacity of the PAC or its support within the GoB to implement the project effectively and, in the process, to fundamentally redefine the role of government agencies in the port sector. Well established "best practice" with regard to port reform suggests that undertaking capacity building and institutional reengineering in advance of making large capital investments in port infrastructure is the best way to ensure that the full measure of potential benefits are realized.

Operational Efficiency

The MCC's works included a wharf and a new container terminal, the South Wharf, the Benin Terminal, as part of a new concession, plus and other works aimed at increasing container capacity. Total port volumes of traffic increased substantially from a baseline of 4.1 million tons in 2004 or 5.4 million tons in 2006 to 10.5 million tons in 2014. Container traffic has increased from 140,536 TEUs of full containers in 2006 to 350,121 TEUs of full containers in 2014. Traffic increased 45 percent from 2012 to 2013, with the opening of Benin Terminal in 2013. Transshipment handled by Benin Terminal increased from less than 4,000 TEUs in 2013 to over 100,000 TEU in 2015. With the addition of the South Wharf and the Benin Terminal, the port increased its capacity three-fold and allowed for the adequate handling of increased demand.

However, without complementary investments, larger ships would not be able to access the port, despite the investments that were made in the new berth and equipment. The MCC's program logic aimed to increase port volumes but did not account for the fact that doing so meant providing for the additional investments required to allow longer, deeper-draft ships to access the port. This required the port authority to undertake 38 billion CFA in complementary works to widen and deepen the access channel. When the complementary dredging works are completed, ships with up to 13.5m draft will be able to call on the Benin Terminal. At the North Terminal, ships will still be limited to a 10m draft.

Operational efficiency (as measured by ship and crane productivity) increased substantially at the Benin (South) Terminal with the introduction of gantry cranes. Productivity is much higher than before the investment, with ship productivity reaching 45 moves/hour in the first half of 2016, compared to 7-20 moves/hour prior to the investment. This indicates an improvement of between

125 percent and 542 percent in productivity. In comparison to other regional ports, at 45 moves/-hour, Cotonou would be outperforming Lomé (32 moves per hour), and Tema (35 moves/hour). Benin Terminal's crane productivity was 23 moves/hour for gantry cranes in the first half of 2016. In comparison, crane productivity at Tema is estimated to be 22 moves/hr per gantry crane, and at Abidjan productivity is between 17 and 21.5 moves/hour for gantry cranes depending on the crane type. Cotonou's gantry cranes are performing better than others.

While the improvements are substantial, the investments aimed at improving efficiency at the berth focused on the Benin (South) Terminal and it is projected that productivity has remained the same at the North Terminal (but this cannot be confirmed due to a lack of data on North Terminal operations).

Further, while operational efficiency has improved, level of service has remained poor. Compact targets for container ship delay, as measured by waiting time at anchor and duration of time at berth, were not met, neither by the end of the Compact nor by 2016. As of both 2016 and the 2011 Compact end, waiting time at anchor for container ships was around 35 hours compared to a baseline of 16 hours and target of 4 hours. Container ship duration at berth is around 1.2 days today, and was 1.3 days at the end of the Compact, compared to a baseline of 2 days and target of 1 day. While this metric has shown an improvement from the baseline, the MCC's Compact target has not been met.

However, these targets do not appear to have been missed due to issues within the control of the MCC and were not a result of the MCC failing to properly implement their investment. The MCC provided the tools necessary for the port to improve its efficiency so that these targets should have been met. Two additional container berths were built and equipped with best-in-practice gantry cranes. In fact, if one considers a representative handling at the Queen's Quay, one finds that a ship monitored during the NORC mission finished its service in about 14 hours—well within the 24-hour goal for time at berth. However, severe delays in piloting caused its stay at berth to hit nearly 40 hours. The remaining issues for improving ship delays lie with the PAC and it fulfilling its duties to provide timely piloting service.

Congestion in terms of ships waiting at anchor has not improved, although delays appear to be attributable to issues with the level of service provided by PAC pilots, and not by issues with the MCC's investment. Congestion due to trucks in the port, appears to have eased. Trucks now remain in the port for 6 hours and 22 minutes, compared to a baseline of 24 hours. This is a substantial improvement and under the MCC's target of 7 hours. The MCC's parking lot, with the port single window and trucking appointment system, have led to these improvements, but it is not possible to attribute impact among these three investments/intervention. Container dwell time improved due to the port single window, but has since increased. None of the MCC's investments targeted container dwell time, which is mainly affected by customs procedures that can change over time depending on stricter inspection policies or inspectors staffing (manpower).

Cost

Although port tariffs have changed little and the port authority has not been able to profit from efficiencies and reforms, it is still clear that the system has seen a reduction on costs. Shippers have seen a reduction in their cost for importing/exporting goods through Cotonou and the cost decrease has kept pace with other ports in the region that have also improved their infrastructure (Lomé and Tema). The other main port users, the shipping lines, have also benefited from the

improved facilities (infrastructure and equipment) but their cost savings (due to reduced time at the port and deployment of larger vessels) are not passed thru the system (lower ocean freight rates benefiting shippers) due to the nature of the industry's pricing practices.

Competitiveness

The port has become more competitive in terms of capacity, modern equipment, operational efficiency, and cost, although level of service and time at both anchor and berth remain a problem. Larger ships are now able to call on Cotonou, as are gearless vessels. Cotonou's connectivity (as measured by the LSCI) has increased 61% since 2006.[3] Traffic has increased, as have transshipment volumes. Cost for import/export goods has decreased and are competitive with other main regional ports. While some issues remain due to ongoing construction and piloting, overall the competiveness of the port has improved, which is evident through its increased connectivity and traffic. Finally, prior to the investment, Cotonou lagged behind its regional competing ports. It ranked the worst out of competing ports in terms of fleet profile and connectivity. Today, Benin has caught up to its competitors. While it has not leaped ahead, it has remained a player in the game. Without the investment, it would have likely fallen farther behind.

Trade

Attribution is a difficult question to answer when it comes to port investments as there are so many factors outside of the port that also affect trade and economic growth. Increasing capacity at the port was a necessary condition for achieving increased trade because prior to the investment the port was operating at full capacity. The NORC team found that after the opening of the South Terminal, the port handled 25,000 more containers than predicted in 2013 and 48,000 more containers than predicted in 2014. These increases may have been due to the increased competiveness of the port, but they also may have been due to other factors. However, after considering capacity constraints at the port, it is likely that much of the increases in traffic from 2012 to 2014 (both predicted and unpredicted) could not have occurred without the increased port capacity due to the investment.

Employment

The NORC team found that port employment increased from 2006 to 2015. Most of the increases in employment were due to in-sourcing, which reflects an increase in the PAC's in-house skillsets. Notably, there was a 39-percent increase in PAC permanent employees and a doubling of top executives. Labor costs for the PAC increased by 55 percent, corresponding with a 57-percent increase in profit. Thus, while employment increased, it did not affect profitability. However, these increases did not correspond with an increase in productivity, since employment productivity decreased 30 percent as measured in employment productivity per metric ton from 2008 to 2014. To increase efficiency, PAC employment should be reduced.

[3] LSCI refers to the Liner Shipping Connectivity Index.

Internal Markets

Markets are not well developed for intra-regional trade within West Africa. Intermediation (production/wholesale/retail distribution) is weakly developed and thinly invested. Price discovery, moreover, is poor. Most products are priced on an import parity basis. With that said the problem of African-to-African trade remains fundamental to development and its challenge is well understood by development professionals.

Regional trade-related challenges are twofold: transaction costs associated with small volume sales across borders are high and the lack of sales volume undermines incentives of producers, even ones who are marginally cost competitive, to invest in additional production capacity. Competing channels for imported goods are better organized in the region and these channels apply to a much wider range of products. Participants enjoy advantages associated with competition-limiting franchises and economies of scale and trade policies which at least until recently have favored overseas imports over regional production.

Thus, an adverse cycle of regional market failure operates in West Africa; one which development organizations and ECOWAS have been trying to defeat in recent years with various projects and programs. Simply put, producers of surplus agricultural and other products located within communities in Benin, Niger and Northern Nigeria are able to access and serve traditional buyers who are closely linked by ethnicity or family but they are not able to compete with imported products even in interior locations like Niger and Northern Nigeria.

Cross-border markets for African to African trade are difficult to develop for a number of reasons, some of which are related to distorted trade policy, some related to other policies, which provide advantages with participation in the informal trading sector versus formal sector participation, and some related to the development of price discovery mechanisms and to trade facilitation.

The NORC project team was not able to identify any significant area of specific advance that the MCC project affected with respect to formal trade or, indeed, with respect to trade enhancement of any kind between African producers and African consumers within the project market target area. With that said, one area of potential project-related gain involves the regional transport market. This source of market integration derives from the development of intermodal through-transport services and through intermodal rates by one of the shipping lines that were a beneficiary of the project. However the cause-and-effect relationship between these regional market-integrating initiatives and the project are indirect.

In sum, our reading of the evidence suggests that by realizing only limited gains with respect to regional market integration, the MCC-led and Beninese-executed project preparation missed an opportunity to examine or address this issue. Better cooperation with other donors who were dealing with this issue might have helped in assuring that project design included support of internal market integration.

Corruption

Evidence suggests that the project resulted in significant reductions in petty corruption that formerly took place on the port terminal and to curbing petty theft that formerly occurred within the port terminal. The MCC terminal monitoring system, improved lighting and extended fence protection were the proximate causes of these improvements. In addition, automatic gates for trucks and ID badges and controls for pedestrians were installed. The purpose of these gates was to reduce

the corruption and theft mentioned above and also to reduce the incredible pedestrian and truck traffic jams that existed in the port at the start of the project and impeded growth of port business. However, ancillary investments made in the port pick-up and drop-off appointment management system probably accounted for the largest share of these gains. Previously access to the port was informal and loosely controlled. With the implementation of the new pick-up and drop-off appointment system personnel, truckers, agents and other key participants with a legitimate need to enter the port could be much more closely controlled.

With that said, corruption with respect to off-terminal trade logistics and with regard to cross-border trading vis-à-vis Niger, Burkina and Nigeria remains a significant problem. The community of service providers clustered in Cotonou continues to have a strong informal sector orientation and to do business via informal networks of trading partners which both diminishes the competitiveness of the PAC and limits the growth service sector growth potential of the entire Benin economy.

Unanticipated Consequences

The MCC project may have had several unanticipated consequences. Two of the most significant were the impacts that the investment and its mode of implementation had on the political economy of the port service sector. The process of concessioning port services inherently involves "winners" and "losers" amongst the existing and future providers of those services – terminal operators and shipping agents, among others. Bolloré, the new Benin Terminal operator and its stevedoring subsidiary, for instance, are obvious "winners" from the investment. Just as clearly, one of the biggest losers is the least efficient cargo-handling entity in the port, the state's own stevedoring company, SOBEMAP. This parastatal was disadvantaged in the allocation of investments in the port and was left without advanced cargo-handling equipment, interim cargo storage capacity or modern systems with which to track cargoes and generate load plans. As of 2006, SOBEMAP was already losing market share to more efficient stevedoring companies. Since Compact completion, SOBEMAP has lost most container traffic, although still maintains employment levels due to increasing levels of general cargo traffic (of which it retains a monopoly).

While the investment was intended to facilitate improved operations and levels of service at the port, and thus encourage service provision by qualified, highly efficient organizations, there is always the risk that doing so may alter the local political economy in unintended ways. In such instances, there exists the possibility that while port efficiency increases through improved operations and levels of service, direct employment at the port may in fact decrease as a bloated workforce and inefficient organizations are replaced with efficient ones. In the case of SOBEMAP and other existing entities at PAC, longtime employees could have found themselves without a job following the MCC's intervention. Often in similar projects involving replacing existing port services with service provision by a new concessionaire, the concessionaire is required to at least make a reasonable effort to hire existing employees at the port in order to avoid possible local workforce issues that may result from the project intervention. With the MCC's intervention at PAC, it is unclear whether such issues were considered during development and implementation of the concession program. The subsequent new competitive order established as a result of the concession may have unanticipated impacts on the local political economy, particularly as it relates to employment in and around the PAC.

Perhaps the most significant unanticipated impact of the MCC project could be its effect in accelerating the tidal degradation of the beach areas to the east of the port in the city of Cotonou. The jetty extension in which the MCC invested has been accused of being responsible for accelerated sea-related erosion of sections of the city which are densely inhabited and where numerous businesses are also located. A community organization has emerged in the effected part of the city to press for remuneration and restoration. This report does not aim to judge the efficacy of these claims, or conduct an environmental impact assessment of the causal relationship between the port/jetty and erosion, but instead highlights an issue that was brought to the evaluation team's attention, and suggests that the issue be studied further.

Recommendations

The NORC team recommends the following for future similar investments:

- Use methods for project preparation and viability testing that are also demand-side-focused rather than just supply-side-focused and that more proactively engage other donors for the purpose of partnership and co-investment. The intervention could have been more effective had the MCC more adequately addressed the larger development strategy context for the entire Benin economy in which it launched its port project. The MCC's program logic was based on the assumption that strong and direct causality linkages exist between the efficiency of a port's cargo-handling capacity and the economy's ability to accelerate its growth and trade. However, investment in port infrastructure is a necessary, but not sufficient condition for economic growth. This linkage is even more complicated in Benin due to the large share of transit, rather than domestic traffic.
- Consider the sequencing of institutional reforms, internal capacity development, and internal monitoring and evaluation capacity-building before making large-scale infrastructure investments.
- Develop a process for managing co-investment risk to confirm that complementary and essential supporting investments will be forthcoming from other donors, private sector co-investors and the government. In this case, many of the project's shortcomings in achieving impact were not due to the MCC's failures, but delays or lack of capacity in Benin. For example, institutional shortcomings ranging from the lack of a PPP unit to insufficiently trained pilots impacted the project, as did delays in completing the complementary dredging investment.
- Test the business background of potential concessionaires in order to assure that no conflict of interest exists (or, that the conflict could be feasibly mitigated given the procurer's institutional capacity) before prequalifying them for final bidding.
- For port investments, focus on improving (and monitoring improvement of) level of service as well as operational efficiency.

The NORC team recommends investigation of the following topics in future evaluations:

- Assess the evolving nature of competition among regional ports and the kinds of external (demand-side-enhancing) investment required to prevail in an increasingly competitive regional market.

- Determine the impact of the MCC port project in realigning the Benin economy from an informal to a formal sector orientation.
- Recommend modes and means that the GoB might deploy to best leverage the infrastructure resources that the MCC has supplied in an effort to maximize their potential for economic growth generation.

1. Introduction

Overview

In 2006, the Millennium Challenge Corporation (MCC) signed a five-year, $307 million Compact with the Government of Benin (GoB). The Compact aimed at increasing private sector lead business activity and value addition in the nation's economy through the implementation of four projects. One of these Projects, the Access to Markets Project, aimed to eliminate physical and procedural constraints hindering the flow of goods through the Port of Cotonou and thus removing constraints to trade flows and accelerating private-sector investment and job creation in trade related activities.

The MCC contracted NORC at the University of Chicago and its subcontractors Nathan Associates Inc. and Agland Investment Services to design and implement a performance evaluation of the Access to Markets Project and to investigate possible designs for a potential impact evaluation.

The report that follows presents the results of that performance evaluation. The report begins by setting the context for the project in terms of its potential economic development and its effect in terms of stimulating private sector investment in Benin with the Port of Cotonou serving as a focal point and primary leverage for ancillary private sector investment. It proceeds in Section 2 by outlining the Compact and reviewing the objectives of the Access to Markets Component. In Section 3 it presents a literature review of studies relevant to assessing the merits of the Compact and in Section 4 it describes the evaluation design that the NORC project team executed. In Section 5 the report reviews the NORC team's findings and in Section 6 summarizes report findings and recommendations.

Benin's Political Economic Context

Benin's first democratic election was held in 1991, when the country entered into a peaceful transition to democratic governance. The country has since made significant progress in economic liberalization and political transformation, which has led to its being considered one of the most stable democracies in the region. This stability can and should become a source of comparative advantage in the port and trade services sectors.

Benin is a small country of approximately 10 million people and it has a per capita GDP of $ 900.[4] The country lacks the scale in its domestics markets to realize economies of scale and scope that can sustain its growth. The economy's primary assets are its location and its port of Cotonou. Cotonou Port has been called the most efficient port in Nigeria and Benin's transit traffic with Nigeria has been one of the two primary drivers of its economy for the past decade. The other being cotton production which is declining in global competitiveness.[5]

Benin's macroeconomic performance remained solid in 2015 with growth of 5.2% - this after four

[4] BBC Benin Country Profile, http://www.bbc.com/news/world-africa-13037572

[5] Based on conversation during the NORC mission with the World Bank's Country Economist for Benin and Chief Regional Economist for West Africa.

years of sustained growth, following Benin's recovery from the global recession.[6] Recently, Benin's transit trade oriented service sector has been under increasing pressure. Competition from other ports in the region, including most importantly Tema and Lomé, increased significantly over the past 4 years as modernized container terminals in both competing ports came on line and their operations were concessioned to private operators[7].

Consumer, voter, and investor opinion is open and protected in Benin and it can be reliably surveyed. The World Bank's Client Survey completed in Benin in 2015 found that the development issues of most concern to Beninese were: education (percentage of respondents = 61%), followed by health (33%) and rural development (29%). Public sector governance, private sector development and job creation also ranked high in the survey.[8] Although official statistics suggest that unemployment rates remain low (1%), anecdotal accounts, as well as the program responses of donors, suggest that youth unemployment remains a serious problem in Benin.[9]

In 2016, increased public investment is expected to keep real GDP growth at about 5.5%, with inflation expected to remain subdued. The medium-term outlook for the Benin economy is also positive, but subject to significant risks, including a further possible slowdown in Nigeria, the implementation of Common Market trade reforms that are being pursued under ECOWAS and delays in making needed structural reforms to the macro economy. Any one of these factors could slow growth.[10]

The Benin economy has at its base a strong agricultural and service orientation. Importantly as well, the political economy of the country still retains a statist orientation and the economy continues to be dominated by public sector financed activities. Significantly as well, Benin's dependence on political and bureaucratic decision making makes the economy less responsive to emerging opportunities and less capable of operating proactively.

Benin's participation in the so called "new agriculture" has been de minimus. High value export crops, like cut flowers; table ready, prepackaged salads and microwaveable vegetable meals, fresh fruits and vegetables all require a combination of air, freight, and direct ocean services in order to

[6] Continued growth will depend on transshipment trade with Benin's neighbors, whose natural resource dependent economies have slowed precipitously in the last quarter of the year. The trade policies of Nigeria, in particular, have been tightened under the control of the new government, which came to power in 2015. Similarly, transit cargo growth is also threatened by increasing competition from nearby ports (Lomé, Tema), which have also been undergoing rehabilitation and expansion. So although the IMF and the World Bank expect continued economic growth in Benin, a number of uncertainties surround that growth. Risks both from Nigerian spillovers and from weak institutions are significant. See IMF Country Report No. 16/6 , January 2016 2015 Article Iv Consultation—Press Release; Staff Report; And Statement By The Executive Director For Benin, http://www.imf.org/external/pubs/ft/scr/2016/-cr1606.pdf

[7] The same port operator who was awarded the concession for the new Cotonou terminal, the Bolloré Group, is the same operator who won similar concessions in Lomé and Tema. The developments in Lomé and Tema raise the issue of whether the MCC investment in Cotonou was sufficient in itself to realize competitive advantage for the port.

[8] Benin World Bank, Country Survey, http://microdata.worldbank.org/index.php/catalog/2600/download/37879

[9] https://www.quandl.com/collections/benin/benin-unemployment and World Bank youth employment program descriptions.

[10] IMF Country Report No. 16/6 , January 2016 2015 Article Iv Consultation—Press Release; Staff Report; And Statement By The Executive Director For Benin, http://www.imf.org/external/pubs/ft/scr/2016/cr1606.pdf

access high disposable income markets in the EU and NA.[11] In order to succeed, the "new agriculture" requires a different kind of transport service foundation than that which the MCC has supported in Benin. Reducing poverty in Benin will depend, in large part, on the modernization of its agriculture sector, which accounts for 82.4% of employment but where 38.9% of farmers still live in poverty.[12]

The production and export of raw cotton remains the economy's primary source both of employment and of hard currency reserves. However, in recent years productivity growth in the cotton sector has been near zero. Only strong global demand for cotton in 2015 helped buoy the sector temporarily. With that said, only a small portion of the Port of Cotonou's total traffic involves local traffic, e.g., Benin imports and exports. Moreover, cotton accounts for a limited share of these. Hence the ability of cotton exports to significantly lift total port activity is extremely limited. Conversely, the possibility of lower port changes to enhance the competitiveness of Benin's cotton exports is also limited, since port-of-origin charges account for only a small portion of delivered commodity prices.

The primary causes of diminished cotton-sector productivity are poor governance within parastatal organizations and an oligarchic marketing subsector. A lack of effective competition among statist cotton marketing institutions continues to inhibit risk taking and commercial experimentation. These factors, together with dysfunctional market regulatory arrangements, have pushed Benin's cotton sector in recent years (before 2015) to the verge of collapse. While several additional global factors have doubtlessly contributed to this problem, comparisons with neighboring countries suggest that Benin's slow growth and loss of competitiveness are largely derived from the nation's slow pace of institutional reform.[13]

Economies of scope and scale derived from improved specialized logistics services can begin to offset these other disabilities.[14] However the MCC project did not focus on the development of any specialized commodity handling capabilities. Opportunities to realize significant export gains through port investment will remain limited as long as port handling remains undifferentiated with respect to cargos and its cotton sector marketing subsector remains unreformed and unable to negotiate better terms of trade and transport.

With that said, two positive nascent developments have recently taken root, one involving the rapid rise in pineapple and another involving an equally rapid rise in cashew production. Both initiatives demonstrate that successful diversification into non-traditional agricultural export products is possible and profitable in a Benin context. However, growth in these two demonstration sectors has

[11] Unlike Ghana, Senegal and Cote d'Ivoire no direct liner or air freight services exist between Benin and the EU. Second morning delivery and fifth morning delivery are essential prerequisites for participation in different segments of the fresh food or high value new agriculture market.

[12] USDA, GAIN Report on Benin, 2014

[13] External factors such as surplus cotton fiber supply and increasing subsidies for the sector in western countries and China can be adjusted for my making market share comparisons among West African countries. For example, farm level subsidies which large cotton exporting countries, like the US, continue to provide their own producers undercut the cost competitiveness of labor intensive production in Benin.

[14] The value-to-weight ratio of raw cotton, Benin's primary export, is low compared even with other agricultural products. Hence the marginal competitiveness enhancement that can be derived from lower transport/logistics costs is limited.

not been accompanied by significant support from government, whose support is essential for scaling up successful demonstration projects.

Ancillary support services related to import and export activities are the country's second most significant economic driver and the one offering what is probably the best opportunity for future growth. Other competing West African ports, e.g., Abidjan and Tema, have adapted their operations to accommodate the needs for specialized ro-ro "fruit boats", which provide superior 3rd- and 4th-morning service to Europe and hence a source of competitive advantage to their national fresh fruit and vegetable sectors.

Benin's neighbor, Nigeria, is the largest market for imported products in Africa. Serving that market from a Benin base is less expensive and less cumbersome than shipping directly into Nigeria. This circumstance affords Beninese businesses with abundant opportunities for growth. Currently, Cotonou effectively operates as Nigeria's second largest and most efficient port. Much of the ancillary business activity supportive of trade in Benin, for example transshipment facilitation, repackaging and relabeling, freight forwarding, warehousing and truck transport are activities which if they take place in Benin currently take place in the informal sector with small scale enterprises operating under a glass ceiling of nonexistent bank credit access, market visability and public sector support that stunt growth. Strengthening and formalizing Benin's maritime trade oriented service sectors so that small firms can secure credit, so that they can compete based on superior service and lowest cost instead of on the basis of black market connections and political privilege is not a simple or straightforward objective. Formalizing informal service sectors may expose the entire economy to significant systemic risk. Closer and more formal trade links with Nigeria will doubtlessly expose Benin to risks from volatile commodity prices, from variable Nigerian trade policy and from the response of a parallel informal economy based in Lomé.[15] However, an inability to deal with these risks and to find ways to mitigate them is tantamount to cutting off Benin from its most promising source of future economic growth.

Informal trade currently contributes up to 20% of Benin's GDP. For example, traders who take advantage of Nigeria's fuel subsidies and consequent lower wholesale prices import an estimated 85% of Benin's gasoline supply informally from Nigeria. Informal trade moving into Nigeria is much greater, however, than trade moving from Nigeria into Benin. This re-export trade has traditionally been based on the commitment of Nigeria's political leadership to accelerating its industrialization through the application of high trade barriers. In this kind of competitive environment, port productivity and lowest cost port handling costs determine market share less than do other political economy factors and the strength of cross border informal trading relations.[16]

In any case, informal trading compounds and abets the growth of Benin's informal private sector. Moreover, once an informal sector is established it is difficult to abolish. Economic rents collected from informal trade benefit Benin's economy in several ways. For example, they augmenting the revenues of traders that fall outside government control, e.g., informal transit, and they create informal trading networks which keep prices below import parity level for consumers and formal-

[15] World Bank Study of Trade Facilitation in Benin, See: http://documents.worldbank.org/curated/en/759931468189257561/pdf/97242-ENGLISH-WP-P145228-PUBLIC-Box393236B-EV-final-Benin-DTISU-English-2015-10-30.pdf

[16] Ibid

sector businesses. Informal payments made to government officials also supplement government pay and thus remove upward pressure on government budgets.[17]

Informal trade activities absorbs a significant portion of the Benin's workforce. Given this circumstance, making too rapid a transition from informal to formal sector activities poses a significant challenge to Benin's political leaders, but one which they must face up to if the economy is to sustain growth over the long term. While providing broadly distributed benefits, "rent taking" constrains the modernization of Benin's economy. The parallel trade channels affect spillover effects into other collateral service sectors, such as transport and warehousing, leaving large parts of the national economy in the shadows without regulatory control, access to bank financing or a basis for competitive advantage that entails productivity gains. Parallel trade channels sustain a vicious circle of informality, price distortions, low productivity and poverty.

Still, proximity to Northern Nigeria and to other land locked trading partners does afford a significant opportunity to accelerate the nation's economic development through the development of cross border (transshipment) markets in which formal sector participants have an opportunity to compete based on creating economies of scale and of scope and through the application of appropriate advanced technology. However, timing is critical and the window of opportunity is closing. A Common External Tariff (CET) among Economic Community of West African States (ECOWAS) countries, which include Benin, Niger, Burkina and Nigeria, became effective in January 2015. Its impact on Benin has begun to be felt in the informal trade conducted between Nigeria and Benin and, consequently, is having an adverse impact on Benin's fiscal condition. With that said enhanced access to the larger ECOWAS market should help Benin boost trade and diversify its economy.

An important tenet of Benin's economic development strategy – a tenet that the WB country team strongly endorses – is the need to affect a transition from an economic base which is informal, with all of the limitations on productivity increases, investment incentives and fiscal revenue generation opportunities that this implies, to a service economy which is formal and attractive to larger and more sophisticated investors.[18] The latter kind of development is growth retarding while the former is growth promoting. To that end, trade policies designed to lead regional compliance with CET and thus diminish incentives for operating in the informal economy could boost investment in the nation's formal economy. In the medium term, Benin faces a formidable employment challenge. With population growth standing at over 3% per year, the national economy needs to create 100,000 additional jobs every year just to absorb new labor force entrants.[19] In spite of Benin's prudent macroeconomic management, growth has proved barely sufficient to keep pace

[17] Over the long term, formal-sector businesses provide a more certain basis for economic growth than informal sector businesses. This is because they compete differently (based on price, quality and service) instead of preferred and preferential government treatment, Informal firms have limited access to capital in the form of bank loans, shared equity and public private partnerships. Hence their ability to realize productivity gains and to expand with new products and into new markets are limited. If the Government of Benin were to successfully tax informal activities, informal sector businesses might shut down and this would benefit formal businesses over the long term and government revenues in the short to medium term. However, the government would still have to deal with the transition challenge. Consumers and formal businesses, for example, would likely face higher prices during the transition period. Moreover, Benin's trade relationships with its regional trading partners would have to change in fundamental ways as described in the text.

[18] Based on in-depth briefing that the World Bank Regional Economist, Country Economist, Private Sector Development Specialist and Transport Economist provided to the NORC team during its 2015 mission.

[19] Ibid

with its expanding labor force but has not managed to generate any surpluses (through productivity growth), which could be translated into higher incomes. As a result, poverty (using the international poverty line of $1.25/day) still affects one in two Beninese and has failed to recede significantly over the past decade. The poor in Benin are highly vulnerable with respect to their livelihoods, with agricultural production strongly affected by weather events. According to the World Bank fully a million people are exposed to food insecurity.[20]

In recent years, prudent fiscal policy has created sufficient fiscal space for a significant level of public investment. However, because the nation's debt to GDP ratio has risen significantly, remaining public sector borrowing capacity needs to be used prudently and reserved for projects which generate high social returns.

Given these fiscal constraints, it is particularly important that public investment be leveraged up with private investment and that investment projects undertaken through PPPs continue to be used in ways which strengthen Benin's formal service sector and thus bolster its capability to develop as a regional trade hub and as a regional transshipment center.[21] The MCC project demonstrated the viability of joint investment with private sector partners.[22] If the project had been differently implemented, the project might also have helped to build capacity within the GoB to formulate and offer well-conceived PPP's. That capacity still does not exist within the GoB. With that said, the MCC project afforded a particularly attractive opportunity to strengthen it - an opportunity that was missed.[23]

Given the nation's tightening fiscal constraints and the historically uneven quality of its investment portfolio, co-investment with private partners is all the more important.[24] Moving forward, it is also important that public investments be more precisely aligned with the nation's overall growth agenda and that innovative means for risk sharing with the private sector be continuously tested and refined. PPPs—like the Container Terminal Concession—represent only one potential form of private sector risk sharing.[25] One of the reviewers asked for information about other possible forms. To which the NORC team responded these include: service agreements, leasing agreements, licensing and subsequent inclusion in the ports tariffs, PPPs for outsourcing services for qualified

[20] Based on discussions with World Bank country team in Cotonou.

21IMF Working Paper, March 2015, " Investment Scaling-up and the Role of Government: the Case of Benin, Matteo F. Ghilardi and Sergio Sola

[22] In a recent ADB policy note on applying PPP's in Guinea Bissau, the author, Yannis Arvanitis posits that: "The analysis which follows asserts that building a viable PPP framework in Guinea-Bissau is a medium to long- term task which needs to be undertaken step-by-step. Continuous improvements – rather than large leaps – are advocated, amongst which (i) setting core regulatory principles; (ii) start small and thereafter fine-tune with lessons learned; (iii) map out predictable administrative process and build capacity amongst relevant players of the public sector; (iv) accumulate experience of fiscal responsibility and PFM improvements; (v) clarify institutional arrangements right from start; and (vi) leverage on development partner's expertise as local capacity is built. The ultimate goal is to go beyond "a project-by-project" approach, to deploy a system for planning, delivering and operating PPPs. See African Development Bank, Policy Note, Oct 2015, "Developing Public-Private Partnerships in Guinea-Bissau: Getting the Policy Framework Right", Yannis Arvanitis

[23] One reviewer conceded that she supported the goal of improved local capacity. However, she suggested that "MCC deadlines did not afford the time required to achieve this goal." She further observed that "[i]n particular, the constraint of being required to complete a MCC compact within five years undercuts the viability of this worthy idea."

[24] Based on conversation with the IMF resident representative in Cotonou as well as on the findings of several IMF Benin studies.

[25] IMF, Expenditure Composition and Economic Development in Benin; by Marco Pani and Mohamed El Harrak; African Departmental Paper AFR10/02; May 26, 2010.

private companies. In addition, the port authority needs to develop a regulatory capacity, which assures that the terms of these various modes of outsourcing are applied rigorously.

Engaging Benin's Private Sector

Significantly, Benin's private sector remains underdeveloped, with a large informal sector and a weak and poorly capitalized formal sector. Private sector credit growth lags behind the WAEMU average. It is also worth noting that the country's banking sector is dominated by Nigerian banks, which have failed chronically to provide sufficient credit to fuel private sector development. The number of multinational companies which operate in the country are limited and to date opportunities for technology transfer and for significant productivity gains which typically come with foreign direct investment have been limited for the most part to infrastructure intensive service sectors, including importantly the port sector.

For these reasons, the way in which concessions are designed and the way in which they open opportunities for sustainable private investment beyond an initial starting point is essential for long term private sector driven growth. At the same time, structural reforms designed to enhance government revenue need to be undertaken, as does a further strengthen of nation's debt management capabilities.[26] Thus, for example, government officials need to avoid the temptations for off budget financing or the mistaken attraction of incurring hidden, deferred or contingent liabilities in concession agreements or PPP contracts. The best way to assure that capital projects are appropriately and objectively priced is to assure that PPP projects are openly and transparently offered and that multiple qualified bidders are explicitly invited to respond to each project offer. Openness, transparency and contestability have not been hall marks of capital investment project offers to date in Benin.

Significantly, the government of Benin recently announced ambitious plans to increase investment in the country's infrastructure. Its plans are to boost internal growth by removing capacity constraints in both its transport and energy sectors. However, the country has sufficient debt capacity to complete only a limited number of these projects and as noted above some form of risk sharing with the private sector will be essential in the future in order to leverage this limited capacity effectively. Risk sharing with the private sector also provides a reliable market test for the merits of specific projects. The IMF and the World Bank both agree that this growth strategy can succeed only if it is accompanied by specific structural reforms.[27] The nation's current relatively low debt level provides some scope for increased investment without jeopardizing debt sustainability. However, in order to succeed, public sector investments must become more productive and less subject to risks.

Complementary structural reforms are essential in order to ensure that investment spending results in growth acceleration and not growth deceleration. Following the narrow development path open to Benin, given its limited fiscal capacity entails the active and effective use of PPP's and other

[26] Based on discussions in 2015 that the NORC team conducted with the IMF head of mission in Cotonou.

[27] Note that the investment logic underlying the MCC program: e.g. Investments in port productivity (e.g., in institutions and infrastructure) should lead to improved port productivity which, in turn should lead to trade creation/trade diversion that then should drive economic growth/private investment is quite different from the strategy that other major donors are advocating and, indeed, from the economic development context assessment laid out in this section.

related modes of private sector co-investment. The MCC opened the window for this kind of co-investment but much more needs to be done.

Additional progress is needed in improving the nation's general business environment, which is not particularly conducive to private investment, this in order to induce a strong private sector response to infrastructure investment opportunities. Offering opportunities for investment to which only a single private company responds is moving in the wrong direction.

Organization of the Benin Port Sector

Context of Benin's Port Sector

According to the World Bank, the Port of Cotonou is the single most powerful driver of the Benin economy. The Director of the PAC referred to the port as "the lungs of the economy. The lungs, the heart, everything." In 2005 prior to the MCC Compact, it was estimated that the port accounted for 80% of Benin's revenue from taxes on trade, and taxes on trade accounted for more than 50% of government revenue.[28] More recently, the US Department of State's 2015 Investment Climate Statement for Benin stated that according to Benin's National Institute of Economic Analysis and Statistics (INSAE), revenues from the Port of Cotonou are estimated to account for more than 40 percent of Benin's annual budget and the port accounts for 85% of Benin's customs revenue.[29]

Prior to the MCC's investment, the port was an autonomous entity administered by seven Board-of-Director members including one each from Niger, Burkina Faso, and Mali.[30] The Autonomous Port of Cotonou (PAC) is a state owned enterprise (SOE) that acts as a port authority. PAC is under the Ministry of Transport and Public Works (MTPT). PAC can set its own rates and collect income from shipping agents and cargo owners. In recent years, PAC has paid 40% of its net income to the MTPT and retained the remaining 60%.[31]

The port is highly reliant on the capture of transit cargo. According to data which PAC provided, about 50% of total traffic moving through the Port of Cotonou in 2014 was transit cargo. The actual number is probably significantly higher. Informal trade transactions are not fully or precisely accounted for. Nunez and Hoareau (2011) estimated that in 2010 re-exports (mainly to Nigeria) accounted for about 15% of Benin's imports, bringing transit traffic in 2010 up to 70%. Raballand and Mjekiqi (2010) estimate that up to US$4 billion of cargo enters Nigeria unofficially through Cotonou port (2.5 million tons). This traffic comprises fully 36% of Cotonou's traffic and nearly 15% of Nigeria's total imports.[32] Since formal data is lacking, it is not surprising that experts disagree.

Reliance on transit traffic means that the port's contributions to the national budget are extremely fragile and depend on factors beyond the control of the Beninese. For example, they depend on the

[28] Wilbur Smith's Port of Cotonou assessment/due-diligence report from 2005 "Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf"

[29] 2015 Investment Climate Statement – Benin (2015). US Department of State. Bureau of Economic and Business Affairs. May. http://www.state.gov/e/eb/rls/othr/ics/2015/241483.htm

[30] Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

[31] Interview with the PAC management team conducing during the NORC team visit to Cotonou

[32] Raballand Gaël and Edmond Mjekiqi. 2010. "Nigeria's Trade Policy Facilitates Unofficial Trade and Impacts Negatively Nigeria's Customs Efficiency and Economy". The World Bank.

economic policies of Nigeria, the ultimate destination for most of Benin's informal re-export trade. When Nigeria closes its border, as it has done several times over the past decade, the Benin economy absorbs a significant shock.

In its most recent Country Economic Memorandum (CEM) for Benin, the World Bank assessed that large rents generated from re-exporting have crowded out more productive economic activities.[33] According to the World Bank the lure of rents collected in Nigeria's distorted markets foster a culture of corruption and tax evasion in Benin that undercuts productive economic growth. The World Bank concluded in its CEM that a development strategy based on smuggling and fraud is not a viable path to sustained development.

According to the IMF, infrastructure remains significantly underinvested in Benin. In a recent study, the Fund assessed that scaling up investment in infrastructure would have a significant, beneficial long-term impacts for the entire economy, in spite of the fact that the government is subject to inefficiencies both on the spending (procurement) and on the tax (collection) side.[34]

According to the Fund, while the scaling up of public investments would result in higher output and consumption levels over the long term, a fiscal stabilization package is still required in order to preserve the fiscal sustainability of such an investment program.

The public-private partnership (PPP) investment which the MCC made in Cotonou is one example of the kind of a public-private financing instrument which is well suited to minimize the government's debt burden and, at the same time, enable growth and thus allow increased government revenue to match mounting debt burdens. The IMF's welfare analysis indicates that consumer welfare increases when the government is able to smooth the fiscal adjustments associated with higher borrowing.

Physical Description

The Port of Cotonou is in the Gulf of Guinea. It is located 30 km from Benin's capital, Porto Novo, and Cotonou is the commercial center of the country. The port is centrally located in the city with little room for expansion due to water or the city on all sides, which leads to traffic and congestion around the port area.

Construction of the port began in 1959 and was completed in 1965, with the original port consisting of 3 berths at the jetty and 4 berths on the 660m quay. The port was expanded between 1979 and 1982. The Oryx petroleum terminal was added in 1999 via a build operate transfer (BOT) mechanism.[35]

As of 2007, prior to the MCC's physical investments in the port, the port contained a 1275m commercial dock with 8 to 10 adjustable berths, plus the 250m Oryx terminal and the 460m east jetty. In addition the port was protected by two jetties, including one which contains berths and also allows for docking. The access channel was dredged to 11-12 meters, allowing for ships with a

[33] World Bank, Benin Country Economic Memorandum 2009 at http://documents.worldbank.org/curated/en/2009/06/10842556/benin-constraints-growth-potential-diversification-innovation-country-economic-memorandum

[34] IMF Working Paper, "Investment Scaling-up and the Role of Government: the Case of Benin," Matteo Ghilardi and Sergio Sola, March 2015.

[35] http://www.portdecotonou.com/pdf/avisnavigateurs110607.pdf

maximum 10m draft. The original 660m dock can only accommodate 9-9.5m draft ships, while the 625m addition can accommodate ships with a 10m draft. The 460m east jetty can accommodate an additional 3 vessels, including: 1) 200m for hydrocarbons or bulk vessels, 2) 160m for liquid bulk vessels, and 3) 100m for trawlers and low-tonnage reefers. Storage included 100,000m², 3 container terminals containing 150,000m², 11,000mt in grain silos, 43,700m³ in liquid storage tanks, Oryx storage facility of 55,000m² and butane storage and bottling facility of 3,200m².[36]

With the MCC's investments, the port has now been expanded to include a 540m South Pier next to the Oryx terminal, which can accommodate 2 additional container ships. When the works are completed, the access channel to the S. Pier will be 15m deep, allowing for ships with a maximum draft of 13.5m. The port can now accommodate:

- North Pier: 1 container ship, 1 RoRo (roll-on/roll-off), 3 general cargo
- South Pier: 2 container ships up to 260m each
- Oryx Terminal: 1 tanker
- Jetty: 1 liquid bulk, 1 trawler, 1 dry bulk

Figure 1, below, includes a picture of the current layout of the port.

[36] http://www.portdecotonou.com/pdf/avisnavigateurs110607.pdf

Figure 1: Diagram of Port of Cotonou

Source: Map from marinetraffic.com (Accessed September 22, 2016 and updated January 10, 2017) with descriptions added by project team.

Currently all cargo is transported to and from the port by the road. A rail connection will eventually link the Port of Cotonou to the hinterland, yet it has not been constructed to date.

Entry to the port consists of seven controlled access gates. Gate 5 contains the pedestrian and truck access gate. Pedestrians must clear two controls, one by the police and one by the gendarme. There is no dedicated container entrance and all trucks enter at Gate 5.

Figure 2: Port of Cotonou Gate Access and Controls

Inside the port, the MCC invested in improvements to the roads including paving. The MCC invested in a 250 vehicle parking lot, which was concessioned and is run by a third party (Solutions Technologiques des Transports du Bénin or STTB). The MCC's investment also lengthened the second jetty (that does not contain berths) by 300m, which was originally built in 1979.

Division of Responsibility between Public and Private Service Providers

The PAC provides certain services with its own employees and its own equipment, including tug and pilot services, security, emergency fire and hazmat services, Thus the PAC operates three tugboats; one funded by MCC. These tugs service all ships coming in and out of the port. As of the team's site visit in 2015, six pilots (including the harbormaster who does not typically provide this function) were working at the port. While the port is operational 24/7, due to the ongoing works, pilots were only operating during daylight (until 6pm) during the last year.

All other services are provided by private or government owned stevedoring companies or by terminal companies which lease specific terminal areas from the PAC. Thus, for example, Grimaldi operates the RoRo terminal at Cotonou. During the day, vehicles are taken from the ship to a 3,000 vehicle parking lot, and vehicles are transferred during the night to reduce traffic and congestion. Most vehicles stay-in storage at the port for 24-48 hours.

The North pier contains an adjustable berth 1265m quay that originally could accommodate 8-10 ships but now typically accommodates one container ship, one RoRo ship and three general cargo ships. The container terminal is publically owned but operated by COMAN/APMT/Maersk. Maersk's COMAN group has four mobile dock cranes. The general cargo berths are managed by PAC.

The South side of the port contains the South Wharf financed by MCC and also referred to as the Benin Terminal. The South-side container terminal is partially financed and operated by Bolloré, and also includes a fuel terminal operated by Oryx. Benin Terminal includes a 540m berth built by the MCC, which is operated by Bolloré. The terminal currently has four gantry cranes purchased by Bolloré, which allow gearless ships to now call on Cotonou. Bolloré's SMTC was operating two additional mobile cranes at the time of the NORC mission.[37] The terminal operating company

[37] According to Bolloré's concession contract, Bolloré should be providing six gantry cranes once the Government of Benin had completed the dredging and construction required to be completed under the concession. Bolloré has only provided four to date. Provision of four gantry cranes allows two cranes to work at once per ship, but best practice would have three gantry cranes per ship.

had not yet installed the full complement of gantry cranes which it is obligated to provide under the concession agreement (only four of the six). Bolloré wishes to expand its terminal, perhaps into the Oryx terminal to the east, to add an additional 360m berth. As of September 2015, ships were still limited to 10m draft, but when the dredging is completed, ships with up to 13.5m draft will be able to call on the Benin Terminal.

Three stevedoring groups serve Cotonou for containers: the public SOBEMAP and private COMAN and SMTC. Grimaldi services RoRo ships and SOBEMAP has a monopoly on bulk cargo. SOBEMAP is the largest employer at the port, with 5,600 employees, according to interviews with SOBEMAP. There are five stevedore unions and SOBEMAP sets wages and negotiates with the unions. COMAN's stevedores are often sourced through SOBEMAP and paid the same rates, but SMTC recruits its stevedores outside of SOBEMAP's stevedoring recruiting office. While SOBEMAP had a 21% market share of container traffic in 2006, its share is negligible at present and the two private stevedoring companies handle nearly all containers.

Legal Framework

As noted above, the legal framework that supports the PAC and port operations more generally is not well suited to the current division of responsibility between public and private service providers. Neither does it define clearly the regulatory and concession implementation responsibilities of different branches of government. In Oct 1976, the Benin Parliament created PAC under Law No. 76-55. The port authority was formed as an independent corporation with the rights to provide port services within the boundaries designated for port operations in Cotonou, to enter into contracts instrumental to the efficient operation of the Port of Cotonou, to buy and sell assets, to incur debt collateralized against its assets and to make strategic decisions without government direction or approval.

The Port's charter defined the powers of its management and of its board of directions, as well as the means of their election and their modes of governance. These include the management of properties assigned to the PAC or acquired by it and maintenance of those properties in ways recommended by good international practice to keep them in good operating order and to support the port's traffic.

Decree No. 96-217 of 31 May 1996 extended the responsibilities of PAC management to provide police and security services within the ports domain and to issue licenses to service providers who operate within that domain.

When the IFC conducted its due diligence review of the proposed concession agreement in 2008, it found that sufficient authority existed under the existing port charter to complete the PPP transaction. The IFC proposed specific terms and conditions for the concession which the government adopted.

Regulatory Responsibilities

No independent regulatory oversight exists which possesses explicitly legislated responsibility for overseeing the port sector in Benin.[38] PAC is an autonomous self-regulated agency. However, the

[38] Based on conversation conducted with high ranking official responsible for organizational reassignment and governance enhancement conducted during the NORC team mission to Cotonou.

primary control over port activities is through the political chain of command. The port director nominally reports to the Minister of Maritime Economy but when critical strategic decisions are pending, she or he effectively reports to the President of the country. This high level engagement with port affairs is because the Port of Cotonou is the country's primary strategic asset and the one, which provides the primary basis for wealth creating activities in the country and the country's principle source of hard currency.

Over the past 10 years, the president has elected to replace the port director on four occasions due either to the failure of incumbents to perform or due to political miscues or political realignments. The selection of port directors does not appear to be based primarily on experience with and qualifications to manage ports.[39] The NORC team discovered a significant level of cynicism with regard to top down guidance among second and third level PAC management during its mission.

The PAC is effectively self-regulating. Tactical day to day direction of port activities resides with the Harbor Master and compliance with international port and maritime conventions into which the government has entered resides with various elements of a multi-functional, specialized bureaucracy within PAC. This bureaucracy, which operates under the port director, is well entrenched with a number of highly specialized, silo-like functions each or with a small staff of specialists, such as legal director, financial director, director of environmental protection, safety director, chief operating officer. The consequence of organizational structure is a fall back to routine functions and broad diffusion of responsibility with a resulting inherent resistance to significant change in real power.

It is this diffused and specialized bureaucracy, which supports the tactical regulation of maritime and port affairs. A functional orientation is typical of service ports, within which strong staffs become entrenched and manage day-to-day affairs in ways which sustain the status quo of internal power centers, including ones involving harbor-master functions, tug-boat functions, management of port security, oversight of effluents discharged by vessels into local waters, fire protection, legal functions, tariff publication functions, financial-reporting functions, etc. In the case of PAC these stand-alone overhead functions have adapted little to support the combination of "service" and, more recently, emergent "landlord" port command and control structures.The port's administrative structure has not yet adapted to include new omnibus functions related to managing the concessionaire, Bolloré.

It is also important to note that the port director at the time of the first NORC team mission is the director of the MCA office in Benin. Relating outwardly to donors was apparently, as high a priority for the then standing government as was managing port assets in ways that maximized their contribution to the competitiveness of the port community.

No comprehensive legislation exists for port-sector regulation and oversight. In particular, the day-to-day management of concessionaires like Bolloré, which now controls the South Terminal, has not been responded to with the creation of new management control and operational coordination guidelines. No owner's manual has been created for the PAC which might have helped it reengineer some of its own internal functions around the terms and conditions of the new master concession agreement. The project could have been better designed to require new legislation

[39] During its recent return mission to Cotonou during which the NORC team discussed its findings with local officials, the team discovered that another change "at the top" had been made in PAC since its last mission in 2015.

and/or related regulatory reforms in advance of and as a condition for the final disbursement of funds.

By way of explanation, one of MCC reviewers of an earlier draft of this evaluation design report—a reviewer who was also involved in planning the MCA investment-- pointed out that "MCA had limited leverage at the end of the Compact to push the Government of Benin to implement the reforms that had been planned as part of the compact. At that time," he noted further, "corruption was seriously interfering with port operations, so MCA joined Bolloré in highlighting the responsibility of the Government of Benin to take action." This insight into the political economy evolving within the PAC is significant and suggests that some of the entrenched functional interests noted above many have been self-serving in ways that went beyond employment retention and the banking of discretionary power within the organization.

Revenue Functions and Finances

The Autonomous Port Authority (PAC) is an independent and self-supported financial entity. As noted above it nominally reports to the Minister of Maritime Economy regarding policy issues. However, with respect to financial performance it reports to the Ministry of Finance. In actuality the PAC retains a great deal of autonomy to allocate capital or to retain or pass through cost-saving benefits like the ones which were expected to accrue from MCC's investments.

The PAC sets its own tariffs and thus regulates its own revenue flow. As noted above, the director of PAC has the authority to hire and fire personnel, to borrow money and to enter into service contracts with private service providers. It maintains its own financial statements, balance sheet and income statement.

Two aspects of the Port Authority's financial governance determine in large part the degree to which benefits realized through the MCA project could pass through to port users. These two aspects include: i) the ability of the Port Authority to generate to generate profits or cash surplus; and ii) the disposition of the surplus cash-flow to change tariffs and fees, which the autonomous port charges for cargo handling, ship operations and ancillary fees.

Overview of the Intervention

MCC Benin Compact I

In 2006, the Millennium Challenge Corporation signed a five-year, $307 million Compact with the Government of Benin aimed at increasing investments and private sector activity through the implementation of four projects.[40] The MCC Compact I included $307 million in funding for four project components: Access to Land, Access to Justice, Access to Financial Services and Access to Markets. The main goals of the Compact were to:

- Eliminate constraints hindering the flow of goods by eliminating physical and procedural barriers[41];
- Expand access of financial services through grants;
- Increase security and allow more citizens to have more access to land; and
- Provide access to the justice system through training and procedural improvements.

Access to Markets Project Component

One of these project components aimed at improving "access to markets" by eliminating physical and procedural constraints hindering the flow of goods through the Port of Cotonou. The Access to Markets Project had an original budget allocation of $169.5 million[42] and the MCC Closeout Country Brief indicates that $188.7 million was actually invested.[43]

The Access to Markets Project can be broken down into four main project activities:

- **Feasibility Studies/ Assessments Activity**: Feasibility study activity commenced with initial technical studies (engineering, economic, environmental) followed by the conduction of Environmental and Social Impact Assessments for port landside rehabilitation, waterside improvements. This first activity concluded with the development of a revised master plan for the port's rehabilitation, which was developed in 2008.
- **Port Institutional and Systems Improvements Activity**: The port institutional and systems improvements consisted of a fine tuning of legal and fiscal frameworks including the restructuring of concession agreements as well as enhancing the efficiency of customs procedures.
- **Port Security and Landside Improvements Activity:** The port security and landside improvements intended capital injections aimed to enhance or implement information communication technologies and capacity-building training programs. On the landside road rehabilitation, construction of fish/seafood handling area and additional physical

[40] In September 2015, the MCC signed a second $375 million Compact with Benin focused on power/electricity. See https://www.mcc.gov/where-we-work/program/benin-power-compact.

[41] As suggested above the "removal of constraints" may not be sufficient in and of itself to achieve the objectives of the compact. Some combination of business environmental strengthening, bi and multilateral trade agreement implementation and deeper forms of public private partnership, in addition to investment in port productivity enhancement, may have been required to achieve the original goals.

[42] "Expanding Markets through Benin's Port of Cotonou," January 24, 2011 from Benin Port Story.pdf

[43] Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

capital were intended to serve as the catalyst for greater efficiency, but the seafood handling area was not constructed.

- **Waterside and Other Improvements Activity:** The waterside improvements included the construction of a new South wharf, extension of a sand-stopping jetty to save on dredging; provision of a tugboat; construction of 2,462 meters of road, 1,584 meters of rail,[44] and five access gates upgraded to better control security of personnel and vehicles accessing the port and circulation around the port; installation of new fire protection and security systems; modernization of customs operations and improved port procedures supported by investments in new hardware, software, communications and training personnel; implementation of a management information system and a centralized automated customs system to monitor all customs operations in real time; and the acquisition and implementation of pollution control equipment.[45]

Complementary Investments

In addition to the investments made by the MCC, complementary investments were made by the PAC and Bolloré. According to the MCC's Benin project close out economic analysis report, the PAC planned on providing an additional €63.4 million ($82.5 million) in funding to enlarge the seaport access to allow larger ships to call on the port, extend the western jetty by 230m, and reduce the east jetty by 90m.[46] According to the same document, Bolloré was investing $100 million in works to allow for the use of the new South Berth, including yard pavement, buildings, and networks. We understand that this investment also was to include the purchase of 6 gantry cranes and other equipment.

Complementary investments, which were apparently planned but never made, are significant as well. Most importantly among these was the investment proposed to be funded by the Islamic Development Bank in shore restoration and rehabilitation for the south side of Cotonou City that was designed to offset some of the serious shore line degradation experienced east of the port jetty[47].

[44] When the NORC project team visited the Port in 2015 no improvements had been made to rail lines within the port terminal.

[45] Benin Compact MCC Benin IST Post-Compact Completion Report (Redacted to remove all information not pertaining to the Access to Markets Project), Millennium Challenge Corporation, May 2012.

[46] The second and third investment were not mentioned in the team's field visit, and were only uncovered through the close out report, which was received in July 2016. The purpose of these two investments is not clear to the project team, and it is also unclear how the jetty work differs from the jetty work done by the MCC.

[47] The performance evaluation was not tasked with, nor aims to attribute whether the soil erosion was a result of the MCC Compact. However, evidence collected during the NORC mission from affected businesses and citizens; as well as before and after photographic evidence; as well as direct observation of the impact of erosion on homes and businesses, strongly suggests that the MCC investment has had a significant impact on private property and property value. Moreover, one of the consultants who developed implementation plans for the project has conceded that accelerated erosion to East Cotonou was anticipated but that remedial investments on the part of the government were anticipated with the support of a loan from the Islamic Development Bank, which unfortunately was never consummated. Moving forward, a sound principle for future MCC investments should be this: "Do no harm, or remediate directly whatever harm investment projects may cause" This prime directive does not appear to have been applied in the case of the Port of Cotonou Project.

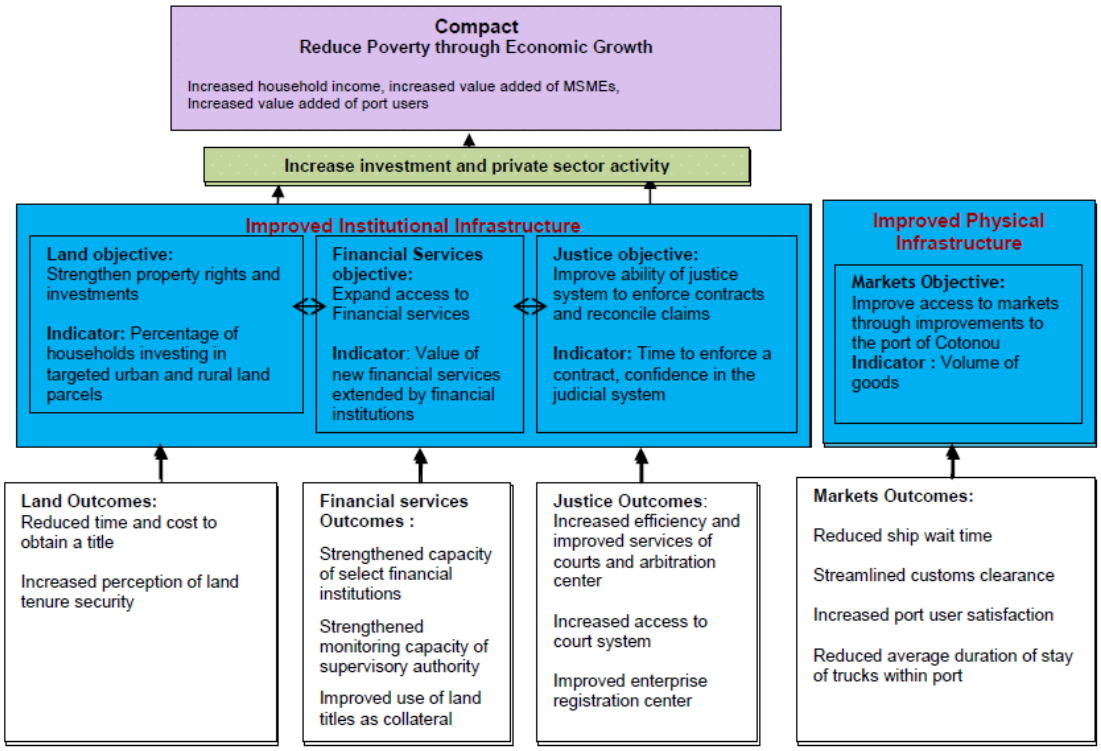
MCC Program Logic

The Millennium Challenge Account-Benin (MCA-Benin) First Compact Program aimed to increase investment and private sector activity by improving key institutional and physical infrastructures through the four projects described above. The Access to Markets project aimed to enhance the efficiency of the port, increase the volume of goods flow, and reduce vehicle operating costs, as well as reduce instances of corruption.

The MCC's expected outcomes of the Access to Markets activity were: reduced ship wait time, streamlined customs clearance, increased port user satisfaction, and reduced average duration of stay of trucks within the port. The underlying assumptions to the program logic were that improved port infrastructure would improve productivity and reduce shipping costs to port users and thereby increase the flow of goods moving through the port and value added to port users; and that the improved port infrastructure would decrease the average duration of stay of trucks at the port. In turn, the improved physical infrastructure at the port would lead to increased investment and private sector activity, and ultimately reduce poverty through economic growth. Figure 2 below depicts the

MCC program logic.[48]

Figure 2: MCC Benin Compact I Program Logic



Source: MCC/MCA-Benin Monitoring and Evaluation Plan, Version 4, September 2011.

[48] MCC/MCA-Benin Monitoring and Evaluation Plan, Version 4, September 201.

The NORC team found that there are a few noticeable gaps in this program logic:

- MCC logic relied on a supply-side (e.g., enhanced cargo handling capacity) response to induce additional demand for port services. It assumed too easily that competitive advantage within an increasingly competitive chain of West African ports could be secured simply by making additional investments in basic infrastructure. This logic paid too little attention to the specific local context in which the Port of Cotonou competes and it failed to drill down into and respond to the regional trade issues as well as the local issues of service responsiveness of the needs of Nigerian shippers and Benin based shipping agents. Accordingly, MCC did not focus sufficiently on underlying port service demand issues. These are ultimately driven by shipper to consignee logistics cost, corruption enhanced transaction costs and certainty and security in end to end shipments. All of the demand side issues materially directly affect project success. However, none of them were analyzed sufficiently in advance of MCC's investment or factored sufficiently into the project logic.
- The MCC project assumed that the engagement of the private sector concessionaire was sufficient in and of itself to ensure that the full potential benefit of the MCC's investment would be invested because of the incentives inherent in the concession contract without consideration of the details included in that contract, the business background of the concessionaire, or the capacity of the port authority to adapt to a concession management model of port control.
- The MCC project logic did not account for the potential external costs resulting from its investment including, most importantly, the displacement of low skilled stevedores, impact on endangered species, and the acceleration of the shore erosion to the east of the port jetty that threatens to destroy a significant portion of residential and commercial property east of the Port of Cotonou.

Other issues, which could have been more explicitly considered in the program logic, include the following:

- Improved port infrastructure does not necessary lead to reduced shipping tariffs—in many cases, it makes sense to pay more for improved port infrastructure to cover the investment costs. Instead, savings come to port users more indirectly through reduced transport times, which then lead to savings to shipping lines.
- Reduced shipping costs increased do not necessarily increase the flow of trade. This presumes that high shipping costs are the constraint must be addressed in order to make the port more competitive. However, there are many other components that also influence competitiveness including operational efficiency, the level of service at the port, the overall cost, efficiency and quality of the corridor, and the total corridor transport time.

Drawing on the above points, it is our opinion that the program logic did not include all requisite considerations and focused too narrowly on the assumption that port infrastructure alone can improve access to markets. Research has shown[49] that a port is just one piece (albeit an important one) in the logistics chain, and that there is an increasing focus on the cost, time, and performance

[49] The literature review section discusses this in more detail.

of the entire logistics chain. In this case, the focus was on the port, and no complementary investments were made to rail, roads or trucking industries, which creates bottlenecks and limits the corridor's competitiveness. The impact of the logistics chain is compounded by the fact that most traffic through the port is transit cargo. In order for transit cargo to increase, the overall transport cost and time must be competitive, not just the time and cost at the port.

- While access to markets may lead to increased trade, the program logic does not take into consideration the composition of trade. It also does not consider that the majority of trade passing through the port is comprised of transit traffic. Increased transit traffic will have different economic impacts than increased domestic cargo. On one hand, the higher volumes due to transit traffic allow a country with small domestic trade to have a larger and more modern port. On the other hand, benefits to trade and the economy are spread between Benin and the destination countries. Indirect and induced economic benefits from port investments at Cotonou are far more likely to be generated at the aggregate regional level than in Benin itself given the port's primary role as an entry / exit point for transit cargo to regional hinterland destinations. Benefits of ports are driven by the hinterlands that those ports serve. Thus, in Benin, the local impacts are likely to be less significant than those at the regional level.
- The MCC Compact called for an increase in volume without specifying how; the MCC's investments aimed at increasing the number of ships calling on the port of Cotonou, but did not account for larger ships calling on the port. During the PPP concession it became clear that investments must be made in order for larger ships to call on the port and called for the Government of Benin to dredge the port and widen the access channel to allow for larger ships. The concessionaire was required, after completion of the government works, to provide additional investments to accept the larger ships and volumes. These complementary investments were seen as essential so that Cotonou could be competitive with other ports. The government investments proved to be a problem, despite the IFC's offer to assist the government in obtaining financing.[50] These works were not completed as of the project team's site visit in September 2015. Identifying financing within the parameters imposed by Benin's prudent macroeconomic policies proved to be difficult.[51] The subsequent delays in implementing these works impacted port traffic. If the PAC had not provided the complementary investments to accommodate this, the impact of the MCC's investment would likely have been less.
- The second assumption of the M&E plan (improved port infrastructure will decrease the average duration of stay of trucks at the Port) is also flawed. Improved port infrastructure was not required to reduce the duration of trucks in the port. A trucking appointment system and better institutional controls would have a large impact, as would the development of a truck staging area or dry port *outside* of the port.[52]

[50] This information was provided by a peer reviewer of this final report. The NORC team was not able to verify it independently.

[51] *Ditto*.

[52] According to a report reviewer, improved port infrastructure was required for the Port of Cotonou 2007-2011. According to the reviewer, pedestrians, motorcycles, and trucks randomly placed themselves where they chose, even sleeping in the roadways inside and outside of trucks. Trucks were often owned by ministers so that truck drivers within the port behaved as though they were ministers, defeating the port's efforts at better management and policing of the port that were seriously attempted. There

- Finally, focusing on access to markets and reduced-shipping costs leading to growth implies that there was an unmet demand for improved market access and that the lack of access was suppressing economic activity. The theory of change therefore implies that improving access will unleash latent economic activity. In the case of Benin, it is not clear that port infrastructure by itself was a key constraint limiting country-level economic growth.[53]

The primary beneficiaries of the project were to be members of the Port of Cotonou community. These include shipping agents, shipping lines which call on the port, freight forwarders and customs brokers who manage the shipment of cargoes beyond the port, port service providers (including terminal operators and stevedoring companies), and beneficial owners of cargos (including both exporters and importers). According to MCC estimates, there are between 37,000 and 43,000 such potential direct beneficiaries.[54] In addition to these primary beneficiaries, Beninese rural and urban consumers were identified by the MCC as secondary beneficiaries; these secondary beneficiaries would be impacted if port infrastructure and institutional improvements decrease port congestion and reduce shipment costs, thereby reducing prices of consumer goods and productive inputs imported through the port and reducing transport costs for products exported through the port.[55] Though not a stated goal of the MCC Compact, there could also be impact on exporters and consumers in Benin's neighboring landlocked countries and Nigeria.

was no success until after the installation of mechanized gates and turnstiles for trucks and pedestrians (and serious support for improvement of port management that came directly from the president).

[53] At first blush it may seem obvious that economic growth was unleashed given the huge increase in trade volumes. However, the type of cargo being handled is pertinent here. Volumes can in fact increase significantly in the case of transit and transshipment cargo and have a limited effect on country-level growth. This is the case in Benin where cargoes are not being consumed or produced in said country and instead are destined for hinterland markets or being transshipped to other destinations.

[54] MCA Benin: "Final Report of the Port Advisor of MCA-Benin to the General Manager of the Autonomous Port of Cotonou"; October 5, 2011 discusses port-sector employment on page 7 and estimates that the port sector employs over 43,000 people (however the report questioned the reliability of some of the numbers). According to the MCA-Benin Focus Bilan Closeout Magazine from September 2011, the Port Advisor found that the port supports over 1,000 businesses and provides 37,000 jobs including PAC employees, customs, police, gendarmes, private security, food and fish vendors (at the fishing port), and cargo handling/stevedores. These figures could be updated in the Option Years.

[55] There are no quantitative estimates of the indirect or secondary beneficiaries, but presumably lower import costs could in theory impact all 10+ million people living in Benin, plus the populations in neighboring countries that import/export through the port of Cotonou.

2. Literature Review

Operational Efficiency

Measures of Operational Efficiency in the Literature

Kent and Ashar (2010)[56] propose two categories of indicators that can be used to measure port performance, those for operational efficiency and those for level of service (LOS). Operational efficiency pertains to the actual use of assets, while LOS pertains to the quality of service provided to users of the assets, mainly cargo and ship owners and their representatives. The operational efficiency indicators are ship productivity, crane productivity, and berth throughput productivity. The LOS indicators are ship delay, truck delay, and truck turn time. For attracting cargo (generating higher throughputs), the main indicator of interest is the time required to serve the vessel at the berth and LOS that the shippers experience. These indicators are further described in the Finding's section of the report under the Operational Efficiency Methodology.

Gaps in the Literature

We have not been able to find literature that specifically studies the impact of donor investments or port concessions on port efficiency in developing countries.

Costs and Tariffs

Literature on Port Costs and Tariffs

Meersman, Strandenes, and Van de Voorde (2014) discuss principles, structures and models of port pricing, which typically consists of port-calling costs (services to the vessel including quay access, pilotage etc.), terminal-handling costs (loading/unloading, storage, customs clearance etc.) and concession pricing (costs to acquire the terminal). Table 1 extracted from the article, summarizes categories of typical port costs.

[56] Kent, Paul E. and Asaf Ashar, 2010, Indicators for port concession contracts and regulation: the Colombian case. Paper presented at the Annual Conference of the International Association of Maritime Economists, Lisbon, Portugal.

Table 1. Port Costs from Meersman, Strandenes, and Van de Voorde (2014)

Activity		Who is pricing?	Who is paying?	Variable(s) applied
Port of Call Pricing				
Port Dues				
	Tonnage dues	Port authority	Shipping line	Vessel gross tonnage
	Mooring dues	Port authority	Shipping line	Load (ton)
Pilotage				
	Sea pilotage	Government	Shipping line	Draught (entering and leaving)
	Dock pilotage	Government	Shipping line	Length of vessel + distance
Towage		Port authority	Shipping line	Gross tonnage + distance
Agency costs		Shipping agents	Shipping line	
Other costs				
	Berthing/unberthing	Private company or Port authority	Shipping line	Per port call
	Ship reporting	Private company or Port authority	Shipping line	Per port call
Port state control		n.a.	Government	Condition of vessel
Waste reception facilities		Service company	Shipping line	Quantity and type of waste
Bunkering		Bunker supplier	Shipping line	Int'l prices, quantity, # bunkers/year
Supplies (water, electricity)		Supplier (private, govt or port authority)	Shipping line	Quantity supplied
Terminal Handling Pricing				
Cargo Handling on Quay		Terminal operating company	Shipping line via agent	Per weight (tons) or movements (# containers)
Transport to/from storage				
	Inside terminal	Terminal operating company	Shipping line, owner or recipient	Per weight (tons) or movements (# containers)
	Outside terminal	Carrier	Shipping line, owner or recipient	Per weight (tons) or movements (# containers)
Storage		Terminal operating company	Recipient of goods	Per unit of weight (tons of TEU) + time (dwell)
Delivery/receiving		Terminal operating company	Recipient of goods	Per unit of weight (ton) or TEU
Cargo moving inland				Per unit of weight (ton) or TEU
	Carrier haulage	Inland transport operator	Shipping line	Per unit of weight (ton) or TEU
	Merchant haulage	Inland transport operator	Recipient of goods	Per unit of weight (ton) or TEU
Customs		Customs authority	Owner of goods via broker	Value of goods + customs clarification
Handling of empty boxes		Terminal operating company	Shipping line	Per box
Storing of empty boxes		Terminal operating company	Shipping line or leasing co	Per box + dwell time
Concession Pricing				
Granting concession		Port authority	Concessionnaire	Varies

Source: Meersman, Strandenes, and Van de Voorde (2014).
Note: River-related costs have been excluded.

The authors discuss how port pricing is often opaque, comprised not only of a series of list prices for a menu of services, but also of discounts which typically result in different prices for different customers (price discrimination) based on volumes purchased or timing. Short-run marginal cost is used as a costing base, but as port tariffs need to be constant for some period of time, price is typically costed at the average short-run marginal cost over time, which is approximated by the long-run marginal cost. Ports determine their pricing based on a variety of factors including costs, demand, and the competitive environment.

Gaps in the Literature

There is sufficient literature discussing port pricing. However, due to the complex nature of port pricing structures, no one paper can concretely describe how a given port will price its services.

Competiveness

Measuring Port Competiveness

A common definition of port competition is found in Verhoeff (1981).[57] According to Meersman et al. (2010),[58] Verhoeff (1981) defines four levels of seaport competition:

- competition between port undertakings
- competition between ports
- competition between port clusters (common geographical location)
- competition between ranges (common hinterlands)

Meersman et al. (2010) also notes that Van de Voorde & Winkelmans (2002) define three types of port competition:

- Intra-port operator competition (different operators within one port)
- Inter-port operator competition (different ports serving the same area)
- Inter-port port authority competition (different ports serving the same area)

Aronietis et al. (2010)[59] conduct an extensive literature review of ways of assessing port choice. Their review found that the main decision makers are shippers, forwarders, shipping companies and terminal operators and that each decision maker has different top criteria in choosing a port. Shippers and shipping companies were the original focus of many studies, but literature in more recent years have also focused more on forwarders and terminal operators than in the past. Shippers thought cost, port operations quality/reputation and port location are the most important in their decision making. Shipping companies similarly focused on cost, location, port facilities/infrastructure and port operations quality/reputation. Forwarders focused on efficiency and port operation quality/reputation. Terminal operators cared about the most factors including port facilities/-infrastructure, port operations quality/reputation, cost, location, intermodal/hinterland links, port

[57] Verhoeff, J.M., (1981). Zeehavenconcurrentie: overheidsproductie van havendiensten, in Ver - hoeff, J.M. (Ed.), Vervoers- en haveneconomie: tussen actie en abstractie (Leiden, Stenfert Kroese), 181-202.

[58] Meersman, Hilde, Eddy Van de Voorde & Thierry Vanelslander (2010). "Port Competition Revisited," Review of Business and Economic Literature, Intersentia, vol. 55(2), pages 210-233, June.

Note that Verhoeff (1981) is not in English and therefore the reference is based on Meersman's summary.

[59] Aronietis, R., Van de Voorde, E. and Vanelslander, T. (2010). Port Competitiveness Determinants of Selected European Ports in the Containerized Cargo Market. Paper presented at IAME 2010.

information systems, congestion in port and efficiency. Aronietis et al. conducted a survey to test the results of their literature review and found that shipping companies always have the decision making power over choosing the port and this choice is highly influenced by geographical considerations. Shipping companies surveyed in this study said that the most important criteria was cost, followed by quality of hinterland connections, capacity, reliability, port location (at sea or inland) and cargo base.

Caschili and Medda (2013)[60] measure "port attractiveness" in 41 container ports in 23 countries in Africa (including Cotonou) by looking at exogenous port determinants (such as user perception and hinterland wealth), endogenous port characteristics (physical characteristics of the port), and subjective determinants using data from 2006-2010. The authors use Structural Equation Modelling (SEM) to assess the causal relationships between the variables that determine port attractiveness. Endogenous factors in the model include total land area of the port, number of quays, berth length, average water depth, and number of days to clear customs (as a proxy for logistics efficiency and cost). Subjective factors in the model include port quality index liner shipping connectivity index (LSCI), and piracy attacks. Exogenous factors in the model include GDP, total investments per year as a percent of GDP, consumer price index, goods import and export, number of internet users, and the corruption perception index. They find that port reputation influences port attractiveness, and to increase port attractiveness, governments focus on addressing "soft infrastructure" issues (developed and productive hinterlands and good port reputation) before addressing "hard" infrastructure issues (efficient and well equipped ports). Their port attractiveness index ranked Cotonou 28th out of 34 West African ports in 2006, 29th out of 35 ports in 2008, and 34th out of 41 ports overall from 2006-2010. In comparison, Tema was ranked 21st in both 2006 and 2010, and 25th overall from 2006-2010; Abidjan was ranked 20th in 2006 and 2010, and 26th overall. Neither Lomé nor Lagos were included in the rankings.

On the other hand, Tongzon (2009)[61] finds that port efficiency is the main factor influencing freight forwarders'' port choice. He evaluates the main factors that influence Southeast Asian freight forwarders' choice of a port using a survey of a sample of freight forwarders in Penang, Malaysia and Bangkok, Thailand to calculate rankings of various factors in influencing port choice. The study finds that the most important factor influencing their decision is port efficiency (speed and reliability), followed by shipping frequency, adequate infrastructure and location. Port charges were only ranked 5th in terms of importance.

Ugboma et al. (2006) similarly found that shippers find port efficiency to be an important part of their decision in choosing a port. This study is of particular interest because it studied Nigerian ports.

Van Dyck (2015) measures competitiveness based on operational efficiency by calculating rankings for 6 of the 12 West African ports using Data Envelopment Analysis (DEA). DEA is a non-parametric frontier technique that can be used, in this case, to analyze port production. Van Dyck's model analyzed container throughput in TEUs based on total quay length, terminal area, number of quayside cranes, number of yard gantry cranes, and number of reachstackers using annual data

[60] Simone Cashili and Francesca Medda (2013). Port attractiveness index: Application on African ports. IAME, Marseille.

[61] Tongzon, Jose L. (2009). Port choice and freight forwarders. Transportation Research Part E 45 186–195.

from 2006 through 2012. In the analysis, Cotonou ranked last, with an average score of only 46%, compared to Tema which received a score of 91% and the number one ranking (see table below).

Table 2. West African Port Efficiency Rankings

Port	Rank	Average Score
Port of Tema	1	91%
Port of Abidjan	2	90%
Port of Lomé	3	88%
Lagos Port (Apapa)	4	76%
Port of Dakar	5	62%
Port of Cotonou	6	46%

Source: van Dyck, G.K. (2015) Assessment of Port Efficiency in West Africa Using Data Envelopment Analysis. American Journal of Industrial and Business Management, 5, 208-218. http://dx.doi.org/10.4236/ajibm.2015.54023

The study says, "[Cotonou] can be said to be a serial under-achiever. In terms of size, Cotonou is similar in size to the Port of Tema but achieves significantly lower output than Tema. In order to increase its efficiency, the port may either have to put in measures to attract more containerized cargo or reduce its use of inputs."[62]

Conversely, Figueiredo de Oliveira and Cariou (2014)[63] test whether inter-port competition affects port efficiency. The paper looks at 234 container terminals in 2007 using Data Envelopment Analysis (DEA). DEA models can be used to assess the efficiency of container ports based on various factors ranging from the institutional environment (such as private versus public ownership), differences in technical or scale efficiency and macro-economic factors (GDP, port-city population, etc.). Figueiredo de Oliveira and Cariou test whether competitive factors affect port efficiency. The authors calculate an "inefficiency" score based on the port city's population, whether the port is a hub, the country's connectivity based on the United Nations Conference on Trade and Development (UNCTAD) country LSCI, and two indexes to account for inter-port competition: the number of ports within 250km or 500km, and the Herfindhal-Hirschman Index (HHI) of traffic within that vicinity. The study found that the level of competition from neighboring ports measured by the HHI improves the explanation of port efficiency, but also noted that the topic needs to be further studied.

Przybyłowski (2008) notes the importance of hinterland connections: "Ports no longer have control over inland markets and cannot be sure of the trade even in their own local areas. They have to invest huge sums of money in superstructure and infrastructure to successfully compete within the container flows environment. However, it is not a guarantee to take profits from this business as

[62] van Dyck, G.K. (2015) Assessment of Port Efficiency in West Africa Using Data Envelopment Analysis. American Journal of Industrial and Business Management, 5, 208-218. http://dx.doi.org/10.4236/ajibm.2015.54023

However, it should be noted that the study only uses data through 2012, the study does not capture the full effects of the MCC's investments, including the opening of the South Terminal operational improvements from the use of ship-to-shore gantry cranes.

[63] Figueiredo de Oliveira, Gabriel and Pierre Cariou (2014). The Impact of Competition on Container Port (In)efficiency. IAME 2014 Conference Norfolk VA.

some of them, despite having a container terminal, may be bypassed because of the reasons linked to the whole transportation chain, like hinterland connections." [64]

Similarly, Meersman et al. (2010) notes the "evolution in recent years from competition between individual ports to competition between entire supply chains." They define the "sphere of influence" of a port as "extend[ing] well beyond its own perimeter, both towards the hinterland and the open sea." Port users will call on the port with the cheapest logistics chain, given that other market factors also make sense. Costs also include time costs, distance costs and actual expenses (including depreciation). The study notes that shipping lines often hold much of this decision making power on which port will be chosen.

Fraser and Notteboom (2014)[65] discuss the attractiveness of port-corridor combinations using the example of three Southern African container gateway port corridors (Southcor, Natcor, and Trans-Kalahari Corridors) that all compete to serve the same hinterland area of Gauteng. They present a framework for methodological and empirical approaches that can be used to assess corridor-port attractiveness. The study collected information via surveys and then used multi-criteria analysis (MCA) to weight the criteria and calculate an overall attractiveness score for each port-corridor.

Effects of Port Investments on Competiveness

Caschili and Medda (2013) also look at whether foreign aid and FDI affect their port attractiveness index. They use information on foreign aid and FDI from the World Bank and conduct correlation analysis to see if there is a statistical association between their port attractiveness index and foreign aid. They first find that foreign aid and port attractiveness are uncorrelated, with the analysis producing a Pearson's correlation coefficient of -0.12. However, they find a different relationship between the port attractiveness index and FDI, with the analysis showing that they are correlated with a Pearson's correlation coefficient of 0.81.

Gaps in the Literature

We have reviewed various studies including van Dyck, G.K. (2015), MLTC/CATRAM (2013) and Nathan Associates (2013) which assess the competitiveness of West African ports and compare West Africa regional port costs and traffic volumes. While these studies do not have data for the last 2-3 years, they still provide a picture of Cotonou's competitiveness since the MCC investment as the MCA compact ended in 2011. However, our study will provide use more up to date data, where possible, and add additional insight, including an analysis of the liner connectivity index.

[64] Przybyłowski, A., 2008, Attractiveness goes far beyond, Baltic Transport Journal, 5, 20-21.

[65] Fraser, D. and Notteboom T. (2014). A strategic appraisal of the attractiveness of seaport-based transport corridors: the Southern African Case, Journal of Transport Geography, 36 pp.53-68.

Trade

Impacts on Trade from the Literature

A number of studies[66] have found that a significant, causal relationship exists between investment in transport infrastructure and resulting transport cost reduction, on the one hand, and trade competitiveness, on the other hand.

As formal trade policy barriers such as tariffs have become less significant in determining trade viability, the contribution of transportation to total trade costs have become more significant. One study published in the World Bank's *Economic Review*, for example, found that among developing countries a 2-percent increase in trade volume resulted from a 1 percent reduction in end to end transport logistics costs.[67] When transport corridors are improved in ways which reduce cost, shorten transit time, and improve reliability and predictability in delivery time, trade competitiveness increases.

These increases are particularly significant for land locked countries. It has been documented, for example, that landlocked countries trade 30 percent less than countries with direct maritime access.[68] As a result, landlocked economies experience slower economic growth than do coastal economies. Significantly, Limao and Venables found that the cost of being landlocked, cannot be explained in terms of an infrastructure gap alone. Other factors appear to have a more significant effect on transport logistics cost, including governance arrangement defined under the terms of prevailing transit treaties, rent seeking on the part of authorities vested with responsibility for cross border goods movements, competitive efficiency in supporting transport and service markets and other political economy issues which operate on opposite sides of trade borders. [69] These conditions appear to have a particularly adverse impact on landlocked countries where transport costs are higher due to inefficient transport market structure, which prevent potential cost savings resulting from investments being passed through to cargo owners in the form of lower prices, and small market scales which do not justify investment in either technology or specialized services. Moreover, firms' administrative costs and overheads suffer when numerous rent-seeking activities accompany the award of cargo control rights to multiple independent agencies,[70]

Other studies have found that both lowering transport logistics costs and enhancing trade competitiveness have a positive impact on FDI flows into developing countries.[71] Positive feedback appears to exist between these variables. With increased FDI the competitiveness of specific transport corridors improves as economies of scope and scale are realized and as positive feedback

[66] See for example: "Unlocking Trade for Low-Income Countries: Report of the Trade Facilitation Facility, 2009–2015", Dominique Njinkeu and Olivier Hartmann, World Bank, 2015 and "Connecting Land Locked Developing Countries to Markets, "Jean-Francois Arvis, et all, World Bank, 2011.

[67] "Infrastructure, Geographic Disadvantage, Transport Costs and Trade," Nuno Limao and Anthony Venables, World Bank Economic Review, 15, no13, 2001.

[68] "Connecting Land Locked Developing Countries to Markets, "Jean-Francois Arvis, et all, World Bank, 2011

[69] Ibid

[70] Ibid

[71] Making Foreign Direct Investment Work for Sub Saharan Africa: Local Spillovers and Competitiveness in Global Supply Chains, Thomas Farole and Deborah Winkler, eds, World Bank, 2014

loops kick in.[72] The converse, unfortunately, is also true: Even more than high transport-logistics costs, transit delays and a declining degree of reliability and predictability for inventory availability tend to drive logistics costs higher and market response time downward. This combination of effects creates strong disincentives for FDI.[73]

With that said, it is also true that trade activity is affected by a number of important factors other than transport-logistics factors. For example, a strong correlation normally exists between trade and the level of overall economic activity. Growing economies trade more with each other than do economies which are not growing. In general, however, trade activity grows more quickly than does overall productive activity and when trade growth takes place it helps economies to develop new sets of value creating competencies. Hence trade operates as a growth engine. This fact applies no less to West Africa than to other developing parts of the global economy. Trade, which leads to diversification, of competencies and specialized commercial capabilities, is particularly useful for developing a small economy like that of Benin. Benin currently possesses a narrow set of competitive advantages, most of which is concentrated in agricultural production (e.g., cotton). Creating competitive advantage in service sectors entails investments in education, ICT intensive undertakings and regulatory reform within government. In general, it is less costly and less challenging to realize that competitive advantage based either on agricultural production or labor intensive manufacturing.

Importantly, trade growth both derives from and further enhances basic, underlying sources of competitive advantage within an economy. Some of these essential competencies relate to supply chain management some to ICT and others to service responsive transport.

Trade competitive supply chains require specialized competencies to be developed at a variety of levels. They require manufacturers, for example, to conform to exacting quality, volume of production and timeliness of delivery standards. To fulfill these demands, producers need access to appropriate transportation means that assure that goods will reach buyers in a timely and reliable fashion. To support trade competitiveness ports need to offer not only competitive services, including infrastructure, equipment, and labor, but also value adding ITC and order fulfillment services and storage services. In many cases, this places a responsibility on government to provide the necessary conditions that allow these activities to take place through private sector investment.[74]

Another set of studies have found that, while investment in transport infrastructure is an essential ingredient for enhancing trade competitiveness, it is not a sufficient one. Improvements in infrastructure mostly effect direct transport costs. However these costs account for only a portion of the total logistics cost that an exporter or importer is obliged to absorb. In general end to end transport costs for ocean shipping include equal shares (1/3) for ocean shipping segments, for port-handling segments and for inland transport segments. The impact of low cost port operations on trade decisions may be further diluted, however, when all of the buyer side costs as well as the seller side distribution chain costs are accounted for.

[72] Logistics Clusters: Delivering Value and Driving Growth, Yossi Sheffi, MIT Press, 2014

[73] Ibid

[74] GAP Analysis of the GPHA, World Bank and UNIDO, 2015, Ronald Kopicki

Based on these findings, it would appear that policies effecting improved inland transport costs and enhanced dock to door transit time reliability are likely to have the positive dual effects to increasing trade, increasing FDI and accelerating economic growth.[75]

Trade and Economic Growth

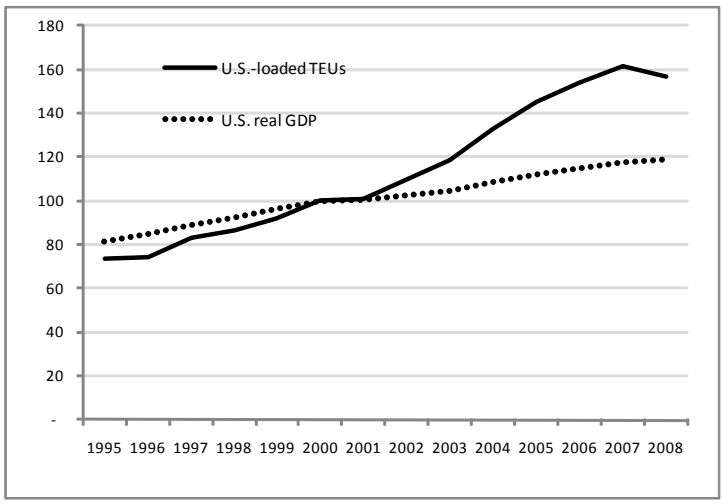
Many studies[76,77] recognize the relationship between GDP and trade volumes and incorporate this relationship in the formulation of container demand forecasts. These studies have demonstrated the economic relationship between GDP and trade volumes and consider it useful for forecasting the development of the container sector. The forecasting relationships used by most industry studies are simple linear relationships between container volumes and GDP. And in most cases, regression analysis provides a good basis for measuring the extent to which these relationships are correlated (see the example of the USA in Figure 2 and comparison of World Container Trade and GDP Growth Rates in Figure 3).

[75] http://www.na-businesspress.com/JMPP/BabatundeA_Web12_7_.pdf

[76] See, for example, UNESCAP and Korea Maritime Institute, *Regional Shipping and Port Development, Container Traffic Forecast 2007 Update*, Publication ST/ESCAP/2484, 2007, New York, p. 28. The report states that "although there is a wide range of factors that impact on the volume of container imports and exports, including exchange rate fluctuations, changes in economic structure, etc., it is necessary for forecasting purposes to use very simplified relationships, as many of the causal variables are themselves even harder to predict than container volumes. An example of this analytical challenge is that even though container imports and exports are undoubtedly greatly affected by exchange rate movements, the uncertainties involved in estimating exchange rates are immense."

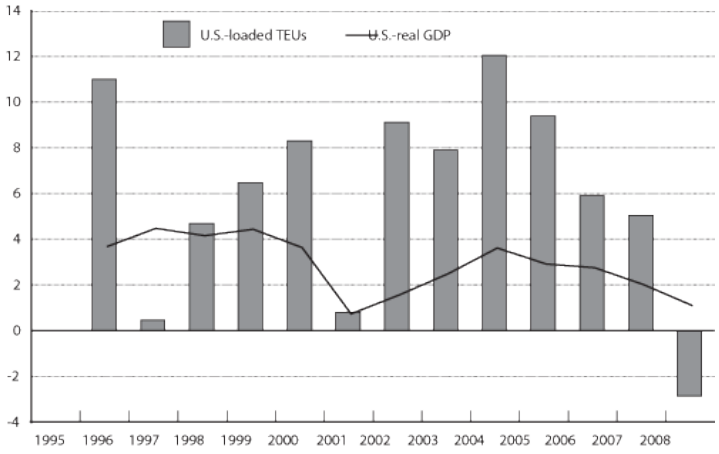
[77] The linkages between trade and GDP growth are not surprising. Economists have long assessed the impact of liberalized trade regimes on trade growth and the relationships between trade growth and GDP. This is not to say that growth rates between GDP and trade volume are the same; container volumes are a reasonable reflection of the extent of trade a country engages in due to the fact that the vast majority of trade volumes are handled in maritime ports. See European Commission, *Trade as a Driver of Prosperity* (Commission staff working document accompanying the Commission's Communication on "Trade, Growth and World Affairs"), Brussels, 2010.

Figure 3: Growth in U.S. Container Trade and Real GDP: 1995–2008



Regression Statistics	
Multiple R	0.977582
R Square	0.9556667
Adjusted R Square	0.9519722
Standard Error	6.9010247
Observations	14

	Coefficients	*Standard Error*	*t Stat*
Intercept	-149.07696	16.4367316	-9.0697447
U.S. real GDP	2.5825943	0.16057487	16.0834274



Source: U.S. DOT, Research and Innovative Technology Administration, Bureau of Transportation Statistics.

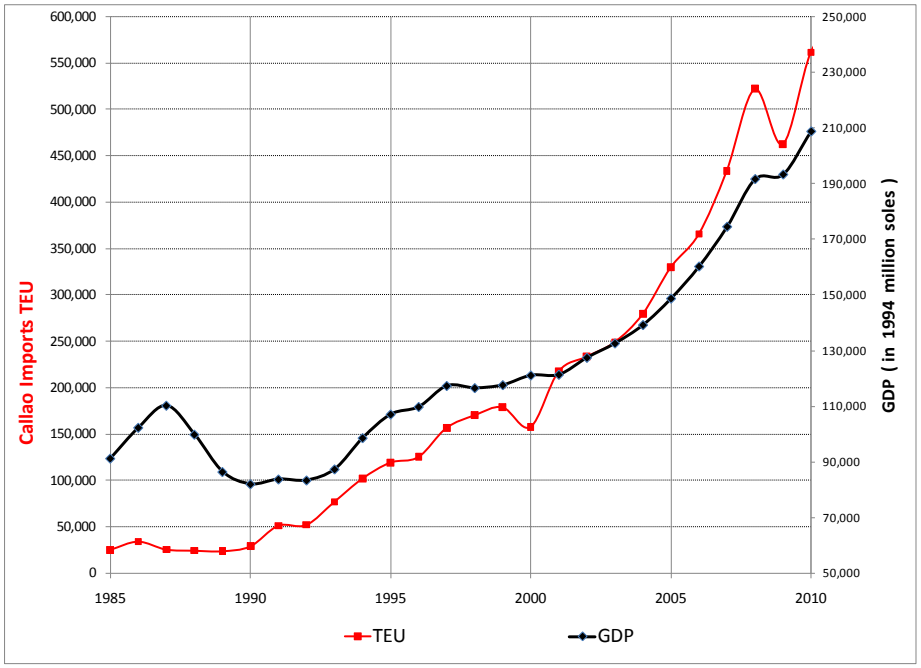
Figure 4: World Container Trade and GDP Growth Rates

(1) World GDP data from the IMF World Economic Outlook 2010.Container Handling Growth data reported from Drewry.

Source: DP World presentation "DP World -An Introduction", Credit Suisse Conference June 2010.

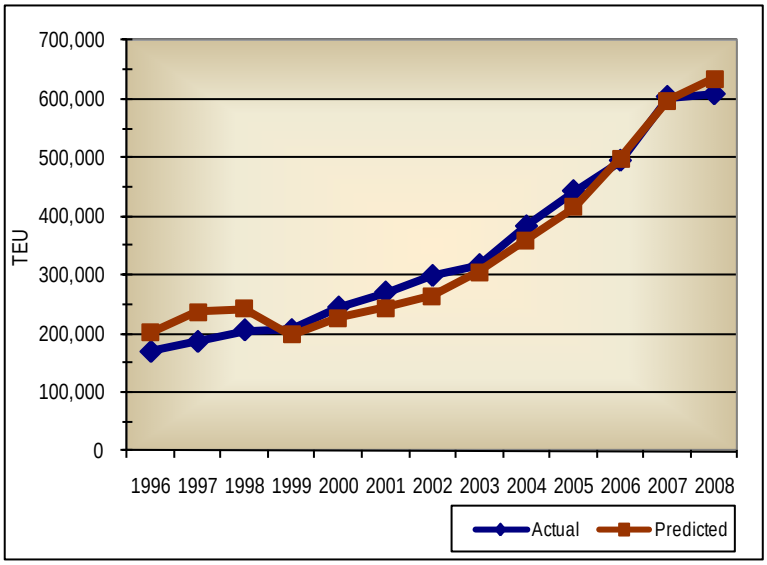
Nathan has corroborated this notion in several studies; Figure 4 and Figure 5 present typical examples of the correlations of GDP and container import trends, in these cases for Peru and Buenaventura container throughput.

Figure 5: Historic Trends for Callao Imports TEU and Peru's GDP



Source: Nathan's study on Peru's Container Trade, 2010.

Figure 6: Regression Analysis Curve Fit with Historic Data for Buenaventura Container Throughput



Source: Nathan's Due Diligence Report for TCBuen Container Terminal, Buenaventura, Colombia, 2009.

Gaps in the Literature

Benin's trade relations with the landlocked countries which are its neighbors in West Africa are complicated by a set of trade protocols under ECOWAS which remains untested, as well as by the pro-domestic production policies of the new government, which has recently been installed in Nigeria. The project team was not able to find studies which deal definitively with either of these issues in the specific context of shifting Nigerian policy. When the research for the project was conducted the trade strategies of the new Nigerian government were still being formulated and the willingness of Nigeria to continue the commitment to an integrated regional market under ECOWAS—a strategy embraced by the previous government was unclear. The fact that the impact of external factors on Benin's own trade was significant had been well documented. What the literature had failed to analyze was the scale of this impact vis-à-vis other considerations and to provide an up-to-date assessment of the new policies.

Integration of Internal Markets

As already noted, port investments afford one means for improving the integration of internal regional markets within ECOWAS, but by no means do they afford the most effective or the most likely to succeed means without the ancillary support of several other initiatives, policies and complementary investments. The best example of this multi-factor etiology comes from commodity markets, which afford the greatest opportunity for increased regional trade. Most importantly among these are regional markets for food staples, for livestock and for fresh vegetables and fruits. The diverse nature of West Africa's agro-ecological zones, more than any diversity in industrial capacity, provides an argument for greater regional collaboration with regard to food trade and food security.[78]

[78] http://www.worldbank.org/en/region/afr/publication/connecting-food-staples-input-markets-west-africa-regional-

In fact, food staple markets are strongly integrated in West Africa, where price levels are determined to a statistically significant extent by demand and supply balances in key high population urban markets. A statistically significant degree of price integration, for example, normally exists between Niger, Benin and Nigeria. All three countries are importers of food staples with Nigeria being the largest importer of wheat and rice followed by Niger and then Benin. This market, however, is unstable and varies from season to season depending on supply which is in turn determined in large part by rain fall. In a normal year, Nigeria and Benin both export traditionally grown cereals (e.g., maize and sorghum) to deficit areas in Niger. In years of low output, however, Benin and Nigeria consume a larger share of their own domestic production and sometimes import grains from Niger. This condition tends to exacerbate deficits in Niger. Parity prices of imports in regional markets are, therefore, a key determinant of food supply in all countries. With that said, regional shortages within Nigeria typically result in significantly altered cross border trade patterns with Niger which suffers the most from interrupted supplies and from the resulting high prices in local markets, well above prevailing import parity prices.[79]

With that said, the single most significant constraint to regional trade in food products appears to be weak marketing institutions. In 2014 several researchers at the Nigerian Institute of Palm Oil research undertook a study of food distribution channels.[80] They found that that the primary cause of a lack of market integration was underinvestment in and lack of market infrastructure and of price discovery mechanism which operate across borders. Efficient farm to market chains simply do not operate in cross border trade. The researchers interviewed 90 food wholesalers based in Edo State and on that basis analyzed the constraints that limited their trading activities. Respondents provided diverse responses to their questionnaire. However, the most significant results showed that 42.2% of the respondents had the same problem: insufficient capital to run their trading businesses. The marketers also encountered problems with high interest rate (28.9%) and a lack of collateral/guarantor (6.7%). Only 10% attributed their failure to increase their trade volume to the high cost of transportation. Other constraints that respondents reported included high cost of rent for storage facilities (10%), price fluctuations (13.3%) and high cost of marketing charges (7.8%).

Diverse soil types and rainfall patterns exist across national borders in the region and vary primarily in east to west bands. So, more trade in food staples might logically be expected. However, negative feedback effects with regard to unpredictable demand and supply season over season would appear to trump comparative advantage as a factor limiting local market development. As it turns out, most markets within economic reach of production centers within the region are close by to those centers. Serving those close-by markets, however, allows for the realization of only limited economies of scale and scope. Regional trade has an important role to play as a source of economies of scale in production, in the supply of cheaper and more efficient inputs, in the reduction of exposure to shocks, and as a source of marketing opportunities for producers. With that

trade-agenda-ecowas-countries and "Food markets and barriers to regional integration regional integration in West Africa", Stéphanie Brunelin Alberto Portugal-Perez, October 2013,

[79] "Markets, prices, food situation and prospects for Benin, Niger and Nigeria," FAO, Famine Early Warning Network Report 2008.

[80] "Economic Analysis of Staple Food Marketing in Benin Metropolis, Edo State, Nigeria," Erumwenbibi, B. O. in International Journal of Agricultural Economics & Rural Development - 6 (1), 2014.

said, its effects are limited by the uncertainties of balancing supply and demand at consistently profitable price levels.[81]

Effects of Port Investments on the Integration of Internal Markets

Despite a strong consensus among ECOWAS member states about the value of regional integration,[82] regional trade in food remains underdeveloped.[83] Other categories of regionally produced products such as processed food and other categories of consumer products fair even worse. Modern distribution channels are only now beginning to form in the region, anchored by supermarket chains and other big box retail formats. Local producers are for the most part unable to satisfy the product quality, assured delivery and just in time requirements the modern retail market segment.

Importer-distributors from Niger, Burkina and Nigeria who are based in Cotonou have developed some of the most efficient distribution channels, albeit informal ones, in the region. These distribution networks are built around networked relationships developed throughout the region with family, tribal and national members and with other fellow traders whose credit and conformance to agreement can be assured without contract legal enforcement.

These expat traders perceive regional market integration unfavorably. They are unwilling to share access to their informal distribution channels with local producers. Food and other products produced within ECOWAS typically complete with imported products, which ex pats import, warehouse and redistribute from a Cotonou base. Farmers and other local goods producers righty perceive these traders to be competitors. The cross-border trading networks, within which these ex pat traders operate, are specialized and close ended, even if they are not tremendously efficient. Hence they are not well adapted to facilitating regional market integration, most of which continues to be driven by import parity pricing vis-à-vis port cities like Cotonou and Lagos.

Trade development efforts under ECOWAS have been consistently undercut by trade distorting national policies, particularly during periods of food shortage.[84] The problems that constrain the implementation of regional trade integration include unpredictable unilateral changes in trade policy and biased trading rules, lack of implementation of regional multilateral commitments, rents imposed on cross-border traders at customs, road blocks and informal road fees, all of which result in higher transport costs, lack of appropriate product standards and product quality policies, and so forth.

The prevailing political economy within Nigeria, Benin and Niger has also generally been adverse to trade openness. Regional trade development has not been a priority among any of the West African countries. Advocates for regional free trade have been under represented or absent altogether within national policy dialogues.[85] Importantly as well, official statistics fail to account for the true extent of regional markets, recording only an estimated one-fourth to one-fifth of the actual

[81] http://www.worldbank.org/en/region/afr/publication/connecting-food-staples-input-markets-west-africa-regional-trade-agenda-ecowas-countries

[82] http://www.worldbank.org/en/region/afr/publication/connecting-food-staples-input-markets-west-africa-regional-trade-agenda-ecowas-countries

[83] ibid

[84] ibid

trade volume.[86] Trade that is not properly recorded fails to be suitably taken into account in policy making, meaning that economic agents, regions, and products cannot benefit from much needed policy reforms.

Moreover, truly integrated regional trade requires a diversity of transport modes and corresponding infrastructure to support each transport mode and each potential multimodal combination of two or more modes. In other words, it requires a corridor development approach, which entails reciprocal investments and complementary trade logistics policies from two or more trading partners rather than unilateral investment, for example, in a single port.

Gaps in the Literature

Most of the trade that takes place within the region – including most importantly trade in food commodities – is priced on an import parity basis. Most of the trade volume which moves in and out of Cotonou moves under the control and for the account of informal expat traders who operate their own proprietary distribution networks made up of family members, fellow tradesmen or close business associates. The project team could not find any literature which exists dealing with the challenge of integrating regional markets and replacing existing traditional distribution systems with more open and efficient ones. The most comprehensive treatment of this subject involves work that one of the NORC team members has undertaken both for ECOWAS and for the World Bank on the subject of regional market integration. To date this work has not been published.

Employment

In spite of mechanization and large commitments of capital to port mechanization labor still accounts for a large share of total port operating cost. This situation allows port labor, which is typically well organized and represented by strong unions, to realize significant wage gains through collective bargaining action. However, it also gives comparative advantage to non-union stevedoring companies who wish to enter port service markets. This situation creates strong incentives for private sector outsourcing.[87] The experience of many ports in developing countries has been that once precedents are established for non-union operations, unionized operators cannot continue to operate profitably for very long.

Port unions are mindful of these challenges and, accordingly, have adopted a variety of means to counter de-unionization, ranging from negotiations and cooperative agreements to strikes and work stoppages. In the process unions have played a key role in shaping entire national port industries.[88]

One point of significant union leverage has been the management of markets for stevedoring labor. In most ports, longshoremen register every morning at a union hall for same-day employment. Under these circumstances, port unions typically enforce the mechanisms which operate to clear these same-day labor markets and thus allow stevedoring companies to respond to variable demand

[87] "A Change of Course on the Waterfront", Wright, R., *Financial Times*, 7 October Wright, R. 2008.

[88] "Leadership and its Consequences: Technical Change in the Longshore Industry", Waters, R.C., *Industrial Relations, 1993*, vol. 32, no. 2, pp. 262-271.

and thus to fill be their rosters with qualified personnel and longshoremen based on seniority or special qualifications or some other formally agreed criteria.

The replacement of a local labor union as the labor market intermediary with the direct contracting of services on the part of individual stevedoring companies represents an apocalyptic event in the development of a port labor community. Thus, for example, in 1969, the list of workers at the Port of New York and New Jersey was closed and longshoremen who did not work a minimum amount became ineligible for future employment.

In general, containerization has shifted power away from longshoremen. The labor-intensive practices used to handle break-bulk cargo gave workers a greater role in the operations of the port. The application of their specialized skill sets made them difficult to interchange without adverse productivity and safety consequences. Significantly as well, management changes accompanying containerization, increased the use of computers to plan work and thus transferred more responsibility to terminal management.

In most ports "flexibility" has been at the core of disputes waged over the hiring practices applicable to longshoremen. Unions have traditionally controlled the process of allocating workers to terminals. At certain locations, employers have pushed for an electronic dispatch of longshoremen, a management proactive that further reduces the power of unions. In other cases, employers have sought to change the rules that govern how workers are assigned to certain jobs.

In most cases, however, tension resulted and port labor unions adamantly resisted pressures for change. That kind of tension is currently brewing in the Port of Cotonou where the state owned stevedoring company, which manages the market for same-day labor and which also serves as the primary intermediary for organized labor is attempting to respond to the changes which the MCC investment has brought about.

Governance of Port Labor Markets

Prior to containerization, the limits to the jurisdiction of longshoremen unions were clear. Most activity related to trade was done dockside. Warehouses were situated on or near the pier. Goods were stacked on the quay before being loaded or after coming off a vessel.[89] All of this activity took place within the geographic jurisdiction of longshoremen and thus went relatively unchallenged. The introduction of containers introduced more forcefully the issue of jurisdiction and on terminal vs. off-terminal domains into the port industry.

Containers have clearly expanded the physical boundaries within which port related activities can take place. For example, in almost all ports, empty containers are stored in off-terminal locations. The contents of containers are rarely handled at the terminal, thus transferring what was once a significant port activity to other locations.

Impacts on Port Labor Markets

Flexibility, however, has not necessarily meant the elimination of unnecessary workers. For example, terminal operators often avoid investing in more technologically advanced equipment because

[89] Ibid

they cannot guarantee which longshoremen will be assigned to operate this equipment on any particular day.

Newer and more sophisticated equipment often requires specialized training and prevailing work assignment rules may not take this fact into account. Terminal operators may attempt to find ways around the prevailing rules and in this way retain individual longshoremen rather than draw from a homogenous pool of labor. In many ports savvy terminal operators have sought out greater flexibility in the hiring process by paying premium rates or in other ways by offering more attractive incentives for appropriately skilled crews that they prefer.

In terms of labor assignment flexibility, research has focused on a few aspects of port labor's response. Longshoremen have in many cases fought to preserve a minimum amount of pay regardless of the activity at container terminals. The types of work that port labor are able or willing to engage in at the terminal are often specified in the longshoremen contract, as are the size of gangs and the duration of shifts, breaks, and leave. For longshoremen, the value of the contracts lies in the stability and certainty that they bring by managing or slowing the pace of change in port operations.

Employment Dividends Associated with Ancillary Trade Logistics Services

A report developed for the Durban Port Authority in 2009, estimated that the relationship between direct and indirect employees involved in providing port related services was 3,300 to 40,000.[90] The report estimated the number of jobs in the manufacturing, agriculture and trade sectors that are located within the Thekwini Municipal Area due to the relative advantages of the port. Making various assumptions, the authors conservatively estimate that 50,000 jobs in related sectors owed their presence in the city to the existence of the port. This would bring the total to 53,000 jobs directly related to the port and at least another 50,000 induced jobs, suggesting a total of 103,000 jobs.

Collateral Impacts on the Real Economic Sector

The relevant literature contains two divergent views regarding the effects of ports on local economic growth.[91] The traditional view holds that ports are economic accelerators and that investment in ports tends to "pull" private investment into port cities and to development ancillary industrial activities in regions served by ports through the creation of external economies…economies which benefit companies which are based within the vicinity of the port. Thus, several studies have been completed, for example, of Ports along the Pearl River in China and among South Korean ports which suggest that a positive feedback mechanism operates between container port development, FDI and regional economic growth.[92] With that said, the Bank of Korea has quantified the production inducement coefficients associated with port activities. These are presented in the table below.

[90] " Dr Ajiv Maharaj ,E Thekwini Municipality Economic Development and Investment Promotion Unit: Policy, Strategy, Information & Research

[91] https://people.hofstra.edu/geotrans/eng/ch7en/appl7en/ch7a5en.html

[92] James J. Wang, Wang, Koi-Yu Ng, Ng, Olivier, "Port governance in China: a review of policies in an era of inter-

Table 3: Quantified Production Inducement Coefficients

Industrial Production Inducement Coefficient among Major Ports in Korea		
	2005	2008
Overall Industrial Average	1.947	1.965
Stevedoring	1.842	1.953
Water Transport Supporting	1.422	1.533
Warehousing	1.676	1.739

Source: "The role of the maritime industry in the Korean national economy: an input–output analysis," Marine Policy July 2005.

A second group of researchers supports the opposite position. That is that ports simply respond to demand generated in the real sector of the economies that they serve.[93] This view has it that demand for port services is derived from real sector demand, that ports generate only limited positive externalities and that the real sector simply generates potential demand for port services to which ports either respond well or poorly with minimum ancillary demand enhancing effects.

No reciprocal demand in the real sector occurs as ports adapt their services because containerization has made port services homogeneous and interchangeable via other networked modes of transport such as rail and road. This school of thought believes that ports generate minimal additional demand for local production because the spill over benefits which ports are able to generate have declined over time, while the cost of improving ports has greatly increased.[94]

The progressive diminishing of economic spillover effects, as geographic proximity to ports diminishes, is an axiom of globalization. This diminution of spillovers is related to increasing costs associated with sourcing primary inputs, subcomponents and subassemblies.[95] At the same time, the negative externalities, which ports generate in the form of congestion, pollution, inflated land prices and limited land availability near port facilities all increase over time. Positive externalities available for spill over are compressed between rising costs and declining benefits. The notable exception to this trend may involve hub ports, which are still able to deliver significant spill over benefits to local industry.[96]

Several researchers have developed life cycle theories of co-port and industrial development which suggest that ancillary benefits accrue to local economies early in their development cycle but progressively decay over time as local economies mature and as the supply chains which link their participants to global buyers calcify.

In order to restore and renew spill-over benefits, port managers need to take active steps to: i) incubate logistics services that add value to manufacturing and service industries; ii) expand watershed markets to encompass additional transit and transshipment traffic; iii) synchronize port development plans with local and regional real sector development.[97]

[93] Brian Slack "Transformation of Port Terminal Operations: From the Local to the Global", *Transport Reviews*: 54 January 2005

[94] Daniel Olivier, "Rethinking the Port,," Environment and Planning: 54 August 2006

[95] Antoine Fremont, "Shipping Lines and Logistics," Transport Reviews: July 2009

[96] Antoine Fremont, "Shipping Lines and Logistics," Transport Reviews: July 2009

[97] *ibid*

Formal vs Informal Sector Employment

In the case of Benin, an important distinction can be made within the economy's real sector between formal and informal sector activities. The informal sector in Benin is larger than in most other African sectors, where in any case it is large by international standards.

In any case, these two sets of activities—formal and informal—have special relevance to port modernization and port technology upgrading.[98] An inherent mismatch exists in most traditional ports between demand for port labor and supply to which in many ports an informal labor markets response appears to be the most effective one.

The need for an informal sector in the port community is caused by the fact that traditionally ships arrive at various random times into ports and when they arrived they require off loading and on loading services on an immediate basis. This circumstance translates into the requirement that reserve labor pools be created which supply labor on an as needed basis with few scheduling rules applying to work forces within the pool. Indeed, most pools which operate within tradition ports remain informal still with relatively few rules except for seniority bidding for specific vessel unloading opportunities existing to protect labor forces even when these forces are organized into unions.

Overall Effects of port investment on employment

Port concessions have sometimes conflicting effects on employment at a port and within the greater industrial economy that ports support.

On one hand, employment at the port itself, and specifically within the port authority, typically falls when moving from public to private operation as public sector-run ports often have inflated employment which is rationalized with privatization. Przybyłowski (2008) notes that "containerization has also reduced the economic impact of ports on the cities, because ship crews are smaller than they used to be and spend less time in a port and dock labour has been considerably diminished."[99] Pallis (2014) states: "As machines carry containers, and technological advancements allow for almost full terminal automation, labor and once powerful port labor organizations, have seen their numbers role and influence diminish at the expense of the role of capital."[100]

On the other hand, as port efficiency and competitiveness improve and cargo volumes increase, the industry hires more employees to handle the resulting cargo and to move that cargo to its destination (increasing employment of freight forwarders and related industries). When processes are automated, however, manual labor may decrease, but skilled labor in the form of ICT experts, crane operators, data entry clerks and custom support agents will increase.

[98] Roseline Nyakerario Misati , "The Role of the Infomal Sector in Investment in Sub Saharan Africa," http://www.policyinnovations.org/ideas/policy_library/data/01443/_res/id=sa_File1/PAPER.pdf

[99] Przybyłowski, A., 2008, Attractiveness goes far beyond, Baltic Transport Journal, 5, 20-21.

[100] Pallis, Thanos A. (2014). Revisiting the basics: What is a Container Terminal?. Port Studies. Accessed from http://www.porteconomics.eu/port-studies/item/538-revisiting-the-basics-what-is-a-container-terminal

Importantly, employment will also increase temporarily during periods of port expansion and construction. The net impact on employment depends on the extent that each of these forces offset and ultimately balance each other.[101]

Gaps in the Literature

A gap in the literature appears to exist with respect to policies and programs that have proved effective in transforming informal labor and companies reliant on them to formal sector labor and companies reliant on them.

Effects of Port Investment on Corruption

Existing Evidence on Corruption

Evidence exists that corruption remains an issue of concern in Benin.[102] In response to the question: "*In your opinion, over the past year, has the level of corruption in this country increased, decreased, or stayed the same?"* 1,200 randomly selected respondents to a 2014/15 Afro Barometer survey responded as follows:

- 45.7% replied "Increased a lot"
- 28.5% replied "Increased somewhat"
- 7.1% replied "Stayed the same"
- 12.9% replied "Decreased somewhat"
- 4% replied "Decreased a lot"; and
- 1.8% replied "Don't know"

Thus, while the government has taken steps to reduce corruption in several areas of public service delivery, corruption and perception of corruption remains a serious problem and, significantly, corrupt practices remain the basis of much of the gray market trading which traditional traders have conducted from a Cotonou base for a very long time.[103]

With that said, recent multilateral actions being taken both by Benin and its regional trading partners open new doors of opportunity for transforming the domestic trade sector from one which relies on economic rents to one which facilitates fail safe intraregional trade under the recently adopted ECOWAS rules and standards.[104]

Gaps in the Literature

The last user survey was undertaken in 2011; as such, our evaluation will provide an updated review of corruption in Benin since 2011. Apparently the 2011 survey, coming as it did during the run up to a national election, provided a biased representation of "normal" levels of corruption.

[101] World Bank, Port Reform Toolkit. Labor Force Management Section

[102] AfroBarameter Data Analysis for Benin at http://afrobarometer.org/online-data-analysis/analyse-online

[103] Documents and data dealing with informal trade and traffic through the port of Cotonou can be found at: http://pubdocs.worldbank.org/en/643351466184172074/Jarreau.pdf

[104] Port Reform Toolkit, World Bank, First and Second Editions, also "Privatization and Regulation of the Sea Port Industry," Lourdes Trujillo Gustavo Nombela, UNCTAD/World Bank

Moreover, reforms that have taken place since the last user survey are alleged to have been effective. Still the fact remains that corruption continues to pervade multiple aspects of Benin's political economy and our report will add to the literature in providing an updated measure of such corruption.

Institutional Issues

Impacts of Institutional Changes on the Port Sector

The World Bank and the UNCTAD have both sponsored work dealing with institutional changes in the port sector and their impacts on productivity and service quality. Much of this work has been consolidated into the two port reform toolkits that the Bank prepared for its clients in the port sector.[105]

Over the past 20 years most ports in the developing world have transitioned from self-regulating institutional modes to alternative modes that entailed a separation of regulatory and operating functions. Two primary factors have motivated this separation:

i) the need to verify conformance with international treaties and conventions dealing with safe and environmentally responsible port and in-port vessel operations and more recently with best practice security responses to terrorism and piracy threats[106], and
ii) the increased participation of private sector service providers in the port service industry.

The first kind of regulatory oversight is essential for conforming to the terms and conditions of treaties that assure that seagoing cargos from all signatory nations can move through any specific ports. The terms of these treaties require effective local oversight by an empowered branch of government which is professionally staffed and sufficiently independent in its decision making to assure full conformance. Assuring on-terminal security is an important aspect of this conformance, which the MCC project materially assisted.

The second factor effecting port institutional arrangements is increased delivery of services and provision of port equipment and infrastructure by private parties. This shift has increased the importance of procurement methods and of concession awarding and subsequent monitoring. Separating this organizational function from day-to-day operating control corresponds to best international practice and minimizes risks associated with corrupt practices.[107]

Still a third consideration affecting institutional arrangement is the degree of competition within ports. When competition for essential port services is muted or completely absent within a specific port or set of twined ports, both public port authorities and private terminal owners are tempted to use their superior market positions to raise tariffs or to price differentially among classes of users based on their degree of market capture. Dominant market conditions when they are abused may justify regulation and the need for such regulation may lead to the creation of an independent port

[105] See for example: "Implementation of PPP's by GPHA: A GAP Analysis', World Bank and UNDP, 2015

[106] Trujillo and Nombela identify five areas in which regulatory controls over seaports are desirable: i) seaport industry regulation generally (including specifically the enforcement of concession agreements), ii) price regulation, iii) regulation of quality and safety; and iv) performance and profitability regulation. A fifth type of regulation—conformance with international treaties dealing with security and inspection of cargos and vessels—might be added to this list

[107] "Implementation of PPP's by GPHA: A GAP Analysis', World Bank and UNDP, 2015

sector regulator. Importantly, as well, organizational changes effected within the GOB during the MCC project complied with the separate and independent requirements of IMO treaties as well.

Another important aspect of independent port control relates to assuring competitiveness among shippers and among shipping agencies. An important objective for port sector regulators is to operate in lieu of competitive market mechanisms to ensure equal treatment among classes of port users, fair competition among service providers and effective control over monopoly service providers (including public ones) and thus the prevention of anticompetitive practices.

A port sector regulator typically has legal powers to counter anticompetitive practices, such as:

- Misuse of a dominant market position to prevent or lessen competition.
- Cross-subsidization by the provider of monopoly services of contestable services, thereby threatening fair competition.
- Price fixing among competitors.
- Use of other practices that are intended to restrict, distort, or prevent competition.

Smaller ports are more vulnerable to anticompetitive abuses than are larger ports because the traffic volumes of smaller ports limit their number of independent container, bulk, and oil terminals. Generally, when a monopoly or merger among terminal operators does not operate against the public interest, it may be permitted provided if is properly regulated. Examples of regulation in such cases could include tariff caps, volume or traffic thresholds to trigger any additional future concession, or expansion limits to incumbent operators that otherwise require an open tender.

The literature further suggests that the establishment of a port sector regulator with price control powers should only be effected in the event of serious threats to free competition within the port.[108] In any case it should preferably assume the character of an arbitrator instead of a court of law, and be accepted by the port community as being independent and fair.

Unanticipated Impacts on the Benin Port Business Ecosystem

Sub-Saharan Africa had been slower than other regions to embrace private participation in the port industry. As recently as 2000, for example, only 10 percent of SSA's ninety main ports involved private participation beyond stevedoring services.[109] This gap has begun to close, however, with concessions concluded for container and general cargo terminals having been completed in many SSA countries in recent years. But by the end of the 1990s, private participation in port operations still lacked widespread support in SSA for reasons that still slow port reform in many developing countries: (1) ports generate hard currency revenues that many governments feel they must tightly control; (2) ports often play a sensitive, strategic role in the transport networks of many SSA countries, with a single port often handling most of a country's international imports/exports—again, government officials sometimes see private participation as diminishing their control; (3) ports have enjoyed strong growth in the volume of containerized traffic (over 9 percent annually in SSA during the 1990s), regardless of whether the efficiency of their operations has improved; and (4) with strong growth in container traffic, and often relieved of the responsibility for servicing debt

[108] Port Reform Toolkit, World Bank, Second Edition

[109] ibid

needed for investments, government-managed ports sometimes show positive, if misleading, profit performance.

UNCTAD has developed a useful definition of the functions which modern and efficient seaports must be able to carry out. According to UNCTAD, "Seaports perform several key economic functions. Seaports are interfaces between several modes of transport, and thus they are centers for combined transport. Furthermore, they are multi-functional markets and industrial areas where goods are not only in transit, but they are also sorted, manufactured and distributed. As a matter of fact, seaports are multi-dimensional systems, which must be integrated within logistic chains to fulfill properly their functions. An efficient seaport requires, besides infrastructure, superstructure and equipment, adequate connections to other transport modes, a motivated management, and sufficiently qualified employees."[110] This definition is useful in assessing the effectiveness with which the Port of Cotonou operates within the commercial business system which surrounds it.

The commercial ecosystems which operate within port communities have a significant impact on the overall ability of a port to serve the real sector markets it is intended to serve. Some port oriented commercial ecosystems are "inward focused" with enterprises affording specific services which correspond to long standing (frequently colonial) regulatory and service delivery templates. Other port ecosystems are "outward focused" and thus relating more to the competitive challenges posed by other ports within specific ranges. They embrace service innovation and are open to service experimentation. Typically these outward oriented ports are restructured in ways that increase their ability to adapt to new technologies, new carrier market development strategies and new trade policies.

Shifts in the basis for port governance and control that are outward focused provide extremely useful platforms for competitiveness-enhancing changes within the entire port-centered ecosystem. Transformations of this kind, however, typically confront entrenched bureaucracies within port authorities and larger entrenched interests within national economies whose influence effects public sector decision making at the highest level. Under circumstances which retard economic growth and real sector modernization decisions within the public sector are corrupted by the interests of specific political parties and specific influential high-level politicians.[111]

Evidence of Port Institutional Development and Evidence of Development in Cotonou

As noted above, institutional reform is a prerequisite for enhanced competitiveness. Positive signs of reform have appeared throughout West Africa during the past decade, and the pace of reform appears to be increasing. However, much still remains to be done, especially in countries like Benin which have been late in embracing reform. In general, areas of additional opportunity include: i) foundational legislation, ii) organizational restructuring, iii) separation of policy, regulatory oversight, and operational responsibility; and importantly, iv) increased private sector involvement.

[110] Quoted in "Gap Analysis of Best PPP Methods for Port Restructuring and Reorganization for the GPHA", World Bank and UNDP, 2015, Ronald Kopicki

[111] "Gap Analysis of Best PPP Methods for Port Restructuring and Reorganization for the GPHA", World Bank and UNDP, 2015, Ronald Kopicki

Being able to modernize and adapt the "institutional software" which ultimately controls a port and drives its modernization program is sometimes difficult politically. However, it is nonetheless an essential precondition when a port attempts to change the way in which it operates as fundamentally as PAC has been trying to transform itself from a "service port model" to a "landlord" port model.

If done correctly updating institutional arrangements is much less costly than investment in physical infrastructure. Over the long term, institutional reform is more effective in improving port competitiveness than investment in bricks and mortar.[112] Conversely, if done incorrectly, it can have the opposite effect and can actually pull a port backward. Ideally, upgrading port institutional software and renewing its hardware should be executed in tandem and in a coordinated way. Institutional upgrading is complementary and multiplicative of investment in port infrastructure.[113]

Three models of modernized port management are common: (a) the management concession model, in which the public sector hands over the entire management and operation of the port to the private sector; (b) the service port model, where the port authority is also the operator of the cargo-handling and other frontline functions under a centralized organizational structure and private participation is circumscribed to secondary services; and (c) the landlord port model, in which the public sector withdraws from direct cargo-handling operations, allowing these to be concessioned to the private sector, while the port authority, functioning on a corporatized autonomous basis, focuses on estate management, navigation, and planning.

In the intermediate model that is popular in many African francophone countries the port authority rents on-dock storage and warehouse space to privately owned, licensed, stevedoring companies, which are contracted by shipping lines to provide handling equipment, hire casual labor, work the vessels, and store and deliver cargo. The landlord model is now widely regarded as the preferred institutional set-up. Its adoption in Sub-Saharan Africa, however, has so far been confined to Nigeria and Ghana alone. Benin's model appears to be a hybrid version of the "intermediate model."

Institutional arrangements and organizational structures directly affect the speed with which decisions are made, the value created through coordinated action and the level of confidence within the larger port community in the effectiveness of the port administration. Institutional arrangements correspond to the software element of port operations. Too many reporting levels make ports slow reacting and bureaucratic. Too few reporting levels or lack of professionally competent managers at various levels make port authorities simply reactive to current events, uncertain with regard to strategic direction, and ultimately ineffective. Three ingredients are essential for the development of effective institutional software: i) experienced and competent managers, ii) clearly defined responsibilities and accountabilities, and iii) sufficient levels of checks and balances to assure that public resources are delivering public goods efficiently. Well-coordinated management processes such as strategic planning, capital planning, procurement, security management, port harbor master functions, gate functions, coordination with customs and cargo handling are important, as well. Efficiency gains and improvements in service can both be achieved and tradeoffs between the two shifted through the embrace of superior procedural, managerial and administrative

[112] "Port Reform Toolkit," World Bank, Also see the Association of West and Central African Port Authorities web site at http://http:/www.pmawca-agpaoc.org/

[113] Ibid

processes and, importantly, through the strengthening of port governance and the tightening of internal controls.[114]

Improvements made in these areas can and do affect the quality and timeliness of both short term and long term decision-making. When taken together and synchronized through coherent governance they determine just how competitive a port can become, given the resources at its disposal. Essential decision issues which are consequently affected include: i) service/cost tradeoffs, ii) capital budgeting decisions; iii) work scheduling and the deployment of manpower; iv) efficient inland transport linkages to the hinterland, and v) types and levels of "outsourcing", e.g., the engagement of private service providers in lieu of public sector service providers. By understanding how decisions are made in these five decision areas within the Port of Cotonou management ecosystem, the NORC project team was be able to drill down deeply enough to understand basic institutional arrangements.

Status of Institutional Reform in Cotonou

It appears that institutional reforms essential for securing a full measure of potential benefits from the MCA project have not yet been fully implemented.[115] Indeed, the sequencing of investments and reforms appear to have taken place in the opposite order from that which would have enhanced gains realized from the MCA investment.[116]

Typically, major institutional reforms preceded large capital investments and not the other way around. For example, at the time of the NORC team mission to Cotonou, the charter of the Port of Cotonou had not been amended to adapt to its new role as concession regulator and procurer of private sector services. Another example: the state owned stevedoring company was having difficulty adapting and adjusting to its loss of traffic to the new private operator and its financial capacity was being tested severely. No arrangements had been made to provide for stevedore employees of the state owned terminal operator during the project preparation. Still another example: specific responsibilities for monitoring terminal concession agreements had not yet been assigned within government. Without strong and forceful oversight of the Bolloré concession, the conditions imposed on the concessionaire remained unfulfilled at the time of the NORC mission.[117] At the time of the NORC team's mission, the terms of the concession had still not been activated because the GoB had not completed its commitment to extend and deepen the turning basin in the port and the concessionaire had not yet installed the second gantry crane that it was obliged to deliver for the reason that the GoB had not made good its capital improvement commitments.[118,119]

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[114] Ibid

[115] Based on several conversations with high level government officials undertaken during the NORC mission as well as from the focus group interview conducted in Cotonou among shipping agents.

[116] Conclusions presented here with regard to institutional development are based on several interviews with high level government officials conducted during the NORC mission to Cotonou and validated in a focus group interview involving members of the port's affiliated business sector. Also, "best port reform practice" as advocated by the World Bank and the UNDP suggest that statutory and institutional reform should precede rather than succeed major capital improvements.

[117] Based on interviews with the PAC management team conducted during the 2015 mission,

[118] Ibid

[119] The hours of operation of pilots within the port had likewise been restricted to day light hours because the turning basin had not been fully extended, the pilots had not been fully trained and operating under the lighting system then

Apparently, a major shakeup took place within the PAC in May 2014 when the Council of Ministers appointed the then Director of the Millennium Challenge Account as director General DG. Once appointed, the new DG proceeded quickly to restructure and re-staff the PAC. His aggressive restructuring, however, preceded the delivery of an organizational audit, which had already been contracted with the consulting firm, Mazars International. Apparently, the new DG also proceeded without extensive consultation with key port stakeholders, including most importantly the Port of Cotonou Labor Union and the association of shipping agents.[120]

Looking into the PAC from the outside it is unclear where decision-making authority and accountability actually lie, particularly regarding high-level decisions and ones effecting basic strategic directions. The division of responsibilities between the Port Authority (PAC), the Ministry of Maritime Economy, the Ministry of Finance, and the Presidency, for example, is unclear and may, indeed, vary from issue to issue.

The engagement of the Bolloré Group as the container terminal concessionaire is an important bell-weather issue relevant to this assessment. When it began concession preparation, the government was responding to an MCC requirement to engage a qualified container terminal operator to complete investments in equipment and systems and to operate the terminal under the terms of a concession agreement. At the time that it responded to the MCC mandate, the government had very little internal capacity to define and implement the terms of a concession. The MCC grant did not provide resources for creating this missing capacity within the PAC. It did require that a concession be developed and competitively tendered to a qualified terminal operator who had sufficient resources to complete the port modernization investment.

Consequently the government engaged the IFC to act as its financial advisor and to prepare and implement the container terminal concession. At that time little capacity existed within the government to either manage the concession tendering process itself or, indeed, to oversee effectively the activities of the IFC.

The IFC was mindful of the need to assess the underlying legal and institutional foundations that applied to the Port of Cotonou concession before it undertook to carry out its mission as financial advisor. To this end, the IFC retained the services of several consulting firms to conduct a due-diligence review of the legal and institutional prerequisites for the transaction. These third parties found the prevailing institutional framework adequate to support the proposed concession.

However, an earlier World Bank review of port governance in Benin suggested that many decisions affecting the port's operating performance and its service responsiveness appeared to be poorly coordinated both among government agencies and between the port administration and private sector stakeholders.[121] Indeed, according to the World Bank report some decisions

available made it difficult for the pilots to operate safely. A good deal of contention and difference of opinion existed among the several groups whom the NORC team interviewed. However what was clear was that the container terminal was not operating at its highest potential level.

[120] Based on several conversations that we held as part of a focus group interview conducted in Cotonou among shipping agents.

[121] http://www.ppiaf.org/sites/ppiaf.org/files/publication/AICD-Benin-Country-Report.pdf also the WB's most recent Country Partnership Strategy 2013-17 finds that: "In the port, underperformance is largely due to governance problems and managerial deficiencies. Cooperation between the principal port actors is limited; ownership of the reforms initiated by the Government is lacking; corruption is often entrenched in business practices; and management responsibilities and accountabilities for port operations need to be clarified and strengthened. These weaknesses generate long dwell times in the port, excessive transaction costs, unmanageable truck congestion inside the port and in Cotonou,

appeared not to be in the best interest of port operations and others appeared to be unduly influenced by political considerations. The review suggested that the prevailing decision making system was open to criticisms on the basis of insufficient transparency and potential corruption.

In any case it would be difficult for the PAC to effectively manage port operations when it is not responsible for choosing or finalizing contracts with private terminal operators, when reforms were imposed on it without sufficient consultation with PAC staff and other stakeholders, and when decisions taken by PAC were reversed or altered by other layers of government.[122] Such precedents exist in Benin. According to the World Bank study, this has occurred in the past when change programs imposed from the outside failed to realize their anticipated impact. Change plans that do not fully engage those affected are difficult to implement.

Implementation of substantive reforms in an institutional environment where only limited capacity exists to implement reforms is difficult, particularly when significant resistance occurs. The World Bank study cites the implementation of the private sector concession initiative provides an example where resistance should have been expected, accounted for, and built into implementation plans.

Complex and Conflicting Roles within the GOB

The formal powers and responsibilities entrusted in the PAC are important factors in determining whether the Port Authority's management has sufficient powers to provide effective oversight over concessioned operations. However, other factors also directly affect the management effectiveness, confidence and the speed with which PAC's management is able to make timely decisions. These additional factors include the actual relationship between the Port Authority DG, his board, the Minister of Transport, the Ministry of Marine Economics and other high level elected officials. Port Authorities in most developing countries are profoundly affected by the conditions in the political economy in which they operate and by other considerations (internal and external governance issues) that limit their ability to control resources. That control begins with a capable internal planning function[123]. Other of these limitations include ones effecting the allocation and

and serious revenue leakages with macroeconomic consequences. In 2011, the loss to GDP growth resulting from poor port performance was estimated at 0.6 percentage point. Important port reforms were implemented in 2012 and performance has improved. However the momentum must be maintained and the reform agenda completed to further enhance port performance."

[122] In response to an earlier draft of this study the MCA review pointed out that "The weakness of the PAC as an institution is a reality; recommendations were provided to strengthen the structure and its operations; but dealing with political interferences is beyond control especially with the Port being one of the main sources of revenue for the country."

[123] The PAC continues to look outside itself for assistance in operational planning. For example according to recent news reports, the Port of Amsterdam announced that their experts will work with Benin officials to develop a Port Master Plan and Implementation Plan. PoAI Director, Gert-Jan Nieuwenhuizen, stated "This project will eventually result in a master plan and implementation plan that will transform and restructure the Port of Cotonou in order to facilitate its growth and drive the Benin economy. PoAI is focusing on West Africa on account of its existing trading relationship with this region." The experts from the Port of Amsterdam will most likely be exercising their expertise in organizational and technical structuring, along with monitoring and quality control to come up with the best plan of action for the Port of Cotonou. This brings forth the question of how successful the MCC's investments could have been, if such a restructuring had been completed before its investment rather than after it. It will be interesting to further investigate the PoAI's plans and goals, and how their investments will complement the MCA investments.

assignment of port labor and others regarding the assignment of transiting truck loads among members of different national truckers associations and insisting that the operators employed by private companies are adequately trained in the use of new cargo handling technologies.[124]

In an environment like Benin, where there is apparent strong commitment to administrative and governance reform, and where clear political will is being demonstrated at the highest levels, considerable improvements should be realizable with limited financial investment. For that reason, understanding the constraints in the political economy that prevent their full realization is extremely valuable.

Gaps in the Literature

While a great deal of work has been done both by the World Bank and the UNDP dealing with institutional changes in the port sector and their impacts on productivity and service quality, studies which deal with port institutional development specifically in a Benin context are missing.

Also missing is a literature which deals with best practice for port legal frameworks and supportive regulatory structures.

[124] An MCA reviewer commented on an earlier version of this report that container handling was a major challenge to the PAC before the investment was made and the MCA investment was designed primarily to solve this problem. Indeed, that primary problem does seem to have been solved.

3. Evaluation Design

The performance evaluation design described in this section is intended to assess the MCC's investment in the Port of Cotonou primarily by measuring changes in port performance before and after the investment was complete. It also applies a number of other evaluation methods including benchmarking against other ports of comparable size and with similar competitive circumstances. In addition, it assesses factors which relate the MCC's investment to impacts in the real sector of the Benin economy, including trade impacts and informal sector to formal sector conversion impacts.

At the beginning of the project, the NORC project team worked with the MCC to identify a number of outcomes of interest to the MCC and converted these outcomes into project performance parameters in the form of research questions (which are detailed below). This evaluation aims to answer those research questions in a comprehensive manner using a mix of quantitative and qualitative analysis.

Research Questions

The MCC formulated the following research questions, which have guided the performance evaluation presented in this report. These research questions are categorized into topics related to "key anticipated results" including: competiveness, trade volume, operational efficiency, costs, integration of internal markets, employment, corruption, unanticipated impacts, monitoring and process questions, and lessons learned and recommendations.

Table 3. Overview of Research Questions

Research Questions
1. Competitiveness
a. How has the competitiveness of the Port evolved since 2006/2005?
b. Among the ports in the region, how has the competitiveness of the Port changed following completion of the works?
2. Trade Volume
a. What is the relative change in the level of domestic and international traffic, volume of container and bulk maritime trade, value of trade (USD) and growth trends in relevant sectors before and after the improvements to the port?
b. To what extent can changes in trade volume be attributable to MCC's intervention?
3. Operational Efficiency
a. To what extent do the completed works mitigate/resolve observed constraints to port capacity and improve the efficiency of port operations as identified in due diligence and feasibility studies?
b. How has the project affected the Port's operational efficiency? What is the percentage change in the overall productivity of the port following completion of the works?
c. What percentage change in the port's principal measures of operational efficiency can be observed following completion of the works?
d. Has the level of congestion in the Port changed? If there has been change, what has caused the change?

Research Questions
4. Costs
a. What percentage change in the port's annual total direct costs (shipping, cargo handling and land transportation, etc.) can be observed following completion of the works?
b. What is the relative change in the cost of doing business to importers, exporters, agents, transportation companies, and other businesses sensitive to port improvements?
5. Integration of Internal Markets
a. To what extent has the port project contributed to achieving an overall compact objective of increasing the integration of internal markets?
6. Employment
a. What net change can be observed in employment among the permanent and non-permanent employees in the port sector following completion of the works?
7. Corruption
a. What has been the cost of corruption? Refer to evaluation methodologies developed by West African Trade Hub and World Bank.
8. Unanticipated Impacts
a. What were unanticipated positive and negative impacts of port investments? What were unanticipated institutional, economic, et al. positive and negative impacts of port investments?
9. Monitoring/Process Questions
a. Is the Port Authority using a) the new MCC-funded fire protection system (including fire station, water tank, fire pump room, distribution system, fire hydrants and fire trucks), b) the new security system and c) the 250 truck parking lot installed as a part of MCC-funded improvements effectively?
b. Is the MCC-funded electrical system fully operational? Has the service from the utility company to the central electrical station been upgraded from 2 to 10 megavolt amps?
c. Are investments being sustained? If investments are not being used or sustained, why not? What can be done about it?
d. What changes, if any, in the import/export tariff structure and port fees can be observed?
e. Describe to what extent the Port Authority has made progress in meeting its commitments to its concessionaire(s)?
f. Have customs reforms targeted under the compact have been implemented/sustained?
g. What is the implementation status of the new Code of Customs, new Code of Ethics and unique tax codes (IFU) for persons and legal entities for improving: i) customs operations and management ii) combatting corruption and iii) coordination with the Tax Commission? (Reference: Benin's 25 Feb 14 Plan of Action Against Corruption)
10. Lessons Learned/Recommendations
a. What are key lessons learned, both in terms of the project performance (were the right investments made?) as well as the implementation of the evaluation study?
b. What recommendations with respect to engineering, economic logic, private sector outsourcing and institutional reform can be made for future MCC port investments and evaluations?

Methodology

The NORC team designed its evaluation to identify and measure accomplishments that resulted from the MCC investment, to assess specific performance issues which had a material effect on project outcomes, to analyze various constraints to the full and successful implementation of the project, and, importantly as well, to extract lessons which were learned during the implementation process.

In general, the research methods, which the NORC project team applied in assessing each of the selected performance parameters entailed the collection of empirical evidence that responds to each of the key evaluation questions that the team committed itself to investigate. Most of the evaluation assessments entailed "before" and "after" comparisons. Others involved comparisons vis-à-vis relevant regional or global benchmarks. Quantitative assessments were then applied to contextualize, explain, and elaborate using subjective but expert assessments of key informant interviews and focus group discussions.

What follows is a brief overview of the methodologies utilized by the NORC team in order to answer the research questions posed by the MCC. Further discussion of our methodology is included in Section 5 (Findings) under each evaluation topic (e.g., competitiveness, trade volume, etc.).

To assess changes in operational performance and efficiency, we focus on how productively the Port of Cotonou utilized assets by measuring ship productivity and berth throughput productivity. We assessed the quality of service provided by the Port by measuring ship delay. Port capacity was assessed through an analysis of berth capacity to determine if the investments increased enough cargo handling capacity to address effectively future demand. Our operational analysis also included qualitative assessments of the impact of customs processing as well as port security on truck throughput.

To analyze changes in port costs, both total direct costs as well as costs to users, NORC assessed Port Autonome de Cotonou (PAC) financial statements. From these statements the NORC team was able to determine whether the port authority realized cost savings since project completion and, if so, whether the savings realized were passed through to port users in the form of lower tariffs. NORC also analyzed broader costs (port plus trucking plus other administrative fees) for importing/exporting goods through Cotonou and main neighboring ports to estimate if the average rate of cost increases/decreases for shippers has changed historically before and after the investments.

To assess competitiveness, NORC looked at both changes in the port of Cotonou's general competitiveness and changes in Cotonou's competitiveness compared to other regional ports. The assessment included analysis of fleet profiles, the United Nations Conference of Trade and Development's (UNCTAD) Liner Shipping Connectivity Index (LSCI) as a proxy indicator for regional port competitiveness as reflected in the routing and call decisions made by shipping lines, market shares, and port pricing.

Our analysis of trade assessed changes in trade volumes and trends before and after the investment. This analysis also assessed trade volume trends compared to forecasts and capacity constraints to determine if the investment could have had an effect on port volumes.

The assessment of market integration impacts, of necessity, include (i) an assessment of integration in transport markets that has taken place in Cotonou since the MCC investment; and (ii) an assessment of product market integration and in particular regional product markets that link Cotonou-based traders to counterparties in Nigeria and Niger. These two markets—transport and real sector—are interrelated. Efficiency in transport and cargo handling directly effects the scope and efficiency of cross-border trade.

Regarding employment, NORC reviewed PAC's work force by labor category during the Compact period in order to identify changes in employment at the Port of Cotonou and assess whether changes were connected to improvements made to port infrastructure and operations. NORC also analyzed PAC financial statements in order to determine whether labor and other human resource-related costs decreased following completion of the project.

The assessment of corruption was based primarily on published survey data, as well as on the results of the pre and post investment surveys which MCC had conducted. In addition, the NORC team collected data from the port authority on incidents of on-terminal cargo losses and incidence of on-terminal corrupt practices. It augmented these data with interview and focus group data collected during its mission.

Based on our analyses of the aforementioned topics and research questions, NORC assessed, from an institutional, economic, social, and environmental perspective, both the positive and negative unanticipated impacts of MCC's investment at Port of Cotonou. Through this analyses, the team also assessed whether the investment was sustainable, and if not, why, and what corrective measures would be available to PAC and the Beninese government and its partners to remedy perceived deficiencies.

Lastly, NORC identified key lessons learned regarding both performance of the port project as well as the evaluation process itself. This exercise was then used to make recommendations on engineering, economic logic, and institutional reform for future MCC port investments as well as future evaluations.

Quantitative Analysis

The methodology for quantitative analysis responds to limitations and challenges associated with an only partially planned ex-post evaluation of this nature. Ideally, an evaluation should identify project impacts and source(s) of attribution. However, rigorous statistical attribution of impacts is difficult in the absence of an acceptable counterfactual. The MCC defines a counterfactual as "what would have happened to the same group of program participants if they had not received MCC's assistance."[125] The MCC defines assessments as "impact evaluations" when, inter alia, there are distinct counterfactuals. If treatment units were randomly assigned to either treatment or

[125] See https://www.mcc.gov/our-impact/independent-evaluations.

no treatment then the evaluation is "design-based;" i.e., derived from an experimental design. Non-random alternative methods of assignment may lead to the evaluation being considered quasi-experimental. The MCC defines an assessment as a "performance evaluation" in the absence of an acceptable counterfactual, regardless of the degree of sophistication or rigor.

In the case of the MCC project at Port of Cotonou (as well as at the level of *any* individual port), identification of an acceptable counterfactual is not feasible. There is only one major port in the country, and therefore no way to define a control group. As such, the MCC defines this evaluation as a performance evaluation, and not an impact evaluation. Performance evaluations cannot attribute impact to an MCC investment as there is no counterfactual; instead, performance evaluations can compare changes before and after the investment. In the absence of a counterfactual and thus stopping short of attribution, this evaluation uses a two-pronged approach to quantitative analysis when possible: (i) critical measures of success of the MCC investment through "before project" and "after project" assessments and (2) comparisons of performance vis-à-vis global benchmarks for ports of similar sizes and operational profiles.

This evaluation relied on economic analyses (as described, above, and in Section 5: Findings) coupled with qualitative methods (detailed below) in order to assess the correlation between the MCC's investment and changes in performance at Port of Cotonou. Such changes were then viewed in light of broader economic trends to understand whether there is a correlation between the improvements at Port of Cotonou and trade and economic growth in Benin.

Qualitative Analysis

The qualitative assessments presented in this report complement, contextualize, and provide support for the quantitative analysis. Qualitative assessments presented in this report are based on evidence and testimony solicited through interviews and data requests from the most credible and knowledgeable parties whom the project team was able to access during its mission to Benin. A list of those data sources can be found in Annex 1. In general, the team made efforts to solicit two or more collaborative sources of data to support specific findings related to qualitative elements of the project.

As described below, some key issues affecting impact assessment can be better analyzed with data based on the judgments and opinions of informed sources than can others. Some issues, which are not amenable to quantitative testing, require informed judgments from knowledge experts. This difference in etiologies is the direct result of the differing levels of complexity entailed in assessing different types of impacts, the difficulty of sorting out the causal relationships between the multiple factors which may contribute to specific results and the additional difficulty associated with assigning responsibility for making decisions effecting investment project preparation and implementation.

Differences also derive from the political economy in which the Port of Cotonou operates—including, importantly, differences in the economic and political interests of the various sources whom the project team was able to access and from differing levels of knowledge that these sources possess regarding the causes of and levels of project related impact.

Whenever possible, the project team endeavored to secure supportive collaboration from more than one source. It further endeavored to apply methods which entailed cross-referencing and group validation (e.g., focus groups, cross referencing interviews, combining and comparing qualitative and quantitative data from different sources).

The Annex reviews qualitative data sources which the project team used to support its inferences under each of primary themes discussed in the project evaluation planning document.

4. Findings

Assessment of Operational Impacts

Summary of Methodological Approach

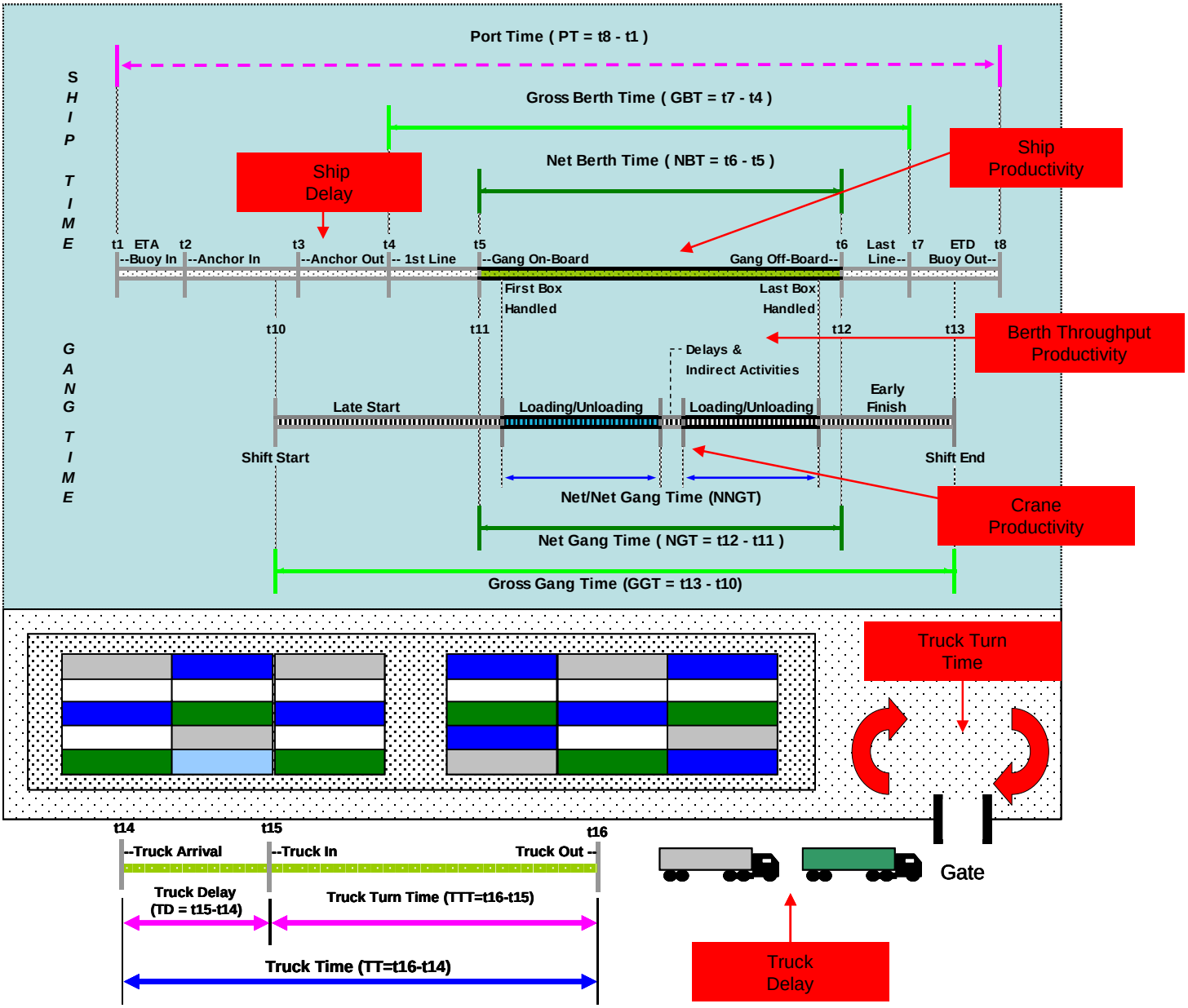
This section aims to answer the following research questions related to impacts on port operations:

- To what extent do the completed works mitigate/resolve observed constraints to port capacity and improve the efficiency of port operations as identified in due diligence and feasibility studies?
- How has the project affected the Port's operational efficiency? What is the percentage change in the overall productivity of the port following completion of the works?
- What percentage change in the port's principal measures of operational efficiency can be observed following completion of the works?
- Has the level of congestion in the Port changed? If there has been change, what has caused the change?

The NORC team will use a two-pronged approach to assessing the impact of the MCC's investment on operational performance. First, we will assess changes in the Port of Cotonou's performance before and after the MCC's investment. For this analysis, we will follow much of the same performance metrics that the MCC applied in its own assessment of program results, focusing on assessing changes in the MCC's monitoring and evaluation (M&E) indicators, along with additional indicators that the team deemed necessary to evaluate performance. Next, we will compare the Port of Cotonou's performance against benchmarks of regional performance and international best practices.

In general, the parameters of assessment fall into two categories: operational efficiency (OE) and level of service (LOS). Operational efficiency pertains to the productive use of assets, while LOS pertains to the quality of service provided to users of those assets, mainly cargo and ship owners and their representatives. The operational efficiency indicators include ship productivity, crane productivity, and berth throughput productivity. The LOS indicators include ship delay and truck turn time. Port capacity was also assessed in order to understand if constraints that previously inhibited efficient operations were resolved.

Figure 7: Port Time Accounting System and Operational and Level of Service Indicators



Source: Kent and Ashar (2010)

Operational Efficiency

The main indicators which assess operational efficiency include ship productivity, crane productivity, and berth throughput productivity.

Ship Productivity

Ship Productivity is probably the most important measure of terminal performance. It is based on the number of moves per hour during a vessel's *net berth time*. Net berth time occurs between the period when the first gang appears on the vessel and the departure of the last gang from the vessel.

Ship productivity is calculated by dividing the number of moves by net berth time measured in hours (moves/hour). The more cranes attending a vessel, then the more gangs that work the vessel; therefore, the calculation is the sum of the moves handled by all the cranes (or by all the gangs). Because of varying degrees of productivity (generally, the higher the loading/discharge volume), the calculation of ship productivity should distinguish larger volumes from smaller volumes moved. We will assess ship productivity before and after the investment, and also compared to benchmarks. We do not have a full time-series dataset of ship productivity data, and therefore cannot do more rigorous statistical analysis, however such analysis is also not required as the relationships are clear.

Crane Productivity

Crane productivity is calculated by dividing the number of crane moves by the period of time between the first "pick" (first box handled) and the point of rest of the last move (either on the vessel or onto a truck at the berth). Crane productivity is reported as number of moves per crane-hour. It is affected by the skill levels of the port workers as well as the technology that is applied. Crane productivity varies by crane type. Ideally, we would calculate crane productivity by crane type for each terminal (as crane productivity varies by type) before and after the investment, but crane productivity data was only provided for the South Terminal from 2015-2016.[126] Therefore we will only be able to assess crane productivity for the South Terminal compared to regional and global benchmarks.

Berth Utilization and Throughput Productivity

The final measures of operational efficiency that we measure are Berth Utilization and Berth Throughput Productivity. Berth utilization (the percent of time the berth is occupied) can be represented by the percentage of time that the berth is occupied or the amount of throughput at the berth. The amount of throughput at the berth is no longer a consistent measure of berth throughput productivity as vessel sizes have increased, thereby rendering berth sizes no longer uniform. The length overall (LOA) of ships employed by an intra-West Africa feeder service might be half that of mainline vessels. Today's larger vessels can take 1.5 ("traditional" sized) berths, so as a practical matter berth utilization can be better represented by throughput per *berth-meter*. And, since throughput is usually measured in TEUs and not in moves, the TEUs per berth-meter can be adjusted to reflect the "average" size per move.

Both the Conseil National Des Chargeurs and PAC provided some berth utilization data. However, the data only cover the periods 2006 to first semester of 2011 (CNCB) and 2006 to 2013 (PAC), and are inconsistent between the two sources. We analyze the PAC's data as it is a longer time series and comes directly from the source, but note that rates are often over 100%, indicating that more than one ship was using the berth. The PAC data are only through 2013, so still do not provide a complete picture as the Benin terminal only opened in 2013; data from 2014-2016 are essential

[126] The South Terminal is also called the Benin Terminal and the two names are used interchangeably in this report.

for assessing the project's impact on berth utilization, but this data was not available to the assessment team.

We are able to use data provided by Bolloré to calculate berth throughput productivity for 2014 and 2015.

Level of Service

As described above, indicators that measure level of service include ship delay, truck delay, and truck turn time.

Ship Delay

Ship delay, a measure reflecting the availability of berth and gangs, is calculated by subtracting the original scheduled time for the vessel's arrival at the port from the time the vessel arrives at the berth (second line tied) and is ready to work. Zero delay is ideal, but a delay of up to four hours can generally be absorbed into the vessel's itinerary. Delays beyond four hours usually mean that carriers will impose congestion surcharges as such delays cannot be absorbed in the itinerary. The calculation assumes that the ship arrives on schedule and it incorporates a provision for sailing time between buoy and berth, mooring, and clearances. For example, ships are expected to arrive at the pilot station at least two hours before the planned "ready to work" time. Delayed arrival of ships should not be considered when calculating ship delay, as vessel arrival time is outside the control of terminal operators; in vessel window systems, time slots are negotiated between the terminal operator and the carrier.

To assess ship delay, we will analyse PAC, Bolloré and MCC M&E data on waiting time at anchor and waiting time at berth by ship type (focusing on container ships but also assessing bulk vessels when data possible). Waiting time at anchor measures the amount of time a ship waits for a berth to become available. The addition of two new containers berths at the South Terminal due to the MCC's investment, along with the four new gantry cranes, should theoretically reduce the waiting time at anchor for container ships. Waiting time at berth measures the amount of time that a ship spends at the berth. Improved equipment such as gantry cranes should reduce the amount of time that a ship is spending at the berth, and if these figures do not improve despite increased operational efficiency, it indicates issues with service.

Port operations departments record ship waiting at anchorage and berth in a daily/monthly basis. Such detailed information can be plotted for an analysis period of several years that includes ship delay data for years before/after the opening of the new terminal. Enough data points should reveal a trend indicating a positive effect from the inclusion of new berthing space and more efficient operations that reduce berthing time. We will assess changes in waiting time at anchor and berth before and after the investment. We will also compare Cotonou's performance to appropriate benchmarks.

Truck Delay

Truck delay is calculated as the difference between the truck appointment time and the commencement of gate processing and acceptance of trucks onto the port terminal. The evaluation team was told that no truck appointment system data is collected/available, so the assessment of truck delay is purely qualitative.

Truck Turn Time

Truck Turn Time refers to the time required for the truck to enter the terminal, pick up or discharge its load, and exit the terminal. As the measure involves gate processing, travelling to the stack, waiting for yard equipment, loading/unloading, travelling back to the gate, and gate processing on the way out, it also serves as a proxy measure of the efficiency of the storage operation.

The single window system allows the creation of buffer inventory within the terminal and thus decouples off street operations and inside the terminal loading and stacking operations. Ideally, truck turn time (with respect to drop-offs and pickups to and from the buffer zone) should not exceed one hour, but exceeding this time is justified if the truck is engaged in both discharge and loading, thus requiring about 30 minutes more. However, we find that data distinguishing trucks that are only loading, only discharging, or both discharging and loading are not readily available, and in this case, are not available. Neither PAC nor M&E data on truck turn time provide a continuous time series; however, they do contain data for points in time before, during and after the investment so that a before/after analysis can be conducted. We will also compare the Port of Cotonou's current truck turn time to various benchmarks.

Dwell Time

Dwell time typically refers to the amount of time that containers stay at the port. A long dwell time can mean that the port or customs is inefficient or simply that shippers have no incentive to quickly remove containers from the port. The main issue with a high dwell time is that it can lead to congestion. We assess dwell time based on the average container stay at the port before and after the investment. Data are on available from the PAC from 2005 through mid-2011, from other sources (the World Bank) through mid-2012, and from CNCB for 2013-2015.

Port Capacity

When estimating port capacity, it is typical to calculate the capacity of all terminal components – berth, yard, and gate – following industry standard methods.[127] The component with the most restrictive capacity then determines terminal capacity. However, based on NORC's due diligence and site visit to the Port of Cotonou, combined with our review of existing feasibility studies, berth capacity was identified as the primary constraint to port capacity that, prior to the project, limited the efficiency of port operations. Calculating berth capacity typically requires very specific operational assumptions on equipment, productivity, scheduling, etc. For this evaluation, given the lack

[127] "Stock and Flow Methodology for Calculating Capacity of Cargo Terminals", A. Ashar and G. Ayzanoa. Proceedings of the Second Annual Transportation Management Conference, April 1995.

of available data, we approximated berth capacity for 300-350 meters of berth by the number of gantry cranes working at the berth and throughput for each crane. Modern container terminals are planned assuming annual productivities of about 150,000 TEU/crane. Given that North Terminal of the Port of Cotonou does not have the assumed standard equipment (gantry cranes), but instead functions with mobile cranes, a multiplier of the crane productivity was assumed at a value of 0.6 for the North Terminal. We will then compare Port of Cotonou capacity in 2006 (prior to the Compact) with its expanded capacity in 2014 against cargo volumes for both time periods.128 By doing so, we can determine the percentage increase in throughput that can be handled at Port of Cotonou before reaching berth capacity constraints.

Challenges

As mentioned above, there is no feasible counterfactual, therefore it is difficult to attribute changes in operational efficiency and level of service to the MCC's investment. One way to attempt to isolate these effects is to use multivariate regression analysis to isolate the changes due to the MCC's investment from exogenous factors. However, such analysis requires time series data, preferably in monthly or quarterly format, or if over a long enough time, annually.

In general, the project team had significant issues obtaining much of the essential data, including data from the PAC. Much of the data that was received was only obtained very late in the assessment, which delayed the finalization of the methodology and created redundancies in conducting analysis. Key data received regarding operational efficiency and level of service was only provided through annual reports, which were sometimes in Word or PDF format, which further complicated the data collection process. The PAC often only provided data through 2013 or 2014 depending on the indicator, which does not allow us to fully assess the impact of the investment including the impacts of the operation of the South terminal. The PAC was not willing to provide additional data and did not respond to follow-up requests by the project team.

The most important challenge is that despite significant efforts to establish complete time-series datasets, there are gaps in the datasets for many of the most important indicators. Unfortunately we are missing too many data points to have continuous time series data for many of the indicators. For example, ship productivity is one of the most important indicators, but data for this indicator was not an M&E indicator and was only accessible for the period from 2006 to 2009 for the North Terminal and 2015 to June 2016 for the South terminal. Similarly, very little data exists on truck delays and turn time, so we cannot quantitatively analyze whether changes in port capacity affected congestion. Instead, qualitative assessments from interviews and focus group discussions will have to fill in these gaps, especially in terms of attribution and describing exogenous factors that may be affecting port performance.

[128] We do not have data for the North Terminal for 2015.

Analysis

First, we present and interpret traffic volumes and composition at the Port of Cotonou. We also focus on containerized traffic and Bolloré's Benin Terminal. Next, we examine operational efficiency. The subsequent section assesses level of service, and this is followed by discussions on port capacity.

Port of Cotonou Traffic

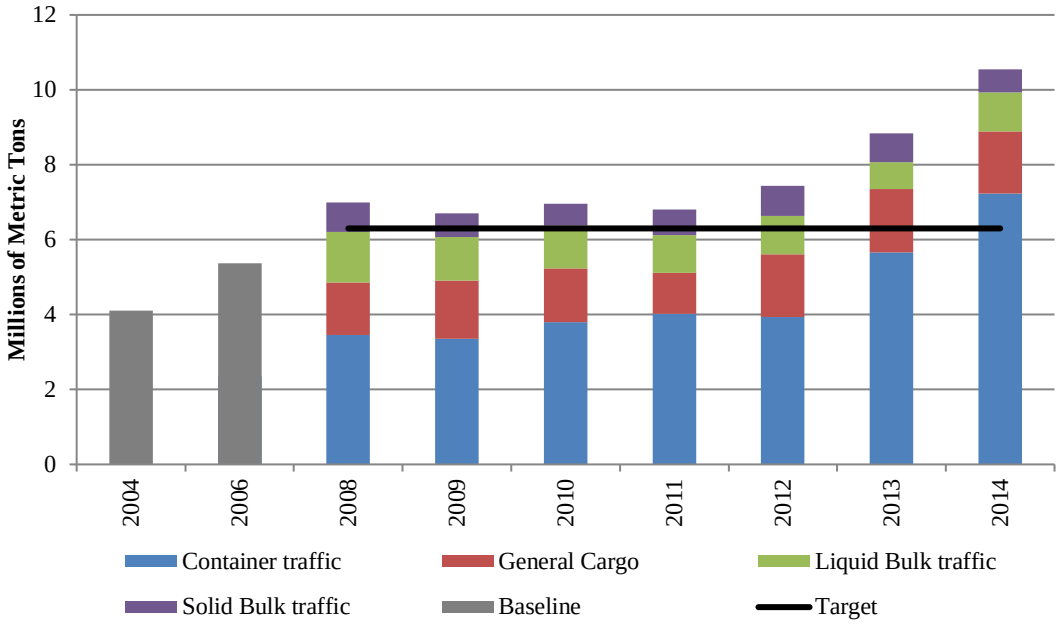
Traffic Volumes

Traffic moving through the port of Cotonou increased from a baseline value of 4.1 million tons in 2004[129] or 5.4 million tons in 2006 to 10.5 million tons in 2014 (see Figure 77).[130] Traffic exceeded the 2011 target of 6.3 million tons, with 6.9 million tons of traffic moving through the port in 2011. However, it appears that the baseline and target volumes may be flawed. The baseline target was from 2004 instead of 2006. In 2006, volumes were already at 5.4 million tons, which was the Year-2 target. If data from 2006 were used as the baseline, assuming the same growth (2.2 million tons) from the baseline, the target would have been 7.6 million tons instead of 6.3 million tons, and this was not reached by 2011. It should also be noted that the concession process and construction were still in progress in 2011 (the end of the Compact), and the real project impact was likely not realized until 2013/2014 (after the opening of the South Terminal). In this sense, the "true" baseline could even be considered to be 2012. Nonetheless, by 2014, volumes had increased substantially to 10.5 million tons. This shows a clear increase in traffic after the opening of the South Terminal in 2013. The trade attribution section of this report discusses how this growth compares to regional growth and whether or not these increases are in line with Benin's expected growth rates based on GDP.

[129] Data from the PAC indicate slightly different data than the M&E baseline data (4 million vs 4.1 million tons). The MCC M&E indicators show baseline volumes from 2004 instead of 2006, but the reasoning for this is unclear to the project team.

[130] Note that much of the data reported in this assessment is from 2014, as the PAC was not able to provide updated data for 2015 for many of the metrics. When available to the project team, more recent data is reported.

Figure 8: Port of Cotonou Traffic Volumes by Type (Metric Tons)



Source: PAC.
Note: Both 2004 and 2006 have been included in the legend as baseline traffic; the 2004 data are the baseline data as per the M&E plan, and the 2006 data are considered to be the true baseline by the project team.

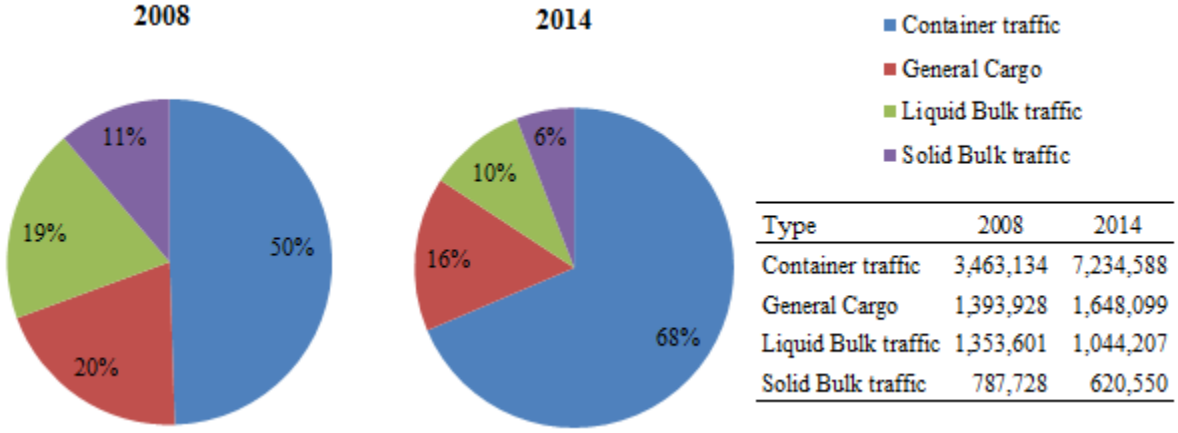
As many of the MCC's investments were into infrastructure affecting container trade, it is also essential to assess changes in container volumes. Container traffic grew from 2.4 million tons in 2006 to 6.6 million tons in 2014 and is discussed in more detail, below.[131]

[131] Tons include container weight. Source: PAC.

Traffic Composition

In 2014, 68% percent of traffic was container traffic, 16% general cargo, 10% liquid bulk, and 6% solid bulk (see Figure 8). This represents a large increase in the share of containerized cargo, from 50% of traffic in 2008 to 68% in 2014. The increase in container traffic can be attributed to the port investments because (as shown in the capacity discussion below), container traffic was operating at capacity prior to the investment. The reduction in liquid bulk is comprised of reduced fuel imports (both domestic and transit). This reduction can be explained in large part by the liberalization of fuel import and internal distribution activity which had previously been monopolized by the state owned fuel distribution company and entailed mostly government-to-government transactions.

Figure 9: Composition of Traffic, 2008 and 2014 (Metric Tons)



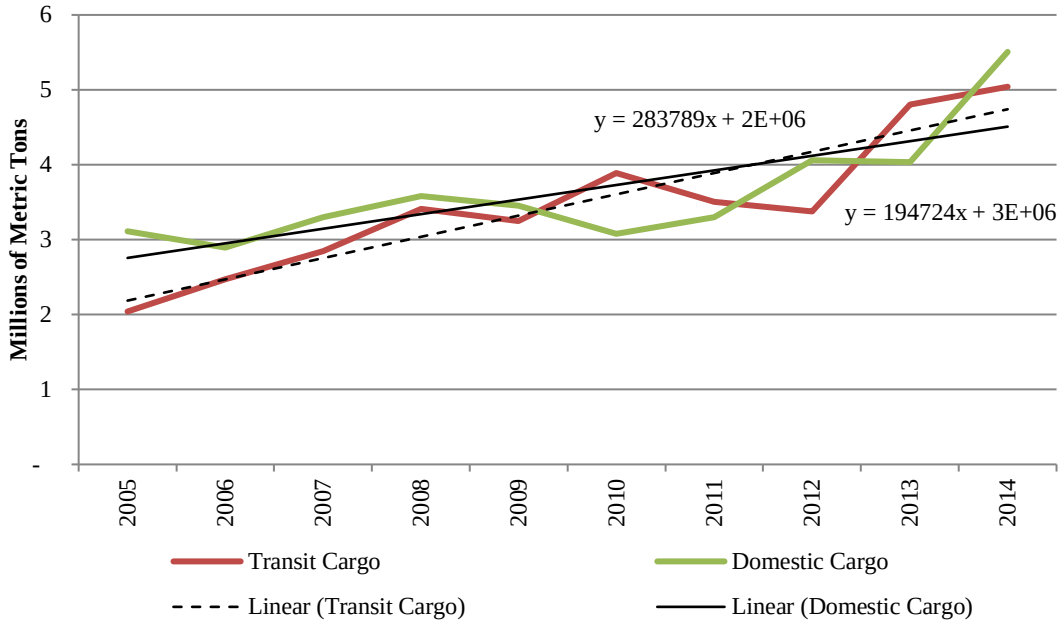
Type	2008	2014
Container traffic	3,463,134	7,234,588
General Cargo	1,393,928	1,648,099
Liquid Bulk traffic	1,353,601	1,044,207
Solid Bulk traffic	787,728	620,550

Source: PAC.

The figure below depicts trends in traffic volumes for all transit and domestic cargo. In 2005, the port handled 2 million tons of transit cargo[132] and 3.1 million tons of domestic cargo, with transit cargo officially representing 40% of cargo. In 2014, the share of transit traffic increased to 48%. In reality, some "domestic" cargo is also transit cargo, smuggled across the border to Nigeria, so the share of transit traffic is likely even higher. In 2010, 2013 and 2014, transit traffic officially represented more than 50% of traffic.

[132] Transit cargo is cargo that moves through the port to other neighboring or nearby countries such as Niger, Nigeria, Mali, Burkina Faso etc. by truck or rail. Transit cargo differs from transshipment cargo, the latter of which is shipped out by sea. For example, cargo may come to Benin in large ships and then be sent to smaller nearby ports by smaller feeder ships.

Figure 10: Port of Cotonou Traffic Volumes, 2005-2014 (Millions of Metric Tons)



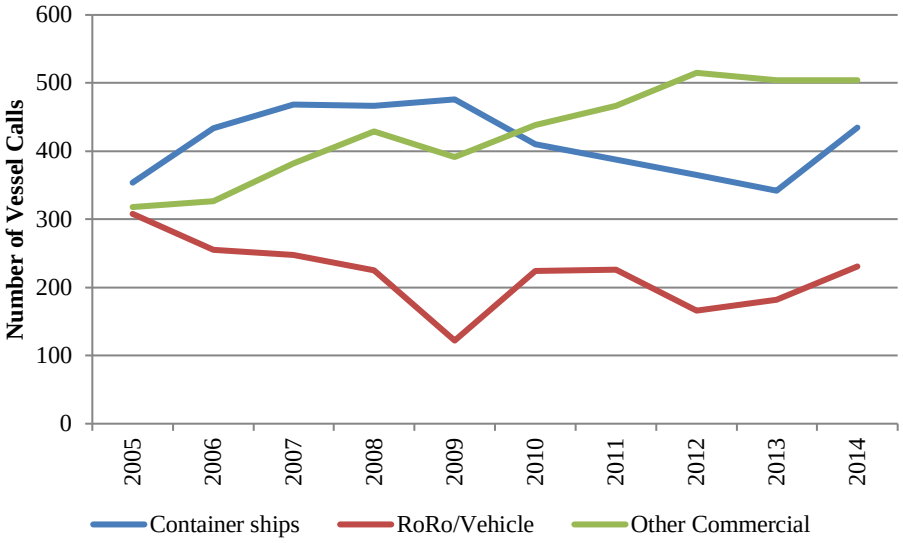
Source: STAT 2003 2014.xls.
Note: Transshipment is excluded as of 2009, but our understanding is that volumes were very minor and do not affect the overall volumes.

As shown by the trend lines in Figure 9, transit traffic grew at a faster pace than domestic cargo. This, along with the large share of transit cargo, means that not all of the benefits of increased trade are accruing to Benin. Many of the benefits of the project will instead be spread throughout the region.

Vessel Calls

Figure 11 shows the trends in vessel calls by ship type from 2005 through 2014. Despite the large increase in tons of containerized cargo, the number of container ships calling on the port of Cotonou remained constant, with 434 container vessels calling in 2005 and 435 vessels calling 2014.

Figure 11: Port of Cotonou Commercial Vessel Calls, 2005-2014 (Number of Calls)



Sources: TRAF NAV ET MSES 2005 2014.xls and STAT 2003 2014.xls. Transshipment excluded as of 2009.

To account for the large increases in volumes with the same number of ship calls, this implies that larger ships have been calling on the port. We tested this hypothesis by accessing data from Bloomberg, which has a database of ship calls by port. We found that in 2008, the largest ship calling on the port of Cotonou had a maximum capacity of 2,602 TEU, while in 2015 the largest capacity was 5,466 TEU.

The MCC's investment, along with complementary dredging done by the PAC and the investments made by the concessionaire, Bolloré, has allowed for larger ships to call on the port of Cotonou, which has in turn allowed for volumes to increase without shipping lines having to increase the number of vessels calling on the port.[133] Using larger vessels brings savings to shipping lines, which is a benefit due to the investments into infrastructure at the Port of Cotonou. According to the MCC's economic analysis close out memo, "[t]he switch to larger ships is assumed to save 10% of shipping costs, which is $14.12 per ton. This amounts to about $10.6 million per year."

However, Figure 11 also shows that the number of container-vessel calls has not increased, which calls into question whether the competitiveness of the port increased due to the investment. This is further discussed in the Competiveness section below.

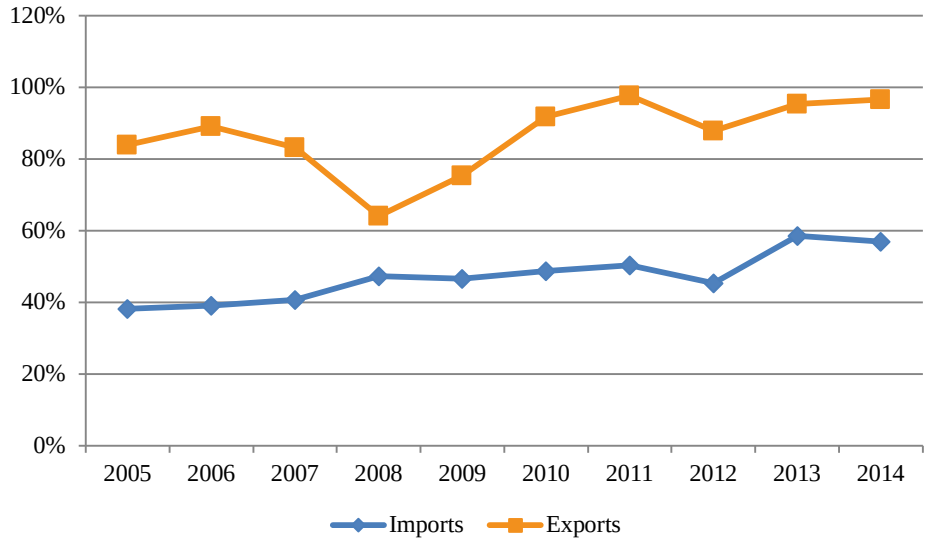
Containerized Cargo

Both imports and exports are increasingly being transported through the port as containerized goods. The MCC's investment focused on containerized traffic, with major investments and focus on the new South Terminal for container ships. The containerization rate increased from 84% of

[133] The PAC funded the enlargement of the port sea access so that ships of 250m and up to 13.5 m draft can call on the port and Bolloré made additional investments in the Benin Terminal at the wharf itself and in its new container terminal. We consider these to be complementary investments that would not have occurred but for the MCC investment.

tons exported in 2005 to 97% of tons exported in 2014, meaning that nearly all exports are containerized. The containerization rate for imports is lower but still increasing—from 38% in 2005 to 57% of imports. The lower import containerization rate is due to major imports including food products and fuel being imported in bulk form; excluding breakbulk and liquid bulk would increase the containerization rate.

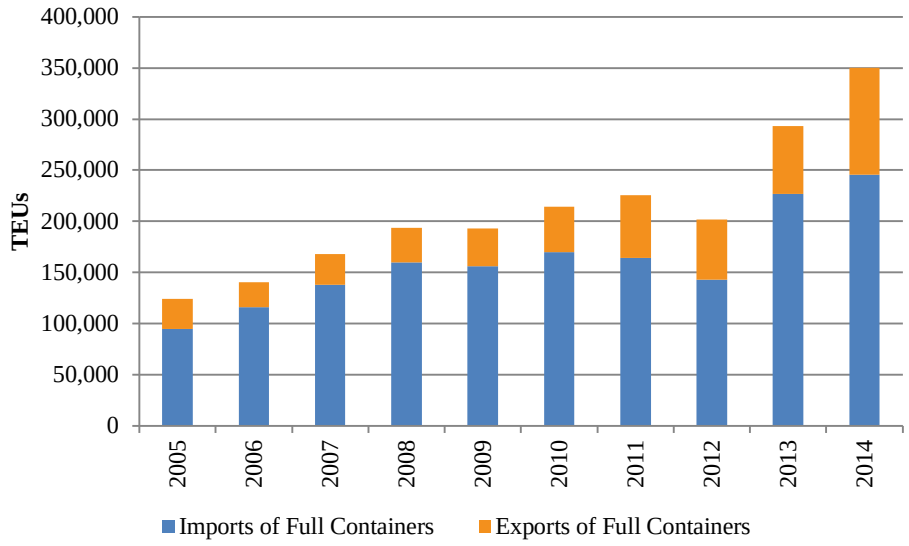
Figure 12: Containerization Rate (Percent of Total Tons)



Containerization is important because it is the most efficient and cost-effective way of moving cargo. It also allows cargo more global connectivity and access to the global network. Tariffs for loading and unloading cargo per ton are also cheaper than for breakbulk.

Cargo volumes reported in tons are a good measure of actual activity at the port (Figure 9). Containerized cargo, however, is normally measured by the number of containers handled through the terminal, including empty containers that are not reflected in volumes reported in tons. Accounting for empty containers is important because it provides a more complete picture of the volumes of traffic handled at the port. The ratio of full-empty containers also provides insight on the composition of traffic (imports and exports). However, the PAC was not able to provide time-series data on the number of containers handled, and instead only provided data for full containers handled in TEUs (not including empty containers)—see Figure 12.

Figure 13: Port of Cotonou Container Traffic, 2005-2014 (TEUs)

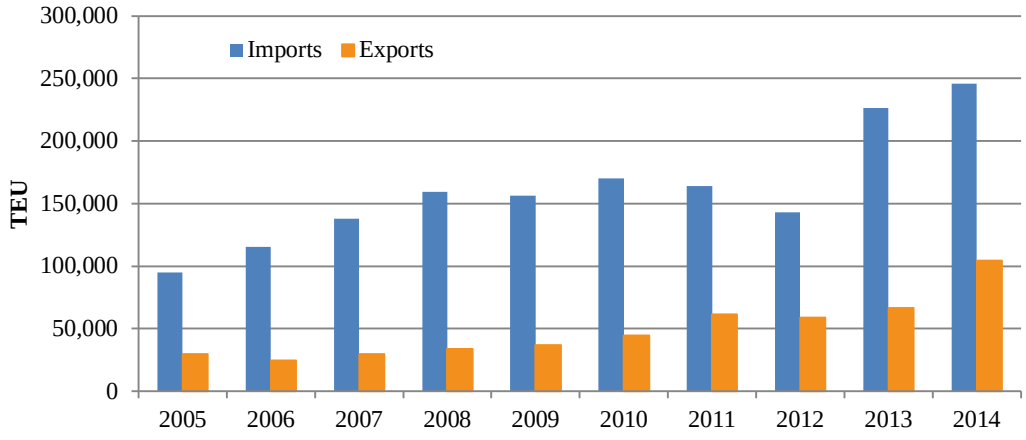


Source: STAT 2003 2014.xls. Transshipment excluded as of 2009.

As seen Figure 12, container traffic has increased from 140,536 TEUs of full containers in 2006 to 350,121 TEUs of full containers in 2014. Traffic increased 45% from 2012 to 2013, with the opening of Benin Terminal in 2013.

Figure 14 shows the import and export split of container traffic. While both imports and exports have risen, exports have been growing at a faster rate (CAGR of 15% for exports compared to 13% for imports). In 2005, the import-to-export ratio was 3.2; by 2014, the ratio had fallen to 2.4, indicating that exports have grown faster than imports. This is important as it means that the country is exporting more goods.

Figure 14: Port of Cotonou Container Traffic by Imports and Exports, 2005-2014 (TEUs)



Bolloré's Benin Terminal

In July 2013, the South Terminal (Bolloré's Benin Terminal) opened for business. In 2014, the only full year for which we have comparable data, the Benin Terminal captured 40% of the Port of Cotonou's full-container traffic excluding transshipment as shown in the table below.[134] This share is likely to increase over time as the South Terminal has more modern equipment and larger draft. However, Maersk ships may still continue to call on the North Terminal as it is operated by APMT.

Total port container traffic of full containers increased 45% from 2012 to 2013 and another 19% from 2013 to 2014 showing a large increase after the opening of the South Terminal. The PAC was not able to provide data for 2015 so we cannot assess total volumes for this year, but note that in Table 4 Benin Terminal full-container traffic falls slightly by 75 TEU from 2014 to 2015. This appears to be due to weak imports from January through May 2015. Whether total port volumes fell or just those at Benin Terminal is unclear as no data was available. Additionally, as no data is available for 2015 Lomé traffic, we cannot assess whether the decrease was due to a loss transit traffic to Lomé. However, Benin Terminal's transshipment increased by 29% to more than 100,000 TEUs in 2015, which meant that overall traffic to Benin Terminal increased year/year from 2014 to 2015. The increase in transshipment traffic indicates that the port became more competitive in attracting transshipment traffic, which is likely attributable to the modern equipment provided by Bolloré.

Table 4. Benin Terminal and Total PAC Volumes of Full Containers, 2013-2015 (TEUs)

	Full Containers [a], excluding transshipment (TEU)			
Year	Benin Terminal	Total PAC	Percent Benin Terminal	Benin Terminal Transshipment
2013 [b]	65,662	293,185	22%	3,707
2014	141,673	350,121	40%	80,118
2015 [c]	141,598	NA	NA	102,993

[a] Benin Terminal opened in July 2013

[b] No PAC data for empty containers

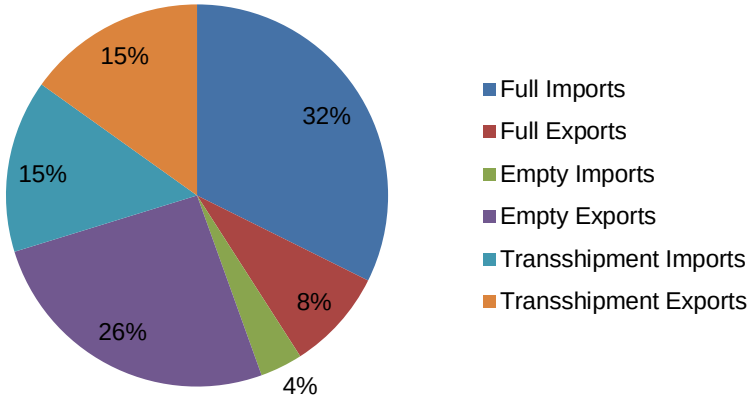
[b] No PAC data for 2015

Sources: STAT 2003 2014.xlsx and Volumes manipul-s 2013 2015 Benin Terminal.xlsx.

Benin Terminal provided data for July 2013 through December 2015 including a breakdown of full containers, empty containers and transshipment; the figure below provides this breakdown for 2015. Despite traffic of full containers falling slightly from 2014 to 2015, total container traffic increased 6.4% year-over-year from 2014 to 2015 (from 325,259 TEU to 346,063 TEU). In 2015, full-container imports exceeded full-container exports by a large margin, with imports of 111,934 TEU and exports of 29,664 TEU. Transshipment totaled 25% of traffic in 2014 and 30% of traffic in 2015 in terms of TEUs.

[134] The PAC has not provided data for empty containers, transshipment in TEU, or 2015 for the port as a whole (2015 data only included Benin terminal). In 2014, transshipment accounted for 8.4% of containers handled in tons.

Figure 15: Composition of Benin Terminal Traffic (TEUs), 2015

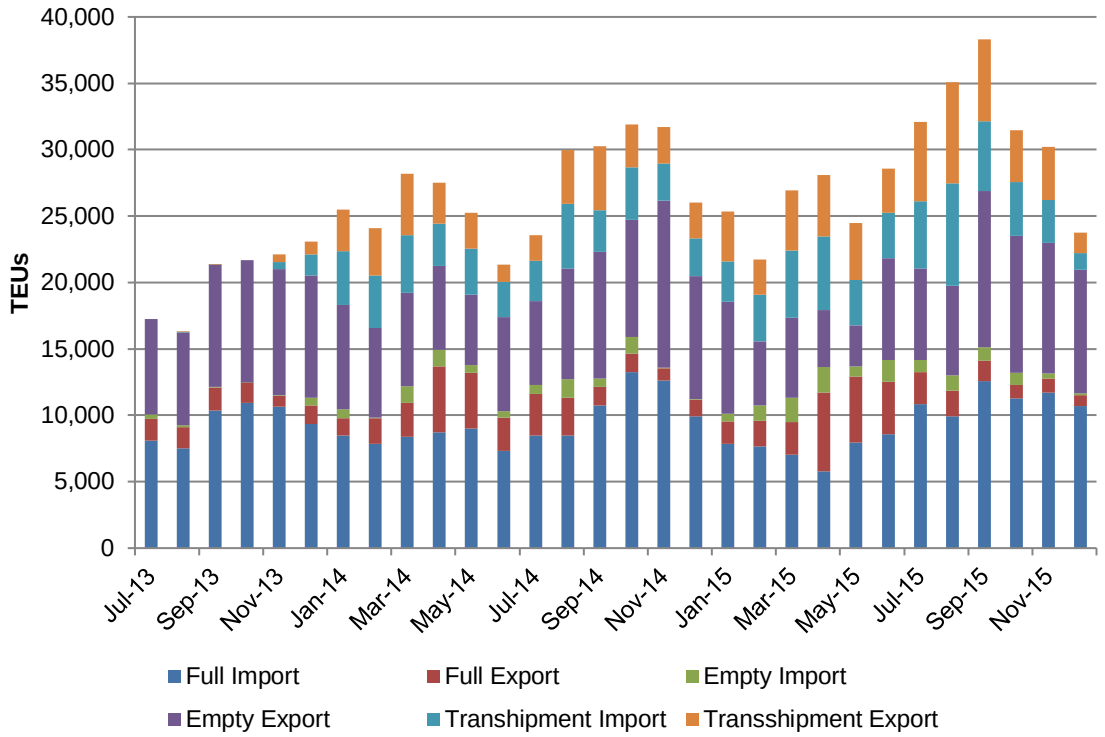


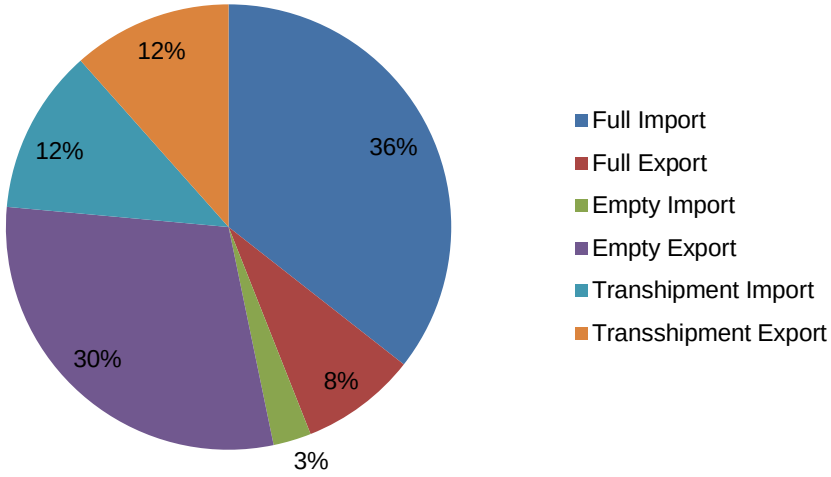
Sources: Donnees Benin Terminal.xls, Volumes manipul-s 2013 2015 Benin Terminal.xlsx.

Figure 16 presents monthly traffic at Benin Terminal in TEUs from its opening in July 13 through December 2015. While June through September 2015 showed strong year-over-year growth ranging from 17% to 36% per month, the last quarter of 2015 showed negative year-over-year growth with full-container imports, full-container exports, and transshipment imports all falling. This could indicate that competition from the opening of Lomé's new container terminal is affecting traffic through the port of Cotonou. Bolloré's new terminal at Lomé opened in 2015 with a theoretical annual capacity of 1,100,000 TEUs, 4 gantry cranes, and a 546m berth with 15m draft. Volumes could be further threatened by additional planned port expansions.[135]

[135] For example, the IFC just recently announced a $667 million loan to expand Tema port. See http://www.out-law.com/en/articles/2016/september/international-banks-join-ifc-in-ghana-container-terminal-finance-deal/.

Figure 16: Monthly Benin Terminal Traffic, total TEU (full containers, empty containers and transshipment)





Operational Efficiency

Summary of Key Indicators

Prior to the investment, stakeholders' main concern about the port was port congestion due to poor port layout and administrative bottlenecks attributable to the PAC and customs, which increased costs and the risk of doing business in Cotonou. The Port of Cotonou is surrounded by the gulf and

city, leaving little room for expansion. For ports where space is at a premium, operational efficiency is key to increasing capacity without physically expanding the port.

The main indicators which typically assess operational efficiency include **ship productivity**, **crane productivity**, and **berth throughput productivity**.[136] The table below summarizes key measures of operational efficiency before and after the investment.

Table 5. Key Characteristics and Operational Efficiency Indicators, Container Ships

Indicator	UOM	2006	2010	2011	2012	2013	2014	2015	2016[c]
Number of vessel calls	Number	388	494	468	359	494	641		
Average length	Meters		178.9	190	192.6	198.8	197.5		
Average draft	Meters		8.7	9	9.2	9.4	11.8		
Average gross tonnage	Tons		19,916	23,756	3,717	25,598	26,584		
Ship Productivity	TEU/hr	7-20[a]		17-18				35[b]	45[b]
MHC Productivity	TEU/hr	NA						10 [b]	11 [b]
Gantry Crane Productivity	TEU/hr	NA	NA	NA	NA			18	23
Container Berth Occupancy Rate N. Terminal (PAC)	%	94	172	257	180	306			
Berth Throughput Productivity S. Terminal	Annual TEU/m	NA					302	641	

Source: PAC, Bolloré, MCC (Wilbur Smith (2005) and Port Advisor (2012)).

[a] 2005. Depends on equipment used.

[b] Benin Terminal only.

[c] First half only, Benin Terminal only.

Ship Productivity

As noted above, the most important measure of terminal performance is ship productivity, which is measured by the number of moves per hour during a vessel's net berth time. Before the MCC's investment, the port had no cranes, and ship gears were used to load/unload cargo. In 2005, ship productivity averaged 7-20 moves/hour depending on the equipment used, which is below the productivity at most other regional ports as seen below.

[136] None of the MCC's M&E indicators covered indicators for measuring operational efficiency despite the fact that some of the key investments were aimed at improving operational efficiency.

Table 6. Regional Ship Productivity, 2006 (2005 for Cotonou)

Port	Moves per hour
Douala	40
Matadi	7
Tema	40
Lagos	28
Dakar	10
Cotonou	7-20

Source: Cotonou data from Wilbur Smith's 2005 report for the MCC. Other port data is from an African Development Report 2010. Using data from "Ocean Shipping Consultants (2007) for SSA; International Containerisation Yearbook, 2009" and the World Port, http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African Development Report 2010_CH 2.pdf

COMAN introduced 4 mobile cranes around 2007 and SMTC introduced 2 more cranes around 2009, which should have improved productivity. An MCC report from 2012 contains ship productivity data for the North Terminal and notes that Maersk's productivity (using mobile cranes) is only 17-18 moves/hour compared with a benchmark of 25 moves/hour at other regional ports.[137]

The Benin Terminal currently has four gantry cranes purchased by Bolloré, which allows for two cranes to serve two ships at one time. According to Bolloré, gearless ships have been calling on Cotonou's South Terminal since July 2015 which has increased efficiency. With the introduction of the South Terminal and four ship-to-shore gantry cranes, ship productivity increased dramatically with an average of 35 containers per hour in 2015 and 45 containers per hour (with 2 cranes) in the first half of 2016. However, it should be noted that this data is only for the Benin Terminal, and assuming that the North terminal was still operating at 10-11 containers per hour using mobile cranes (see Table 9). This is below the benchmark 25 moves/hour of 2 mobile cranes working on a ship.

Table 7. Ship Productivity in TEUs per hour

Year	# of Full Containers	TEUs (Full Containers)	Ship Productivity				
			Containers/Hour-Stay		Containers/Hour-Work		
			Total Stay (hr)	Productivity	Total Work (hr)	Productivity	Notes
2006	101,749	139,376	11,019	9	10,021	10	
2007	123,778	164,414	13,291	9	12,102	10	
2008	145,572	186,676	17,256	8	15,711	9	
2009 [a]	137,984	180,623	15,359	9	12,919	10.5	
2015 [b]		141,598				35	[c],[d]
Jan-May 2016 [b]						45	[c],[d]

[a] Productivity was provided semi-annually and data have been annualized using a simple average. [b] Benin Terminal only. [c] Benin Terminal does not specify whether the statistics are for hours in port or hours working, but we assumed hours working. [d] Simple average of all months (no data available to calculate overall annual average).
Source: CNCB and Bolloré.

[137] Rapport D'achèvement Du Programme Du Benin Pour Le Millennium Challenge Account (MCA-BENIN) from February. 2012.

The Benin Terminal's productivity compares well against international benchmarks; such equipment should be able to handle 24-30 moves per hour per crane (48-60 moves per hour for 2 cranes). It is also more productive than Lomé, which was operating at 32 movements per hour/ship and Tema, which averaged 35moves/hour/ship according to a 2013 report.[138]

While ship productivity is high at Cotonou, according to Bolloré's concession contract, Bolloré should have provided six gantry cranes instead of four. This would have allowed for three cranes to serve each ship at one time—which is more in line with industry best practices[139] and would further improve ship productivity. The berth can technically service two 260m ships at once; however, this is not possible in practice using the gantry cranes as the gantry cranes rails can only reach 511m. Therefore, if one 260m ship calls at the port, the maximum size of the second ship that can be serviced is 250m; if an additional 260m ship calls, it would have to wait at anchor. With three gantry cranes servicing each ship, this issue would be addressed.

In addition to the investment in new equipment, fixed berthing systems were implemented, starting with a test period from October 2009-April 2010. Fixed berthing systems can have an impact on both operational efficiency (through improved gang productivity) and level of service (through reduced waiting times). At the system start, only the North Terminal was operational, therefore the system was run for quays Q8, Q6, and Q5. Initially, 14.5 out of 21 days-quay were assigned and 6.5 were held out of the berthing window system. In order to partake in the fixed berthing window program, ships had to meet a set of conditions including arriving within 3 hours of the window and to be eligible for fixed windows ships had to observe minimal productivity over 6 months of 25 container-moves/hour or 80 cars per hour. Berthing windows were granted for a renewable 6 months.[140] As shown in the table below, gang productivity was greatly improved after the implementation of the fixed berthing windows.

Table 8. Gang Productivity Before and After Fixed Berthing Window, TEU/hour

Shipping Line/Stevedore	Average Monthly Rate 2008	Monthly Productivity			Average Q3-2009	Apr-10
		Oct-09	Nov-09	Dec-09		
MAERSK / COMAN	28.08	46.39	43.89	48.85	46.38	46.78
CMA CGM /SMTC	15.4	19.8	27.2	21.23	22.74	22.23
MSC /SMTC	15.4	14.8	15.5	27.95	19.42	15.85
GRIMALDI /SOBEMAP	24.4	72	49	48	56.33	52.61

Source: CNCB and Bolloré .

[138] Market Study on Container Terminals in West and Central Africa (2013). MLTC/CALTRAM, funded by the Agence Française de Développement.

[139] Global Container Terminal Operators – 2012, Drewry. Table 2.11, "Regional container terminal performance comparison".

[140] Final report of the port advisor of MCA-Benin to the General Manager of the Autonomous Port of Cotonou.

Stevedoring

The three main stevedoring groups at Cotonou are SOBEMAP (public), COMAN (APMT), and SMTC (Bolloré). Prior to the MCC's investment, COMAN was the largest stevedore with 50% market share, followed by SMTC (29%) and SOBEMAP (21%). SOBEMAP's traffic decreased significantly with the introduction of the Bolloré, from 63,643 TEUs in 2008 to 6,799 in 2009. The market share of Bolloré's affiliate, SMTC increased from 29% to 46%, while SOBEMAP's share fell from 21% to under 3%.

Gang Market Share, Full Containers

Year	COMAN	SMTC	SOBEMAP
2006	50.0%	29.0%	21.0%
2007	51.3%	29.5%	19.2%
2008	53.5%	26.9%	19.6%
2009	49.3%	49.1%	1.6%
2010	51.2%	46.1%	2.8%

Gang Productivity, TEU/hour

Stevedore	2004	2006	2009	2010
SOBEMAP	18	14.8	28.17	19
COMAN	15	24.4	40.54	46.78
SMTC	19	20.4	17.59	23.05

Source: CNCB.

In 2006, SOBEMAP's gang productivity in TEU/hour was much lower than the two private operators at 15 TEU/hour compared to 24 for COMAN and 20 for SMTC. COMAN's productivity was enhanced by the 2 MHCs acquired by APMT in 2007 and similarly SMTC acquired 2 MHC in 2009.The fixed berthing window also improved productivity in 2010. No current data exists to look at improvements through the present.

Crane Productivity

Crane productivity is affected by the skill levels of the port workers as well as the technology that is applied. As noted above, crane productivity varies by crane type: ship to shore gantry crane productivity is superior to mobile harbour crane (MHC) productivity, and mobile crane productivity is superior to ship's gear.

Prior to the MCC's investment, ship's gears and mobile cranes were used to load and unload vessels. Presently in Cotonou, the South terminal has four gantry cranes that were provided by Bolloré under the MCC investment and their concession terms, but the North terminal relies on mobile cranes provided by Maersk/APMT.

Figure 17: Picture of Four Ship-to-Shore Gantry Cranes at Benin Terminal (left) and Two of APMT's MHC (right), September 2015

The only crane productivity data available to us was data provided by Bolloré for 18 months of 2015-16. The limited data provided clearly indicates that the gantry cranes have been performing at a far superior pace than the mobile cranes. As shown in Table 9, the gantry cranes averaged 23 moves per hour in the first half of 2016. This is in line with industry standards of 24-30 moves/-crane/hour and well above MHC efficiency (typically around 12 moves/hour and for Benin Terminal 10-11 moves/hour). Gantry crane productivity is also higher than Tema (22 moves/hour) and Abidjan (17 and 21.5 moves/hour depending on the gantry crane). [141]

Cotonou's MHC productivity at Benin Terminal increased from 10 moves/hour in 2015 to 11 moves/hour in the first half of 2016, but is still below regional competitors like Tema (12 moves/-hour) and industry standards.

Table 9. South Terminal crane productivity, moves per hour

	Crane Productivity [a]	
	Gantry	Mobile
Year	Avg. Moves/hr	Avg. Moves/hr
2015	18	10
Jan-May 2016	23	11

[a] Simple average of all months (no data available to calculate overall annual average). Assume Ground crane means Mobile.

While the addition of gantry cranes at the South terminal has greatly improved operations there, it is assumed the operations at the North terminal are no more efficient than before the investment.

[141] Market Study on Container Terminals in West and Central Africa (2013). MLTC/CALTRAM, funded by the Agence Française de Développement.

The South Terminal has great efficiency advantages over the North terminal due to the gantry cranes, plus can accommodate larger ships due to the deeper waters.

Berth Utilization

Typically berth occupation rates over 70% indicate port congestion. The table below contains berth occupancy rates for 2006-2013 using data from PAC reports.

Table 10. PAC Reported Berth Occupancy, 2006-2013

		Berth Occupation Rate (Percent)							
Berth	Berth Description	2006	2007	2008	2009	2010	2011	2012	2013
B				27	104	20	58	25	8
QC	Bulk	266	263	217	271	169	149	133	202
ORYX	Oryx	47	92	44	105	90	81	75	83
P1				1					
P2	Petroleum	207	276	82	275	182	240	151	200
PP	Fishery	216	385	352	390	64	43	19	31
Q1	Conventional Cargo	74	153	75	148	123	84	145	216
Q2	Conventional Cargo	70	163	88	168	133	59	148	201
Q3	Conventional Cargo, Low Draft	16	35	44	109	75	88	135	191
Q4	Conventional Cargo	159	140	56	67	70	74	70	147
Q5	Conventional Cargo	128	216	83	216	165	262	181	244
Q6	RoRo	87	186	88	233	161	207	161	186
Q8	Container	94	210	88	255	172	257	180	306
Q9	Benin Terminal Container								58
Q10	Benin Terminal Container								40

Source: PAC annual reports

Note: Annual reports contain 2 years' worth of data. When data differed from report to report, data in most recent report was deemed to be the most updated data and is the data that is reported.

CNCB also contained berth occupation rates for 2006 through the first half of 2011. These data often conflicted with data from the PAC and it is unclear why there is a discrepancy between the two sources.

Table 11. CNCB Reported Berth Occupancy, 2006-First Half 2011

Berth (length)	2006	2007	2008	1S 2009	2S2009	1s2010	2S2010	1S2011
Conventional Berth (155m)	36%	41%	46%	44%	72%	59%	67%	64%
Conventional Berth (155m)	31%	42%	72%	60%	75%	44%	44%	44%
Conventional Berth (155m)	12%	8%	29%	30%	51%	48%	36%	21%
Conventional Berth (155m)	34%	49%	43%	38%	32%	54%	24%	62%
Conventional Berth (180m)	50%	91%	83%	111%	unknown	92%	77%	62%
Conventional Berth (180m)	66%	83%	87%	92%	82%	78%	84%	69%
Container Berth (220m) [a]	65%	0%	1%	4%	6%	1%		2%
Container/RoRo Berth (220 m)		90%	89%	88%	88%	79%	80%	75%
Subtotal Commercial Berths	42%	40%	60%	58%	66%	57%	59%	50%
Bulk/hydrocarbon Berth (East Jetty)	70%	72%	77%	70%	87%	61%	66%	90%
Traverse Dock (East Jetty)	30%	53%	47%	10%	11%	67%	49%	58%
Oryx Berth	32%	33%	59%	58%	49%	40%	40%	40%
Total North/East Terminal	43%	35%	61%	50%	56%	57%	57%	53%

[a] Berth 7 not often used.
Source: Bulletin Statistique des Transports, CNCB

As shown above, overall occupancy rates were very high according to both sources. The high rates are not surprising considering the high average occupancy times (still over one day for container ships) but the rates calculated by the PAC do not provide an accurate measurement of utilization because the berths are not discretely defined. For rates to be so far over 100%, it implies that more than one ship is using the berth at the same time. Still, it is clear that the container berth is congested with multiple ships at the same time occupying the berth (PAC data) and over 70% occupancy rates (CNCB data). The average duration in port is also too high at 41 hours per container ship in 2013.

The MCC's investments should reduce occupancy rates with the opening of new berths, and lead to greater efficiency, which would reduce time in port. Unfortunately the data provided do not extend through a long enough time period to assess this. Berth occupancy rates did not fall by the end of the compact, but construction was ongoing. The new Bolloré terminal had much lower occupancy rates in 2013, but again construction was still ongoing so is it unclear whether the rates held. Data from 2014-16 would provide a clearer picture of the situation after the investment, but were not provided to the evaluation team.

Berth Throughput Productivity

Berth throughput productivity was calculated for the Benin Terminal by dividing TEUs by the berth length of 540 m. Berth throughput productivity increased from 602 TEU/m in 2014 to 641 TEU/m in 2015. As larger ships utilize the berths, throughput productivity increases.

Level of Service

Summary of Key Indicators

Prior to the investment, one container berth plus one container/RoRo berth were available to service container ships. The MCC's investment provided an additional 540m container berth at the South Terminal that can service two ships at a time. The additional container berths, along with the gantry cranes, should reduce waiting time for container ships. As noted above, the implementation of fixed-berthing windows also typically reduces ship delays; the benefit of fixed-berthing windows is that ships are scheduled and therefore do not have to wait at anchor for a berth to become available. Indicators that measure level of service include ship delay, truck delay, and truck turn-time, as summarized below.

Table 12. Key LOS Indicators, Container Ships

Indicator	UOM	2006	2010	2011	2012	2013	2014	2015	Target
Average waiting time at anchor	Days	0.7	1.2	1.9	1.9	1.7	1.9	1.9 [b]	0.2
Average time at berth	Days	2.0	1.1	1.5	1.5	1.5	1.4	1.2 [b]	1
Average Waiting time for sailing	Hours							4.8 [b]	
Truck turn-time	Hours	24h	12h22	6h30				6h22 [a]	7
Container dwell time	Days			39	28	12			N/A

[a] Data for first half 2015. [b] Benin Terminal only. *Source*: PAC, STTB, Bolloré.

Ship Delay

Ship delay measures the availability of berths and gangs. While zero delay is ideal, delays of up to four hours can generally be absorbed into the vessel's itinerary while longer delays usually mean that carriers will impose congestion surcharges.

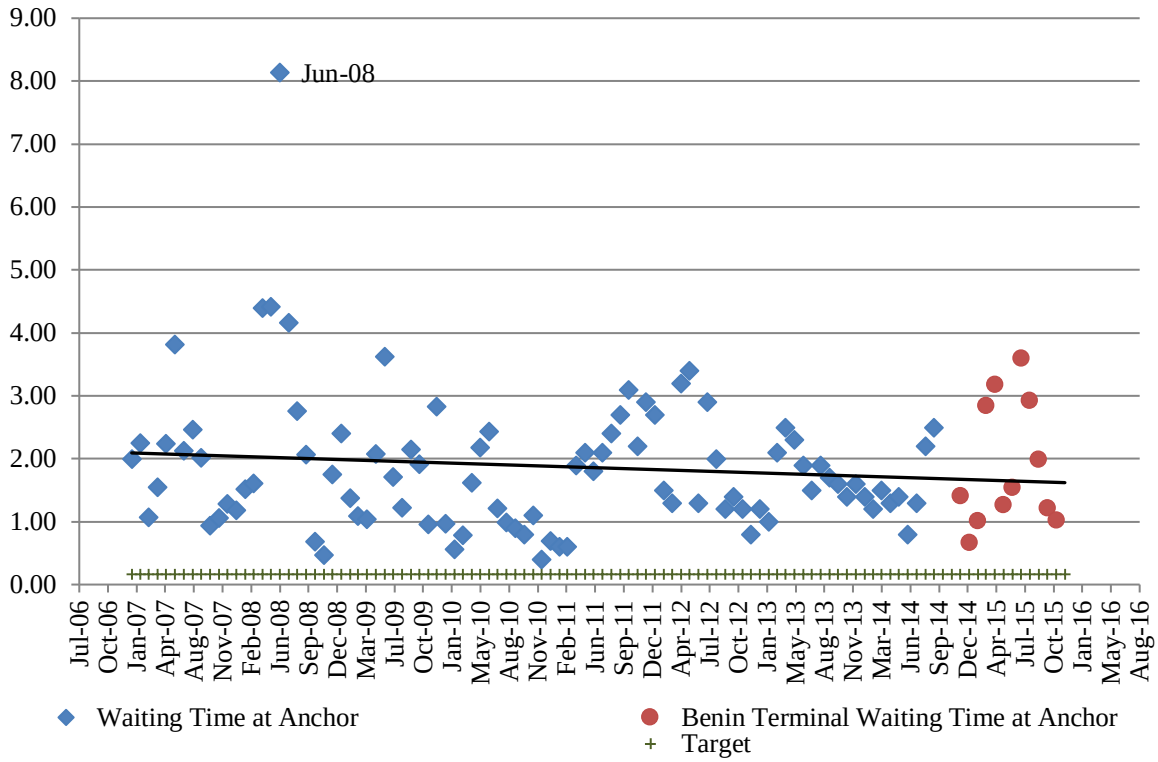
Ship delays are still a major problem at Cotonou, despite the additional berths, implementation of the fixed-berthing window, and improved ship-handling equipment. Neither the MCC project target for container ship waiting time at anchor (4 hours) nor berth (1 day) were met by the project completion date or even today. As of the 2011 Compact end, waiting time at anchor for container ships was 34.6 hours compared to a baseline of 16 hours and target of 4 hours. Container-ship waiting time at berth was 1.3 days at the end of the compact, compared to a baseline of 2 days and target of 1 day.

As construction was still ongoing as of the Compact end in 2011, it may be understandable that some of these targets were not met by the end of the MCC Compact. A more meaningful assessment therefore may be to compare waiting time today to waiting time at the baseline.

As of 2014, the average waiting time at anchor for container ships was still 1.9 days compared to the target of 4 hours. Benin Terminal also provided data for 2015 and the data similarly show an

average wait of 1.9 days.[142] Therefore even today, the target for waiting time at anchor has not been met. The figure below shows monthly waiting time at anchor from 2007 through 2015. The trend line shows that waiting time has decreased from 2007 to 2015 although the target has not been met. It is unclear to the evaluation team how or why waiting time increased from the 2006 baseline to 2007, or why there is an apparent outlier of 8 days in June 2008.

Figure 18. Waiting time at anchor, container ships



Source: Tableau Sur Les Indicateurs De Performance Des Operations Portuaires Troisieme Partie.xls and Donnees Benin Terminal.xls.

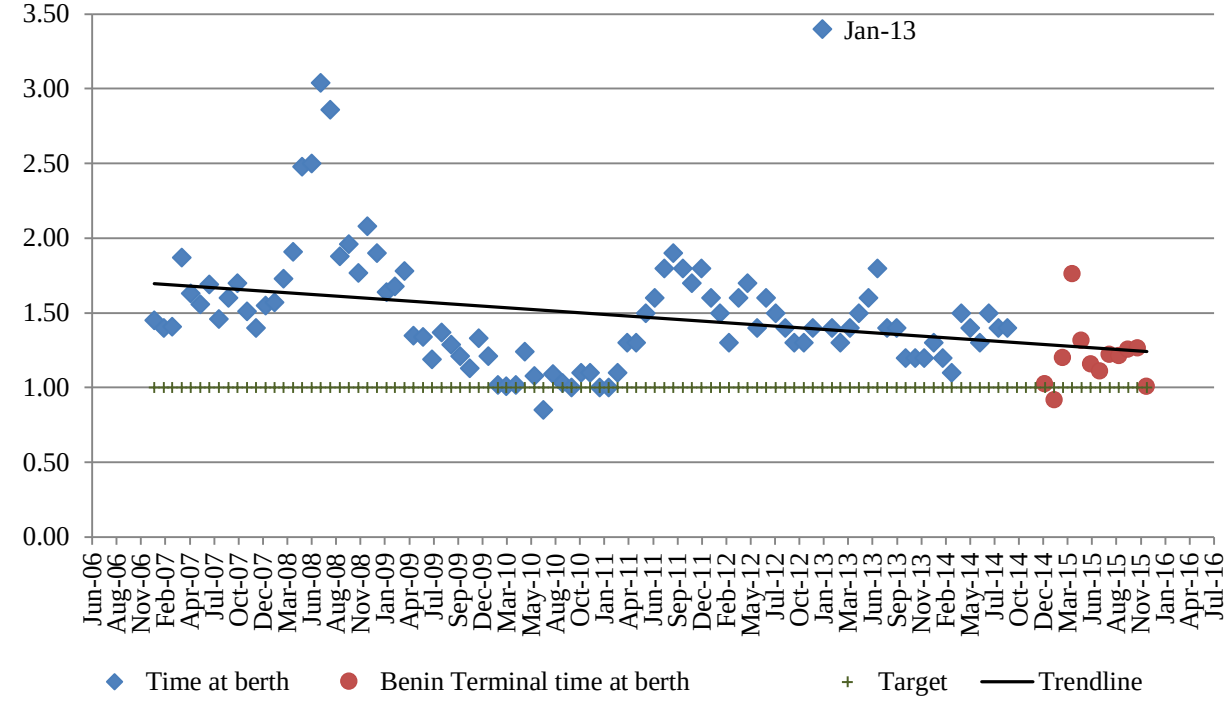
During our visit to the port, the team visually counted 12 ships waiting at anchor. The harbormaster stated that 11 were general cargo ships and 1 was a RoRo ship. He said that most often only general cargo ships are now waiting at anchor; while the port can fit three general cargo ships at one time, they take a long time (up to 2 weeks) to offload the bulk product in bags such as rice etc. However, the data above indicate that container ships also still wait over a day for a berth.

Both data through 2014 and our interviews in 2015 indicated that time at the berth is also still an issue at the port, although the time has decreased from the baseline and are following a downward trend. Data from 2014 indicate that waiting time at berth was 1.4 days compared to a target of 1

[142] During our interviews in September 2015, the PAC informed us that container ships rarely waited for a berth, so these results are surprising to the project team.

day—which is actually an increase from the end of the Compact. Data from Benin Terminal show an average of almost 29 hours or 1.2 days in 2015, nearing the target of 1 day.

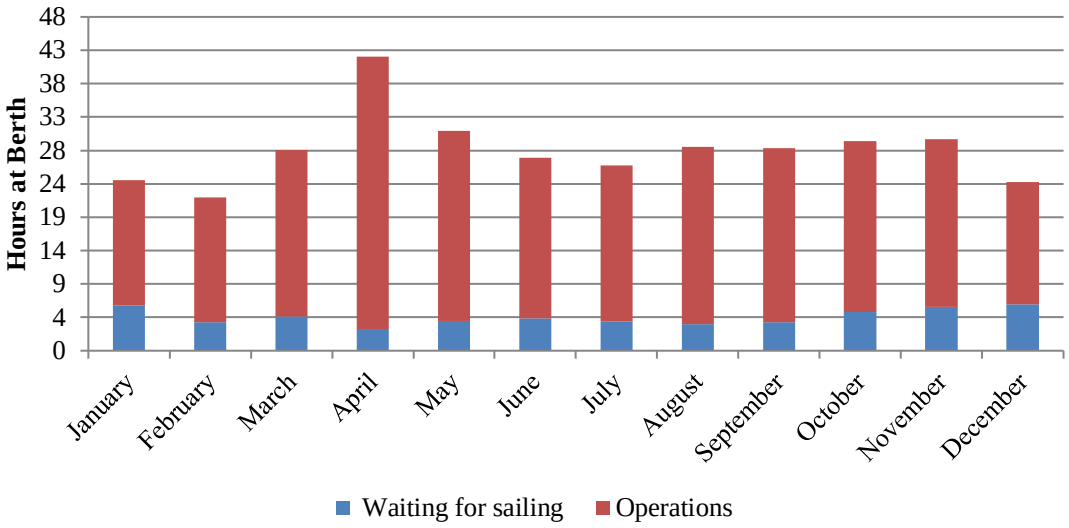
Figure 19: Time at berth, container ships (days)



Source: PAC and Benin Terminal.

The South Terminal began using gantry cranes in 2015 so waiting time at berth should have decreased based on operational performance; any delays are likely due to issues with level of service. Data from Benin Terminal show that on average in 2015, ships waited an additional 5 hours for sailing and 17% of their duration at port was spent waiting for a pilot. Without this wait, Benin Terminal would have met the target of 1 day at berth in 2015.

Figure 20: Composition of Benin Terminal Time at Berth, 2015



Source: Benin Terminal.

Our understanding from interviews in Cotonou is that one of the main reasons for the continued ship delay is due to pilot services including constraints with pilot training and availability. For example, during our visit to the port in September 2015, the last ship to leave the South Terminal spent 40 hours (1.7 days) at berth, of which about 26 hours was spent waiting for a pilot.

Tug and pilot services are operated by the PAC. The PAC has three tugboats, including one funded by the MCC, that service all ships coming in and out of the port. Five pilots (excluding the harbormaster) are currently working at the port. While the port is operational 24/7, due to the ongoing works, pilots were only operating during daylight (until 6pm) during the last year, leading to delays in entering and exiting the port. The PAC explained that the size of the port was originally only built for smaller ships (180m), and the entrance is not wide enough for larger ships. There is an obstacle at 300m, the west breakwater, where other regional ports like Lomé and Tema don't have obstacles for 1km. Other regional ports also have wider entrances (300m vs 180m at Cotonou and Cotonou was reduced to 120m during construction). Instead of reducing the maximum ship size to 200m during construction, the PAC limited the hours of piloting. In addition to the limited hours of piloting, shipping lines have indicated that pilot quality is also lacking. Pilot availability appears to be a long standing issue and not just limited to issues with construction; the Port Advisor Final Report from 2011 mentions complaints from port users regarding the availability of pilots, specifically mentioning a September 26, 2010 complaint from CMA-CGM.[143] As of our trip in September 2015—5 years later—this still had not been resolved and remains a key constraint to level of service.

Another way to assess level of service is to look at TEUs per hour at berth. Data presented in the following table documents improved berth productivity, rising from 11 TEU/hr in 2006 to 17 TEU/hour in 2014. The new facilities and equipment directly affect positively berth productivity,

[143] Final report of the port advisor of MCA-Benin to the General Manager of the Autonomous Port of Cotonou

reducing vessel time at berth. However, this positive effect can be tempered by non-operational issues such as waiting for pilotage, inspections, clearances for exiting the berth, etc.

Table 13. Estimate of TEUs per hour at berth, 2006-2014

Year	Average Time at Berth	Number of Ships	Total Ship-Hours at Berth	Full Containers (TEUs) [b]	TEU/hour
2006	32h15	388	12,513	140,536	11.23
2007	45h01	365	16,431	167,791	10.21
2008	65h48	342	22,504	193,745	8.61
2009	44h05	435	19,176	193,024	10.07
2010	28h09	494	13,906	214,587	15.43
2011	58 h50	468	27,534	225,849	8.20
2012	44h27	359	15,958	201,994	12.66
2013	41 h15	494	20,378	293,185	14.39
2014	32h10	641	20,619	350,121	16.98

[a] 2014 is Based on unweighted average of monthly time at berth.
[b] 2006-7 includes a small amount of transshipment; transshipment excluded as of 2008. *Source*: PAC.

Truck Delay

Truck delay measures delays in entering the port. Measures were taken to reduce truck delay including the implementation of a trucking appointment system operated by STTB and the construction of an internal port parking lot funded by the MCC. With these things in place, trucks should no longer have to wait to enter the terminal. According to STTB, an average of 22,056 trucks per month entered the port in the first half of 2015, averaging 735 trucks per day.

Figure 21: Picture of MCC-Funded Parking Lot, September 2015

During the team's site visits, truck queues were at times very long (see figure below)—from the port entrance gate all the way to the end of the port and up the next road—presumably hundreds of trucks but too many to count. At other times, the lines were shorter, depending on ship calls. The truck queue outside of the port mixes in with urban/city traffic, and at certain times of day causes congestion in the city.

Figure 22: Picture of Truck Queue, September 2015

The "single window" consignment management system installed in the port, independently from the MCC but complementary with regard to the creation of beneficial outcomes, significantly reduced truck delay. Before its installation, cargoes were "pushed" onto the port terminal with the consequence that many consignments arrived during peak periods when it was difficult to absorb them operationally and thus to synchronize their arrival with actual ship loading and unloading activities. Once installed, the single-window system allowed cargoes to be "pulled" onto the terminal in response to the forward planned of ship loading and unloading operations. The resulting scheduling system has resulted in reduced truck delay and significantly improved utilization of containers, chassis and trucks.

Truck operators interviewed during the field study indicated that the typical gate-queuing time has been greatly reduced. Freight forwarders credit much of the reduction in truck delay to SEGUB.

Forwarding agents said that before SEGUB a truck could wait from 2 to 3 weeks before getting into the port, but with the system, when the truck is called and has the proper documentation it typically enters the port within 2 hours.

Truck delay for container ships would have been reduced more if a dedicated container entrance was developed; however, there is no dedicated container entrance and containers must wait on the same queues as bulk cargo.

Truck Duration in Port and Turn Time

Truck turn time measures truck stay in the port from the time it enters the terminal to the time it exits the terminal. Ideally, this is less than an hour or 1.5 hours if a truck is both loading and unloading cargo.

The MCC M&E data contained information about truck turn-time for some periods (see below).[144] The average duration of trucks at the port fell from a baseline of 104 hours in 2006 to 27.6 hours at the end of the Compact, though still indicating that the Compact ended 21% short of its target of 7 hours. Data was also collected after the end of the compact through September 2012; however, the duration of trucks increased to 36 hours. Internal port circulation (truck turn time) increased from a baseline of 2 hours to 6.5 hours at the end of the Compact, 300% short of the target of 0.5 hours.

Table 14. Truck Turn Time Data, 2006-2012

Indicator	Unit	Baseline (2006)	Compact Period								Progress at the end of Compact			Post Compact	
			Jul - Sep 2008	Jan -Mar 2010	Apr - Jun 2010	Jul 2 - Sep 2010	Oct - Dec 2010	Jan -Mar 2011	Apr - Jun 2011	Jul - Sep 2011	Actual	Target	% Complete	Jan – Mar 2012	Jul - Sep 2012
Average duration of stay of trucks at Port	Hrs	240	104		36.7	39.8	40.8	29.3	19.0	21.1	27.6	7	-21%	124	36
Internal port circulation time	Hrs	2	51	12.6					6.5		6.5	0.5	-300%		

Source: Copie de SE 2012 10 05_ ITT_UCF_Benin_2012 Q3+MCC comments +UCF.xls

As of the first half of 2015, the average duration of stay-of-trucks at the port was 6 hours and 22 minutes—within the MCC target of 7 hours and port window of 8 hours.[145] No data was available for current internal port circulation time, but Benin Terminal indicated that it is less than 60 minutes (and in line with best practices). Data was not available for other regional ports with the

[144] It is unclear why this indicator was not collected on a more systematic basis for the entire compact period.

[145] Source: STTB.

exception of Dakar, where it has been reported that truck turn-time has been reduced to under 30 minutes.[146]

Dwell Time

Container dwell time shows how long a container stays at the port. Dwell time is less dependent on port operations or the port operator and more dependent on customs and the client; the client wants to keep containers at the port as long as possible so that they do not have to pay for storage outside of the port as it is often cheaper. However, long dwell times can lead to congestion, especially at ports with small yards or limited storage space, like Cotonou. Reducing dwell time can increase port storage capacity without investments in physically expanding port storage.

In 2006, dwell time in Cotonou averaged 15 days for container imports, with a maximum of 250 days. Of this, an average of 3 days (and maximum of 185 days) was spent in customs.[147] The MCC's investments had little impact on dwell time. Data from CNCB showed an average container dwell time of 15 days in 2010 and 13 days in 2011. However, according to the World Bank, Cotonou's dwell time was 21 days in 2011 compared to 18 days at Lomé and 14 days at Abidjan.[148] The World Bank noted that dwell time in Cotonou increased to 25 days after the implementation of the import verification program (PVI) in late 2011/early 2012, and only fell again after PVI was halted, remaining at 16 days in August 2012.

A Port Single Window was implemented in 2011 through a PPP. The single window is operated by the Société d'Exploitation du Guichet Unique du Bénin (SEGUB) with the Group Bureau Veritas BIVAC BV - SOGET SA as shareholders; Bureau Veritas operates the single window and Soget designed the software.[149] The concession was awarded in November 2010 for 10 years, and was piloted in April 2011. The software went "live" for imports in October 2011, transshipment in June 2012, and exports in July 2012. The three main objectives of the port single window were to: 1) reduce dwell time; 2) improve transparency of customs clearance; and 3) increase customs revenues.[150]

It was after the implementation of the port single window that changes in customs really began to be realized and subsequently dwell time fell. According to SEGUB, dwell time was reduced from 39 days in 2011 (presumably high due to PVI) to 6 days in 2012.[151] This was lower than Lomé, where dwell time from June to August 2012 was 12 days. [152] However, the reductions in dwell

[146] Market Study on Container Terminals in West and Central Africa (2013). MLTC/CALTRAM, funded by the Agence Française de Développement.

[147] CNCB Statistical Bulletin 2005-2006.

[148] MacWilliam, David Cal. (2013). *Reducing Dwell Time to Boost Efficiency at the Port of Cotonou.* Africa Trade Policy Notes, Policy Note 39. World Bank. July. p. 2.

[149] http://www.segub.bj/?Presentation-Structure

[150] SEGUB. Press kit. IAPH World Ports Conference. Los Angeles - May 2013.

[151] Presentation by SEGUB at the World Ports Conference in 2013. No data from the PAC or CNCB was available for 2012 to corroborate these figures.

[152] MacWilliam, David Cal. (2013). *Reducing Dwell Time to Boost Efficiency at the Port of Cotonou.* Africa Trade Policy Notes, Policy Note 39. World Bank. July. p. 2.

time were short-lived; in the first half of 2015, the average container dwell time by month ranged from 10.6 to 55.7 days.[153]

Port Capacity

A calculation of berth capacity requires very specific operational assumptions on equipment, productivity, scheduling, etc. However, a good indication of the capacity of a 300 – 350 meter berth can be approximated by the number of gantry cranes working at the berth (typically three) and each crane throughput. Modern container terminals are planned assuming annual productivities of about 150,000 TEU/crane. The assumed resulting berth capacity is then 450,000 TEU per berth annually for terminals with three cranes per berth. The calculation of berth capacity for facilities without the assumed standard equipment (gantry cranes) can be done similarly. In the case of mobile cranes, a multiplier of the crane productivity is usually assumed to be between 0.4 to 0.8 of a berth equipped with gantry cranes, implying 180,000 to 360,000 TEU annually for a berth equipped with three cranes.

At Cotonou, the South Terminal contains a 540m double berth with two gantry cranes per berth (not the typical three). This would imply a current South Terminal berth capacity of about 600,000 TEU per year; if a third crane is added to each berth, the capacity would increase to about 900,000 TEU per year (Bolloré estimates 950,000 TEU annually as the theoretical capacity for the terminal). It is our understanding that Bolloré was required to purchase six gantry cranes under their concession contract, but has not yet done so as there have been delays in other works funded by the PAC. Due to physical space constraints at Cotonou which make it difficult to add additional berths; the addition of two more cranes in the future will be the best way to ease future capacity constraints once volumes pick up.

The estimation of the North terminal berth capacity is not as straight forward as with the South Terminal due to the operational setting: vessels berthing at this terminal use either their own mounted cranes (ship's gear) or the two on-shore mobile cranes. Ship's gear productivity is even lower than mobile cranes, usually a third of a gantry crane; a productivity multiplier for a ship's gear can then be assumed as ranging from 0.3 to 0.4 of the gantry crane's productivity. Therefore, assuming that two ships can be berthed at the same time at the North Terminal (berths 7 and 8), with one being served by the two mobile cranes and the other one with two of its own cranes at one the time, an estimate of the berth capacity ranges from 210,000 to 360,000 TEU annually (the range is 90,000 to 120,000 TEU annually for the berth using two ship's gears and 120,000 to 240,000 TEU for the berth using two mobile cranes).

Overall, the container berths provide a total capacity to handle container cargo of more than 800,000 TEU per year (600,000 TEU in the South Terminal and between 210,000 to 360,000 TEU in the North Terminal. Other recent estimates of the terminals combined capacity provide similar results.[154] This is a considerable increase from before the investment (about a 280%, increase

[153] CNCB.

[154] Market Study on Container Terminals in West and Central Africa (2013). MLTC/CALTRAM, funded by the Agence Française de Développement estimate the combined capacity at 790,000 TEU per year.

assuming the low end of capacity for the North Terminal). If the two additional gantry cranes are added to the South Terminal, the capacity will increase to at least 1.1 million TEU per year (a 424% increase).

Interpretation and Findings

Findings are organized below by research question.

- To what extent do the completed works mitigate/resolve observed constraints to port capacity and improve the efficiency of port operations as identified in due diligence and feasibility studies?

The MCC's works included a new container berth and other works aimed at increasing container capacity. Total port volumes of traffic increased substantially from a baseline of 4.1 million tons in 2004 or 5.4 million tons in 2006 to 10.5 million tons in 2014. Container traffic has increased from 140,536 TEUs of full containers in 2006 to 350,121 TEUs of full containers in 2014. Traffic increased 45% from 2012 to 2013, with the opening of Benin Terminal in 2013. Transshipment handled by Benin Terminal increased from less than 4,000 TEUs in 2013 to over 100,000 TEU in 2015. With the addition of the South (Benin) Terminal the port increased its capacity three-fold and allowed for the adequate handling of increased demand.

However, without complementary investments, larger ships would not be able to access the port, despite the investments that were made in the new berth and equipment. The MCC's program logic aimed to increase port volumes. Doing so meant allowing larger ships to access the port. The Port authority understood its obligation under the concession contract to undertake complementary works to widen and deepen the access channel. As of the NORC team's field visit in September 2015, these works were not yet completed and ships were still limited to 10m draft. When the complementary dredging works are completed, ships with up to 13.5m draft will be able to call on the Benin Terminal. At the North Terminal, ships will still be limited to a 10m draft.

- How has the project affected the Port's operational efficiency? What is the percentage change in the overall productivity of the port following completion of the works?
- What percentage change in the port's principal measures of operational efficiency can be observed following completion of the works?

These two questions are identical and will be assessed together. Operational efficiency (as measured by ship and crane productivity) increased substantially at the South Terminal with the introduction of gantry cranes. Productivity is much higher than before the investment, with ship productivity reaching 45 moves/hour in the first half of 2016, compared to 7-20 moves/hour prior to the investment. This indicates an improvement of between 125% and 542% in productivity. In comparison to other regional ports, at 45 moves/hour, Cotonou would be outperforming Lomé (32 moves per hour), and Tema (35 moves/hour).

Benin Terminal's crane productivity was 23 moves/hour for gantry cranes and 11 moves/hour for MHC in the first half of 2016. In comparison, crane productivity at Tema is estimated to be 22/hr per gantry and 12/hr MHC, and crane productivity at Abidjan is 17/hour for gantry cranes and

21.5/hour new gantry cranes.[155] Cotonou's gantry cranes are performing better than others, but the MHCs are slightly behind.

While the improvements are substantial, the investments focused on the South Terminal and it is projected that productivity would have remained the same at the North Terminal (although the PAC did not provide any data to test this). Any minor increases in productivity at the North Terminal since the baseline would be due to purchases of mobile cranes by private operators, which are also outside of the MCC's investment.

While operational efficiency has improved, level of service has remained poor. Compact targets for container ship delay, as measured by waiting time at anchor and duration of time at berth, were not met, neither by the end of the Compact nor today. As of both today and the 2011 Compact end, waiting time at anchor for container ships was around 35 hours compared to a baseline of 16 hours and target of 4 hours. Container ship duration at berth is around 1.2 days today, and was 1.3 days at the end of the Compact, compared to a baseline of 2 days and target of 1 day. While this metric has shown an improvement from the baseline, the MCC's target has not been met. In comparison, with the concession to DPW in Dakar, time at berth fell from 12 hours to 7 hours in three years.[156]

However, these targets do not appear to have been missed due to issues within the control of the MCC and were not a result of the MCC failing to properly implement their investment. The MCC provided the tools necessary for the port to improve its efficiency so that these targets should have been met. Two additional container berths were built and equipped with best in practice gantry cranes. In fact, if one looks at the example of the ship, the Queen's Quay, service was completed in about 14 hours—well within the 24 hour goal of time at berth. However, severe delays in piloting caused its stay at berth to hit nearly 40 hours. The remaining issues for improving ship delays lie with the PAC and it fulfilling its duties to provide timely piloting service.

Ship delays come at a great cost to shipping lines reducing such delays are essential for port competitiveness. Delays at an average of 1.9 days at anchor for container ships comes at a great cost: an average of 45 hours at anchor with 435 container ships calling in 2014 means that shipping lines are losing between $12.7 million[157] and $39.2 million per year[158] in waiting at anchor at the Port of Cotonou. Additional costs would also be incurred for time at berth waiting for a pilot.

- Has the level of congestion in the Port changed? If there has been change, what has caused the change?

[155] Market Study on Container Terminals in West and Central Africa (2013). MLTC/CALTRAM, funded by the Agence Française de Développement.

[156] Market Study on Container Terminals in West and Central Africa (2013). MLTC/CALTRAM, funded by the Agence Française de Développement.

[157] Kent and Fox estimate a cost of $647/hour of idle time in *Is Puerto Limon a Real Lemon? Port Inefficiency and Its Impact.*

[158] The Port Advisor Final Report notes that a 3,000-4,000 TEU container ship has fixed costs per hour of around $2000. The report also noted that in 2008, Maersk spent 10,140 hours waiting at anchor and 6,771 hours at the berth—meaning that it spent more time waiting for a berth than at a berth. At $2000/hour, this also means that Maersk lost about $20 million in 2008 in waiting costs.

Congestion can be measured in four ways: congestion in terms of ships waiting to call on the port, congestion at the berth (berth utilization), congestion in terms of trucks in the port, and congestion in terms of containers waiting at the port.

The first measure is described above. Congestion in terms of ships waiting at anchor has not improved, although delays appear to be attributable to issues with the level of service provided by PAC pilots, and not by issues with the MCC's investment.

The evaluation team was not able to analyze berth utilization to assess whether capacity increases were sufficient to reduce berth occupancy rates and congestion at the berths because data was not available after 2013, which is required to assess changes after the opening of the South Terminal. Through 2013, capacity remained an issue at the port and berth utilization rates were too high. Presumably, the opening of the South Terminal would have improved container berth utilization, but whether it reduced rates below 70% (the point at which berths are typically considered congested) could not be tested with the data available. The opening of the South Terminal also would not have affected bulk or general cargo berth utilization rates, which were also too high. None of the MCC's investments directly targeted improvements in port congestion related to non-containerized cargo.

The third measure, congestion due to trucks in the port, appears to have eased. Trucks now remain in the port for 6 hours and 22 minutes,[159] compared to a baseline of 24 hours. This is a substantial improvement and under the MCC's target of 7 hours. According to Bolloré, trucks take less than an hour to circulate the terminal to load/unload cargo. The MCC-funded parking lot, along with the port single window and trucking appointment system have led to these improvements, but it is not possible to attribute impact by investment/intervention.

Container dwell time improved due to the port single window, but has since increased. None of the MCC's investments targeted container dwell time.

Assessment of Cost Impacts

Summary of Methodological Approach

Cost and tariff analysis mainly examines the following research questions:

- What percentage change in the port's annual total direct costs can be observed following completion of the works?
- What is the relative change in the cost of doing business to importers, exporters, agents, transportation companies, and other businesses sensitive to port improvements?

Approach

To answer these questions, our analysis aims to calculate, first, if there were actual reductions on port costs triggered by the investments in the port facilities. Secondly, we analyze if these cost reductions were transferred to the port users: shipping lines and shippers (importers/exporters).

[159] STTB SA – Données confidentielle – Rapport d'activité Entrée Automatisée des Camions Port de Cotonou Jan – Juin 2015 Imprimé le : 30-06-2015 à 18h30.

Through our review of PAC's financial statements, we analyzed historical data on revenues and costs and compared them with port throughput to calculate unit costs (US$/ton of handled cargo). Revenue and cost provided detailed information to calculate unit profit margins and to assess the potential of passing cost savings to port users.

Cost savings should be reflected in the port tariff; however port tariffs are usually formal, official approved documents that are not updated or adjusted periodically. This is the case of Benin, where the tariffs are adjusted rarely and always upwards. Therefore, if port users experience cost savings it will be from the overall systems efficiencies gained from better facilities and procedures.

Our analysis aims to estimate if there were actual savings (adjusted for inflation and exchange rate changes) for port users. Port costs both for shipping lines and shippers are aggregated costs charged by multiple service providers. Aggregated, total cost can be estimated and then expressed in unit terms (USD per container or USD per TEU). We document the aggregated historic tariff and non-tariff cost (cost to import/export) for a basket of essential port/local transport services before and after works completion.

Finally, operational efficiencies lead to indirect cost savings to shipping lines as less time is spent in port and deployment of larger and more modern fleet. Allowing less time at berth/port increases the shipping line flexibility to redesign itineraries (decreasing the number of ships needed to complete rotations in one week, or allowing slow steaming with the result of savings in oil consumption). Deploying larger vessels allow for economies of scale. These cost savings, critically important for the shipping lines, are not passed to the shippers but allow for continuous coverage of the trade region improving the country's connectivity and the reach of importers/exporters.

Challenges

Sensitivity to port costs varies widely depending on the port user (shipping line, import/exporter, agents). Even more, among local users or cargo owners, sensitivity to cost depends on the value of the cargo. Therefore, while it is useful to document changes in port costs, the effect on port users varies. Also, port costs are only part of the total logistic cost (door-to-door) and quite frequently the least determinant factor as shipping (maritime transport) and trucking (land transport) can take a significant share of the total transport cost.

Analysis

Port of Cotonou Costs

Analysis of PAC Financial Statements – Tariff Impact

PAC financial statements are available for the 2005-2014 fiscal years (January 1 – December 31). Although the nature of the services provided by PAC have changed since the South pier (Bolloré's terminal) started operations in 2013, overall PAC revenue and cost data from before and after the specialized container terminal became operative should reflect the impact of gained efficiencies. Efficiencies can be expected from the Port Authority by better focusing on its core functions and

complementary activities in order to secure continued proper and efficient handling of non-containerized cargos.

The analyzed data is summarized in the table below. On a cargo unit basis (a ton of handled cargo), net profits have reduced significantly from US$0.79 to US$0.11 (in year 2000 constant USD). The reduction in profitability makes difficult to consider a reduction in tariffs that will benefit port users.

Table 15. Analysis of PAC Financial Statements – Unit (per ton) Revenue and Cost Changes

Revenue/Cost Metrics

Year	Tariff Revenue per ton	Total Revenue per ton	Personnel Cost per ton	Total Cost per ton	Net profit/ loss per ton
2006	4.32	6.76	1.75	5.98	0.79
2014	6.45	13.03	3.21	12.91	0.11

Revenue/Cost Metrics Change

Period Analyzed	Tariff Revenue per ton	Total Revenue per ton	Personnel Cost per ton	Total Cost per ton	Net profit/ loss per ton
2006 vs 2014	49%	93%	84%	116%	-86%
CAGR 2006-2014	5%	9%	8%	10%	-22%

Notes:
Revenue/cost figures in year 2000 Constant US$.

Source: PAC.

Port of Cotonou Tariffs

The analysis of changes on port costs based on tariffs is challenging as the Port of Cotonou has made few minimum adjustments in the last published tariffs of 2010 and 2015 (see Annex 2). After converting the terminal handling charges to constant USD, most charges only increased 3% from 2010 to 2015, with the exception of storage for exports over 15 days, which increased 106% for 40' containers, and reefer-plug electricity after 5 days for 40' containers. It is our understanding that these tariff increases were necessary for reducing container dwell time at the port. The typical 3% increase is considered modest and suggest that port users are benefiting from increased efficiencies without significant cost increases. The large increase in storage costs was aimed at reducing container dwell time, not increasing revenue, and only comes into effect for containers remaining at the port for more than 15 days.

Cost Comparison for a Regional Comparative Analysis

Comparing changes in tariff levels per tariff item provides only relative insight on port costs. Port costs both for shipping lines and shippers are charged by multiple service providers: port operator, port authority, customs, truckers, agents, etc. Most of the costs/tariffs are expressed in unit prices but some are aggregated; for example, tariffs for services to the ship (vessel) have to be allocated

to cargo units so they can be expressed in unit terms (USD per container, USD per TEU, USD per ton). The result will be an estimate of total port/logistics cost for a basket of essential port services provided by the different port service providers.

This standard methodology has been applied to create "standardized cost indicators" that allows for historic and regional (multiple neighboring countries) analysis and comparison. The World Bank "Doing Business" project compiled cost of imports/exports indicators that covered documentation requirements and procedures at customs and other regulatory agencies as well as at ports.[160] They also cover logistical aspects, including the time and cost of inland transport between the largest business city and the main port used by traders. This database is the only source that provides historic data prior and after the Benin Terminal initiated operations; it also provides a uniform basis to compare costs in different countries.

As shown in the following table, cost for importers/exporters significantly declined in the region between 2006 and 2014. Cotonou, Lomé and Tema provide the most comparable and competitive costs for shippers. It is noticeable that the cost decrease in Cotonou for the period just before and after the Benin Terminal start of operations was the second largest in the region with a reduction of 5.0% for exports and 4.0% for imports, decrease rates more pronounced than the 2.8% for exports and 0.9% in imports for the 2006-2014 period. As measured by these data, it is clear to conclude that Cotonou kept costs in pace with its main regional competitors and references, Tema and Lomé.

[160] "Doing Business 2016, Measuring Regulatory Quality and Efficiency", http://www.doingbusiness.org/. The compilation included in the table (data for 2016-2014) measures the time and cost (excluding tariffs) of exporting and importing a standardized 20-foot, 10-ton cargo container of goods by sea transport, except for the time and cost at sea.

Table 16. Cost to Import/Export for Benin and Regional Competitors (World Bank Doing Business)

	Average of Cost to EXPORT (deflated US$ per container)					Average of Cost to IMPORT (deflated US$ per container)				
Year	Benin - Cotonou	Côte d'Ivoire - Abidjan	Ghana - Tema	Nigeria - Lagos	Togo - Lome	Benin - Cotonou	Côte d'Ivoire - Abidjan	Ghana - Tema	Nigeria - Lagos	Togo - Lome
2006	1,330	2,187	3,728	3,010	701	1,647	3,085	5,030	5,506	1,273
2007	1,274	2,098	3,243	3,171	1,225	1,577	2,960	4,376	3,236	1,461
2008	1,235	2,008	2,004	2,702	1,235	1,529	2,832	2,573	2,758	1,472
2009	1,290	2,284	1,991	2,964	1,297	1,725	2,731	2,794	3,283	1,530
2010	1,220	2,193	1,677	2,865	1,133	1,617	2,699	2,475	3,266	1,337
2011	1,196	2,072	1,438	2,994	1,111	1,586	2,698	2,122	3,414	1,311
2012	1,174	2,033	1,234	1,480	1,098	1,662	2,648	1,992	1,687	1,295
2013	1,179	1,970	1,093	1,456	1,040	1,681	2,671	1,763	1,625	1,227
2014	1,060	1,944	1,036	1,380	1,059	1,531	2,637	1,610	1,695	1,242
Years	**Growth Rates - Export Costs**					**Growth Rates - Import Costs**				
2006-2007	-4.2%	-4.1%	-13.0%	5.4%	74.8%	-4.2%	-4.1%	-13.0%	-41.2%	14.8%
2007-2008	-3.1%	-4.3%	-38.2%	-14.8%	0.8%	-3.1%	-4.3%	-41.2%	-14.8%	0.8%
2008-2009	4.5%	13.7%	-0.7%	9.7%	5.0%	12.8%	-3.6%	8.6%	19.1%	3.9%
2009-2010	-5.5%	-4.0%	-15.8%	-3.3%	-12.6%	-6.2%	-1.2%	-11.4%	-0.5%	-12.6%
2010-2011	-1.9%	-5.5%	-14.2%	4.5%	-1.9%	-1.9%	0.0%	-14.3%	4.5%	-1.9%
2011-2012	-1.8%	-1.9%	-14.1%	-50.6%	-1.2%	4.8%	-1.9%	-6.1%	-50.6%	-1.2%
2012-2013	0.4%	-3.1%	-11.5%	-1.6%	-5.3%	1.1%	0.9%	-11.5%	-3.7%	-5.3%
2013-2014	-10.1%	-1.3%	-5.2%	-5.2%	1.9%	-8.9%	-1.3%	-8.7%	4.3%	1.2%
CAGR 2006-2014	-2.8%	-1.5%	-14.8%	-9.3%	5.3%	-0.9%	-1.9%	-13.3%	-13.7%	-0.3%
Compound annual growth rate (CAGR) from 2012 to 2014, from the year before to the year after Bollore's Benin Terminal initiated operations										
CAGR 2012-2014	-5.0%	-2.2%	-8.4%	-3.4%	-1.8%	-4.0%	-0.2%	-10.1%	0.2%	-2.1%

Source: Data from the "Doing Business" World Bank project.

Non-tariff Savings

Dredging

According to Wilbur Smith's port of Cotonou assessment/due-diligence report in 2005, from 1999-2005, the port spent $10.8 million for maintenance dredging, averaging $1.8 million/year; the rate of sedimentation was first noticeably a problem in 1995.[161] In 2003, Baird & Associates conducted a study and determined that it would cost 37.4 million Euro for coastal protection. To mitigate these costs, the MCC invested in the extension of a 300 meter sand-stopping jetty to keep the sand out of the port entrance channel. The MCC Closeout Country Brief estimates that this will bring savings of $2.1 million/year in dredging and maintenance costs. The Wilbur Smith due-diligence report projected that the jetty extension would have impact for 18 years.

[161] Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

Cost Savings to Shipping Lines

Port efficiencies can induce savings on vessel costs as higher levels of productivity will reduce vessel turnaround times improving ships utilization. However, these efficiencies are rarely reflected in lower ocean freight rates that will benefit shippers. Also, any port tariff reduction (a cost from the ocean carrier's point of view) rarely influences the ocean freight rate.

Theoretically, cost savings for the shipping line can be related to: (a) deployment of larger vessels, with the increase in ship size resulting in lower slot cost probably by about 20 – 30% pending on size differentials; and (b) substituting ship's cranes with shore-cranes with about 2 – 3 times higher productivity and berth time savings of up to 50%. However, these cost savings are not directly reflected on ocean freight rates.

In practice, freight rates are affected by capacity utilization (meaning ship's capacity, or how full is the ship), and utilization is affected by trade on the demand side and by fleet deployment (service rearrangement/relocation or deployment of new buildings) on the supply side. Trade is affected by seasonality (on a periodic basis) or by general economic dynamics/trends (economic growth/-expansion or recession). The following chart illustrates the correlation between freight rates and utilization for container trades between China and the US.

Table 17. Vessel Utilization and Ocean Freight Rates (Cost Index for transport of 40-ft container from China to the East Coast of the United States)

Source: Drewry Maritime Research (www.drewry.co.uk); World Container Index assessed by Drewry (www.worldcontainerindex.com)

Only when the shipping line include an explicit "demurrage" (delay/congestion) extra charge in the ocean freight rate that is associated with port inefficiencies can the change in port operations result in reduction of the ocean freight rate.

Interpretation and Findings

Summary of cost and tariff changes

Although port tariffs have change little in the last years and the port authority has not been able to profit from efficiencies and reforms, it is still clear that the system has seen a reduction on costs.

Shippers have seen a reduction in their cost for importing/exporting goods through Cotonou and the cost decrease has being in pace with other ports in the region that have also improved their infrastructure (Lomé and Tema). The other main port users, the shipping lines have also benefited from the improved facilities (infrastructure and equipment) but their cost savings (due to reduced time at the port and deployment of larger vessels) are not passed thru the system (lower ocean freight rates benefiting shippers) due to the nature of the industry pricing practices.

Institutional Context for Benefit Sharing

As noted above, PAC is in the process of transforming itself from a "service port …one "for which all services except stevedoring services are provided by PAC personnel and with PAC provided equipment…into a "landlord port," one for which specific cargo handling zones and/or specific functions (operation of dry ports, operation of a single window service) are concessioned to terminal operators or other specialized service suppliers.

The first terminal operator to set itself up in the new landlord port ecosystem is Bolloré. It is anticipated that the Bolloré pattern of operation and public/private sector division of authority, which emerges from this pattern will be followed by other follow on operators who will provide their own equipment, their own management and their own trained personnel. According to the Terminal Manager for Maersk Moller whom the project team interviewed, that company has proposed just such an arrangement to the PAC, which is apparently considering it.

With that said the transformation from a "service port" to a "landlord port" has not yet been codified by any change in the PAC's chartering legislation, in its organization or in its modes of governance and control over third party service providers.

Moreover, the oversight responsibilities which devolve to the PAC under the concession agreement with Bolloré have not yet been taken up. The terms of the concession remain unfulfilled on the part of the GoB and during the interim period until the GoB completes its commitments under the concession agreement, Bolloré continues to operate under an informal agreement with few contract controls or performance obligations. Importantly, during this interim period the division of responsibility between PAC and Bolloré remains to be fully implemented and codified in the form of new organizational structures within PAC. Financial accounting controls have not yet been set in place with which PAC can separate and monitor Bolloré's billing and accounts payables; track the financial reserves generated from the MCA project; and monitor redefinition of operating responsibilities within PAC in ways which assure Bolloré's compliance with its concession obligations, including most importantly its obligations to generate additional container traffic and to increase PAC's share in the regional transit market.

A major hindrance for more efficient operations and potential cost savings that had remained insurmountable during the project team's visit to Cotonou was the failure of the GoB to satisfy the minimum depth channel and turning basin dredging conditions laid out in the concession agreement. Once accomplished the terms of the original agreement will become effective. However, the issue of closing the gap between conditions already passed during the interim period and future conditions under the concession will still need to be resolved. During the project teams mission it

remained unclear whom within the GoB would assume responsibilities for negotiating arrangements with Bolloré to close this gap.

Assessment of Impact on Competitiveness

Summary of Methodological Approach

The analysis in this section is relevant to examine the following research questions:

- How has the competitiveness of the Port evolved since 2006/2005?
- Among the ports in the region, how has the competitiveness of the Port changed following completion of the works?

Approach

Port competitiveness is influenced by many factors, including but not limited to efficiency, level of service (to all users, both shipping lines and cargo owners), costs, availability of shipping services (connectivity). The broad question of how competitive a port is relates mainly to how its users (shipping lines and cargo owners) assess its advantages/limitations given the choice of selecting a neighboring port or terminal. As the main users, the shipping lines make the first decision: does Cotonou provide a minimum required level of service at a competitive price so I can serve my client base from Cotonou or should I divert Benin's or transit cargo to a neighboring port? For the cargo owners, a measure of competitiveness is if there exists enough shipping lines from which to select a transport option that could include or not Port Cotonou. Then, when many transport options are available, the competitiveness of each transport option can be assessed by assessing changes over time in its user base.

The evaluation team assesses competitiveness based on four key factors:

- A comparison of fleet profiles of vessels calling on regional ports which tells the capability of ports to receive larger and more modern container vessels;
- United Nations Conference of Trade and Development's (UNCTAD) Liner Shipping Connectivity Index (LSCI) which captures how well countries' ports are connected to global shipping networks;
- Market shares of regional ports confirming whether the port improvements have had a direct effect on the competitive environment and whether Benin gained or lost market share to competing ports; and
- Port pricing compared to its main direct competitors to assess if efficiencies are passed to the users and pricing remains comparable with other transport options (competing ports).

These data points provide a solid base for assessing competitiveness and are supplemented by qualitative assessments from interviews with liner and feeder service operators and shipping agents. Interviews with shipping lines and vessel operators are used to document the existing competitive positions of the Port of Cotonou and rival ports and if and how these ports have been affected by emerging developments within the region. The interviews document any changes in

the competitiveness of the subject ports caused by changes in the shipping service patterns and fleet characteristics relevant to the region. Our interviews also address how the service conditions have changed and influenced changes in the vessel fleet profile since the investment. The current competitiveness of Cotonou relates to the strategies of individual vessel operators with respect to their individual offerings of services and deployments of vessels, such as load centering, slot sharing, transshipment and feedering.

Challenges

The challenges associated with assessing competitiveness in the port sector are similar to the challenges that analysts have in assessing competitiveness in any dynamic sector. Market leadership and success in competition among specific participants in dynamic economic sectors often ebb and flow. Initiatives undertaken by one competitor are matched or better by initiatives under taken by other competitors. So it is among the four ports that are vying for market share among land locked countries in West Africa. Container port investments made by initially by Dakar have been matched and bettered by investments made first in Tema, then in Cotonou and subsequently in Lomé. Other competing ports in the range have responded to deepening of harbours and turning basins undertaken by leading ports by deepening and expanding their own harbours. It has been reliably estimated that $2 billion has been expended on container port improvements over the past 8 years among ports in the range.[162] What is unclear is whether comparable social benefits have been realized as a result of competitive emulation and "me too" investment. It can be argued, however, that the MCC investment has allowed Benin to "remain in the playing field": with the new infrastructure improvements, Cotonou has met the requirements by shipping lines searching relentlessly for efficiencies by deploying newer, larger vessels. If Cotonou would have been dropped from the main shipping itineraries, the country would have suffer increased costs by having some (if not all) cargo being fed via other ports and then by trucking or feeder vessels.

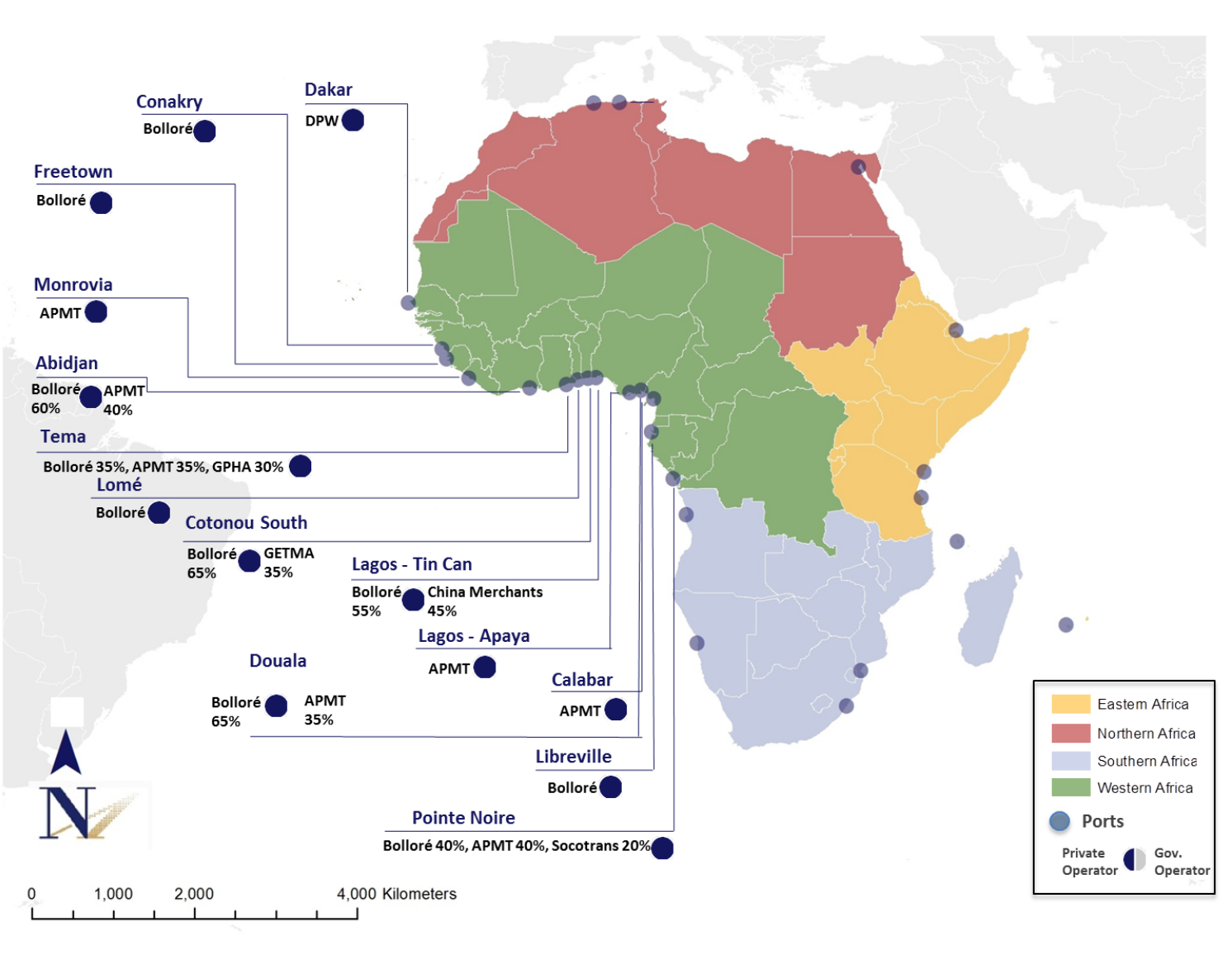
Overview of Competing Regional Ports

The West Africa regional ports intensively compete with one another for hinterland traffic to landlocked Burkina Faso, Mali and Niger. Cotonou's main competitors for hinterland traffic are Lomé in Togo, Tema in Ghana and to some extent, Abidjan in the Ivory Coast. Nigeria's ports, particularly Lagos, also compete with Cotonou for traffic to Nigeria. Figure 22 below graphically depicts West Africa's ports. The figure also presents ownership; of note, Bolloré operates many of these ports, and has a controlling ownership stake in all ports competing with Cotonou.[163]

[162] "African Ports Rising: In-depth Report, Including Infographis and Download," http://patersonsimons.com/news-cranes-forklift-west-africa/african-ports-rising

[163] See *Making the most of ports in West Africa*, World Bank, November 2015.

Figure 23: West Africa Ports and Ownership



Source: Nathan Associates Inc.

Analysis

Fleet profile

Fleet profiles show whether a port can serve large ships. Changes in the fleet profile act as a proxy for assessing changes in routes, schedules, frequencies of calls, and the transformation of ocean carrier call patterns. Comparing fleet profiles across countries also benchmarks port efficiency.

In 2010, Cotonou lagged behind other regional ports in terms of calls by large ships, but by 2015, it has caught up to its peers with the exception of Lomé. As shown in Table 18 in 2010 Cotonou had calls with a maximum ship size of 46,652 dead weight tons (DWT) compared to ships with a 51,634 DWT at Abidjan, Lagos, and Tema and 73,715 DWT at Lomé. Of the regional ports, Lomé had the largest ship call in 2010 in terms of DWT, likely due to the deepness of Lomé's port; while the largest ship calling upon it only had a draft of 7m at the time, it was a ship with a maximum draft of 14.52m. By 2015, Cotonou had caught up to Abidjan, Lagos and Tema in terms of ship size by DWT, but all four ports greatly lagged behind Lomé. In terms of ship length, in 2010, Lagos, Tema and Abidjan had the longest ships at 246.86m, while Cotonou and Lomé only saw ships under 230m. In 2015, Cotonou, Tema and Lagos were called on by ships of 265 meters; Abidjan's largest ship was 261.84m. Lomé had the largest ship call at 336m. In general, Cotonou has caught up with and kept up with regional competing ports.

Table 18. Maximum Ship Size, 2010 and 2015

	Maximum DWT		Maximum Length		Maximum Draft Calling		Maximum TEU Capacity	
Port	2010	2015	2010	2015	2010	2015	2010	2015
Abidjan	51,634	65,347	246.86	261.84	12	13	3,650	5,466
Cotonou	46,652	65,193	222.51	265.03	12	13	3,398	5,466
Lagos	51,634	65,347	246.86	265.03	12	14	3,650	5,466
Lome	73,715	117,333	228.60	336.67	12	14	unavailable	9,403
Tema	51,634	65,347	246.86	265.03	12	13	3,650	5,466

Source: Bloomberg.

Maritime Service Network/Port Connectivity

In the container trades, documenting the strategies of vessel operator services and deployments, such as load centering, slot sharing, transshipment and feedering, is a critical input to assessment of the increased connectivity (supply of shipping services) that occurred in response to a change in the transport network when the port "node" becomes more prominent/attractive due to improved accessibility or better facilities. The upgraded transport network resulting from a better "port node" could, or could not, have resulted in net gains (more trade, savings for shippers, etc.) for the country's or region's economy. The fact that the port node has stopped being an impediment for the movement of goods is what needs to be researched neutrally. Therefore, measuring the change on the competitiveness of the port in comparison to other ports in the region following the completion of the works funded by MCC should be approached primarily on the merits of the change in shipping services. All things been equal, a port's infrastructure and equipment improvement should lead to better shipping services or connectivity (increased supply).

Port connectivity can be used as a proxy for port competitiveness. The Liner Shipping Connectivity Index (LSCI) is an analytical tool developed by the United Nations Conference on Trade and Development (UNCTAD) that aims at capturing a country's level of integration into the existing liner shipping network by measuring liner shipping connectivity. UNCTAD's LSCI provides a proxy indicator for port regional competitiveness based on the aggregate decisions made by ocean carriers to include specific ports in their service networks.

By UNCTAD's definition, LCSI captures how well countries are connected to global shipping networks. It is based on five components of the maritime transport sector:

- number of ships,
- ship container carrying capacity,
- maximum vessel size,
- number of services, and
- number of companies that deploy container ships in a country's ports.

For each component, a country's value is divided by the maximum value of each component in 2004, then the five components are averaged for each country, and the average is divided by the maximum average in 2004 and multiplied by 100. The index generates a value of 100 for the country with the highest average index in 2004.

The higher the index, the more connected a country's ports are to high capacity and frequency global container liner services. Thus, the LSCI is a good measure of connectivity to global shipping, as well as reflective of the strategies of liner services. Countries with higher indices can be understood to be those with ports offering competitive costs, levels of service, and efficient operations.

Accordingly, for Benin, we measured changes in shipping connectivity before, during, and after the Compact period and compared those to other countries in the region to determine Benin's regional position in terms of port competitiveness. The index has been calculated and is available for the period from 2004-2015 for Benin and its neighboring countries of Ivory Coast, Ghana, Nigeria and Togo. Therefore, changes in shipping connectivity can be measured before and after the Compact was in place and regional comparisons can be made. Table 19 provides the LSCI indexes for Benin and its competing ports from 2005 – 2015.

Table 19. Liner Shipping Connectivity Index for West African Countries

Economy	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
						Index (Maximum 2004=100)					
Benin	10.23	10.99	11.16	12.02	13.52	11.51	12.69	15.04	14.28	17.21	17.67
Côte d'Ivoire	14.52	12.98	14.98	16.93	19.39	17.48	17.38	16.45	17.55	21.87	31.35
Ghana	12.64	13.80	14.99	18.13	19.33	17.28	18.01	17.89	19.35	21.69	21.85
Nigeria	12.79	13.02	13.69	18.30	19.89	18.28	19.85	21.81	21.35	22.91	32.68
Togo	10.62	11.09	10.63	12.56	14.42	14.24	14.08	14.07	14.76	19.09	20.44
						Annual Percent Change					
Benin	1%	7%	2%	8%	12%	-15%	10%	19%	-5%	20%	3%
Côte d'Ivoire	1%	-11%	15%	13%	15%	-10%	-1%	-5%	7%	25%	43%
Ghana	1%	9%	9%	21%	7%	-11%	4%	-1%	8%	12%	1%
Nigeria	0%	2%	5%	34%	9%	-8%	9%	10%	-2%	7%	43%
Togo	4%	4%	-4%	18%	15%	-1%	-1%	0%	5%	29%	7%

Source: UNCTAD.

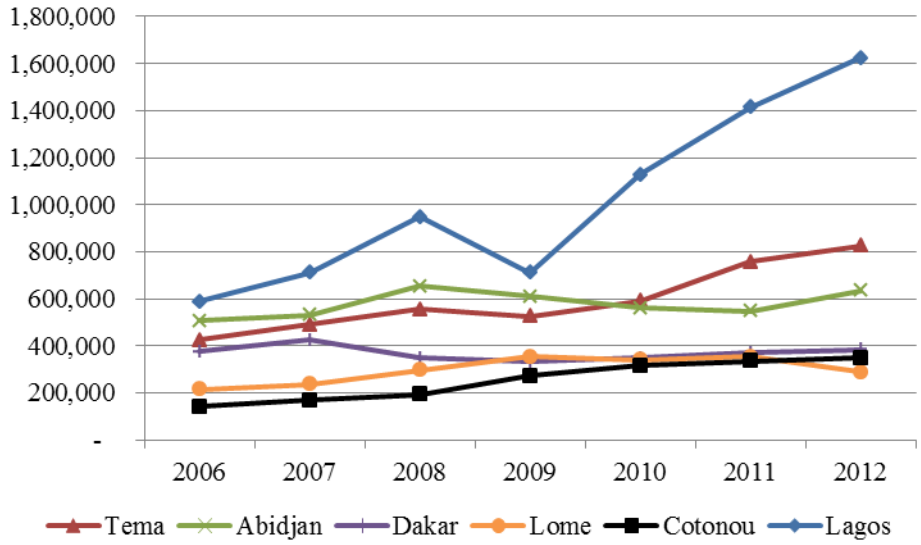
From 2005 to 2015, Benin increased its score by 73%. However, Benin was the lowest ranking score in both 2005 and 2015. While Benin's 73% increase over the 11 year period shows improvement, the other regional ports improved as much, if not more—Ghana increased 73%, Togo 92%, Cote d'Ivoire 116% and Nigeria 156%. Nigeria was the highest ranking country out of the competing countries in 2015, with a score nearly double Benin's score.

Regional Port Traffic and Market Shares

In both 2006 and 2012 (the latest year with comparable data between ports), Lagos had the highest amount of container traffic, with 587,600 TEUS in 2006 and 1.6 million TEUs in 2012. Cotonou only had 140,500 TEU of container traffic in 2006, the lowest in the region. Cotonou remained the lowest in the region until 2012 (when it passed Lomé) with 348,190 TEU of container traffic.[164] Figure 23 depicts the evolution of regional container traffic from 2006 through 2012.

[164] van Dyck, G.K. (2015) Assessment of Port Efficiency in West Africa Using Data Envelopment Analysis. American Journal of Industrial and Business Management, 5, 208-218. http://dx.doi.org/10.4236/ajibm.2015.54023 using data from the World Bank and Port Management Association for West and Central Africa.

Figure 24: Container Throughput at West African Ports, 2006-2012 (TEU)



Source: van Dyck, G.K. (2015) Assessment of Port Efficiency in West Africa Using Data Envelopment Analysis. *American Journal of Industrial and Business Management*, 5, 208-218. http://dx.doi.org/10.4236/ajibm.2015.54023 using data from the World Bank and Port Management Association for West and Central Africa.

As shown in Table 18, the assessment team attempted to find updated data through the present, but was unable to find data for Abidjan beyond 2012 or Lomé beyond 2013 as shown below. While the data are not completely comparable, they give a rough indication of Benin's market share before and after the investment. In 2006, Benin had 7% of regional port volumes, and in 2014, Cotonou had a share of 9%. Notably, the data do not provide a complete picture as Lomé Container Terminal opened in 2014 and 2014 data are not available for Lomé.

Table 20. West African Port Market Share, 2006 and 2014

Country	TEU 2006	Market Share 2006	TEU 2014	Market Share 2014
Benin - Cotonou [a]	140,500	7%	350,121	9%
Côte d'Ivoire - Abidjan [b]	507,100	27%	633,917	16%
Ghana - Tema	425,408	23%	732,382	19%
Nigeria - Multiple	587,600	31%	1,853,966	48%
Togo - Lomé [c]	215,892	12%	311,470	8%

[a] Benin TEU-full containers only
[b] Abidjan- 2012.
[c] Lomé-2013.
Source 2014: PAC, Abidjan from http://www.en.agpaoc-pmawca.org/members/statistics/, Ghana Ports and Harbor Authority, Port Automne de Lomé, Nigerian Port Authority.
Source 2006: van Dyck, G.K. (2015) Assessment of Port Efficiency in West Africa Using Data Envelopment Analysis.
American Journal of Industrial and Business Management, 5, 208-218. http://dx.doi.org/10.4236/ajibm.2015.54023

Regional Transport Cost Benchmarking

We compare the Port of Cotonou's cost to import/export with other competing regional ports in the "Assessment of Cost Impacts" section. We concluded that the cost for importers/exporters significantly declined between 2006 and 2014 with Cotonou, Lomé and Tema providing the most competitive costs for shippers. However, it is noticeable that the cost decrease in Cotonou for the period just before and after the Benin Terminal start of operations was the second largest in the region with a reduction of 5.0% for exports and 4.0% for imports. These rates are more pronounced than the 2.8% for exports and 0.9% in imports for the 2006-2014 period. As measured by these data, it is clear to conclude that Cotonou kept costs in pace with its main regional competitors and references, Tema and Lomé.

Qualitative Assessment of Perceptions of the Port of Cotonou's Competitiveness

Importance of User Perception

Port user perception can be an important determinant of port attractiveness and therefore port competitiveness. Caschili and Medda (2013)[165] measure "port attractiveness" in 41 container ports in 23 countries in Africa (including Cotonou) by looking at exogenous port determinants (such as user perception and hinterland wealth), endogenous port characteristics (physical characteristics of the port), and subjective determinants using data from 2006-2010. They find that port reputation influences port attractiveness, and to increase port attractiveness, governments focus on addressing "soft infrastructure" issues (developed and productive hinterlands and good port reputation) before addressing "hard" infrastructure issues (efficient and well equipped ports).

[165] Simone Cashili and Francesca Medda (2013). Port attractiveness index: Application on African ports. IAME, Marseille.

Port User Surveys

Under the MCC Compact, conducted three surveys of port users were conducted in 2007-2008 (baseline), 2009-2010, and 2010-2011. These surveys tried to capture the level of satisfaction of various port users with various aspects of the port.

The baseline port user satisfaction survey conducted from 2007 to 2008 provides some insight into the main challenges faced by the port prior to the concession.[166] The survey was conducted in two phases. In Phase 1, a census of port operators and users was taken, and in Phase 2, a representative sample was surveyed. The census identified a population of 2,742 operators and users of the Port of Cotonou, including:

As operators (who can have more than one of following functions):

- 33 Consignees vessels
- 76 Chartered Auditors in Customs
- 24 companies with operations in the Port

As users:

- 2,059 Importers
- 210 Exporters
- 19 associations and organizations

The Phase 2 survey covered the level of litigation and port damage, the level of theft (smuggling of goods and objects through the port), the value added to the operators and port users, the level of corruption at the port, the satisfaction of operators and port users, and measures to improve the current information system.

In the baseline survey, port user satisfaction scores were low:

- 89% were unfavorable about the availability of infrastructure/equipment and organization capacity of the port.
- 68% were unfavorable about customs/transit procedures.
- 75% were unfavorable about the number of procedures.
- 73% thought port operators took too long.

The situation did not improve by the second port user satisfaction survey administered from December 2009 to August 2010.[167] In fact, port user satisfaction fell from 59% in the baseline survey to only 38% in 2009. Over 71% were unsatisfied with the competitiveness of the port. Most other indicators also had a negative change from the baseline. However, considering that construction was ongoing during the survey period, these results are not too surprising. But unrelated to the ongoing works at the port, 49% claimed very high levels of corruption plus an additional 25% claimed high level of corruption. The one silver lining from this survey was that the time in transit

[166] « Etude Sur Les Litiges, La Valeur Ajoutée Et La Satisfaction Des Usagers Du Port De Cotonou Rapport Final, » Feb. 2009.

[167] « Enquêtes de suivi de l'Etude sur les Litiges, la Valeur Ajoutée et la Satisfaction des Usagers du Port de Cotonou Rapport final de l'enquête de suivi n°1 »

for customs fell to 2.29 days in 2009 from 2.90 in 2008 and 3.77 in 2007; however, the third user survey shows a reverse.

The third and most recent user satisfaction survey administered from December 2010-September 2011 indicates that improvements were made since the second survey, but overall port user satisfaction at 50% was still below the baseline of 59%.[168] Again, construction was ongoing which may have affected the results and this prevents the NORC team from conducting a meaningful analysis of the results. However, views on port competitiveness rose from 28% to 43%.

While no port user satisfaction survey was conducted after 2011, our team interviewed many stakeholders in September 2015. The sentiments gathered from these interviews follow.

Sentiments from NORC team's 2015 Interviews

Shipping Lines

In some areas, the port investments have improved the competitiveness of the Port of Cotonou. The concession of the South Terminal has led to investment in equipment which has modernized the port and brought it more in line with modern ports. To date, Bolloré has purchased four gantry cranes and 5 RTG, improving port productivity. The number of moves per hour has therefore increased to 45 moves/hour. These improvements in operational efficiency have increased the competitiveness of the PoC.

However, interviews with stakeholders also highlighted some issues that remain and negatively affect the PoC's competitiveness. Stakeholders identified various operational issues affecting the level of service they receive at the Port of Cotonou, which were mainly related to the quality of the port's pilots and the hours that the pilots operate. While the shipping lines, port operators and stevedores work around the clock, pilots have been operating around a curfew which limits maritime operation timing and means that ships may have to wait overnight for pilots. There were also concerns about an inadequate number of pilots and inadequate pilot training, which also leads to an increased wait time. Increased time at the port has great costs to the shipping line, and lowers the competitiveness of Cotonou compared to other ports in the eyes of shipping lines.

Shipping lines also expressed concerns about the depth of the access challenge and delays in increasing the depth. There was frustration in the lack of accurate communication from the PAC regarding the timeline for completion. Inaccurate and overly optimistic estimates led to the shipping lines being unable to call with the larger boats as scheduled, which led to the shipping lines having to change the rotation at the last minute and in one case leave cargo in Lagos so that a ship was light enough to meet the draft requirements at Cotonou.

The overall sentiment of shipping lines was that while the improvements at Cotonou were much needed and have led to additional improvements, other regional ports have been making similar and even larger improvements. The LSCI confirms this. Therefore while the MCC's investment

[168] Enquêtes de suivi de l'Etude sur les Litiges, la Valeur Ajoutée et la Satisfaction des Usagers du Port de Cotonou Rapport final de l'enquête de suivi n°2.

improved operational performance and the competitiveness of Cotonou, the Cotonou's competitiveness vis-à-vis its regional competitors did not increase. However, it is important to note that without these investments, Cotonou's competiveness compared to other regional ports would have fallen even farther.

Freight forwarders and shipping lines

Interviews with stakeholders also highlighted that for hinterland traffic, the whole logistics chain matters, not just the operational efficiency and level of service at the port. Even though Cotonou is closer in distance than Lomé to Niger, the poor road conditions actually mean that the journey takes longer and costs more.

Bolloré

A representatives from Bolloré's Benin Terminal identified Tema as being the most competitive regional port today. His reasoning is that it is geographically in a good location in the middle of the hinterland countries and as such, can easily serve many places. He also said that Tema performs well operationally. On the other hand, Cotonou is limited in size by its location in the city. He said that while Cotonou has received a lot of investment in a short time including a tracking system, training, equipment etc., there needs to be investment into training and human capital improvement as they have found that workers have a low level of training and often lack even basic literacy skills.

Interpretation and Findings

Findings are organized below by research question.

- How has the competitiveness of the Port evolved since 2006/2005?

The port has become more competitive in terms of capacity, modern equipment, operational efficiency, and cost, although level of service and time at both anchor and berth are still a problem. Larger ships are now able to call on Cotonou, as are gearless vessels. Cotonou's connectivity (as measured by the LSCI) has increased 61% since 2006. Traffic has increased, as have transshipment volumes. Cost for import/export goods has decreased and are competitive with other main regional ports. While some issues remain due to ongoing construction and piloting, overall the competiveness of the port has improved, which is evident through its increased connectivity and traffic.

- Among the ports in the region, how has the competitiveness of the Port changed following completion of the works?

Prior to the investment, Cotonou lagged behind its regional competing ports. It ranked the worst out of competing ports in terms of fleet profile and connectivity. Today Benin has caught up to its competitors. While it has not leaped ahead, it has remained a player in the game. Without the investment, it would have likely fallen farther behind.

Assessment: Impact on Trade

Summary of Methodological Approach

This section addresses the following research questions:

- What is the relative change in the level of domestic and international traffic, volume of container and bulk maritime trade, value of trade (USD) and growth trends in relevant sectors before and after the improvements to the port?
- To what extent can changes in trade volume be attributable to MCC's intervention?

Approach

Economic theory indicates that the MCC's investment into the Port of Cotonou should positively impact trade through the port. At the macroeconomic level, we would expect an effect on GDP, directly through a change in the value of imports and exports, and indirectly on its sector components intensive in the use of imports and on suppliers to exporting industries. At the microeconomic level, we would expect the greater availability and lower prices of imported inputs to stimulate local production, increasing private sector income. As a large portion of traffic through the port is transit traffic (48% in 2014), the extent of these direct impacts to Benin is dependent on increases in domestic traffic.

However, while a well-functioning port is a *necessary* condition for trade, it is not a *sufficient* condition. Many other factors must align, in addition to an efficient port, for trade to increase after a port investment. For one thing, the entire logistics chain from the port to the final destination matters, and impediments at any level of the chain could threaten gains in trade despite port improvements. As another example, in order to stimulate exports, businesses must have access to capital and skilled labor, besides easier access to inputs.

To answer the first research question related to trade, we focus on analyzing volumes, values and trends of the various market segments that are served by the Port of Cotonou. We assess trade volumes and trends before, during, and after the Compact period to determine if there were changes in trade volumes since the investment.

To attempt to answer the question of "attribution", we use regression analysis to determine the relationship between container trade volume and GDP and use this relationship to forecast what trade would have been without the investment in the South Terminal. As noted in the literature review, forecasting cargo based on the relationship between trade volumes and GDP is common practice. Many studies recognize the relationship between GDP and trade volumes and incorporate this relationship in the formulation of container demand forecasts. The forecasting relationships used by most industry studies are simple linear relationships between container volumes and GDP estimated through regression analysis.

Studies forecasting Benin's port traffic, including the MCC's "Study on the impact of port performance improvement on consumption prices" by Egis International (2011), have found that Benin's cargo is also influenced by Nigerian GDP, likely due to the fact that much of Benin's transit cargo is destined for Nigeria, plus some of Benin's "domestic" cargo is really re-exported

to Nigeria. In 2014, 50% of cargo moving through the Port of Cotonou was officially listed as transit cargo,[169] and the actual numbers are estimated to be up to 70%.[170] Raballand and Mjekiqi (2010) estimated that up to US$4 billion of cargo enters Nigeria unofficially through Cotonou port (2.5 million tons), comprising of 36% of Cotonou's traffic and nearly 15% of Nigeria's total imports.[171]We look at the relationship between Nigeria and Benin's GDPs and determine whether it is necessary to include Nigeria's GDP in our forecast.

We then forecast Benin's trade volumes from 2005 to 2014 based on the relationship between container volumes and GDP prior to the opening of the South Terminal. We compare the forecasted trade volumes with actual trade volumes and capacity constraints at the port prior to the investment. This allows us to measure whether trade increased more or less than expected; if trade increased at a higher rate, it *could* mean that the improved port efficiency had a positive effect on trade. Trade beyond the capacity constraints without the investment show attribution to the investment. This allows us to establish if the MCC investment had an impact on capacity and if that impact enabled the supply of port services for an existing demand. For example, if the port was operating at full capacity utilization before the investment, then volumes moving through the port would not have been able to increase absent the investment—therefore the investment could be concretely tied to increases in trade volumes beyond the level of capacity prior to the investment.

Given the difficulty in isolating the impact of a port project on trade volumes compared to other variables such as improved real sector competitiveness, FDI, trade and investment promotion policies, the project team assessed the order of magnitude impacts of these collateral factors that impacted Benin trade volumes, and on that basis estimated the residual potential impact attributable to the project.

Challenges

As mentioned, attribution is difficult without a counterfactual. In this case, the question is whether changes in trade can be attributed to the MCC's investment, whether they would have occurred anyway, or whether they are a result of other factors or interventions. This is an especially difficult question to answer due to the lack of counterfactual, issues with the program logic and theory of change connecting economic growth, trade and port investment, and in the case of data constraints (including limited time series data are available on key operational performance parameters and limited TEU data for other regional ports), which also limit our ability to conduct multiple regression analysis. We also recognize that there are hundreds of factors other than GDP that could impact trade volumes, but it is difficult to account for many of the potential impacting influences with a limited time series dataset with few degrees of freedom. This is uniquely and importantly the case with respect to Benin, where most of trade involves transshipment to and from Niger and Northern Nigeria and hence Benin's trade patterns are materially affected by the border control and trade policies in both neighboring countries. Still, we will account for important influencing

[169] Discussion with PAC management team.

[170] Nunez and Hoareau (2011)

[171] Raballand Gaël and Edmond Mjekiqi. 2010. "Nigeria's Trade Policy Facilitates Unofficial Trade and Impacts Negatively Nigeria's Customs Efficiency and Economy". The World Bank.

factors when possible, and as noted above, many studies have shown that simplified models focusing on GDP are most often the best predictors.

Background on Trade in Benin

Overview

Over the past decade Benin has become a more open economy, one increasingly integrated into the global economy as demonstrated by its ratio of general merchandise imports and exports to GDP. This ratio has increased gradually from 21.4 % in 2011 to 36.1% in 2015.[172] An increasing ratio connotes an economy that trades openly and freely. In fact, few trade barriers exist which inhibit either importing or exporting in Benin.

Significantly, however, Benin continues to suffer from a large and chronic trade deficit. Its imports have exceeded its imports by 300 % or more each year for the past 5 years.[173] The country is dependent on imports for much of its energy, as well as for all of its high value consumer goods. Petroleum product imports accounted for 45% of total energy use in 2012, the last year for which the World Bank has compiled these data.[174]

The nation's deficit is due primarily to its lack of competitiveness both at the sector level and, more generally, at the macroeconomic level. Benin's currency—the CFA—is overvalued. However, the local currency cannot be devalued unilaterally. Devaluing the CFA requires the concurrence of other West African countries and the actions of the Central Bank of West Africa.[175]

Over the past two decades Benin's export "volume" has increased only marginally. Its export volume index has been static for the past three years fluctuating within a narrow range of between 115 and 130.[176] Export "values" have also failed to increase significantly. Benin's export value index for the past three years has hovered around 290, compared with a year 2000 value of 100.[177]

The nation's slow export growth is primarily the result of two factors: i) a secular decline in its cotton sector; and more generally ii) the extremely slow diversification of its agricultural sector into higher value crops.[178] Compared to other low-income countries, Benin's exports remain highly concentrated in a few agricultural products. In addition to cotton, Benin's primary agricultural exports include cocoa and maize commodities, both of which are highly vulnerable to the weather and price fluctuations. The value enhancing effects of the so called "new agriculture" (e.g., high value fresh fruit, fresh packed table ready vegetables and cut flowers) have had only

[172] Country Economic Memorandum for Benin, World Bank updated with 2014 data, http://documents.worldbank.org/curated/en/436291468330309812/pdf/482330ESW0BJ0p1C0Disclosed071171091.

[173] ibid

[174] A reviewer has suggested that these data may understate Benin's dependence on energy imports. For example, in 2012, 99% of Benin's electricity supply was met through imports, with domestic sources accounting for only 1% of supply. In any case Benin is highly dependent on imports for its energy supply.

[175] http://www.tradingeconomics.com/benin/balance-of-trade

[176] These parameters are indexed to 2000 export volume levels where 2000 volumes equal 100. http://data.worldbank.org/country/benin

[177] World Bank Macro Data for Benin, http://data.worldbank.org/country/benin.

[178] World Bank, 2006, John Baffes, "Distortions to Cotton Incentives in Benin, Bukina Faso, Chad, Mali and Togo"

minimum impact on the country. This is not surprising as these products require a sophisticated cold chain and in the case of products like fresh flowers, air transport system.

While formal exports face significant hurdles, transit trade and import/ re-exports to and from Nigeria, Niger and Burkina Faso have continued to thrive. According to the World Bank, Benin's re-exports account for US $5 billion and accounted for fully 70% of the nation's own combined imports and exports. Re-exports are the basis for Benin's largest service sector, the trade and transport services sector. Re-export activities are motivated by large differences between the prices which prevail particularly in Nigerian and international prices. These differences result from Nigeria's traditionally high tariffs and its import prohibitions on some products that its political leaders consider strategic. On the other hand, a large part of Benin's fuel supply is imported through parallel channels by traders taking advantage of Nigeria's fuel subsidies.

Trade arbitrage opportunities, however, can vanish suddenly. For example, several episodes of abrupt trade-policy changes in Nigeria, in the mid-1980s and mid-2000s, have exposed Benin's vulnerability to such changes. More importantly, with the progressive emergence of an ECOWAS customs union, and more immediately with the impending alignment of Benin and Nigeria's tariff policies under the newly agreed ECOWAS Common External Tariff, the progressive disappearance of large price differences between member States appears increasingly likely. Price convergence, therefore, will gradually erode the rents from parallel trade.

Much of the transit trade, which takes place in the country, takes place through informal enterprises, which are unregistered, poorly regulated and only thinly capitalized. As the project team discovered many of these informal enterprises are also "foot loose" and are subject to relocation to other West African port cities when managing transit trade from these venues proves more lucrative.

Taken in total, informal trade makes up a substantial share of Benin's GDP (perhaps as much as 20%). Rents collected from arbitrage have hamper efforts to modernize Benin's economy. The informality of parallel trade spills over to ancillary services such as transport and other supporting services, placing entire segments of the national economy largely (although not entirely) beyond the reach of taxes and regulation. This condition hinders the state's capacity to invest in infrastructure, education and public services, contributing to a vicious cycle of poverty and informality. Rents generated by the private sector are also less likely to be reinvested in the economy. Until incentives shift decisively in favor of formal activities, Benin's economy will have difficulty securing private sector investment and thus growing. For reasons noted above, investment in port-related activities afford a particularly important potential "tipping point" in this reform process.[179]

Aside from parallel re-imports-exports to Nigeria, regional trade continues to perform far below its potential in Benin. Formal trade, however, is hampered by a myriad of non-tariff barriers including roadblocks, the non- recognition of certificates of origin, protracted negotiations with customs MFN officers at land borders, and a general lack of information about and interest in ECOWAS's Trade Liberalization Scheme (ETLS). In particular opportunities for intra ECOWAS trade in processed food, meat and staples remains under developed and local manufacturers continue to fail in availing themselves of the MFN terms to which they are entitled….preferring instead to

[179] World Bank, Benin Trade Integration Diagnostic Study, https://www.openknowledge.worldbank.org/handle/10986/22968?show=full

conduct what little trade they can accomplish through traditional intermediaries without realizing MFN benefits.[180]

Trade Policy Issues

Benin is currently facing a significant change in the policy environment which affects its own trade, its government's ability to raise revenues (since most taxes are currently trade based) as well as the trade and transport businesses which depend on trade arbitrage with Benin's neighbors.

These changes are primarily the result of the common external-tariff policies, which ECOWAS implemented on Jan 1, 2015. The new ECOWAS policies entail the implementation of a common customs union, which includes Benin together with all of its West African trading partners. The implementation of a common customs union is already having an impact on informal trade as opportunities for arbitrage across different customs regimes have begun to diminish.[181]

The new common external tariff includes a fifth band for certain consumer goods, to which a 35% rate will apply. This maximum rate is substantially higher than the highest rate that currently applies to Benin imports (e.g., 20%). The effect on domestic imports which are consumed in large volume by Beninese consumers of limited means including items like poultry, edible oils, sugar, textiles and clothing and hence will have a significant adverse impact on most Benin households. The World Bank has determined that the common external tariff is regressive and that it will disadvantage most households having the lowest levels of disposable income. Opportunities to substitute regionally produced products from within the unified tariff zone for products produced outside the zone are limited at least in the near term by the inadequate documentation, country-of-origin certification, and other failures to comply with MFN registration requirements on the part of regional firms. A related problem is that regional transport and trade systems are less developed and higher in cost for moving regional products north and south as contrasted with transport and trade systems with an East-West orientation which support trade with China and the EU.

Another significant trade policy change involves the Economic Partnership Agreement with the EU. This agreement entails the step by step elimination of tariffs on most West African imports from and exports to the EU over a 20 year period. Again the implications for government financing and for trade and transport sector reform are profound. Changes in both have material consequences both for the way the GoB and the service sector in Benin do business.

Trade Facilitation Basis for Realizing Comparative Advantage

Decreasing the transaction cost and increasing the transparency, legal security and speed of trade transacted within its borders are the goals of the government's strategy to position Benin as a regional logistics hub. To this end, coordination among government agencies and interfaces between government agencies and the private sector need to improve. As noted above, fledging efforts to engage private sector entrepreneurs with specialized competencies in the design and implementation of information systems, which facilitate trade has enjoyed some success in Benin. However, these efforts have been "one off", disconnected from each other rather than modular or progressively additive and entailed term concession commitments from government which may

[180] ibid

[181] ibid

well exceed the useful life of the technologies on which the delivery of specific trade facilitation services depend.

The modernization of customs clearance procedures has an essential role to play if Benin is to develop as a preferred entry point for neighboring markets, since a considerable portion of Benin's trade involves transit traffic. However, modernization requires coordination and data exchange with the customs services of neighboring countries. To this end, Benin needs to persevere in making "soft" investments in customs and regulatory modernization, particularly with respect to border management processes that enable and are fully supportive of ECOWAS's new common external customs processes. An opportunity exists to invest heavily in ECOWAS-compliant transshipment and transit and thus move from a laggard to a leader in regional cross border trade.

As already discussed, the import and export markets which Cotonou serves are served competitively by many other medium-sized ports. In addition, Nigeria is planning two new greenfield port developments. As a result of intense infrastructure challenges from other ports, competition for the region's premier logistics-hub is likely to result in a winner-take-all outcome. Ongoing container port investments in the region suggest that a serious risk of overcapacity may exist if all projects go ahead. Moreover, the fact that most of the container port and railway concessions in the region have been secured by one company (Bolloré) suggests that Bolloré's traffic growth commitments made in the Cotonou concession contract are unlikely to be fulfilled. Moreover Bolloré still needs to test and prove the financial viability of the fully implemented concession agreement to its bankers and its equity investors. It is incumbent on the GoB to develop a fall-back strategy in case the project corporation which currently holds the Cotonou container port concessionaire should fail to make its planned investments.

Most recently, competition among ports in Cotonou's range has taken on a more advanced technology aspect, as other ports have invested in "single window systems," engaged capable private sector economic operators surrogates, and undertaken non-intrusive physical inspections and geo-tracking of transit cargo. Thus, Benin's advances need to be redoubled and its efforts to reduce transit cost and transit time.[182]

Cotonou needs to build on top of the advantages realized from the MCA investment and further reduce costs and further improve the quality of logistics services along its two main service corridors (East-West and North- South). One important aspect of this strategy involves the active development of a service sector which is competent to implement and facilitate all elements of the ECOWAS's Trade Liberalization Scheme and logistics management support to regional firms which quality for MFN status under the new policies. Another important part of this strategy should involve working with shipping lines, who are committed to the Port of Cotonou to develop region wide intermodal services, an intermodal though bill of lading and dock to door cargo liability cover.

[182] It would be useful in a follow on M&E effort to drill down into the specific bases on which PAC competes with other ports in its range including Lomé and Tema for transit traffic. That kind of detailed assessment exceeds both the mandate and the resources provided to compete this assessment.

Informal Trade

Informal trade in Benin accounts for a very large part of the economy and a large source of both employment and wealth creation, though it does not contribute as much to tax revenue and therefore to the provision of public goods as it could. Moreover, and most importantly, it is based on the arbitraging of price differences between Nigeria and Benin, themselves largely due to the presence of distortionary policies in Nigeria — a fragile source of rents. Abrupt (though short-lived) policy changes in Nigeria in the mid-1980s and in 2003 translated into major shocks on the Beninese economy, underscoring its vulnerability.

Two main sources of rents result from the distortionary policy interventions of Nigeria, which together explain a large part of the informal trade in Benin: i) Energy subsidies, which reduce the price of gasoline and other fuels in Nigeria and encourage the enormous and illegal importation of hydrocarbons in Benin; ii)Import bans and high border taxes on major items such as edible oils, rice and textile and clothing, which raise the price of those products in Nigeria and encourage the equally-large illegal re-exportation of those products through Benin.

This is important since the primary reason that MCC invested in the Port of Cotonou was to expand its cargo handling capacity. If much of the port's capacity is required to handle informal trade and if that informal trade should disappear and not be replaced by formal trade, the Port of Cotonou will be overbuilt and the traffic projections which were the basis of the concession agreement will prove insufficient to justify the concessionaire's long-term commitment.

Analysis

Port of Cotonou Import and Export Trade Volumes and Composition

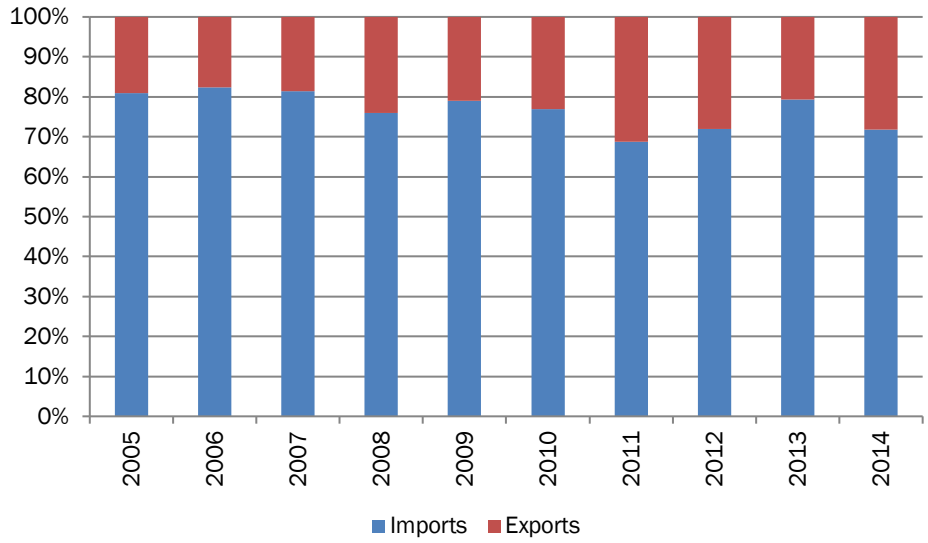
This section assesses changes in trade volumes and values, without assessing whether these changes could be due to the MCC's investment. Attribution is described in the subsequent section.

Benin's Domestic Trade Balance

The country suffers from a chronic and increasing trade deficit over the past 10 years. The chronic trade deficit is a reflection of two factors: the country's overvalued currency and its lack of export competitiveness. Trade destined to/from Benin through the Port of Cotonou is heavily weighted towards imports.[183] In 2005, imports accounted for 81% of cargo volumes. However, export volumes have grown faster than import volumes, and imports accounted for only 72% of cargo in 2014 (see figure below).

[183] The first sections describe imports into Benin destined for Benin and exports from Benin. The data attempt to look at Benin's own trade. However, it must be noted on the onset that Benin's trade volumes are likely tainted and include products that are re-exported to Nigeria. Data from the PAC attempts to split transit cargo from domestic imports/-exports, but there is still some re-exporting that is likely not captured in transit cargo.

Figure 25: Benin Domestic Import and Export Composition, Percent of Trade Volumes, 2005-2014

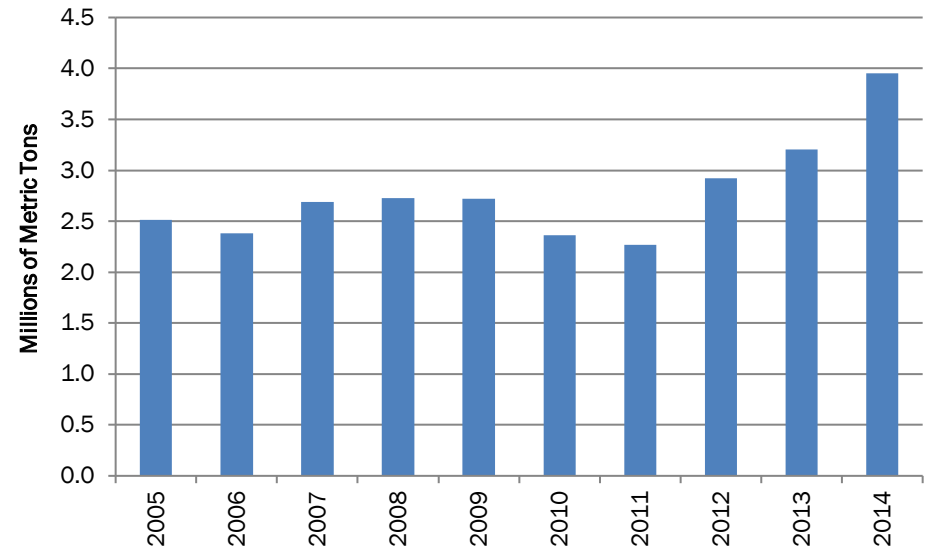


Source: PAC, Stat 2003 2014.xls

Benin's Domestic Imports

While exports have grown faster, imports have also grown substantially from 2005 to 2014, from 2.5 million tons per year in 2005 to nearly 4 million tons per year in 2014 (a 57% increase in terms of volume). While imports saw a downturn in 2010 and 2011 due to the global financial crisis, they have increased steadily since 2012, as shown in the figure below.

Figure 26: PAC Import Volumes Destined for Benin, 2005-2014

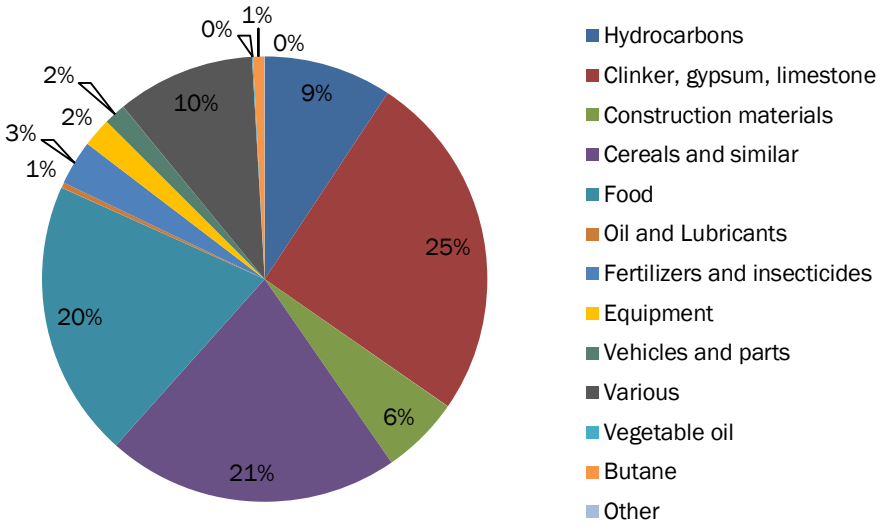


Source: PAC, Stat 2003 2014.xls

Benin's imports are significantly more diversified than its exports. The diversity of Benin's imports demonstrates two distinct influences: 1) the country's narrow production base--demand for consumption goods that are not produced domestically must rely on imports; and 2) it reflects

the misclassification as imports goods which are actually re-exported to Nigeria, Niger and Burkina. Indeed, among Benin's top import products, many that figure most prominently are those most adversely affected by high import tariffs in Nigeria (e.g. rice, automobiles) or those whose import is prohibited (e.g. textiles, frozen poultry, edible oil, second-hand clothing). By contrast, products that are known to be imported in large quantities, such as gasoline, do not figure in mirrored statistics, as Nigeria does not record parallel exports of gasoline to Benin. In 2014, Benin's largest import by volume was cereals and other food products, which together accounted for more than 40% of imports. This was followed by clinker, gypsum and limestone, which accounted for 25% of imports. Hydrocarbons accounted for 9% of imports.

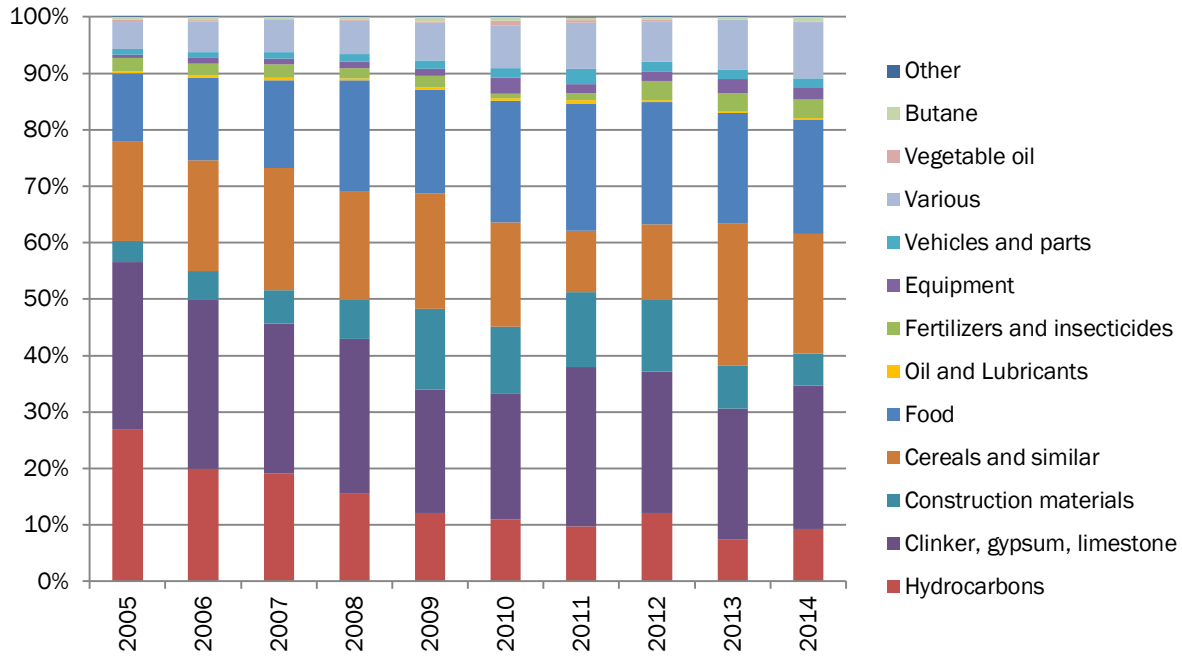
Figure 27: Composition of PAC Import Volumes Destined for Benin, 2014



Source: PAC, Stat 2003 2014.xls

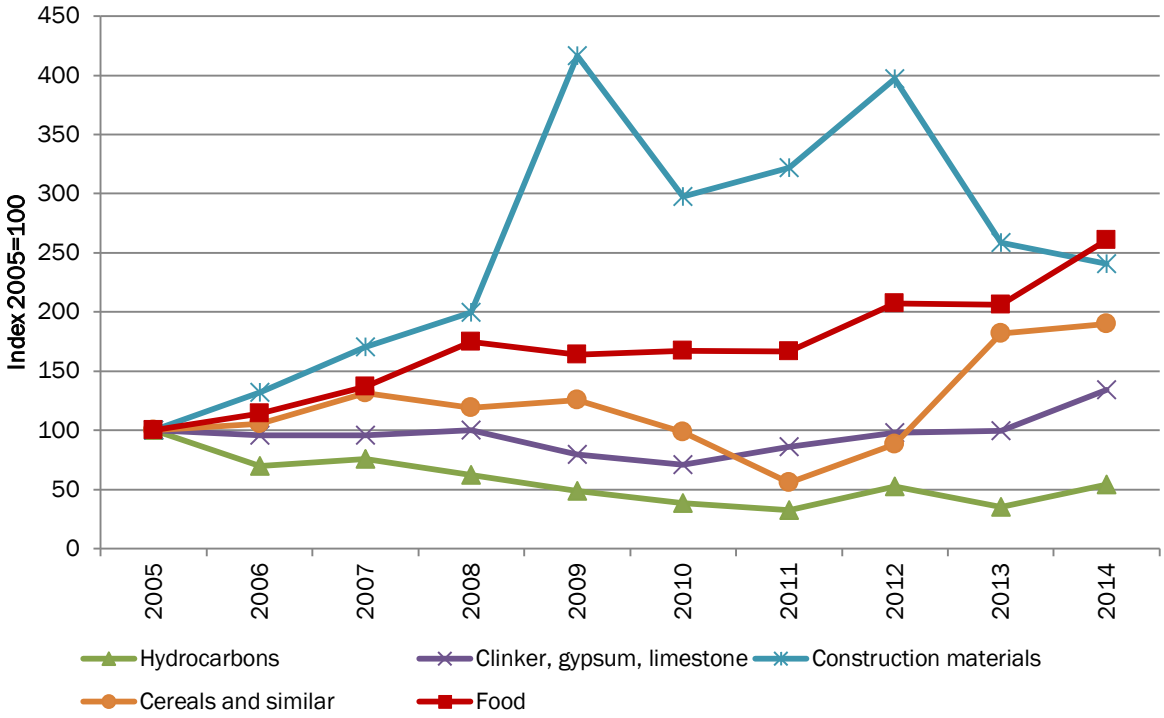
The composition of imports has evolved over the last 10 years, with food products comprising an increasingly large share of imports. In 2005, hydrocarbons comprised about 27% of import volumes, but by 2014, they had fallen to less than 10%.

Figure 28: Composition of PAC Imports Destined for Benin, 2005-2014



Source: PAC, Stat 2003 2014.xls

Figure 29: Growth of Top 5 PAC Imports Destined for Benin, 2005-2014 (Index 2005=100)



Source: PAC, Stat 2003 2014.xls

Of Benin's top domestic imports, food products have seen the highest growth from 2005 to 2014 (over 250%). Until 2013, imports of construction materials had seen the highest growth, but they

have fallen much below their 2009 peak of over 400% growth. As noted above, hydrocarbons have fallen to about 50% of their 2005 volumes.

In terms of value, the value of imports has skyrocketed from less than $1 billion in 2005 to nearly $3.6 billion in 2014, as shown below. However, an important caveat on the quality and availability of Benin's trade statistics is necessary. In 2010, Benin stopped reporting trade data to Comtrade in nomenclature that allowed for refined product/commodity time series comparisons and/or comparisons with other countries at the level of product detail.[184] As a result, no direct trade data is available. Only "mirrored" trade data (i.e., trade flows to and from Benin reported by Benin's trading partners) can be used for quantitative analysis. This situation is not conducive to improvements in the capacity of Benin's own statistics and analysis units (INSAE and ministries), nor to conduct useful policy scenarios and analysis.

Table 21. Total Value of Imports and Re-Exports, 2005-2014

Year		Imports
2005	$	898,695,761
2006	$	1,003,250,250
2007	$	1,630,866,027
2008	$	1,713,643,054
2009	$	1,548,967,817
2010	$	2,133,551,198
2011	$	2,070,012,091
2012	$	2,316,427,344
2013	$	2,940,678,607
2014	$	3,596,078,234

Source: UN Comtrade.

According to Comtrade data, Benin's largest import by value is cereals, which is mainly composed of rice. These imports accounted for over $1 billion in 2014. Ships, boats, and floating structures, which include "Light-vessels, fire-floats, floating cranes & other vessels the navigability of which is subsidiary to their main function; floating docks" accounted for $151 million in imports in 2014.[185] However, nearly $46 million was re-exported. These imports are likely composed of materials resulting from the MCC or Bolloré's investment in the port.

[184] Journal of Development Economics, June 1994, 'On the (in)accuracy of economic observations: An assessment of trends in the reliability of international trade statistics,' Jerzy Rozanski, Alexander Yeats and World Bank, " The Republic of Benin, Trade Integration Study Update: From Rents to Competitiveness, Box 29, May 2015.

[185] UN Comtrade.

Table 22. Top Ten Imports by Value, 2014

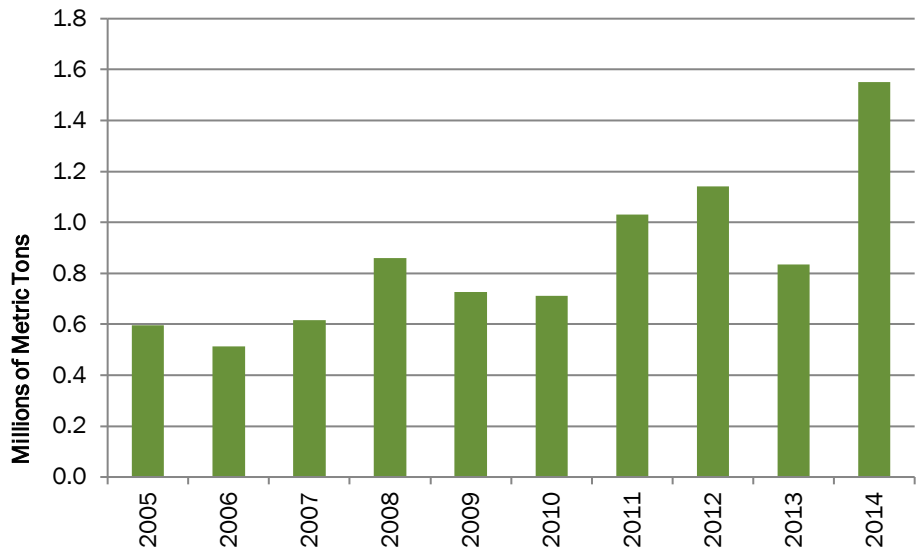
Commodity	Trade Value (US$)
Cereals (mainly rice)	$ 1,024,686,687
Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	$ 514,991,031
Meat and edible meat offal	$ 245,901,346
Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	$ 206,613,737
Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	$ 161,400,223
Ships, boats and floating structures	$ 151,750,090
Fish and crustaceans, mollusks and other aquatic invertebrates	$ 139,757,873
Pharmaceutical products	$ 94,753,301
Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	$ 90,616,313
Other made up textile articles; sets; worn clothing and worn textile articles; rags	$ 87,238,730

Source: UN Comtrade.

Benin's Domestic Exports

Over 1.5 million metric tons of product were exported from Benin through the port of Cotonou in 2014. This is a 160% increase over export volumes in 2005 (595,800 metric tons).

Figure 30: PAC Export Volumes from Benin, 2005-2014



Source: PAC, Stat 2003 2014.xls

Exports in terms value in USD have increased 230% since 2005, according to data from the UN Comtrade database.

Table 23. Total Value of Exports, 2005-2014

Year	Exports
2005	$ 288,195,509
2006	$ 224,593,084
2007	$ 274,387,393
2008	$ 421,063,805
2009	$ 425,347,736
2010	$ 533,902,342
2011	$ 388,592,197
2012	$ 460,338,227
2013	$ 602,013,920
2014	$ 951,000,010

Source: UN Comtrade.

Historically, the country's primary export has been raw cotton. As a result of the slow growth of competitive export alternatives to cotton, Benin's export structure remains highly concentrated, with cotton accounting for over 50% of exports in 2013 according to Beninese Customs. This data should, nevertheless, be interpreted with caution. Import/export data quality is an issue in Benin because of the level of re-export and re-import activity.

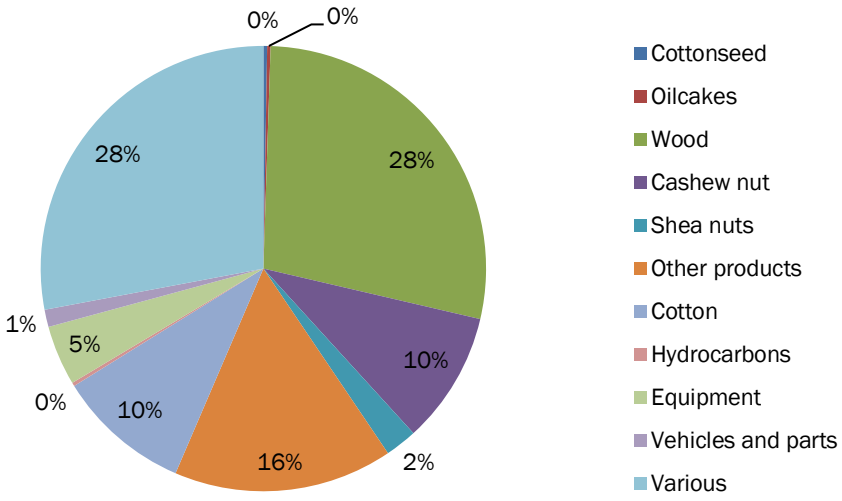
While cotton is still Benin's largest export product by value, accounting for over $300 million in exports in 2014, in terms of volume, wood was the largest product exported in 2014 (28% of volume). While cotton is Benin's largest export in terms of value (see Table 24), it is a light product, especially compared to wood, so its importance is underrepresented when measured in terms of metric tons (See Figure 30below which shows cotton at 10% of export volumes).

Table 24. Top Ten Exports by Value, 2014

Commodity	Trade Value (US$)	Percent of 2014 Value
Cotton	$ 302,143,999	32%
Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	$ 103,994,614	11%
Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	$ 103,909,457	11%
Edible fruit and nuts; peel of citrus fruit or melons	$ 87,854,019	9%
Iron and steel	$ 52,360,785	6%
Aircraft, spacecraft, and parts thereof	$ 47,537,007	5%
Ships, boats and floating structures	$ 46,073,964	5%
Salt; sulfur; earths and stone; plastering materials, lime and cement	$ 42,955,742	5%
Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewelry; coin	$ 21,854,323	2%
Articles of iron or steel	$ 17,426,787	2%

Source: UN Comtrade.

Figure 31: Composition of PAC Exports from Benin, by Volume, 2014



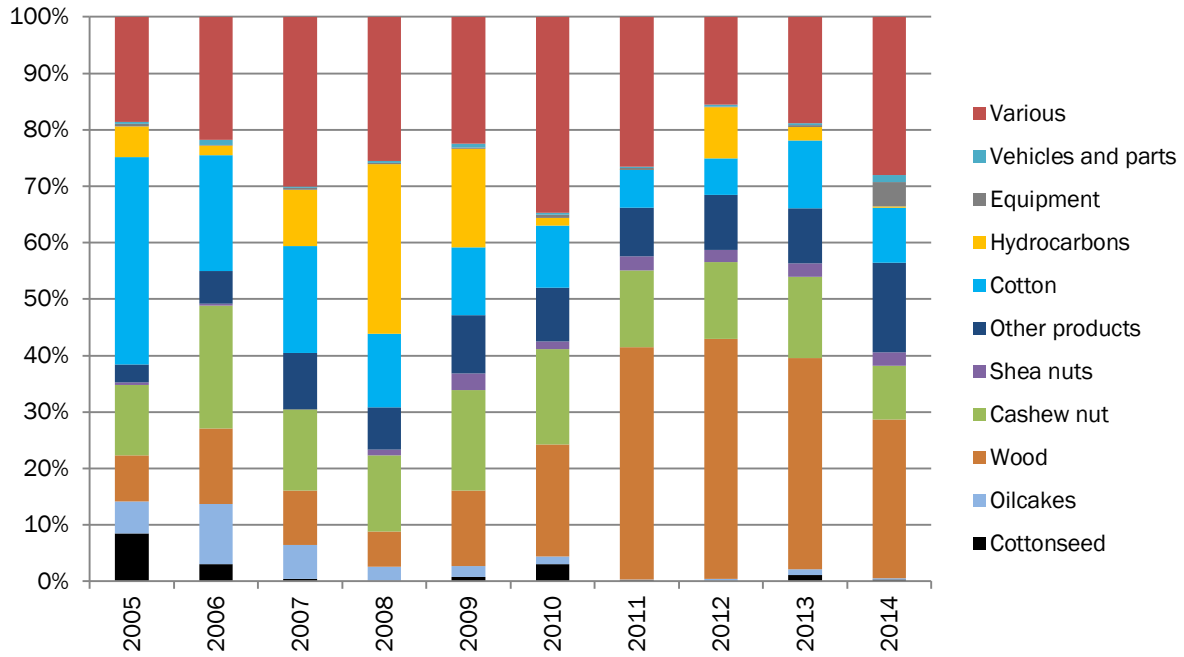
Source: PAC, Stat 2003 2014.xls

Despite cotton industry reforms, affected between 1993 and 2005, overall industry competitiveness has fallen well below pre-reform expectations. A single export channel was replaced by competing channels controlled by private ginners each of whom was licensed between 1995 and 1998. However, instead of growing out of its low equilibrium, the industry has declined further under the weight of overcapacity and a lack of new investment. Until 2000, the state owned integrated cotton company, SONAPRA, retained the sole right to assign quotas for seed cotton to growers. After that date when SONAPRA's monopoly was abolished and the production end of the business opened to competition, the industry continued to operate at a low equilibrium level. This decline is due in part to the dependence of cotton production on small scale producers, whose yield varies from year to year depending on rainfall, but which has generally been trending down because of limited opportunities for expanding crop areas and the leveling out of input applications.

On average, between 2006 and 2014, cotton accounted for approximately 35% of Benin's export value.[186] However, for the past 10 years, when measured in volume terms, Benin's output of cotton has been shrinking, as shown in Figure 31 and Figure 32. In recent years, however, the drop in cotton export volume has been buoyed by a rise in prices. Improved port facilities may have had some marginal impact as well.

[186] UN Comtrade. Data by product unavailable for 2005.

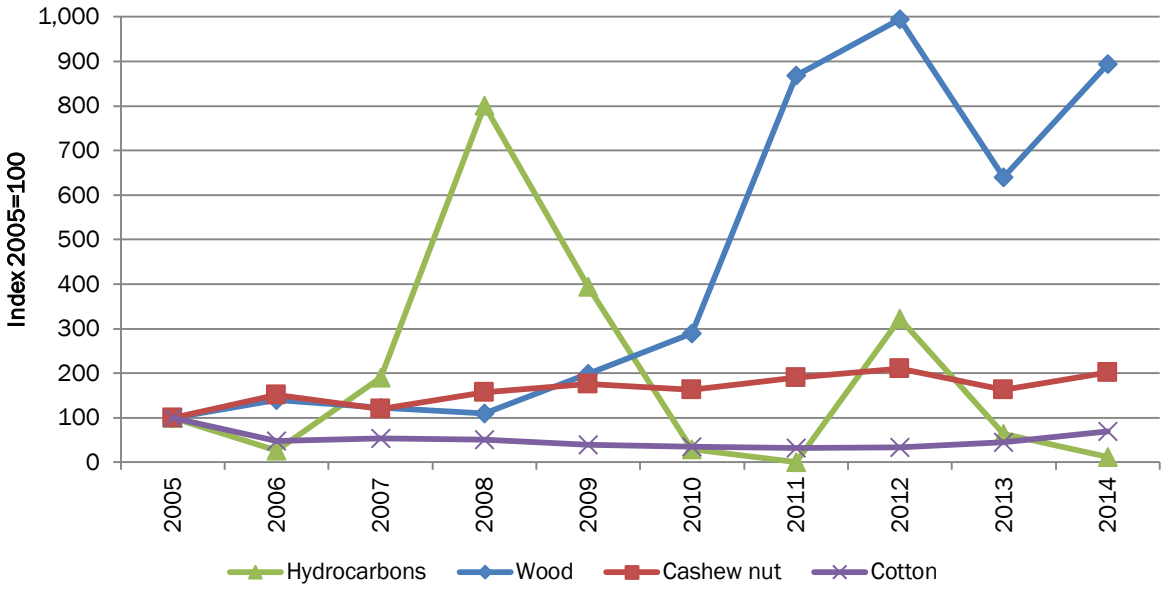
Figure 32: Composition of PAC Exports from Benin, by Volume, 2005-2014



Source: PAC, Stat 2003 2014.xl

Non-traditional exports such as wood and cashews have partly offset volume reductions in cotton. Benin's fastest growing agricultural export has been wood, which have grown by nearly 900% in terms of volume since 2005 and now accounts for approximately 28% of total exports by volume. Exports of wood have significantly increased since 2005 when they represented only 8% of total export volumes (compared to 28% in 2014). However, in terms of value, wood only accounted for $12.4 million in exports in 2014, according to UN Comtrade. Figure 32 highlights the trends of Benin's top export products by looking at volumes indexed to 2005 values.

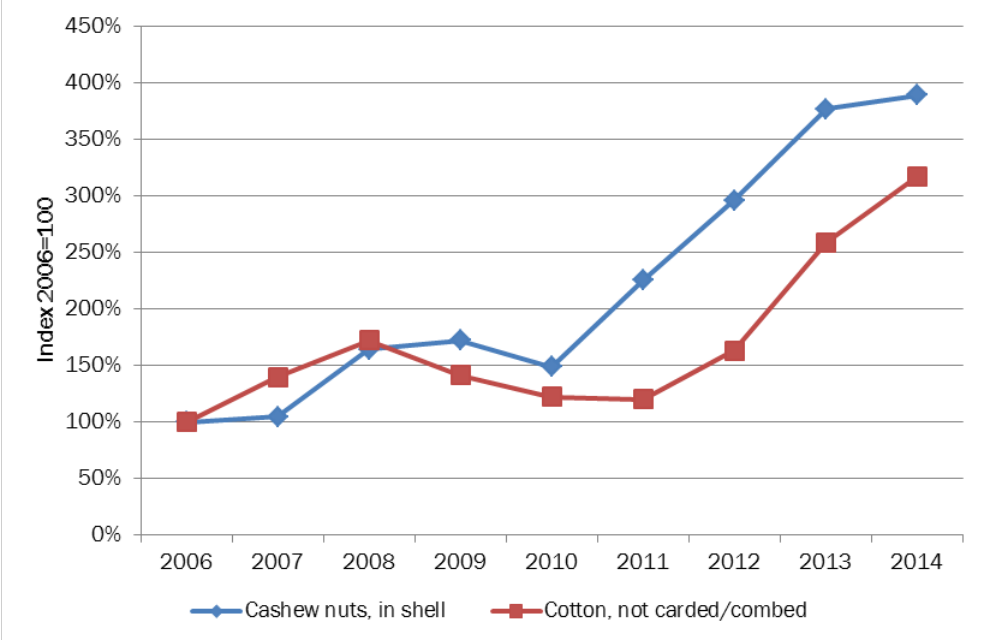
Figure 33: Growth of Top PAC Exports from Benin, by Volume, 2005-2014 (Index 2005=100)



Source: PAC, Stat 2003 2014.xls

Export volumes of cashew nuts have also grown by over 200% since 2005 while cotton exports by volume have fallen since 2005.In terms of value, cashew exports have increased 390% since 2006. Despite cotton's decline in export volumes, cotton prices have increased, leading to a 318% increase in the value of cotton exports since 2006, as shown below.

Figure 34: Growth of Cashew and Cotton Exports, by Value, 2006-2014 (Index 2006=100)



Source: UN Comtrade.

As is the case of cotton, cashews are exported as raw nuts with little value addition in Benin. This is in part because of the fact that the commercialization of cashew resides in the hands of foreign

intermediaries who operate as agents of overseas processors and manufacturers. Benin has the potential to increase exports of both pineapple products and cashew. According to the US Department of State's 2015 Investment Climate Statement, Benin is the world's 5th largest cashew producer. However even with that standing it exports only 3% of the total international market. Additionally, the country produces 400,000+ metric tons of pineapples meeting international standards and processing pineapples into pineapple juice, jam and dried pineapple which could be exported. However, despite their potential, pineapple exports have also failed to take off, accounting for only $292,000 in 2014 (including pineapple juice).[187] While pineapples grew by 4% a year in 2014, its failure to grow faster is attributable to marketing and logistics constraints, as well as to lack of extension support to farmers.[188] However, encouraging are Benin's export "hot spots" the fact remains that the large majority of traffic handled through the Port of Cotonou is traffic which neither originates nor terminates in the country. It is this transit traffic which drives the Port of Cotonou, which stimulates the growth of ancillary trade support and transport services and which serves as the primary justification for investment in port expansion and modernization.

Finally, Benin's services sector is a story of missed opportunities. Although the production of services contributes more than 50% in value-addition in Benin, it's even stronger potential remains untapped. With its superior geographical location as a transit platform for two landlocked countries (Burkina Faso and Niger) and its strategic location next to the largest import market in Africa (Nigeria), Benin has the potential to become an important services exporter. However, Benin's services imports have grown faster than its exports and made overall poor contribution of services trade to the GDP. The current supply of services is considered by most economic actors as an obstacle to business and trade.

Transit Cargo

Transit cargo represents a large portion of the port of Cotonou's traffic. According to the PAC, in 2005 transit traffic[189] represented 40% of cargo and by 2014 this number had risen to 48%. Other sources indicate that the true figure is actually even higher—Nunez and Hoareau (2011) estimated that in 2010 re-exports (mainly to Nigeria) accounted for about 15% of Benin's imports, bringing transit traffic in 2010 to 70%. Table 25 describes the composition of Cotonou's transit traffic in 2005, 2008 and 2014. As clear in the table, imports dominate transit cargo, and little is exported. This imbalance leads to very little back-haul, which increases the cost of inland transportation.

Table 25. Composition of Cotonou Transit Traffic (Metric Tons)

	Imports			Exports			Total		
Cotonou transit traffic to/from:	2005	2008	2014	2005	2008	2014	2005	2008	2014
Niger	1,041,090	2,202,586	3,632,355	163	3,219	857	1,041,253	2,205,805	3,633,212
Nigeria	629,145	835,913	443,487	137	78	4	629,282	835,991	443,491
Mali	41,978	107,533	106,153	-	-	-	41,978	107,533	106,153
Burkina Faso	105,785	225,856	181,291	-	35	43,032	105,785	225,891	224,323
Tchad	17,927	27,350	6,541	-	-	2,818	17,927	27,350	9,359
Togo	6,366	3,594	17,131	-	-	417	6,366	3,594	17,548
Others (Ghana, Ivory Coast, Transshipment)	198,447	7,835	606,923	34	-	-	198,481	7,835	606,923
Total	2,040,738	3,410,667	4,993,881	334	3,331	47,128	2,041,072	3,413,998	5,041,009
Transit Cargo as % of All Traffic							40%	49%	48%

[187] UN Comtrade.

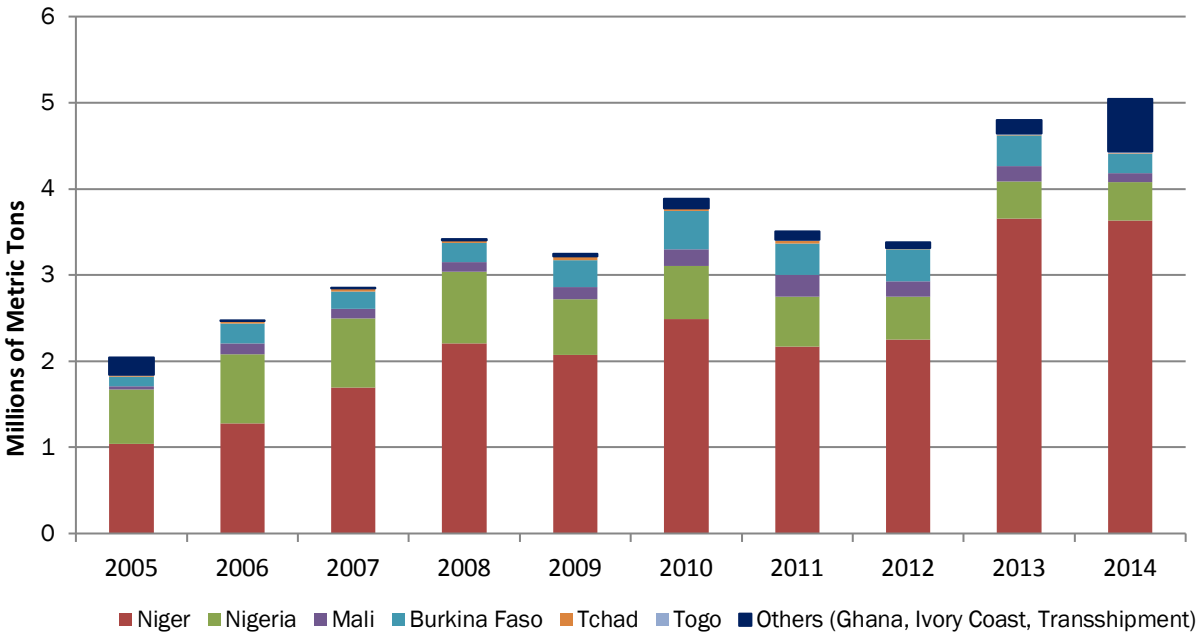
[188] World Bank, " The Republic of Benin, Trade Integration Study Update: From Rents to Competitiveness, May 2015

[189] PAC statistics include transshipment in transit cargo, and prior to 2009, data do not allow us to remove it from our calculations. Therefore to be consistent, transshipment traffic is included with transit cargo in all time periods.

Source: PAC, Stat 2003 2014.xls

Traffic to Niger is officially considered the largest component of transit traffic, but it is well known that most of the cargo which is routed to Niger is re-exported to Nigeria. Raballand and Mjekiqi (2010) estimate that up to US$4 billion of cargo enters Nigeria unofficially through Cotonou port (2.5 million tons), comprising 36% of Cotonou's traffic and nearly 15% of Nigeria's total imports.[190] Figure 3434 breaks Benin's transit traffic down by country of origin and destination.

Figure 35: Composition of Cotonou Transit Traffic, By Country of Origin/Destination (Metric Tons)

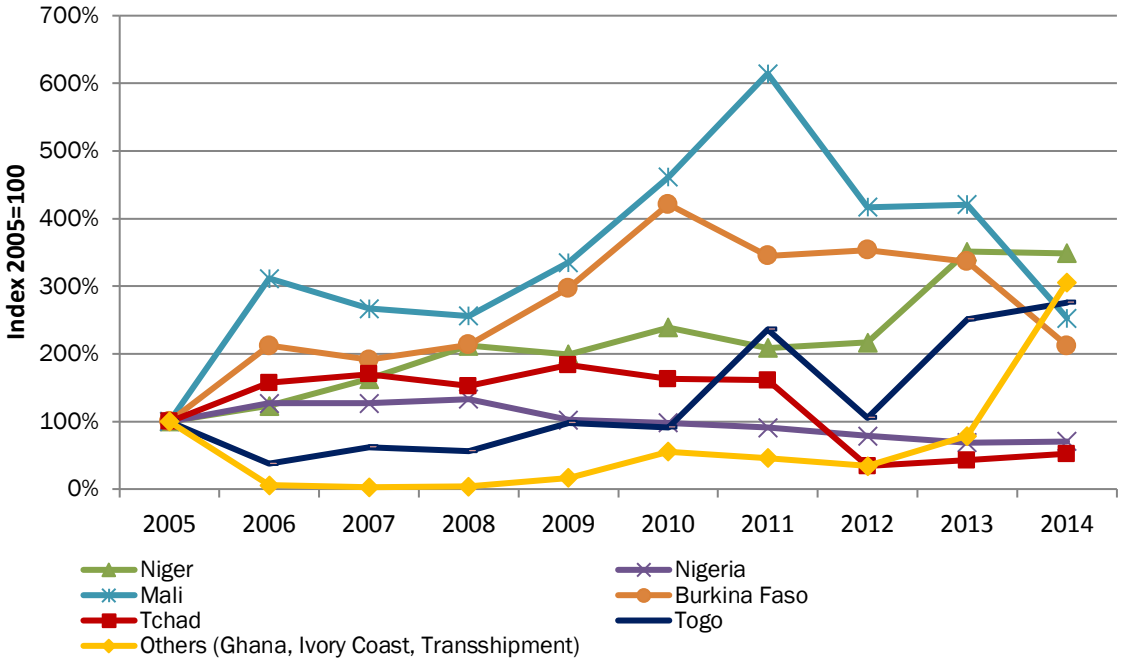


Source: PAC, Stat 2003 2014.xls

Imports destined from Cotonou to Niger increased 250% during the period from 2005 to 2014, as depicted in the figure below. Meanwhile, official imports destined for Nigeria decreased by 30% during the same period (and by nearly 50% from their peak in 2008). However, this decrease is artificial, and captured by an increase in traffic destined for Niger, which is re-exported to Nigeria. Transit traffic to both Mali and Burkina Faso, while above 2005 levels, has also fallen substantially since their peaks.

[190] Raballand Gaël and Edmond Mjekiqi. 2010. "Nigeria's Trade Policy Facilitates Unofficial Trade and Impacts Negatively Nigeria's Customs Efficiency and Economy". The World Bank.

Figure 36: Growth of Transit Trade, by Country of Origin/Destination (Index 2005=100)



Source: PAC, Stat 2003 2014.xls

This reliance on transit traffic means that the port's contributions to the national budget and to private investment are extremely fragile. These contributions depend on actions outside the control of the Beninese. They depend in large part on the economic policies of Nigeria, the ultimate destination for most of Benin's informal re-export trade. When Nigeria closes its border, as it has done several times over the past decade, the Benin economy absorbs a significant shock. When, and if, ECOWAS succeeds in implementing the harmonized trade policies that it is actively pursuing, there is the potential that transit traffic to Benin—and therefore overall traffic—will fall.

Additionally, in its most recent Country Economic Memorandum (CEM) for Benin,[191] the World Bank assessed that large fiscal windfalls from re-exporting have crowded out more productive economic activities. Apparently, the lure of rents collected in Nigeria's distorted markets exacerbates a culture of corruption and tax evasion in Benin that is not conducive to productive economic growth. The Bank concluded that a development strategy based on smuggling and fraud is not a viable, long-run path to becoming an emerging market.

Attribution of Trade Increases to MCC Investment

The above analysis clearly indicates that there have been increases in both trade to/from Benin, and in transit traffic through the port of Cotonou. However, it is still unclear as to whether those increases were the result of the port investments,[192] or other factors. This section attempts to show

[191] World Bank, Benin Country Economic Memorandum 2009 at http://documents.worldbank.org/curated/en/2009/06/10842556/benin-constraints-growth-potential-diversification-innovation-country-economic-memorandum

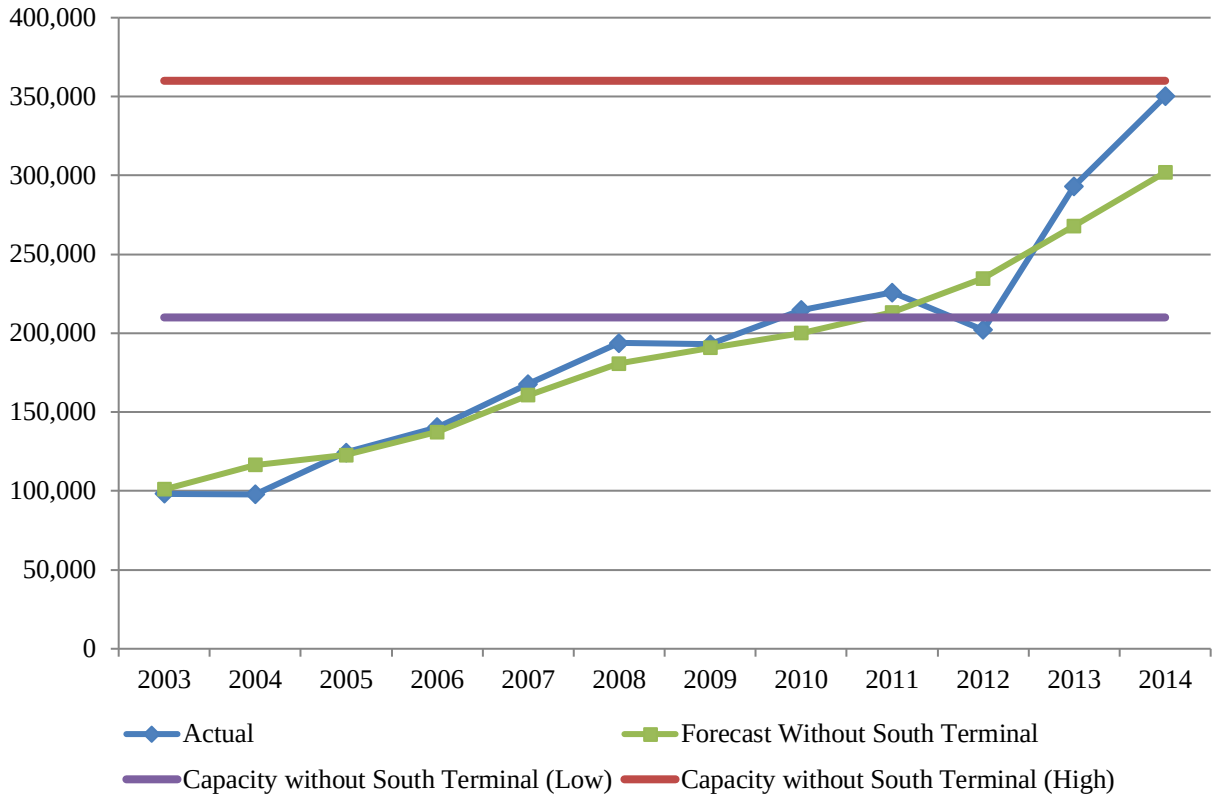
[192] This section does not aim to dissect attribution between the various investments into the port as it is not possible to do so. However, it is assumed that many of the investments were a result of the MCC's investment.

whether any of the impact can be attributed to the MCC's investment, but as this is a performance evaluation, not an impact evaluation, it does not provide a full dissection of attribution.

We focus attribution on container traffic as the MCC's investments focused on container cargo. To try to answer the question of "attribution", we first forecast what trade volumes would have been absent the project using the methodology described above. As noted above, the most common methodology for forecasting container cargo (imports/exports) is based on the linear relationship between container trade volumes and GDP using regression analysis. Also as noted above, studies forecasting Benin's port traffic have found that Benin's cargo is also influenced by Nigerian GDP. However, we found a 97% correlation between Benin and Nigeria's GDP using constant GDP data from the World Bank, so did not include Nigerian GDP in the forecast model.[193]

We forecast container traffic based on the relationship between Benin's GDP and container traffic from 2003-2012 to estimate traffic without the South Terminal (which opened in 2013) as shown below. The differences between the forecasted trade volumes and actual trade volumes give us some indication of the impact of the port investment on trade. As shown below, actual traffic was higher than the forecast in 2013 and 2014, indicating that the opening of the Benin Terminal may have been a factor in leading to higher than predicted trade growth.

Figure 37: Port of Cotonou Forecasted vs. Actual Container Traffic Based On Benin GDP, 2003-2014 (TEUs)



Source: Constant GDP $2005 from World Bank WDI, container traffic from STAT 2003 2014.xls.

[193] We did look at adding Nigerian GDP to the model but found that Nigerian GDP was not statistically significant.

Table 26. Comparison of Actual to Predicted Container Traffic, Full Containers

Year	Actual Traffic	Actual Growth	Predicted Traffic	Predicted Growth	Increase in Traffic
2013	293,185	45.1%	268,095	14.2%	25,090
2014	350,121	19.4%	301,948	12.6%	48,173

Source: World Bank WDI, PAC, NORC projections.

This analysis shows that container volumes grew faster than GDP after 2013 when the South Terminal opened, which implies that the port investment may have increased trade. The figure above also shows how without the investment, trade growth would have been constrained by capacity constraints at the port. Even though it may not be possible to attribute all trade growth to the investment, without the investment the growth could not have occurred at the pace that it did grow because the port would have hit its capacity constraints around 2012/2013. That is, while other factors may have also been essential to trade actually growing at or more than GDP, the port capacity improvements were essential for allowing this to happen.

Interpretation and Findings

This section summarizes our findings by research question.

- What is the relative change in the level of domestic and international traffic, volume of container and bulk maritime trade, value of trade (USD) and growth trends in relevant sectors before and after the improvements to the port?

As shown above, both domestic and international trade volumes have increased in terms of both volumes and value since the time prior to the investment. Domestic imports (in tons) increased 66% from 2006 to 2014 at a CAGR of 6.5%. Domestic exports (in tons) increased 203% over the same period, at a CAGR of 14.9%. Transit traffic increased 79% at a CAGR of 7.6%.

- To what extent can changes in trade volume be attributable to MCC's intervention?

Attribution is a difficult question to answer when it comes to port investments as there are so many factors outside of the port that also affect trade and economic growth. Increasing capacity at the port was a necessary condition for achieving increased trade because prior to the investment the port was operating at full capacity. We found that after the opening of the South Terminal, the port handled 25,000 more containers than predicted in 2013 and 48,000 more containers than predicted in 2014. These increases may have been due to the increased competiveness of the port, but they also may have been due to other factors. However, after considering capacity constraints at the port, it is likely that much of the increases in traffic from 2012 to 2014 (both predicted and unpredicted) can be attributed to the increased port capacity due to the investment.

Assessment of Impact on Integration of Internal Markets

Market integration entails the adoption of pricing structures over distance and time, which reflect transport costs and international commodity prices. Correlation between local pricing and global pricing, taking into account the cost of inland transport and the cost of completing buy/sell transactions is the basis for determining how well "integrated" any specific markets are.

The size of Benin's own economy is dwarfed by the scale of its foreign trade. Benin import and export volumes are significantly less than volumes of trade flows moving though Benin to Nigeria,

Niger and Mali. The informal sector is the primary agent which serves these markets with most trade transactions consummated by expatriates from the several neighboring countries who operate from a Cotonou base to arrange primary imports, false invoicing and documentation, transit storage and transport beyond Benin back into their own countries.

In the context of markets like the land-locked markets that are served by the Port of Cotonou, the issue of market integration is complicated by a number of additional issues. The subsidy-supported trading system that Nigeria has long upheld and to which the current government appears to be regressing provides strong incentives for traders to import products destined for Nigeria via Cotonou, thus to avoid relatively high Nigerian duties and to transfer these products illegally to counterparties in Nigeria via less efficient transport modes and routes that are inefficient but that are more difficult for officials to trace or to account for. In this way informal trade translates into a net economic loss for the trading/transport system that links the two countries. Informality in trading leads to informality in storage, transport routing and customs clearance.

The transit and trade treaties into which Benin has entered with Nigeria and Niger, moreover, entail the award of privileged rights to Niger- and Nigeria-based truckers and the administration and protection of these rights through transport management institutions that have developed.

The same incentives affect informal trading practices also affect corruption in customs, in transport service assignments and in other border management functions. Over time these factors have created a sophisticated and large-scale informal economy in Benin made up of expatriate importers/exporters, customs agents, inland transport service providers, and various other essential trade service providers. Market integration entails the replacement of this rent-collecting system with more transparent and market referencing pricing protocols.

The assessment of market integration in cross-border markets can be deconstructed into (i) an assessment of transport market integration that has taken place in Cotonou since the MCC investment; and (ii) an assessment of real product market integration and in particular real product regional markets that link Cotonou based traders to counterparties in Nigeria and Niger. These two markets are interrelated. In both instances “integration” entails the replacement of informal market pricing and market-making protocols with formal-sector protocols, for example, the internalization of transport rates and charges into the combined intermodal rates and charges which shipping lines offer.

In the case of cross-border product markets the development of real -sector trading protocols under the control of larger enterprises would result in lower unit transaction costs with lower unit logistics costs. This would provide the opportunity to realize economies of scale and thus to transform Benin into a more stable and growth-oriented regional trade center. The ancillary effect would be investment in fixed facilities for the storage, assembly, and delivery of specialized products.

Summary of Methodological Approach

This section addresses the following research question:

- To what extent has the port project contributed to achieving an overall compact objective of increasing the integration of internal markets?

Approach

The NORC team applied a combination of quantitative and qualitative measures in assessing whether regional markets have increased in their integration. To that end, the team surveyed the literature dealing with this issue. It found data and analysis presented in a recent World Bank Study of Trade Logistics in Benin particularly useful.[194]

The team also interviewed several participants in local trade including the government agents representing Niger and Mali traders and the agencies through which Trade and Transit treaties between these counties and Benin are enforced. Importantly as well, the team conducted focus-group interviews with local customs brokers in the formal sector whose competitive position in the local market had recently been enhanced with the government's implementation of its one-stop cargo release system.

Finally but also significantly, the NORC team analyzed data that Benin Customs made available on transit and cross-border trade patterns.

Challenges

Assessments of a basic change over from informal to formal trading patterns and of the consequent integration of regional markets are always fraught with uncertainty. The revelation of full and accurate information about how informal markets operate is never in the interest of market participants. Neither is the revelation of insights by the same informants nor indeed by their formal sector competitors regarding the competitive tactics, which formal-sector participants in the same markets apply in efforts to increase their market share. Even the in-depth study of trade/logistics market reform that the World Bank recently completed is replete with estimates and approxima-tions.

Interpretation and Findings

Transport markets in West Africa are neither competitive nor well integrated. The cost of trucking for example is 3-4 times higher than in the EU.[195] Imbalanced head hauls and backhauls account for significant portion of the transport market inefficiencies as does the poor utilization of truck and container assets which is significantly less in Benin than in OECD countries. Fuel efficiency is likewise lower.

The reason why truckers based in Benin and in the watershed markets which they serve operate far from the technology frontier is that competitive pressures and incentives for new investment and for management improvement do not operate effectively. Rent collection incentives trumps efficiency-improvement objectives. Sources of rent collection include duty avoidance, restrictions on cabotage, exclusive national reservation rights for cargoes destined for particular end markets, prevalence of anti-competitive practices (e.g. price fixing and account assignment), small scale operations and separation between truck ownership and truck operations. Most of these constraints

[194] World Bank, "The Republic of Benin, Trade Integration Study Update: From Rents to Competitiveness, May 2015.

[195] World Bank, The Republic of Benin Diagnostic Trade Integration Study Update : From Rents to Competitiveness, http://documents.worldbank.org/curated/en/759931468189257561/pdf/97242-ENGLISH-WP-P145228-PUBLIC-Box393236B-EV-final-Benin-DTISU-English-2015-10-30.pdf

would be removed as a result of the formalization of the trucking sector and the release of economies of scale that would result.

With that said, extending the benefits of containerization to inland destinations affords significant incremental benefits to exporters and importers. However, the poor road conditions and lack of a functional rail system mean that Benin's connections to the hinterland are currently poor and add significantly to transport costs in both terms of time and money. A rail connection will eventually link the Port of Cotonou to the hinterland, yet it has not been constructed to date. If and when the rail connection is completed, shippers will be able to export containers directly from the port to Niger, Nigeria and Burkina Faso. As of our field visit, Bolloré had signed an agreement with Niger and Benin to begin constructing the rail line in October 2015, and the project was projected to take 18 months to complete to the border of Niger. Recent legal challenges (November 2015) from private firms that were given also partial rights to develop the rail line (specifically the Niger-Benin "backbone" project) have stopped the works indefinitely.[196] Future investments to upgrade and expand the rail from Cotonou to Niamey could be a game changer in improving the logistics chain.

Port infrastructure investment and port reform, more generally, create economic value only to the extent that they facilitate faster, less expensive, and more reliable trade. Port authorities succeed in their trade development missions only to the extent that they are able to coordinate effectively with other agencies and departments of government, which oversee inland transportation, and cross-border movements of cargo and customs operations in order to achieve faster, less costly, more reliable cargo movement goals.

Progressive and forward-looking container shipping lines share these objectives. Lines like Maersk Moller and CMA would prefer to development seamless intermodal through-rates and services beyond the Port of Cotonou to various locations within Benin where large volumes of cotton are generated or across the Benin border into Niger. They would prefer to compete on the basis of superior service rather than on the basis of lowest price.

Several intermodal transport developments facilitate the development of intermodal through services. They provide a complement to port investment and multiply the benefits which port investments are able to achieve. These include inland dry ports where container cargos can clear, rail transport beyond port terminals that allow containerized freight to move quickly on a joint interline intermodal bill of landing to its final destination, and bonded transit shipments by truck to and from legitimate transit destinations in Niger and Burkina Faso. Nigeria does not let trucks cross the border, so cargo in transit to Nigeria must be offloaded at the border. All of these service developments require collaboration between major shipping lines, inland transport companies and customs services.

They also require good-condition infrastructure which allows easy movement from the port to the hinterland destinations. However, road and rail modernization have fallen behind the modernizations at the port, and are a bottleneck to increased port traffic. Trucking companies in the informal sector have cited poor road conditions and poor truck quality in Benin as a major roadblock to using Cotonou port for hinterland trade. However, other causes are more likely in play including

[196] The local Petrolin Group has filed claims in the local courts and the French Geftarail (with its Niger subsidiary) has filed claims in the French courts; both claim that they own the rights to develop the Niger-Benin rail connection under different regional initiatives (http://www.reuters.com/article/africa-infrastructure-Bolloré-idUSL8N13L3TG20151127).

ones related to and supportive of informal networks between expatriate traders and clansmen truckers.

Market Integration for Key Products

In West Africa, specialized agronomic growing zones and their corresponding market watersheds crisscross national borders. Livestock and maize are the two most important traded staples in ECOWAS. However, sorghum, rice, cassava and other stables also trade in significant volume.[197] A significant volume of cross border trade exists which derives from inherent local production/consumption complementarities rather than from comparative advantage realized at the level of national economies.

Significantly, a large share of this trade is informal and this informal trade involves relatively small shipment lot sizes, barter exchanges and local routes via unpaved roads which circumvent customs and border checkpoints whenever the trade entails crossing borders. Indeed, most local cross border trade involves production and consumption within a relatively short distance of national borders. For all of these reasons, data relating to regional trade is spotty and what data is available from one off surveys is unreliable.

Moreover, because of the traditional organization of this trade, e.g. it takes place primarily between poorly capitalized traders, who, more often than not, share an ethnic or cultural bond and who individually operate within narrow local market boundaries, only limited opportunities exists to build greater comparative advantage, for example, to deploy modern production/distribution technologies, to satisfy the quality standards of modern food retailers and in these ways to capture economies of scale and scope.

As a result, local producers of food staples, livestock and fruits and vegetables at the production end of local supply chains have failed to secure the productivity enhancing inputs, research and extension services which would allow them to compete effectively with imports in major urban centers. Access to adequate fertilizers and modern seeds could easily increase food staples crop yields by twofold or threefold.[198] Lack of access to modern retail food distributors locks regional producers into the bottom of the market where low-quality levels prevail and exposure to market shocks is highest. For the more affluent consumers in growing urban centers, sources of food consumption have been diversifying from traditional domestically produced crops to a diversity of processed, frozen and even fresh import items.

Importantly, national policies which effect food trade have proved incoherent and inefficient during periods of threatened food shortage. During such periods, individual governments whose farmers have managed to produce surpluses have tended to follow a beggar-thy neighbor policy. In spite of their regional trade commitments, they have curtailed cross-border trade in order to preserve local national production for local national consumption. For all of these reasons, food staples markets, markets for meat and poultry and markets for fresh fruits and vegetables in ECOWAS remain inefficient and far from achieving their full potential. The MCC's investment in the Port of Cotonou did not impact or change this situation.

[197] FAO, "Huge opportunities for agricultural growth in West Africa", 2015, www.**fao**.org/news/story/en/item/284599/icode

[198] ibid

Integration of Regional Markets

Intra-Regional Trade

Depending on the product and end markets involved, intraregional trade is motivated by a diversity of factors. In the section above, we discussed the factors which limit local commerce in food staples traded back and forth within regions close to internationals borders. Our review of informal trade reveals the importance of market sheds that span borders separating Benin from its neighbors in Nigeria and Niger. These markets tend to be naturally integrated. However, they are artificially separated by the domestic policies of individual countries particularly during periods of food scarcely.

Two other types of intra-regional trade exist: (i) re-exported and/or transited products originally imported outside the region; (ii) formal interregional trade between registered companies, which qualifies for MFN status under the ECOWAS regional free trade program launched on Jan 1, 2016.

In the future, opportunities for re-export and transshipment need to be based on real economic gains in the form of economies of scale and scope rather than on the economies which result from arbitrage between different national trade regimes, as has been the case until very recently. To that end opportunities need to be conceived and implemented as PPP's for importing large volumes of specific categories of product, for repacking and relabeling them and then for re-exporting to multiple customers scattered over different parts of ECOWAS. To this end, national policies need to be formulated for developing regional trade centers which are organized as free port or export processing centers. Cotonou would appear to have a natural advantage in filling this strategic role.

With regard to the second set of regional market integration opportunities, ECOWAS is beginning to focus on corridor and bilateral trade relationships and less on ECOWAS wide approaches which have failed in the past. Formal trade between companies who produce in the region with a minimum level of inputs also procured within the region requires a more holistic approach including standards, order fulfillment, transport, trade finance, etc. It might also succeed at creating competition among two or more regional corridors for specific product categories. With regard to volume, regional trade in foods remains modest relative to the importance of the primary sector in the region's economy. This fact points to important market failures in promoting better trade integration. The informality of intraregional trade in food staples suggests trade flows that are highly fragmented and thus inefficient. The causes of fragmentation are difficult to pinpoint, but are probably related to lack of organization in sector value chains and the poor state of infrastructure, both of which prevent economies of scale. One important dimension of infrastructure that needs to be upgraded is roads that connect cross-border markets.

Trade integration in service markets at the regional level has an instrumental role to play in removing constraints to market integration in all three of the regional product markets discussed above. Market opening alone will not be enough to put Benin's service sector on a better growth trajectory. Pro-active "capacity-enhancing" are required, including ones involving regional regulatory harmonization at the regional level and bilateral cooperation at the corridor level.

Transit Cargo

As noted above, transit cargo represents a large portion of traffic through the Port of Cotonou. However, Benin's roads are in poor condition and its rail system not developed, which decreases the competitiveness of the port and increases logistics costs. The main corridor which the port of Cotonou serves is the Cotonou-Niamey corridor. From Niamey cargo splits to go further into Niger, to Nigeria, or to Mali.

Nathan Associates (2013) found that transport costs on Cotonou-Niamey corridor were high due to: high port costs, poor road conditions which lead to breakdowns and higher vehicle operating costs, a supply-demand imbalance especially during the November-February cotton harvest season, trade imbalance leading to lack of backhaul and shippers charging roundtrip prices for one way travel, and many checkpoints with a high number of informal payments. The study noted that truckers were unprofitable transporting most common products like food and cement, and only profited on higher value items such as mining equipment and spare parts, sulfur, and petroleum. Consequently, the study found that current operating conditions were not compatible with the ability to finance new vehicles, and that trucks in Benin averaged 20-25 years of age and trucks in Niger averaged 25 years of age. These findings are all consistent with the information gathered on the NORC team's field visit.

The study calculated inland transport costs between FCFA 1.4-1.9 Million per 40-ft container, depending on the cargo type and value, and total logistics costs ranged from 2.65-2.9 million FCFA (averaging between $US112 and $163 per ton). However, the corridor was also found to have extensive additional "hidden" logistics costs ranging from 133-137% of the road transport cost for high value products and 32-57% of the transport cost of low value products (rice and edible oil respectively). Benin had an average of 13 checkpoints per 100 km compared to 3 per 100 km in Togo, 5 per 100 km in Cote D'Ivoire and 5 per 100 km in Ghana.[199] The NORC team's field visit found that the number of formal checkpoints has been reduced to 3 today, but some stakeholders mentioned that informal checkpoints can still total 8. The study also found that bribes and facilitation payments paid at checkpoints averaged 30,000 FCFA and ranged from 10,000 FCFA to 50,000 FCFA.[200] Total logistics costs from the study are shown below.

[199] ALCO. 2011. "Project de facilitation du commerce du transport sur le Corridor Abidjan–Lagos". Organisation du Corridor Abidjan–Lagos. Rapport Preliminaire #1, DON IDA N° H549–TG, August.

[200] Some truckers disputed these numbers and said that it depended on the time of day as checkpoints vary by time of day, between 4 and 9.

Table 27. Nathan Associates (2013) Total Logistics Costs for the Cotonou-Niamey Corridor

Total Logistics Cost by Case Study (FCFA)

Component	Case Study 1a		Case Study 1b		Case Study 2		Case Study 3	
	FCFA	%	FCFA	%	FCFA	%	FCFA	%
Total financial logistics costs	2,647,622	57%	2,912,552	86%	2,652,184	75%	3,454,310	50%
Hidden costs	2,020,962	43%	485,031	14%	866,127	25%	3,464,507	50%
Total logistics costs	4,668,584	100%	3,397,583	100%	3,518,311	100%	6,918,817	100%
Total logistics costs per ton (FCFA)	141,472		70,783		79,962		197,680	
Total logistics costs per ton (US$)	287		144		162		401	

Note: US$1=FCFA 493
Source: Nathan Associates' calculations.

The study also calculated transit delays by stage, as shown below. Transit time ranged from 18.5 to 40 days.

Table 28. Nathan Associates (2013) Transit Delays on the Cotonou-Niamey Corridor

Cotonou-Niamey Corridor Containerized Cargo Transit Delays by Stage (days)

Process		Min.	Most Frequent	Max.	Range
Port transit dwell time		10.00	18.00	25.00	15.00
Total land transit time	Travel time on the corridor	4.50	5.50	7.25	2,75
	Gaya-Malanville borders crossing and formalities	1.75	2.38	3.50	1,75
	Time for customs clearance at final destination	2.25	2.38	4.25	2,00
Total corridor transit time		18.50	27.92	40.08	21.33

Source: Interviews December 2011 to October 2012.

Interviews conducted by the NORC team in September 2015 found that transit along the corridor still faces many of the same challenges and delays that it did in 2011-2012 when Nathan Associates conducted its prior interviews. A focus group discussion with customs brokers in September 2015 yielded that the poor condition of trucks increases transit time by between 4 and 7 days from Cotonou to Niamey compared to transit with a good truck and driver, which would only take 3 days. The customs brokers estimated that it was currently taking between 7 and 10 days, which is slightly longer than found by Nathan Associates (2013). They said that they newest trucks in the fleet are ten years old. The customs brokers estimated that it costs approximately 500 thousand CFA to transport a container from Cotonou to Niamey. They also mentioned that there are truck shortages, especially during cotton export time. During cotton export time, all the trucks are used for cotton and there are no trucks for other products so they have to borrow trucks from other countries. The peak cotton export time of December to March is very congested at the port.

Interviews by the NORC team with a major shipping line indicated that inland transport costs are lower from Lomé to Niamey even though Cotonou-Niamey covers less distance and has one-less

border crossing. Because the roads from Cotonou are in such bad shape, it takes longer and the trucks incur a lot of additional damage to the roads and themselves suffer a lot of damage. EU and Beninese officials agree that gross overloading of trucks is a key element in the serious deterioration of Benin's roads. Consequently, most shippers do not use new trucks or trucks in as good a condition as they would quickly become damaged. The shipping line representative indicated that competition from Lomé will only increase as Lomé's new port becomes operational, and Cotonou may lose a lot of traffic to Lomé if it does not focus on the roads as well as the port.

Assessment of Impact on Employment

Summary of Methodological Approach

This section addresses the following research question:

- What net change can be observed in employment among the permanent and non-permanent employees in the port sector following completion of the works?

Approach

Regarding employment, the NORC team reviewed data on PAC's work force by labor category from 2006-2014 in order to identify changes in employment at Port of Cotonou and assess whether changes were connected to improvements made to port infrastructure and operations.

The NORC team also analyzed PAC financial statements from 2006-2014 in order to understand how labor and other human resource-related costs changed following completion of the project. While it is difficult to ascertain whether total labor costs will increase or decrease in absolute levels it can be expected that labor costs should decrease as a percentage of total OPEX due to operational efficiencies that are gained from the investment.

Challenges

This evaluation only assesses direct port employment. In the Option Years, the MCC may elect to delve more deeply into this topic, in which case the team could also assess the effect on indirect port-sector employment. This would likely require conducting surveys.

Analysis

Changes in Employment Levels

Port concessions have a sometimes conflicting effect on employment at the port and in the port industry. On one hand, employment at the port itself, and specifically the port authority, typically falls when moving from public to private operation as public-sector-run ports often have inflated employment which is rationalized with privatization. On the other hand, as port efficiency and competitiveness improve and cargo volumes increase, the industry hires more employees to handle the cargo and move the cargo to its destination (increasing employment of freight forwarders and related industries). When processes are automated, manual labor may decrease, but skilled labor in the form of crane operators will increase. Employment will also temporarily increase during

periods of port expansion and construction to increase capacity. The net impact on employment depends on the extent these forces offset each other.[201]

It is difficult to get a sense of changes in port sector employment before and after the MCC's investment without conducting formal surveys similar to the ones conducted by the port advisor in 2007. Table 29 contains all of the information that we were able to collect quantifying port sector employment before and after the MCC's investment, noting that the 2014/2015 data are incomplete and not comparable to overall numbers from 2007 or 2011, which include different and additional categories of employment.

Table 29. Port Sector Employment Before and After the MCC Investment

Employer	2007 [a]	2011 [b]	2015
Bolloré Benin Terminal	0		424
PAC Employees	440		587
Stevedores			
Bolloré Benin Terminal	0		150
SOBEMAP Supervisors	150		
SMTC	560		
COMAN Supervisors	132		
Dockers	5000	5000	5000
Customs brokers (formal)			100
Employees of formal customs brokers including logistics			13000
Customs brokers (informal)			5000
Formal Sector Companies and Users of the Port	31434		
Informal Sector Companies and Users of the Port	5390		
Total Employed	43106	37000	
Number of businesses	1504	1000+	
Formal sector businesses	1014		
Informal sector businesses	490		

Sources: 2007 Port Advisor Report, 2011 MCA-Benin Focus Bilan Closeout Magazine, and NORC study team (2015).
[a] Excludes Customs, Police, Gendarmerie, Security, food and fish sellers in the Fishing Port. Numbers in the 2007 Port Advisor Report for PAC employees do not seem to include part time employees, which have been added as per PAC financial statements.
[b] Includes PAC employees, customs, police, gendarmes, private security, food and fish vendors (at the fishing port), and cargo handling/stevedores

However, it is clear that direct employment at the port has increased since the MCC's investment. PAC employment increased from 384 permanent employees in 2006 to 532 in 2015. Total employees including contractual employees also increased. In particular, the number of top executives almost doubled between 2006 and 2015 from 74 to 134.

[201] World Bank, Port Reform Toolkit. Labor Force Management Section

Table 30. PAC Employment Before and After the MCC Investment

Year	Categories, professional				Contractual	TOTAL Permanent	TOTAL General
	Top Executives	Middle Managers	Foremen	Agents of Execution			
2006	74	45	134	131	unknown	384	
2007	84	59	137	168	unknown	448	
2008	86	53	195	104	20	438	458
2009	97	50	184	110	59	441	500
2010	101	53	206	123	42	483	525
2011	104	53	206	122	74	485	559
2012	125	61	206	116	74	509	583
2013	118	56	197	123	77	494	571
2014	119	55	188	122	75	484	559
2015	134	42	191	165	55	532	587

Source: PAC.

In addition to an increase in the number of PAC employees, Bolloré also employs 424 people at the Benin terminal, plus another 150 stevedores. This essentially indicates that in 2015, 1,011 people were employed by either the PAC or Bolloré tasked with operating the Port of Cotonou. This is an increase of over 150%.[202]

PAC profit and loss (P&L) statements show an increase in labor costs of 55 percent from 2006 to 2014. At the same time, there was a 57 percent increase in profit. Hence, an increase of 150 percent in employees was expected as a temporary increase during periods of port expansion and construction to increase capacity this positive outcome created local jobs and achieved a correlated profit growth.

Changes in Labor Productivity

As shown in Table 31, labor productivity fell by an estimated 30% from 2008 to 2014. This reflects the fact that PAC employment increased while an additional 424 employees were added to operate Benin Terminal and increases in volumes did not keep up with the increases in employment.

Table 31. Port Employment Productivity per metric tons before and After the MCC Investment

Year	2008	2009	2010	2011	2012	2013	2014
Total Employees	458	500	525	559	583	995	983
Metric Tons	6,998,390	6,698,365	6,959,355	6,804,634	7,439,306	8,839,019	10,547,445
Employment Productivity per metric tons	15,280	13,397	13,256	12,173	12,760	8,883	10,730
% Change (2008 as a base)		-12%	-13%	-20%	-16%	-42%	-30%

Sources: Bolloré and PAC.
Note: Bolloré employment for 2015 was assumed to be the same in 2013 and 2014 and has been added to total employees. Does not include Maersk employment.

[202] Assuming that the same number of contractual employees worked in 2008 as did in 2006.

Changes in Skill Sets

Under the terms of the Bolloré concession, Bolloré is required to supply cargo handling and lift equipment which not only affords opportunities for significant improvement in ship unloading and loading times and in cargo throughput cycles, but which also affords opportunities for significant gains in labor productivity. Cargo-handling "mechanization and computerization" requires fewer man-hours to handle the same volume of traffic. However, they also require different skills sets and higher levels of technical competence. Heavy lift equipment operates only as effectively and efficiently as the trained personnel which operate it.

The impact of mechanization and computerization on the labor market which operates within the Port of Cotonou is profound. Significant differences have already emerged in the skill sets which dock workers possess. In this context, comparisons among those workers who operate different categories of heavy lift equipment for Bolloré and Maersk Moller are relevant with experienced and trained "smart equipment" operators receiving premium pay for their specialized skills while other dock workers who have not received training left to compete in a progressively shrinking market for unskilled dock labor.

Under its concession agreement, Bolloré has the right to recruit and to engage the specialized labor forces which it requires. Bolloré also has the obligation to train its labor force and to supervise that force to assure safe and efficient operations. By establishing precedents for recruitment, reskilling and skill upgrading the Bolloré concession sets precedents for operations in the Port which still need to be codified in regulations or in law to secure their standing and to assure that their precedent holds for future concessions.

In-sourcing vs. Out-sourcing of Labor

As reflected on PAC P&L statement, labor costs presented an upward trend from USD 3.7 million in 2006 to USD 8.12 million in 2014; however, the improvements made to the port infrastructure and operations yielded operational efficiencies gains shown by the decrement of labor cost as a percentage of total operating cost starting from 38 percent in 2010 to 25 percent in 2015.

Furthermore the efficiency gains and continuous improved skills during the period can be observed by the percentage increase in-sourcing activities. In 2014 it reached a record high of 93 percent, reflecting a skilled labor force capable of performing practically all tasks in-house.

Table 32. PAC In-sourcing and Out-sourcing of Labor, USD or %

PAC P&L USD	2006	2007	2008	2009	2010	2011	2012	2013	2014
Labor Cost	3,675,078,927	4,220,916,593	5,453,230,288	6,132,549,244	6,887,397,279	7,406,909,320	7,331,615,725	8,248,716,516	8,121,325,343
In-sourcing	3,245,082,596	3,719,032,092	4,921,040,995	5,630,439,692	6,167,752,501	6,674,677,563	6,540,375,940	7,297,179,203	7,574,909,463
% In sourcing	88%	88%	90%	92%	90%	90%	89%	88%	93%
Out-sourcing	429,996,331	501,884,501	532,189,293	502,109,552	719,644,778	732,231,757	791,239,785	951,537,313	546,415,880
% Out -sourcing	12%	12%	10%	8%	10%	10%	11%	12%	7%
Total OPEX	12,575,951,594	16,825,966,843	17,374,965,434	19,617,335,321	18,288,652,574	25,128,403,395	27,370,677,592	34,663,656,882	32,669,660,387
% Labor cost / Opex	29%	25%	31%	31%	38%	29%	27%	24%	25%
Profit / Loss	825,419,528	290,801,343	824,030,966	600,431,536	1,664,218,831	(8,742,374,232)	(3,854,717,937)	(23,511,136)	1,916,367,939

Source: PAC Financials.

Changes in Formal and Informal Sector Employment

The informal economy is supported by various forms of 'informal employment' or employment which lacks legal and social protection. Informal employment occurs both inside and outside infor-

mal enterprises. It includes both self-employment in unregistered enterprises and wage employment in unprotected jobs. Informal or casual employment tends to be at higher wage levels and with more male than female representation.

The informal economy accounts for the largest share of Benin's overall economy because the incentives associated with working outside formal legal and social protections are greater than incentives associated with working inside these same protection frameworks. The gradient between informal and unregulated and formal and regulated employment is a continuum and not a digit, one or the other, attribute of labor markets. Typically significant formal/informal labor market differences exist between sectors depending on the competitive structure of specific sectors and the regulatory role of government in each. In sectors which deal with the illicit trade in goods and services government regulation is minimal and informal labor relations predominate.

As already noted, the port services sector in Benin has been weakly regulated, until recently. The predominant share of labor has been unskilled or semi-skilled and the rules and regulations which affect employment have been enforced primarily on a seniority basis. The modernization regime now being implemented should result in programs that gradually transform service-supplying vendors and replace unskilled or semi-skilled workforces with an increasingly skilled labor pool. Unfortunately, the project review team found little evidence that this kind of conversion was explicitly a part of the PAC's development plan.

Interpretation and Findings

The above section answers the research question: What net change can be observed in employment among the permanent and non-permanent employees in the port sector following completion of the works? As noted, the performance evaluation only assesses direct port employment; employment outside the port could be assessed through surveys during the option years. Changes in port employment from 2006 to 2015 (unless otherwise noted) include:

- A 39% increase in PAC permanent employees;
- A 28% increase in PAC general employment from 2008 to 2015;
- A doubling of top executives at the PAC from 74 to 134;
- A 150% increase in permanent employment at the port when considering the addition of Bolloré's 424 employees in addition to the PAC employees;
- A 55% increase in PAC labor costs from 2006 to 2014 and a 57 percent increase in profit;
- A 30% decrease in employment productivity per metric ton from 2008 to 2014 (including Benin Terminal employment for 2013-2014);
- An increase in PAC in-sourcing of labor from 88% in 2006 to 93% in 2014; and
- A decrease in PAC labor costs as a percentage of OPEX, from 29% in 2006 to 25% in 2014.

Increases in in-sourcing reflect an increase in the PAC's in-house skillsets. While port employment increased, it did not affect port profitability. However, increases in port employment did not keep up with port volumes, indicating a decrease in productivity. To increase efficiency, PAC employment should be reduced.

Assessment of Corruption

Corruption is rife in Benin, just as it is rife in each of Benin's trading partner counties. Corruption is particularly significant when assessing the potential beneficial effects of improved trade logistics, because it influences and distorts many of the individual decisions taken within cargo arrival to delivery chains and thus diminishes the beneficial impact of investment programs like the one that the MCC supported.

Corruption, moreover, can assume a diversity of forms in an economy like Benin's. Some of these forms affect high-level decision making including regulatory policy, infrastructure design and contract awards. Other more petty forms affect work-a-day decision making and routine business processes in which customs, port authorities and other agencies of government interact with private-sector counter parts.

In a recent report to Congress concerning the ways in which the MCC confronts fraud and corruption, the agency explained that it addresses corruption up front when it select countries with whom to partner as well as subsequently after partner choices have been made when designing and implementing programs intended to improve governance and to reduce the incidence of corruption.[203] For the MCC, reduced corruption is both an initial partner-selection criteria and a program objective.[204]

The Report to Congress explains the reasons for MCC's preoccupation. Most importantly, corruption retards economic growth. In emerging markets corruption adversely affects the basis on which private companies compete with each other by creating a new basis (e.g., economic rents) which distort prices and increase transaction costs. Economic rents also diminish productivity in so far as they increase investment requirements and reduce benefits realized from investment. Corruption also undermines institutions. It reduces their credibility and hence their effectiveness. It makes institutions, including both market institutions and government bureaucracies, less compelling in setting rules and in enforcing them. Corruption also undercuts the rule of law and thus diminishes contract enforceability, which in turn injects greater risk into a developing economy. Further, corruption diminishes prudent public financial management. It undercuts accountability for public spending and it increases the share of investment both public and private that goes into unproductive projects.

It follows that measures of corruption are one of the most important metrics that the MCC uses to monitor the productive use of its investments. The MCC requires partner countries to reduce corruption in their own business/policy environment as their contribution to MCC development projects. The analysis presented here attempts to measure the extent to which the Port of Cotonou project succeed in reducing corruption.

[203] Report to Congress: MCC's Approach to Confronting Corruption, March 2012; https://assets.mcc.gov/reports/report-2012001100401-corruption-approach.pdf

[204] "Corruption" is one of the two "hard" eligibility conditions that the MCC applies when selecting its Compact partners. The other "hard" condition is "democratic rights."

Summary of Methodological Approach

This section addresses the following research question:

- What has been the cost of corruption?

Approach

In order to measure "corruption" at the country-wide level it is essential to secure creditable data that is consistent so that cross-country comparisons can be made, replicable in methods and sources over time so that time-series comparisons can be made and that the data collected correspond to the types of corrupt practices that affect economic development.

A significant literature has emerged around the issue of choosing and applying appropriate corruption metrics suitable for MCC use.[205] What has emerged from this literature are findings that no perfect metrics exist but that some aggregate metrics (indices) are better suited to the requirements of the MCC than are others.

After thorough consideration the MCC has adopted an index that measures corruption at the national level. The NORC team applied this same index measure in its assessment of corruption in Benin to the period before and after the implementation of the Compact.

The index chosen is a composite of survey data captured and tabulated annually by the World Bank and the Brookings Institute as well as expert-pool data. The composite index that the MCC has adopted is one component in The World Bank/Brookings Worldwide Governance Indicators. It is called the "Control of Corruption Index" (or CCI) and as noted it serves as the operational basis both for MCC partner selection and for tracking corruption reduction impacts resulting from MCC investment.

The World Bank/Brookings define the Control of Corruption Index as follows: "The CCI captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.[206] "The authors of the index explained its merits and deficiencies in an early paper that explained:

The index is composed of a weighted average of several primary and secondary data sources. These include original surveys of businesses, surveys of consumers and citizens, and opinions of experts as well as elements of other corruption surveys. The authors of the CCI weigh the index's different components so that their contributions reflect the author's best judgment concerning their relevance to a development relevant composition. The number of independent sources that make up the Benin CCI have increased over time. Thus in 2004 the CCI for Benin was based on 5 sources. This number increased to 11 in 2007 and 2008 only to level down to 10 sources in 2009 where it remains today.

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[205] "Hating on the Hurdle: Reforming the Millennium Challenge Corporation's Approach to Corruption," Casey Dunning, Jonathan Karver, and Charles Kenny March 2014 and "The Worldwide Governance Indicators: Six, One, or None?" Laura Langbein and Stephen Knack, *The Journal Of Development Studies* **46**(2), 201

[206] "Aggregating Governance Indicators**",** D. Kaufmann, A. Kraay, and P. Zoido-Lobatón, World Bank, Working Paper, 1999.

The NORC team used another published data set to measure port related corruption. This was the "Global Enabling Trade Report", which the World Economic Forum publishes annually. This complementary data set deals exclusively with trade/port sector performance, including corruption. Like the CCI, its elements are composite indices made up from a number of primary surveys and pools. The data have been tabulated and codified by a consortium of researchers at the World Bank, UNCTAD and the World Economic Forum.[207]

Five elements of the Global Enabling Trade Report deal specifically with corruption issues. These are: i) customs service index; ii) customs transparency; iii) efficiency of the clearance process; iv) time to export: border compliance; and v) irregular payments and bribes (imports and exports).

In addition, the project team attempted to assess the effectiveness of various measures that the Port Authority and the Government of Benin more generally have adopted in order to reduce the incidence and cost of corruption, including, importantly, measures taken to immunize the MCC project from corruption. Data used in these assessments came from diverse sources, including MCC project impact surveys, focus-group interactions conducted in support of this project, and one-on-one interviews conducted with various knowledgeable authorities.

Challenges

As noted above, the objective of reducing corruption within partner countries plays a key role in all MCC projects. Measuring "corruption" within a partner country, however, poses significant challenges.

Corruption is closely linked to and supportive of the informal economy discussed in the section above and, like information relevant to estimating the size and growth of the informal economy, accurate data regarding corruption in its multiple forms is difficult to secure with a high degree of confidence. Principals who are affected directly by corruption have no incentive to reveal their involvement or, indeed, to provide estimates of the impact and consequence of their involvement. Thus most estimates of corrupt practices entail the collection of subjective assessments through surveys and/or polls. Thus the attribution of actual corruption is, of necessity, indirect.

A number of surveys exist, each one designed to estimate different aspects of corruption from the perspective of the specific affected population segments.[208] Still none of these third-party surveys precisely matches the needs of the MCC or indeed of the GoB for feedback on the success of failure of specific anti-corruption initiatives.

Measuring "corruption" in ways that are useful to advancing MCC's overall growth and poverty alleviation agenda poses a number of methodological, as well as practical data collection challenges. For example, different types of corruption exist and these different types differ with respect to their economic impacts, the types of corruption processes involved, their relevant institutional settings and the economic sectors that they most affect. Different data collection methods exist (for example polling experts and surveying selected populations). These differ not only in their

[207] http://www3.weforum.org/docs/WEF_GETR_2016_report.pdf

[208] Additional sources include Afrobarometer; Country Policy and Institutional Assessment Data Base; The Doing Business Data Base; Global Insight; Economist Intelligence Unit Data; Freedom House; Global Competitiveness Survey; the Global Integrity Index; Heritage Foundation; WB Investment Climate Surveys; Ibrahim Index of African Governance; and the World Competitiveness Yearbook.

primary sources but also in their survey design and in thus in their statistical validity.[209] So, no single measure of corruption is likely to correspond to all of the corrupt practices that actually take place within a country.

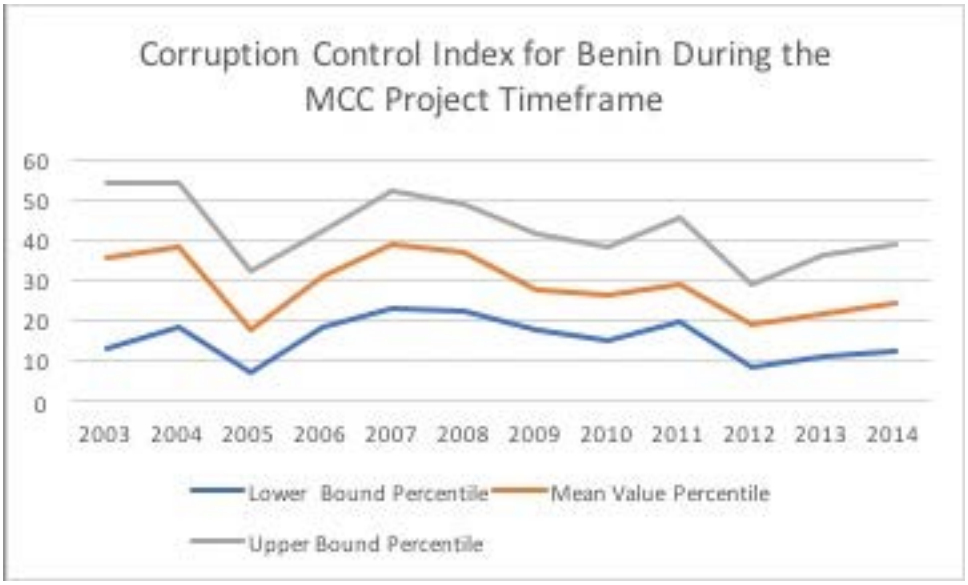
Another challenge is that most measures of corruption are based on the subjective assessments of businesses or citizens who corrupt practices impact. Their assessments are likely to be influenced by past values of the indicator itself and to be affected by their still more general perceptions of government effectiveness, extent of personal impact rather than objective measure of severity, etc. In addition, perceptions may not change as quickly as the actual underlying incidence of fraud, extortion, graft and other forms of corruption.

Analysis

Incidence of Corruption in Benin

The graph below presents the "Control of Corruption" Index for Benin between the years 2003 and 2014. The parameter represented in the graph is the estimated percentile corresponding to government control of corruption for Benin versus survey scores of 150 other developing countries. Because of uncertainties inherent in the estimate of the CCI a range of values for Benin's percentile is specified.

Figure 38: Corruption Control Index for Benin During the Compact Period



Source: The World Bank/Brookings Worldwide Governance Indicators.

As the graph demonstrates the CCI remained relatively stable for Benin before the MCC Compact was implemented albeit at low levels. However the index declined sharply in 2005 as the Compact was being implemented. Subsequently corruption control improved marginally in 2007 and 2008

[209] "Governance Indicators: Where Are We, Where Should We Be Going?", World Bank Institute Global Governance Group and Development Research Group Macroeconomics and Growth Team; D. Kaufmann A. Kraay.

only to revert back to low levels of corruption control in 2009-2011 and to continue to deteriorate after 2011 to record low levels. This review of the CCI suggests that no improvements in overall national corruption control were realized as a result of the MCC Compact.

Data assembled in the Global Enabling Trade Data Base confirm that little or no improvement has been made with respect to corruption that effects trade facilitation and port operations specifically. As the table below demonstrates, the trend as well as the starting point for corruption affecting trade and transport remains a very significant problem in Benin.

Table 33. Indices of Corruption affecting Trade and Transport

Indices Relevant to Corruption Affecting Trade and Transport		
	Rank out of 136	**Trend**
Customs Service Index	113	Declining
Efficiency of Clearance Process	116	Declining
Time to Import: Border Compliance	94	Declining Sharply
Irregular Payments and Bribes: Imports and Export	128	Declining
Customs Transparency Index	110	Stable
Source: Global Trade Enabling Trade Report 2016		

The pervasiveness of corruption in Benin during the Compact implementation period is mirrored in several additional, measures of governance and surveys of citizens' perception of corruption. For example, according to the survey conducted annually by Transparency International, Benin has been failing in recent years both in its ranking and in its absolute level of corruption. In 2014 it ranked 80th among 177 countries covered in Survey where its Perceptions of Corruption score was 39. This is on a scale from 0 (deeply corrupt) to 100 (almost completely uncorrupted).

Benin has slid backwards in that survey over the last decade with respect to government control of corruption from 28.29 in 2002 (on a scale of 0-100) to 19.14 in 2012. Significantly as well, Benin has made little headway with respect to the Freedom Heritage Foundation index of economic corruption. On this basis it received a score of 57.1 (slightly higher than the regional average of 54.6). The Freedom Heritage survey downgraded Benin, particularly with regard to general pervasive petty corruption, and scored it at 29.5 on a scale of 0-100.

Significantly, corruption is a major inhibitor to private sector development in Benin. Companies surveyed in the World Competitiveness Report 2013-2014 declared that corruption is the biggest obstacle to doing business in the Benin, followed by access to financing and inefficient bureaucracy. Similarly, the results of the Enterprise Survey of the World Bank for 2009 showed that a third of respondents perceived corruption as a major obstacle to doing business in the country. Most private companies in Benin face petty bribery as well various kinds of administrative corruption. For example, in the most recent World Bank Doing Business Survey private companies declared that they are expected to make a donation valued at 5% of contract value for a public contract. Larger contracts require still larger payments.

Corruption appears to permeate all levels of government and all government activities in the country. In an UNDP survey conducted in 2008, Beninese companies acknowledged other forms of corruption, such as informal payments to obtain tax reduction (80%), a favorable court decisions (70%), a positive procurement outcome (70%), access to public services (67.5%), and an import permit (56.1%).

In spite of progress made to date, the Government of Benin continues to face major corruption challenges. Corruption in Benin affects all levels of government operations, from day-to-day interactions between citizens and low ranking civil servants to high level corruption involving senior officials who are alleged to have steer large investment projects to their clients.[210] Recent corruption scandals have involved high-level members of the current government and could potentially undermine the credibility of the government's anti-corruption efforts and citizen perceptions regarding the political will of the government to fight corruption.[211]

High-Level Corruption

Several senior officials have recently been accused of requesting payment for approval of large scale projects. These high-visibility instances of corrupt practice have tainted the government and called into question its commitment to actually fighting corruption. In 2010, for example, a major financial scandal filled the front pages of local newspapers. This scandal known as "the ICC business services" alleged the involvement of high-level government officials in an illegal system for managing investment funds. The construction of the new building for the National Assembly began in 2009 in Porto Novo. This project came under public scrutiny when construction was stopped with less than half of the finished work, but with two thirds of progress payments already paid to the contract awardee.

Petty Corruption

Petty corruption is widespread in daily interactions between citizens and public officials. Extortion of bribes by police officers, for example, is commonplace. Citizens interviewed in the 2013 Afrobarometer acknowledge that petty corruption is widespread in public administration. The vast majority, 87%, believe that some (45%), many (30%) or all (12%) public officials are involved in corruption. More specifically, 53% of respondents believe that tax officials are corrupt; 45% believe that most judges, magistrates and police officers are also involved in corruption. Several surveys confirm that corruption is the primary obstacle to business investment. Practically every dimension of the business environment is in need of reform and modernization, including land titles, the establishment of a tribunal to resolve commercial contract disputes, and the empowerment of another specialized tribunal to resolve disputes involving international commerce, multimodal transport and ocean shipping. The prevalence of informality in almost every sector of the service economy only compounds problems associated with contract enforcement, unreliable delivery of public services and unreliable dispute resolution all of which causes feedback into the country's commercial system and diminishes incentives for firms to transition from the informal to the formal sector.

[210] Based on conversation with the head of the ANLC as well as with several ship agency representatives conducted during the NORC team mission to Cotonou.

[211] Ibid

Managing Corruption in MCC Project Implementation

Programs designed to immunize project implementers from corruption and to remedy fraud before it is carried out are designed into every MCC project. At the start of every Compact MCC makes systematic efforts to combat corruption. It designs appropriate remedial mechanisms into all of its projects, including ones designed to counter fraud, the misuse of funds, the non-competitive award of contracts and other types of corrupt behavior which may infect a MCC supported project. Before project implementation commences the MCC takes concerted steps to assure that the use of MCC funds is efficient, that contractors are fairly selected, that best-practice procurement methods are applied that these assure value-for-money results.

To guide project implementation, the MCC has developed specific protocols which are implemented through its in-country offices and which entail local MCA officers to develop close check-and-balance relationship with government project implementation staffs. One of the commentators on this report pointed out that a major accomplishment of this project was the trusting and mutually supportive relationships, which developed between the MCA and GoB officials. He noted that without these relationships implementing the project successfully would not have been possible. The NORC team concurs with this assessment. The team witnessed the effects of the close working relationship on project propriety.[212] MCA staff worked closely and effectively with several echelons of decision makers within government to deliver project results within narrow timeframes and tight budgets and importantly without any improprieties. In the case of the MCC Port of Cotonou project the NORC project team determined that all appropriate procurement and fiduciary anti-corruption safe guards mandated in the Compact were followed.

The MCC has codified "best practice protocols" for procurement, funds management and contract specification and planning in a policy manual, *Policy on Preventing, Detecting and Remediating Corruption and Fraud in MCC Operations*. Prescribed protocols detailed in that manual deal with: i0 the appropriate management of funds, ii) proper contract procurement methods, iii) appropriate competitive tendering methods for project components of different sizes, and iv) rules affecting the competitive procurement of all project elements. Partners are required to commit themselves to these protocols during the project preparation period and these commitments are subsequently codified in the Compacts that partner countries enter into with the MCC.

In this project MCA's in-country staff closely monitored these commitments, which entail use of specific financial reporting controls, independent third party audits, transparent procurement processes, contract award processes that are open, competitive, contestable and transparent, independent expert reviews of procurement plans and budgets, quarterly reporting on project expenses, disbursements and implementation progress measured against schedules contained in procurement contracts.

Government Programs Designed to Address Corruption

President Thomas Boni Yayi was elected in 2006 on an anti-corruption platform. Since he took office, Benin has undertaken a number of legal and institutional reforms. For example, a new anti-

[212] In its response to reviewer comments the NORC team noted that all project implementation is "local." and requires managers to do the best they can with the human, institutional and budget resources that they have available. The NORC team agrees that the MCC should be congratulated for delivering a complex project under difficult circumstances. The team has the benefit of 20/20 hindsight that the project implementers did not.

corruption law was passed in 2011 and a number of anti-corruption institutions have been established. These include the National Public Procurement Regulatory Authority (Autorité Nationale de Régulation des Marchés Publics), a national anti-corruption authority (Autorité nationale de la lutte contre la corruption), a financial intelligence unit to fight money laundering (Cellule nationale de traitement des informations financières) and an office of the ombudsman (Médiateur de la République).

Some reforms have indeed been successfully implemented over the last decade and among these reforms affected within the Port of Cotonou are most noteworthy.

Interpretation and Findings

Reduced Incidence of Corruption on the Port

Data which the project team collected during its mission demonstrates a progressive decrease since 2012, in average cargo release times at the Port of Cotonou. Additional anecdotal evidence suggests that incidents of pilferage, lost and damaged cargoes on the Port have also been declining progressively. What was previously a serious problem in Cotonou and a source of competitive disadvantage has become a source of competitive superiority.

The gradual improvement in performance is largely due to changes in port procedures and operations. Improved on terminal work management systems, which both Bolloré and Maersk have implemented, leave little slack time nonproductive activities to stevedores who are in any case motivated by productivity based compensation systems to remain focused on service delivery. At the same time first line supervision has improved both in its effective terminal control. The video-monitoring systems implemented under the MCA project and staffed around the clock by PAC staff have created an effective system of detection, attribution and penalty which has further reduced incidents of cargo theft and damage.

As a result, average container dwell time decreased from 28 days in early 2012 to around 12 at the end of 2013, and the self-insurance pool supported by shipping agents has been able to reduce its premium levels. Data on container clearance times taken from the single window system show that most of the improvement in more rapid in and out activity was achieved because of better coordination between customs agents and stevedores and more rapid customs release of cargos.

Unanticipated Impacts

Summary of Methodological Approach

Approach

This section addresses the question:

- What were unanticipated positive and negative impacts of port investments? What were unanticipated institutional, economic, et al. positive and negative impacts of port investments?

During the team's review of secondary document's and through the team's field visit, potential unanticipated impacts were identified. The team conducted further secondary research when possible, and provides a qualitative assessment of the issues below.

Challenges

The main challenges that the team faced regarding unanticipated impacts were access to information and budgetary constraints in further assessing these impacts. While some of these issues may merit further analysis, this was not possible within the base year budget and level of effort; it is recommended that these unanticipated impacts be further explored or assessed during the option years.

Discussion of Unanticipated Impacts

The Shifting Political Economy of the Port of Cotonou

The commercial ecosystem of the Port of Cotonou has been disrupted by the MCA investment, in ways which were not anticipated when the project was being planned.

Before 2006 the port community included, in addition to the PAC the following participants: i) shipping agents who represented the interests of the major lines calling on the port; ii) stevedoring companies who transfer loads from the ocean to land side of the port (there were 5 of these); iii) stripping, stuffing and storage companies; iv) customs brokers and freight forwarders; and v) large shipping lines which provide two or more of the services above both for their own uses and for other smaller lines whom they served. Maersk, for example, is a shipping agent as well as a stevedoring company, customs broker and warehouse operator. Maersk provides these services to several client lines as well as for its own line's use.

Since 2006 several concessionaire companies (e.g., Bolloré Terminal Operators, STTB and SEGUB) have joined the port's commercial ecosystem and their entry has affected preexisting equities among the other participants. While carrying out their concession-mandated core functions, all three concessionaires have extended their control over multiple additional aspects of the port's service delivery system. In this way, they have blurred some of the sharp functional distinctions, which previously separated service providers into well-defined categories.

In this process Bolloré has been the biggest winner. As one of the shipping agents interviewed during a focus group explained: "Bolloré is now effectively able to operate as a shipping company." With the initiation of the Bolloré concession, the port has now become divided between two poles: a southern quay which by virtue of mechanized equipment, a dedicated entry gate, and close-by intermediate storage has become the high service zone for large container vessels; and ii) the northern quay which remains congested and which affords limited landside mechanized lift capabilities, limited close-by intermediate storage, and a longer truck haul to the port's primary terminal gate. Importantly, multiple container handlings are required for each container handled on the North Quay while fewer container handlings are required to mount a container on a chassis on the South Quay.

The North Quay has become the integrated, high service zone while the South Quay remains the lift-on and lift-off medium-service zone with extremely limited holding capacity.

Importantly, interested parties deeply involved in the port business perceive that a titanic competition has emerged between Bolloré and Maersk for control over the systems, modes and means by which the Port will develop in the future. However, this simple representation of what has emerged overstates the case.

In fact the real competition/cooperation between the two is much more complicated. For example, Bolloré services the largest Maersk container ships at its dedicated terminal on the South Quay while Maersk discharges smaller container vessels using ship's gear at the dedicated terminal which its affiliated stevedoring company operates on the North Quay. Maersk has made several overtures to the PAC and the GoB regarding its interest in developing a fully integrated quay on the South comparable to the Bolloré's on the North. In any case, the competition between these two companies – Bolloré and Maersk – is likely to impact the strategic direction and consequently the success or failure of the MCA investment over the long term.

The involvement of other concessioned service providers has had other unanticipated knock down effects on the port's business ecosystem, as well. For example, the implementation of the STTB system has had the effect of raising the standing of licensed customs brokers who operate in the formal sector. It is licensed customs brokers whom the STTB system empowers to generate advice regarding truck pick-ups and deliveries to the MCA-funded parking lot inside the Port Gate. This control authority not only elevates customs brokers in the formal sector above ones in the informal sector, but it also subordinates truck dispatchers and informal truck brokers to licensed customs brokers. At the same time it significantly improves the productivity of customs brokers in the formal sector and creates a new revenue stream for them.

These are examples of the kinds of embryonic "weed and feed" activities which the PAC should be planning to undertake to improve its competitiveness. The serial implementation of various private third-party-provided control and management systems extended perhaps beyond the terminal to gateways with Burkina, Niger and Nigeria. These afford an opportunity for systematic improvement of Cotonou's competitiveness vis-à-vis Lomé, Tema and Abidjan. However, the project team came away from its field visit with the sense that this consequence was more serendipitous and unplanned than designed strategically by the PAC.

Sequencing of Key Project Preparation Elements

As noted above, no comprehensive legislation exists for port sector regulation and oversight in Benin. In particular, the day to day management of concessionaires like Bolloré who control terminals within the Port has not been responded to with the creation of new regulatory guidelines. The project could have been better designed to require new legislation and related regulatory reforms in advance of and as a condition for the final disbursement of funds.

By way of explanation, one of the third party reviewers of this evaluation who was also involved in planning the MCA investment, pointed out that "MCA had limited leverage at the end of the Compact to push the Government of Benin to implement the reforms that had been planned as part

of the compact. At that time, he noted further, corruption was seriously interfering with port operations, so MCA joined Bolloré in highlighting the responsibility of the Government of Benin to take action."

Another important issue involves the timing and sequencing of concession preparation. The timeline below demonstrates just how compressed were the several sets of activities which needed to be mutually reinforcing and closely coordinated in order for the PPP project to succeed:

- November 2008: IFC signs contract with Ministry of Development to provide Financial Advisory Services
- December 2008: IFC begins its due diligence review
- January 2009: IFC announces coming offer to prospective bidders
- Jan- April 2009: IFC contracts for legal and technical due diligence report
- April 2009: IFC draft request for concession proposals and forwards to potential bidders
- June 2009: IFC request expression of interest from potential bidders
- August 2009: Bids submitted by qualified bidder(s)
- September 2009: Winning proposal acknowledged and concession signed
- January 2010: Bolloré begins Terminal-Finishing Construction

This schedule allowed too little time for the completion of the IFC due diligence, concession contract development and competitive tendering process which led ultimately to the award of the contract for the operation of the South Terminal. In the end only one bidder submitted a qualified bid for the concession.

This tight timeframe resulted from the requirements of the MCC Compact and the condition it imposed on the Government of Benin that a qualified concessionaire be chosen by the end of 2009 who was able to consult on final plans for quay design and civil works completion. Project design had been finalized long in advance of the concession award and as it turns out the concessionaire had some fundamental problems with that design since it did not allow deep-draft vessels to use the South Terminal. Moreover, the civil works contracts in which the MCC entered contained tight works delivery schedules and conditions which effectively precluded change orders with respect to additional dredging.

The next result was an inability to include concessionaire concerns in time to respond to those concerns under the existing construction contract. The GoB had to seek additional funding and technical design support from the WB to compete the dredging element of the project and the WB's due-diligence process further delayed the implementation of the concession which required the GoB to deliver on its commitment to completing deep dredging of the turning basin and the approach channel before performance conditions on the concessionaire began to bind.

Government Counterpart Functions

The concession development work, which the IFC carried out was managed by and for the Ministry of Development which had assumed cross-sector responsibility under the new government for managing large-scale procurement projects. The minister of this ministry assumed a prominent role as a reformer. However, no effort was made during the concession preparation process to transfer skills or to build capacity within the ministry. As a result, the GoB still lacks the skills and

capacities required to design effective PPP's with which to engage private sector investors in the development and launch of new public services.[213]

The distinction here is the important one between catching fish for consumers and teaching them how to catch their own fish. With knowledge about best practices for designing and implementing PPP contracts key government officials can become more sophisticated in their use of PPP instruments even if they continue to outsource the development of PPP transactions to qualified financial advisors.

The GoB awarded a contract to the IFC to provide financial advisory services without going through a competitive tendering process and without drafting a detailed TOR for the IFC's work assignment. The IFC's obligations to the GoB ended following the selection of a concessionaire. It did not include support to the government for the final negotiation of a concession agreement with Bolloré. However, it was in this final critical step that mistakes were made. The concession agreement, for example, set out penalties for the concessionaire should the concessionaire fail to increase traffic volumes to expected level. However, it also in included reciprocal conditions that the GoB has been unable to satisfy, thus nullifying the demand side contractual commitments of the concessionaire.

Operational Issues

Dredging

As noted above, the MCC's investments allowed for more ships to call on Cotonou, but did not account for increased vessel sizeThe PAC committed to investing 38 billion CFA in complementary works to meet the unanticipated issue of dredging and widening the access channel to allow for larger ships to call on the port. As this issue was not anticipated until it was brought up by the concessionaire, the works were delayed. As of September 2015, the works were nearing completion, but not completed. Interviews with shipping lines indicated that the delays and lack of communication regarding the timing of the completion of the works led to problems with scheduling vessel calls. Larger ships would have been able to call on the port earlier if the works had been completed by the opening of the South Terminal in 2015.

Piloting

As discussed in the section on level of service, time at berth and waiting time at anchor are still much higher than expected and it is our understanding that much of these delays stem from issues with piloting. These delays have had unanticipated impacts on the impact of the MCC's investments.

[213] A reviewer provided this alternative perspective: "The evaluation team obviously spoke to GOB officials who believe this to be true. However, I attended many meetings at which IFC and its consultants made every effort to explain and brief counterparts on best practices. This experience should have provided a good foundation for the next PPP. I doubt that formal training programs would have done better."

Environmental Impacts

The coastline where the Cotonou port is located experiences incessant wave attacks and features a longshore sand transport rate of 1 million m^3 per year (moving from west to east and east to west).[214] The biggest environmental impact caused by the port facility is the blockage of the above-mentioned sand passageway. As a result, a large beach has accumulated on the updrift (west) side of the port facility. Although the above-mentioned phenomenon has been appearing since the port construction during 1965, local communities have alleged that such accumulations were have increased with the recently constructed extension of the jetty constructed at a right angle to the shore and photographic evidence the team received appears to substantiate this. The Harbor entrance channel-dredging requirements are escalating at a level of one million m^3 per year.[215] This phenomena has triggered an asymmetrical erosion of a similar quantity on the down drift (east) side each year.[216] This outcome was anticipated at the time of the construction of the port and it was clearly mentioned on the project feasibility study for coastal protection performed by the Ministry of Environment.

At the time the port was constructed, the erosion was not a concern for the following two reasons:

1) it happened at a slower rate and smaller magnitude; and

2) the area was largely undeveloped.

As the erosion zone escalates (potentially with a larger order of magnitude) and the city of Cotonou continues to develop towards the east, the erosion zone is now currently affecting the livelihood of the local community.

During one of our team field visits, local citizens living and operating businesses on the East side of Cotonou opposite to the port expressed concern regarding the jetty extension preventing sand from accumulating on their shores and restoring them. This situation has caused rapid erosion of the beaches to the east of the port. The team witnessed the erosion of sea front adjacent to several hotels, restaurants and private domiciles on the East side of the river basin and saw photographic evidence of erosion over time. Community action groups and organized claims have arisen in the area; several formal complaints have been filed to the Ministry of Environmental Protection.

On learning of this potential unanticipated impact of the MCC's investment, the evaluation team conducted a qualitative analysis of the situation around interviews with local citizens, port stakeholders and affected business owners, in combination with reviewing secondary documents provided to the team. In addition to reviewing the information presented by the neighborhood association, we also reviewed the MCA's environmental and social impact assessment report (Volumes 1, 2 and 3) from 2009, and pre-project environmental reports from the Ministère de l'Environnement de l'Habitat et de l'Urbanisme and Ministry of Public Works and Transports.

[214] République Du Benin Ministère De L'environnement De 'Habitat Et De L'urbanisme 1 Bp 3621 Cotonou

[215] Etude de faisabilité économique du Project pour la protection côtière à l'est de l'EPI de Siafato-Cotonou. MEHU 2004

[216] Ibid.

Such documents confirm that local communities are currently affected from erosion in the area to the east of the port construction. Although the above mentioned phenomenon has been appearing since the port construction well prior to the MCC's investment, such accumulations may have been exacerbated with the recently constructed extension of the jetty. It is important to point out that the area was largely undeveloped when the port was authorized for its construction and the subsequent infrastructure development east of the port has been constructed despite early signs of erosion. As the project team has not been able to ascertain 1) whether the rate of erosion has concretely increased since the MCC's investment or 2) a causal relationship between the MCC's investment and the erosion, we do not opine on the subject, but merely bring it to the MCC's attention, and suggest that further studies are conducted.[217]

Furthermore, the blockage of the above mentioned sand passageway in East coast of Cotonou, has caused environment side effects to the existence of endangered species (flora and fauna) including:[218]

- ***Leatherback Turtle (Dermochelys coriacea):*** IUCN (International Union for the Conservation of Nature and Natural Resources) Statute category: Seriously threatened.
- ***Green Turtle (Chelonia mydas)***: IUCN statute category: Threatened.
- ***Olive ridley turtle (Lepidochelys olivaced):*** IUCN statute category: Threatened.
- ***Hawksbill Turtle (Eretmochelys imbricata)***: IUCN statute category: Seriously threatened.

The Green Turtle, Olive Ridley Turtle and Leatherback Turtle were commonly found nesting on the coast of Benin previous to erosion occurrence.

While the scope of this performance evaluation and our availability of resources does not allow for a full quantification of the negative impact to flora and fauna through an impact assessment starting with the base year performance evaluation, a more rigorous evaluation is advised to be considered for the option year.

Social Impacts

Interviews with stakeholders introduced some potentially negative social issues resulting from the port improvements. Most of these issues were results of policies that were necessary to improve port safety and security, but should be mentioned regardless as they could be considerations if an impact evaluation is conducted during the option years. Others are a result of improved efficiency.

[217] One of the report reviewer provided the following additional information: The studies which provided the basis for building port of Cotonou, had already foreseen that there would be a coastal erosion problem on the East side of the construction to be carried out. For this reason, the land on the East which was likely to be affected had been declared by law as being the property of the port. Two breakwaters were built, including the one in Siafato, to mitigate the impacts. However, the local populations still went ahead and built their houses in these areas threatened by coastal erosion, eventually leading to the loss of many homes. Since 2004, the Government had a project to build breakwaters East of the one of Siafato, but this was only done in 2014. The delay in the execution of this project resulted in worsening the coastal erosion problem.

[218] Jetty extension in the Port of Cotonou, feasibility analysis. DANIDA, October 2003.

Controls on port access rightly limited port entry. However, interviews indicated that this may have negatively impacted informal traders, mainly women, who sold food etc. to port workers. It also impacted truck drivers who wait in the port, sometimes for days, for their cargo to be cleared. The freight forwarders indicated that their drivers are not able to leave their cargo, and now do not have access to concessions or food facilities. Improvements in customs and truck time that decrease the time truckers spend in the port should reduce these negative impacts on truckers.

While the MCC's investment included a truck parking lot inside the port, neither the investment nor complementary investments considered parking for port employees. Most port workers commute by motorcycle but motorcycles were recently banned from entering the port due to safety concerns. While this was the proper decision for safety reasons, no alternative parking spot was provided for the motorcycles. Thousands of motorcycles were therefore parked on the median outside of the port as there is no assigned parking for motorcycles and they are no longer permitted entry into the port. This was a recent measure that has improved safety inside the port, but port users had mixed thoughts about whether transportation for workers within the port was adequate, and agreed that it was a problem that no motorbike parking is available for port workers.

Figure 39: Picture of Motorcycles Outside of Port Entrance, September 2015

Finally, the public stevedoring company SOBEMAP was negatively impacted by the privatization of the South Terminal. SOBEMAP's market share for all cargo decreased from 51% in 2006 to 33% in 2014 and SOBEMAP's market share for container traffic decreased from 21% in 2006 to 3% in 2010. SOBEMAP was less productive than the private stevedoring companies (see below), so losing share actually would increase overall port productivity. While SOBEMAP lost market share, port traffic also increased so SOBEMAP's volume in tons increased from 2006 to 2014 and hiring increased as well from 4,452 dock workers in 2006 to 6,236 in 2014. As market share moves from the public to private sector, some employment is lost with efficiency gains, but is made up with increased volumes. While the public company may lose share, the net impacts on employment should be minimal, if any.

Table 34. SOBEMAP Traffic, Market Share and Productivity

	2006	2007	2008	2009	2010	2011	2012	2013	2014

Number of dock workers hired	4,452	4,528	5,180	5,865	5,897	5,775	6,342	6,389	6,236
Total Port Traffic (tons)	5,369,134	6,152,417	6,998,390	6,698,365	6,959,355	6,804,634	7,439,306	8,839,019	10,547,445
Total SOBEMAP traffic (tons)	2,618,166	2,985,216	2,699,986	2,441,830	2,440,814	1,744,947	2,427,890	2,801,165	2,933,818
SOBEMAP share of total traffic	51%	56%	44%	35%	36%	25%	36%	38%	33%
SOBEMAP containers handled (#)	22,020	24,069	28,687	2,311	5,458				
SOBEMAP share of container traffic	21%	19%	20%	2%	3%				
SOBEMAP productivity (TEU/hr)	14.83	16.82	15.4	28.17	19				
COMAN productivity (TEU/hr)	24.39	26.35	28.08	40.54	46.78				
SMTC productivity (TEU/hr)	20.44	20.95	17.03	17.59	23.05				

Source: SOBEMAP, CNCB.

Monitoring and Process Issues

Summary of Methodological Approach

Approach

This section addresses the following research questions:

- Is the Port Authority using:
  - the new MCC-funded fire protection system (including fire station, water tank, fire pump room, distribution system, fire hydrants and fire trucks),
  - the new security system and
  - the 250 truck parking lot installed as a part of MCC-funded improvements effectively?
- Is the MCC-funded electrical system fully operational? Has the service from the utility company to the central electrical station been upgraded from 2 to 10 megavolt amps?
- Are investments being sustained? If investments are not being used or sustained, why not? What can be done about it?
- What changes, if any, in the import/export tariff structure and port fees can be observed?
- Describe to what extent the Port Authority has made progress in meeting its commitments to its concessionaire(s)?
- Have customs reforms targeted under the compact have been implemented/sustained?
- What is the implementation status of the new Code of Customs, new Code of Ethics and unique tax codes (IFU) for persons and legal entities for improving:
  - customs operations and management
  - combatting corruption and
  - coordination with the Tax Commission?

For physical investments in infrastructure, the NORC team inspected each component financed under the project during the team's September 2015 mission and insured that it was operational.

The team conducted meetings with the PAC and Bolloré to confirm whether commitments were being met by both sides. The team also collected information regarding tariffs and port fees.

Challenges

The timing of the team's mission to Cotonou was not conducive to conducting interviews and collecting data in the most efficient manner. At the last minute, the team found out that the MCA director and head of the PAC would be in the United States signing the second Compact during the team's mission. The team was only able to meet with him on his return, which was only hours before the team's departure. While the harbormaster and others were able to provide answers to many of the team's questions in the director's absence, the team had some issues acquiring interviews and information from other stakeholders such as customs, who declined to meet with the project team. These meetings could potentially had been facilitated by the director had he been in town. Additionally, many stakeholders promised to send data to the team electronically, yet there were great delays in actually receiving this information, with some information only coming through up to 9 months later. These delays made it difficult for the project team to finalize the methodology and begin analysis.

Status of Obligations

MCC

According to the Port Advisor, the Fish/Seafood inspection and handling facility services investment was not implemented due to delays by the GoB in implementing requirements for the investment and doubts about the ability of stakeholders to properly manage the facility.[219] MCC conducted a feasibility study and drafted tender documents, which were completed in mid-2010. It is our understanding that as a result of the feasibility study, it was deemed the facility would not meet the minimum requirements for return on investment. Instead of investing in the infrastructure, the MCC approved funds for capacity-building and training of personnel of regulatory bodies in monitoring fishery products and security.

The Port Advisor also noted that the Tender LOT 4: "Installing a dry bulk unloading system" was dropped due to budget constraints.[220] If realized, this investment may have reduced congestion at the port and reduced bulk-ship delays. These ships currently experience long waits at anchor and berth due to poor gang productivity and slow unloading.

Coordination with Other Donors

The process of linking MCC investments with the investments and the economic development planning was almost completing missing in this project. Without this reciprocity and the leverage it afforded the effectiveness of the MCC investment appears to have been several limited. Several complementary investments, on the basis of which total project benefits were estimated, failed to

[219] MCA-Benin Port Advisor - 2nd Option Period - 12th Quarterly Report - June 2011.

[220] MCA-Benin Port Advisor - 2nd Option Period - 12th Quarterly Report - June 2011.

materialize over the projects term. These included the failed matching investment by Bolloré, the sea erosion prevention investment by the Islamic Development Bank as well as the two examples cited above. The need to improve coordination with other donors and to link MCC compacts more effectively to complementary investments are two of NORC's recommendations in follow-on projects.

PAC

Obligations

According to interviews with the PAC and the NORC team's site visit, the port has met all of its commitments to the MCA except those regarding the electrical improvements. According to the PAC, commitment C4.17 to increase the electrical capacity from 2 million amps has been delayed due to regulatory reasons. It is currently being executed but has not been completed. This component was funded by the African Development Bank and 2 local banks as a requirement of the MCA compact.

Complementary Investments

In addition to its obligations under the MCA agreement, the port also committed to provided additional, complementary works that were determined necessary to fully realize the MCC's investments. As a complementary investment, the port made an additional 38 billion CFA investment to deepen and widen the channel. This was determined essential for making full use of the South Quay and allowing larger ships into the port. The project began in 2013, however, the additional dredging has been delayed and is still in progress. The PAC indicates that the channel has been deepened to 15 meters and the passage has been widened, with only minor works to still complete.

Bolloré

According to Bolloré's Benin Terminal Managing Director Phillipe Alexandre, Bolloré has invested 100 billion CFA to date in cranes, construction etc. They are planning a 20-hectare expansion to increase their storage lot size, which means reclaiming land from the sea.

As of the NORC team's field visit in September 2015, Bolloré had fulfilled some, but not all of its concession obligations. One major obligation that has not yet been fulfilled is that Bolloré has only provided 4 of the 6 required gantry cranes. However, according to the PAC, Bolloré is not required to fulfill its concession obligations because the government works (increasing the depth and width of the channel) are not finished. Because the government obligations have not been met, the government and Bolloré have signed an intermediate agreement agreeing on intermediate conditions until the government fulfills its obligations. Despite this agreement, the evaluation team recommends that Bolloré purchase and install the remaining two gantry cranes as soon as possible in order to allow larger (260m) ships to call on the port, and also to improve crane productivity. Although this condition made sense from Bolloré's it subsequently became a Catch 22 for the GoB when it failed to make good its commitment.

Security

In the context of the Port of Cotonou, security concerns have several dimensions, including ones related to the competitiveness vis-à-vis competing ports in its range, the cost of doing business in the port and the liability of shipping agents based in the port for lost and stolen cargoes and the legal obligations which they may incur subsequent to cargo losses.

Security concerns per se, however, became a critical issue for the Port only in 2004 when the IMC adopted its new International Ship and Port Facility Security Code (ISPS). The Code is enforceable on all IMC members. It was promulgated in a two-part document which described minimum requirements for port security and for countering terrorism. Part A outlined mandatory requirements. Part B offered guidance for implementation.

For ports like Cotonou, the objectives of the Code were to assure that they could:

i) Detect security threats from terrorism and other malevolent sources and implement appropriate security measures

ii) Establish roles and responsibilities for maritime security within governments, local administrations, and the port industries at the national and international level

iii) Promulgate security-related information

iv) Provide a methodology for security assessments so as to have in place plans and procedures to react to changing security levels

The code requires member ports to create a framework for evaluating risk, enabling governments to offset changes in threat with changes in vulnerability for ships and port facilities and more specifically it requires:

i) Port facility security plans
ii) Designated port facility security officers
iii) Certain security equipment

When the government of Benin initially became aware of this mandate, it was ill-equipped to respond. PAC did not possess the requisite expertise to frame a security plan and the port authority was not staffed or organized in a way to effectively respond to security threats. As described above in the public/private-sector division of responsibility section, the government's response was to engage under contract a Canadian consulting firm to develop its port security plan. That plan ultimately became the blueprint for the STTB system, which the Government of Benin contracted with STTB to design, to install and to manage. The STTB system limits access to the port for trucks, truck drivers and other individual with a need to be on the terminal. The STTB system, together with the extended lighting system and the video surveillance system provided under the MCA capital grant, enabled PAC to qualify as under ISPS.

Anecdotal evidence exists that these investments provided significant collateral benefits to the port and its users in terms of reduced incidents of lost, stolen and damaged cargo and lower insurance premiums for the local shipping agents liability pool. Another ancillary benefit is the corruption suppressing effect that systems provide when they are open to multiple users and provide

transparent benchmarks with respect to dwell times, customs release time and other parameters which signal extortion and rent seeking when that fall out of time with normative standards.

Customs[221]

The port institutional and systems improvement pact with MCC included the government's commitment to enhance the efficiency and transparency of customs procedures. Prior to the MCC's investment, companies wishing to import or export goods to or from Benin faced long delays at customs. According to the World Bank, in 2005 it took 38 days to import and 34 days to export from Benin.[222] Corruption was also a major issue. A lack of traceability and accountability for the release of consignments and the payment of duties resulted in the collection of rents from consignees in return for the rapid discharge of cargoes. The resulting accumulation of cargoes on the port terminal greatly impeded the efficient handing of newly arrived cargoes. This was one of the ancillary factors effecting port efficiency that the MCA project was intended to relieve.

The MCC's baseline user satisfaction survey conducted in 2007-2008 found that 68% had unfavorable opinions about customs. [223] The second port-user satisfaction survey administered from December 2009 to August 2010[224] found improvements; transit for customs fell to 2.29 days in 2009 from 2.90 in 2008 and 3.77 in 2007. The MCC's Country Closeout Brief found that the project reduced the average customs clearance time from 4 days in 2006 to 2 days in 2010. However, by the third, and most recent, user satisfaction survey administered from December 2010-September 2011,[225] customs transit time rose to 3.37 in 2011. However, the MCC Port Advisor's final report[226] from 2011 listed Beninese Customs as one of the three main roadblocks to competitiveness at the Port of Cotonou.

The MCC's Monitoring & Evaluation data, which were collected at baseline, from January 2010 through project close in September 2011, and during the UCF period from October 2011 through June 2012 show poor results. At baseline in 2006, it took an average of 3.8 days to clear customs. By the end of Compact Year 4 (September 2010), it still took 3.4 days to clear customs, compared to a target of 2 days. Similarly, by the end of Compact Year 5 (September 2011), it still took 2.9 days to clear customs, compared to a target of 1 day. After the project was completed, things took a turn for the worse—averaging 6.4 days between October 2011 and June 2012.[227]

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[221] During our field visit to Benin, the team made several attempts to meet with customs, but customs would not accommodate our requests. Therefore our assessment is based on third party materials and secondary research, along with interviews of other stakeholders.

[222] World Bank World Development Indicators, using data from the World Bank's Doing Business Survey.

[223] "Etude Sur Les Litiges, La Valeur Ajoutée Et La Satisfaction Des Usagers Du Port De Cotonou Rapport Final", February 2009.

[224] « Enquêtes de suivi de l'Etude sur les Litiges, la Valeur Ajoutée et la Satisfaction des Usagers du Port de Cotonou Rapport final de l'enquête de suivi n°1 »

[225] Enquêtes de suivi de l'Etude sur les Litiges, la Valeur Ajoutée et la Satisfaction des Usagers du Port de Cotonou Rapport final de l'enquête de suivi n°2.

[226] MCA Benin: "Final Report of the Port Advisor of MCA-Benin to the General Manager of the Autonomous Port of Cotonou"; October 5, 2011, page 2.

[227] The Benin Corruption Report, 2016 described Benin Customs as follows: There is a very high risk of corruption

Table 35. Average Number of Days to Clear Customs

Year	Target	Actual [a]
2006 (Baseline)	n/a	3.8
January-September 2010	2	3.4
October 2010-September 2011	1	2.9
October 2011-June 2012	1	6.4
2015		5.5-6
2016		3

Source: MCA monitoring and evaluation data (2006-2012), World Bank Doing Business Survey Report 2016 (2015-2016).

However, the MCC investment was followed by several policy reforms, including the adoption of the Program for the Verification of Imports in August 2011, which was designed to improve customs processing, increase government revenue and reduce corruption.[228] Unfortunately data presented in this study suggest that none of these anticipated benefits have been realized.

Two other changes to customs were made in 2011. The first was the Société Benin Control (SBC) verification system, which was supposed to determine the valuation of goods by scanning 100% of goods coming in and out of Benin.[229] For transit traffic, STBB would put transmitters on each truck in attempt to get rid of the escort system, but drivers intentionally damaged the transmitters and military escorts had to be reinstated again by May 2012.[230]

The second was the 2011 implementation of a Port Single Window through a PPP. The single window is operated by the Société d'Exploitation du Guichet Unique du Bénin (SEGUB) with the Group Bureau Veritas BIVAC BV-SOGET SA as shareholders; Bureau Veritas operates the single window and Soget designed the software.[231] The concession was awarded in November 2010 for 10 years, and was piloted in April 2011. The software went "live" for imports in October 2011, transshipment in June 2012, and exports in July 2012. The three main objectives of the port single window were to: 1) reduce dwell time; 2) improve transparency of customs clearance; and 3) increase customs revenues.[232]

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when interacting with Benin's customs authorities: Irregular payments are common when importing and exporting goods (GETR 2014). Overall, there is a lack of transparency at the border, and the clearance processes are not very efficient (GETR 2014). Poor infrastructure (e.g., at the port of Cotonou) is also problematic for traders (BTI 2016). Nevertheless, importing and exporting takes less time in Benin than it does elsewhere in the Sub-Saharan Africa region (DB 2016).

Suspected traffickers and smugglers reportedly evade bribe payments by using motorcycles and taking backstreets and bush paths between Nigeria and Benin (*All Africa*, Jan. 2016). Travelers are often defrauded by immigration officers, so many choose to avoid the main control posts and pay bribes of a smaller value to other officials (*All Africa*, Jan. 2016). Immigration officers depend on such bribes as they are poorly remunerated; additional pressure comes from their superiors, who often expect returns from the money made at checkpoints (*All Africa*, Jan. 2016).

[228] MCC Closeout Report.

[229] Interviews completed during field mission

[230] Interviews completed during field mission

[231] http://www.segub.bj/?Presentation-Structure

[232] SEGUB. PRESS KIT. IAPH World Ports Conference. Los Angeles - May 2013.

It was after the implementation of the port single window that changes in customs really began to be realized. Dwell time was reduced from 39 days in 2011 to 6 days in 2012.[233] The Single Window's truck appointment system module, along with the MCC's parking lot, reduced traffic congestion in the port and on the streets of Cotonou. In terms of increasing transparency, SEGUB estimates that "removing the middlemen" saved $85 million in facilitation fees from January to March 2013 alone based on 428,896 bills of lading.[234] Another saving on the environmental side is one million sheets of paper per year. Unfortunately the new government cancelled the contract to maintain the Single Window in 2015 and presumably most if not all of these benefits have been forfeit.

In 2012, the Direction Générale des Douanes et des Droits Indirects (DGDDI) employed a staff of 923. DGDDI staff was distributed at that time over 43 gateways with the largest concentration of agents located in the Port of Cotonou.[235]

In 2015, the World Bank undertook an assessment of Benin's custom service at the request of the Government of Benin, with the intention of providing insights into its strengths and weaknesses as well as a time phased plan for advancing customs reforms more rapidly.[236] The report commended several aspects of reform which DGDDI has undertaken since 2010. For example, it found that improvements had resulted from the following:

i) improved clearance procedures resulting from the better use of ASYCUDA++,
ii) the development of a basic risk analysis DGDDI function for control selectivity, and
iii) centralization of customs data processing on a single server.

DGDDI implemented an electronic document (EDI) system in 2010 that reduced customs clearance time. The following year, as discussed above, customs launched a single window service as a PPP in the Port of Cotonou.

Still, the report found that however promising, these reforms remain incomplete. For example, it found that functionalities embedded in ASYCUDA++ (e.g., monitoring of transit cargo) remain unused. Other mission critical functions were used only at very rudimentary levels, such as post-clearance audits and insufficient technical capacity had been committed to update inspection selection criteria based on rigorous risk analysis.

Importantly, the World Bank report also found that other, even more important structural reforms had been delayed – including ones which involved the outsourcing of mission critical functions to private sector service providers. The government's failure to successfully engage a Pre-Shipment

[233] Presentation by SEGUB at the World Ports Conference in 2013.

[234] Presentation by SEGUB at the World Ports Conference in 2013.

[235] World Bank, Benin: Diagnostic Trade Integration Study, http://documents.worldbank.org/curated/en/759931468189257561/pdf/97242-ENGLISH-WP-P145228-PUBLIC-Box393236B-EV-final-Benin-DTISU-English-2015-10-30.pdf

[236] ibid

Inspection (PSI) service provider is symptomatic of the weak legal charter and institutional capabilities present in Benin to engage private partners in activities supportive of port/trade facilitation and customs reforms.

In its conclusion, the World Bank report found that challenges still facing the DGDDI require a more encompassing approach to reforms. So far, reforms in Benin have concerned the implementation of useful operational tools. However, customs has inadequately addressed the reform of essential customs functions, including:

v) limited capacity for import valuation, risk analysis, risk control and post-control audit;
vi) lack of central control over customs offices, and diverging performances of offices at the port and at land borders;
vii) limited capacity to monitor activities and use consolidated information as a quality control; and
viii) serious governance issues within and outside customs.

Reform efforts to date were undertaken on a discrete piece-by-piece basis rather than as part of a comprehensive and long-term modernization program, aiming at the structural transformation of the way customs work. Moreover, reforms need to tackle that not only challenge obstacles internal to customs, but also obstacles that operate in the broader customs environment, including non-compliance and lack of skills by private partners of custom. Such a comprehensive strategy is required to sustainably improve the performances of the customs and port administrations in Benin and to enable the country to play its role as a regional trade hub.

The business ecosystem which operates around customs remains problematic. In the absence of sufficient incentives to comply and with limited risk of sanctions, fraud by declarants and corruption within custom brokerage is rife. Undervaluation and/or miss-declaration of the import regime (e.g. home consumption vs. transit) by large scale actors, often with the complicity of customs officials, are still frequently used to avoid full payment of duties and taxes due and facilitate smuggling to Nigeria. There are also indications that bans or restrictions on imports from neighboring Togo are used to preserve monopoly positions for Beninese brokers involved in smuggling to Nigeria. Finally, the operation of non-qualified agents as customs brokers has been reported.

However, there is recent evidence of improvements at customs and these improvements are making it easier to conduct trade through the Port of Cotonou. This is highlighted by the World Bank's Doing Business Survey 2016: from 2015 to 2016, where Benin jumped 40 ranks in the Trading-Across-Borders category from 156 to 116. Significant reforms that influenced this rating included the following: "Benin made trading across borders easier by further developing its electronic single-window system, which reduced the time for border compliance for both exporting and importing."[237] The 2014 Doing Business Survey listed significant reforms at the port: "Benin made trading across borders easier by improving port management systems, enhancing the infrastructure around the port and putting in place new rules for the transit of trucks."

[237] World Bank, Doing Business Survey, http://www.doingbusiness.org/reforms/overview/economy/benin.

Use and Operation of Investments

During its mission to Cotonou the NORC team inspected each component investment financed under the project and determined though site inspection and demonstration that each component had been fully and workably installed and that each was being properly maintained to assure full service ability. This section summarizes the findings of these site inspections.

Fire Protection System

The fire protection system financed under the project has been installed and is in good working order. The system consists of a fire truck, high pressure water lines and pumping equipment suitable for dealing with fire emergencies throughout the terminal. Below is a picture of the fire protection system. The NORC mission found the fire protection system to be fully operational, well maintained and adequate for its intended purpose.

Security System

The security system consists of a fence surrounding the entire terminal facility and a set of strategically locate video cameras, with fine focusing and camera aiming capacities, and a control room where feeds from video cameras are monitored continuously by PAC staff and stored. The NORC project team witnessed the application of the securing system in scanning various hard to reach locations on the terminal and further reviewed video tapes which had been used in the detection and apprehension of intruders into the terminal. The NORC mission found the security system to be fully operational, well maintained and adequate for its intended purpose. A picture of the security control room which the NORC team inspected can be found below.

It is worth noting that Bolloré has installed its own security system which encompasses the container terminal which it leases. Currently Bolloré does not have access to the PAC's system. This is one issue among several involving the division of responsibility between PAC and its concessionaire that remains to be resolved.

Tugboat

The NORC had an opportunity to tour the harbor in the tugboat which had been financed under the project and found the tug in good working order. A picture of the tug boat can be found below. The NORC mission found the tug to be fully operational, well maintained and adequate for its intended purpose.

Parking Lot

The parking lot financed under the project has been completed and is in good working order. The on terminal lot provides a critical buffer between on-terminal load placement operations and trucking operations taking place outside the terminal. It appears to provide adequate capacity to perform this important function. While stakeholders reported that demand sometimes surpasses the parking lot's full capacity, it was not full at the time of the NORC team's visit.

The parking lot contains portable restrooms for truckers, but no food facilities. According to trucking companies, prior to the investment, informal sector women would sell food at the port. However, with the controlled access, these women are no longer allowed into the port to sell their wares. While truckers can exit the port to access concessions, some stated that it was not always possible to leave their trucks, and that this was an issue if there was a long wait for their cargo. While trucks are supposed to only be allowed in the port for a maximum of 7 hours, this is apparently not enforced and trucks are at times in the port for more than 24 hours.

Bolloré thinks the buffer storage system is not best practice because it prevents the terminal operator from having direct contact with its customers. The intermediary STTB doesn't have the same interests as Bolloré

Electrical System

The electrical system financed under the project has been installed and is in good working order. The system consists of wired connections that support bright lights and utility plugs scattered strategically throughout the terminal. The NORC mission found the system to be fully operational, well maintained, and adequate for its intended purpose.

Environmental Protection System

The environmental/pollution equipment limits fuel spillage. When there are spills, it separates the fuel from the water. PAC has used the equipment approximately 20 times for small spills that happen when transferring fuel to the ships.

Sustainability of Investments

The issue of sustainability involves two elements: i) the technical ability and financial of the PAC to maintain and to expand when necessary investments which the MCC has made and ii) the ability of the PAC to engage private-sector partners in co-investment in ways which improve overall port competitiveness.

Sustainability of Private Sector Investment

The concession of the container terminal in Cotonou was by far the largest and most strategically significant private sector outsourcing exercise, which has recently taken place in Benin. The concession to Bolloré changed the competitive dynamics among private companies who provide cargo handling services in the port. It also defined the feasible path for other large scale, capital intensive infrastructure based projects in a country which requires a great deal of infrastructure upgrading, but which currently possess only limited debt capacity with which to make large-scale infrastructure investments. When the project team visited Benin, Maersk Moeller was contemplating the development of a look-alike concession entailing a large capital investment on its part with land-use concession rights being offered by the GoB. The timing and processing of that follow-on concession will depend on a number of factors including Maersk's continued growth in the Cotonou market and the willingness of the GoB to offer attractive terms.

The final contract signed with the concessionaire requires the concessionaire to comply with a number of conditions including most importantly increasing traffic volume only after the GoB has complied with a number of conditions…most importantly deepening and widening the harbor approach channel. When the NORC mission visited Cotonou these conditions had not been fully complied with, the port authority had not yet organized itself to enforce the terms of the concession agreement and the only controls which appeared to apply to the concessionaire where the controls which the Harbor Master applied on an ad hoc basis mostly with respect to setting priorities for moving vessels from anchor to berths and for moving vessels from berths to deep water. None of this priority-setting appeared to relate to achieving the strategic goals underlying the MCC investment.

Significantly, the Cotonou container terminal investment was not the only instance of private sector engagement under the terms of public-private-sector partnership (PPP) contracts that took place during the period of MCA investment implementation. Indeed, the container terminal example appears to have stimulated further experimentation with public-private partnership formulations and the outsourcing of other port-related services.

During the period of project implementation the PAC and other agencies of government concerned with enhancing the port's competitiveness began to engage private sector companies to provide specialized services to port users. In this way, several information-based services were launched as PPPs. Each of these ICT-based PPPs was intended to make the port more "user friendly", to reduce transaction costs associated with trading through the port, to integrate transport, cargo handling and customs operations around the port and thus to further enhance the port's overall competitiveness.

The outsourcing and concessioning methods used to engage service providers best qualified to deliver services that added value to a port's core service offerings afford valuable opportunities for institutional learning and for the development of a more systematic approach to private sector service outsourcing. With that said, the PAC failed to respond fully to this "door opening opportunity" in ways which would have allowed private sector partnership development to become one of its core competencies and thus an ongoing source of competitive advantage. Moreover, the long term concessioning of assets, which possess significant technology content, tends to extend the lives of systems and services which have inherently short economic lives and thus over the long term detract from rather than increase the value added advantages of PPP's. So the short term benefit associated with outsourcing ITC services did not necessarily result in a long term competitive benefit.

In any case, a review of the several episodes of marine logistics service sector outsourcing, which the GoB undertook during MCA project implementation will help to clarify just how far the government was able to move the boundary line between the public and private sector and how well it learned to engage private sector initiative, creativity and capital in enhancing port competitiveness.

The most recent private sector-sourced value-adding services involved the acquisition of a "single window" information service for clearing cargos once port charges and customs duties have been

paid. This single-window platform or "Guoce" has had significant structural effects on port operations, as well as positive efficiency impacts on port users. The single-window information service relates to the MCC investment in two ways: it complemented the MCC investment in the interim storage area and accelerated the flow of traffic in an orderly way through the port.

In November 2010 the Ministry with responsibility for Maritime Economy, Maritime Transport and Port Infrastructures signed a concession with SEGUB for the implementation and operation of a "Single Window." SEGUB is a subsidiary of Bureau Veritas Group. It operates the cargo clearance system in Cotonou, in partnership with Soget, a world leader in developing port single window software. The system operates in a paperless environment, through a paperless exchange of documents, and it synchronizes procedures which assure fail-safe and rapid clearance and customs release. The system automates business processes, which were formerly carried out manually and separately. It not only integrates, but also optimizes and secures, trade critical business processes for both public and private stakeholders in international trade transactions. It facilitates import, export, transshipment and transit operations and automates corresponding administrative, logistics and customs operations, while at the same time assuring compliance with international security and trade facilitation standards.

The SEGUB system enables online the delivery of all certificates needed to complete international buy sell transactions. It also allows users to monitor in real time the progress of their requests. The system also provides an opportunity for governments to coordinate their actions by giving them a broad vision of data inputs and information sources. The platform has allowed users to realize significant time savings and reductions in clerical costs.

The single window simplifies pre-clearance procedures. It standardizes documents de facto; it formalizes procedures automatically; and it assures transparency. All standardization is designed into the system. This boosts the competitiveness of service providers based in Cotonou by reducing their document preparation time and costs.

The Guoce enhances the operational efficiency of the private sector as well. It enables interdepartmental synergies through the sharing of information and provides a powerful statistics review capability which enhances decision making. It these ways it, saves time and accelerates decision making. With this tool, operators in several government agencies are able to provide pre-clearances more correctly and rapidly than counterparts in competing ports.

The Guoce process entails five steps:

1. Using the trader's username and password the Customs Commissioner (DAC) approves each consignment via the www.guocebenin.bj platform
2. The single window announces each shipment (import, export or transit) which is being prepared for approval and release to members of the trade community with a need to know. It queries them for missing information (importers, exporters, country, product, quantity, weight, value, currency, etc.) and secures digitized versions of essential documents (invoices, Bl, importer card, etc.) needed to process a cargo release. Once the information is filled in and/or mailed, the system determines completeness and adequacy.

3. Each government authority determines its own conformity (or non-conformity) of submitted documents with its standards, establishes an account payable item, then updates the pay and release file in the system.
4. When the last authorization linked to a request is processed, DAC receives a notification indicating the completion of his application. The Single Payment for Pre-Clearance (BUP) summary lists all the costs which need to be covered and these can be paid electronically from one of several participating banks.
5. After payment of BUP, the entire documentary package is available for download by the DAC and the customs for clearance of goods.

The PAC has recently acquired a second value added service – a traffic management system – from private sector partners under the terms of a concession agreement. In this second case, the private partner is STTB, a Canadian/ Beninese joint venture.

The traffic management system which STTB developed and continues to operate on behalf of the port, has succeeded in transforming the protocol for picking up and delivering cargo to the port from a "supply push" to a "demand pull" mode. STTB designed and implemented a computer system for dispatching trucks, which carry cargoes to and from the Port. In the process it has decongested the port's intermediate storage area and, indeed, decongested the city streets in Cotonou surrounding the port.

STTB tracks the routes of tractor trailers in Benin and, indeed, beyond its borders. It matches seaside activities on the port with land side activities and calls trucks containing export cargoes and other trucks committed to pick up import/transit cargoes in just-sufficient time to make sailings and/or to avoid charges associated with excess premise use in the interim parking area.

STTB requires that all trucks registered to operate in and out of the port be equipped with a smart tag (specific form of GPS). The STTB system enhances the transparency and traceability of cargo movements over all freight corridors linked to the Port of Cotonou. A comparable system has been implemented in Ghana for the Port of Tema. Clearly the newest form of competition among West African ports is based on superior ICT capacities.

In addition to managing container terminal ingress and egress it offers fleet management services on a private contract basis. Users pay a fee for this service. However, the amount of the fee is significantly less than the opportunity cost associated with queuing trucks on city streets.

As soon as a truck scheduled to deliver or pick up a load arrives in Cotonou, it is scheduled to go to the port to be loaded. This is an automatic process. The driver will know with certainty when it is that his load will be available or will be required for outloading in the ports buffer parking lot. In no case will the retention of a truck in the interim park exceed five days.

The Government of Benin awarded a 10-year contract to (BLT - SA) Transportation Technology Solutions in 2010 for the provision of electronic truck dispatch services as well as for the computerized management of trucks operating in and out of ports and dry ports in Benin. BTL is a company, which specializes in electronics, geo-location and the safety of material goods. It has access

to cutting-edge technology for the tracking of vehicles and has applied there technologies in a similar project in the Port of Montreal. BTL subsequently became STTB.

A third public-private partnership (PPP) did not succeed as well as the first two. This third partnership involved the engagement of a Beninese/foreign company joint venture under the terms of a 16-year concession agreement to provide an import verification service (IVS) applying x-ray technology to the inspection of containers moving through the Port of Cotonou. The PPP was implemented with the intent of reducing customs detention time by applying x-ray technology to the inspection of container trucks and a tracking system for monitoring the movement of transit traffic.

Unfortunately the location of the x-ray equipment outside the port resulted in a significant diversion of transit traffic from its direct former route with the results that additional truck queues formed, transit customers and local importers were forced to absorb additional costs, and transit cargoes were delayed. Under the terms of the concession, the IVS service providers had the right to impose significant fees on importers of record.

Soon after the implementation of the system, defects in its design and costs associated with its implementation resulted in the diversion of a significant volume of transit traffic to other West African ports. Increased import fees on consumer goods resulted in consumer discontent and political protests. When the Government suspended the IVP contract in April 2015, traffic diverted to other ports began gradually to return to Cotonou but not without a significant adverse effect on customs revenue collections during the interim period.

During the period when the MCA project was being implemented, each effort to engage private sector expertise in support of port and trade facilitation services has been pursued on a one-off basis, with different agencies and offices of government tasked with its implementation.

Moreover, each PPP was pursued without the benefit of a legal framework which laid out normative standards for PPP procurement, risk sharing, maximum liabilities to be absorbed by government and basis for pricing and for enforcing contract terms. As a result, teams tasked with implementing PPP's within government were able to avail themselves of only limited opportunities for learning and for developing the specialized expertise required to negotiate PPP's effectively. As a result the PAC has not been able to develop PPP tools with which to progressively enhance its competitiveness.

Changes to Import/Export Tariff Structure and Port Fees

Tariffs published and supervised by the port authority have changed very little in constant values. The Port of Cotonou has made few minimal adjustments in the last published tariffs of 2010 and 2015 (see Annex 2). After converting the terminal handling charges to constant USD, most charges only increased 3% from 2010 to 2015, with the exception of storage for exports over 15 days, which increased 106% for 40-foot containers, and reefer-plug electricity after 5 days for 40-foot containers. These tariff increases were necessary for reducing container dwell time at the port freeing storage areas.

Status of Customs Reforms and Effects on Corruption

The creation of a one-stop-shop for customs clearance has helped reduce corruption. The off-site clearance function is managed by a private sector contractor, the "Société d'Exploitation du Guichet Unique (SEGUB)." Under this program authorized and qualified customs clearance agents are entitled to submit clearance requests together will all necessary documentation electronically and to make payments at a designated bank. SEGUB then issues a receipt which authorizes removal of corresponding cargo from the port. According to the Benin customs agents association this development has had a strong positive effect in reducing corruption and accelerating clearance processing time. These effects are the result of three factors: i) enhanced transparency with respect to transaction processing and the creation of a auditable process trail; ii) substitution of a human-to-machine interface for a human-to-human interface and iii) the pruning out of less professional customs agents in the informal sector from the freight clearance industry in preference to formal sector agents whose staffs have been trained and equipped to work in the higher skill SEGUB environment.

5. Lessons Learned and Recommendations

Research Questions Addressed

- What are key lessons learned, both in terms of the project performance (were the right investments made?) as well as the implementation of the evaluation study?
- What recommendations with respect to engineering, economic logic, and institutional reform can be made for future MCC port investments and evaluations?

In the judgment of the NORC project team, the team has been able to secure sufficiently credible and reliable data to provide useful recommendations to MCC regarding the following topics which are material for determining ways in which project impacts might have been improved: i) Methods of Private Sector Engagement, ii) Timing and Control of Complementary Investments, iii) Division of Responsibility for project preparation between agencies within the GoB and MCC contractors; iv) Timing and Sequencing of Institutional Strengthening; v) Need to Assess Port Management Competencies and to Achieve a Minimum impact sustaining level before Making Investments; and vi) Need to Impose Conditions on the Investment, *a priori* versus *a posteriori*.

Key Lessons Learned

Program Logic

In Section 2, we identified some key gaps in the MCC's program logic or assumptions. This section continues the discussion, providing insight into whether the right investments were made.

Focus on Hardware

The MCC program logic was based on the assumption that upgrading infrastructure "hardware" (port infrastructure and equipment) in the Port of Cotonou was the best way to enhance the port's competitiveness and that investment in "hardware" did not need to be accompanied by complementary investments in "software" (e.g., institutions) in order to achieve the government's development goals. The MCC determined that investments in software could either be delayed or left to other donors to undertake. For example, while the MCC required a concession of the South terminal to a private operator in order trigger further investments, it did not fund advisory services for the concession process. The IFC filled this gap, but only in a limited way. Software investments which were clearly needed include:

i) developing institutional capabilities that would allow the port staff to complete its own PPPs and to manage a landlord port operation;

ii) adapting the Port's legal framework supportive of landlord port operation;

iii) providing appropriate training and reskilling of port staff; and

iv) diversifying the array of value-adding private-sector services to support core port services.

The way in which trade-related business is conducted in and around the Port of Cotonou has significant knock-down effects on the rest of the economy. According to the World Bank, the port accounts directly and indirectly for fully 80% of the country's GDP. As a result, the second- and third-order effects, which the MCC's investment had on the Port of Cotonou, should have been weighed more heavily in MCC's planning. These include effects on the business ecosystem, on port-supported labor markets, on the mix of formal-sector and informal-sector businesses and, most importantly, on the competitive consequences of the investment. In infrastructure development projects like this one, "software" matters a great deal and can be underinvested only if the donor is prepared to accept the high risk of project failure.

Focus on Containerized Cargo

Early on the MCA also made a decision to focus exclusively on the port's container traffic, instead of on its bulk or general cargo. While some investments such as those to fire protection, security, port roads etc. affected the entire port, the primary focus of the investment was on the south-pier container terminal. The risk that this investment strategy might disrupt equities among extant terminal-operating companies or among the ports core carriers, some of whom are not exclusively container freight-oriented, was overlooked However, given the rise in containerized cargo at the port and benefits of containerization (in times of global connectivity, cost, security, efficiency etc.), this was the right decision when considering that resources were limited.

Focus on Port

A larger issue is that the MCC's investment did not consider the essential relevance of the whole logistics chain. While we recognize the need to "start somewhere" and the monetary constraints in investing in the whole logistics chain, without good multi-modal connections between the port and the hinterlands, improvements at the port cannot become fully beneficial. Saving a day of time at the port, for example, matters little if the overall transit time for shipping a product is still not efficient due to delays on the roads. Bottlenecks on the road remain, and the trucking industry faces lack of investment in both roads and trucks, the latter due to financing issues. For the port to be operated to its fullest potential, complementary investments need to be made into roads, rail, trucking, and border crossings to improve the overall logistics chain.

Competitive Environment

The team felt that the underlying investment logic took too little account of the competitive environment in which the Port of Cotonou operates and of the likely response of competing ports. More than $1 billion has been committed to container port development in the region's ports in which Cotonou finds itself since the MCC investment was announced. It is not clear that an investment of this size is actually delivering benefits to the economies and peoples in the affected countries. However, while the investment may not have put Cotonou ahead of the game, without the investment, the port of Cotonou would have fallen well behind other regional ports competing for transit traffic. Prior to the investment, Cotonou lagged behind its regional competing ports. It ranked the worst out of competing ports in terms of fleet profile and connectivity. Today Benin has caught up to its competitors. The port has become more competitive in terms of capacity, modern equipment,

operational efficiency, and larger ships are now able to call on Cotonou, as are gearless vessels. Cotonou's connectivity (as measured by the LSCI) has increased 61% since 2006—but at 17.67 remains below Togo (20.44), Ghana (21.85), Cote d'Ivoire (31.35) and Nigeria (32.68). While it has not leaped ahead, it has remained a player in the game. Without the investment, it would have likely fallen farther behind. But its competitors continue to make huge investments, and for Benin to continue to keep up with its competitors, it will have to keep investing. Whether this is a wise growth strategy is yet to be determined, and with a finite amount of hinterland traffic to compete for, there will be likely winners and losers in this race.

Inclusiveness of Growth

Was focusing on the port the best development option for Benin, especially because the port is dependent on transit cargo? As noted above, the West African port sector is very competitive and has been receiving a huge influx of investment, which makes investing in the port to serve transit traffic risky. Transit cargo volumes are very much dependent on issues outside of Benin's control, including trade policies of its neighboring countries and the logistics systems of competitors. Such a focus is a risky proposition for Benin. It may be more prudent to develop domestic industries, value-added production, and internal logistics chains. The project assumed that improving access to markets would lead to growth, but the theory was missing linkages. In the case of Benin, it is not clear that port infrastructure by itself was a key constraint limiting country-level economic growth.

Project Performance

This section discusses project performance. First we assess whether the project met its M&E targets at the end of the compact or today. Only one of nine targets was met at the end of the Compact, as discussed below and shown in Table 36:

- *Volume of merchandise traffic passing through the port*: This target was exceeded by the end of the Compact period with 6.9 million tons of cargo compared to a target of 6.3 million tons.
- *Average time to clear customs*: This target was not met by the end of the Compact as on average it took 2.9 days to clear customs compared to a target of 1 day.
- *Port user satisfaction level*: Port user satisfaction actually fell slightly from the baseline of 49.9% and was well below the target of 75%. As construction was still ongoing, a more meaningful comparison would be from after 2013, but no additional port user satisfaction data is available. Such a survey could be conducted during the Option Years.
- *Average duration of stay of trucks at Port*: This target was not met by the end of the Compact, but was achieved in 2015.
- *Annual number of theft cases*: This target was not met by the end of the Compact and no recent data is available.
- *Internal port circulation time*: This target was not met by the end of the Compact but based on information from Bolloré, has been achieved since the end of the Compact.

- *Container ship time at berth*: This target was not met by the end of the Compact and still has not been met, although times have decreased from the baseline and it appears that this target has not been met due to issues outside of the MCC's control.
- *Container ship waiting time at anchor*: This target was not met by the end of the Compact or today and remains to be an issue at the port.
- *Execution rate of Training Plan*: This target was not met by the end of the Compact, but at 96% was near the target of 100%.

It is understandable that some of the targets were not met by the end of the Compact period as the works were still ongoing; whether this timeline was foreseen or not is unclear to the evaluation team, but our understanding is that some of the delays were unforeseen. The targets were realistic and should have been met by today, even if they were not met by the end of the Compact. However, the port still faces issues with level of service, mainly due to issues under control of the port authority.

Table 36. MCA Compact Port Project Indicators[238]

Goal/Objective/Outcome	Indicator	Definition	Unit of Measure	Baseline (2006)[a]	Endline (2011)	Target (2011)	Met Target as of 2011	Current	Met Target as of 2014
Increase efficiency and volume of goods traffic through port	Volume of merchandise traffic passing through the PoC	Total volume of exports and imports passing through PoC	Millions of MT	4.1	6.9	6.3	Yes	10.5 (2014)	Yes
Streamlined customs clearance procedures	Average time to clear customs	Time associated with moving merchandise through customs procedures	Days	3.8	2.9	1	No	Unknown	Unknown
Increased Port user satisfaction	Port user satisfaction level	Share of port users satisfied with Port operations	%	50	49.9	75	No	Unknown	Unknown
Reduced average duration of truck stay in Port	Average duration of stay of trucks at Port	Average duration of stay of trucks at Port	Hours	24	27.6	7	No	6h22 (2015)	Yes
Increased port security	Annual number of theft cases	Annual number of thefts within the Port area	Number	40	32	20	No	Unknown	Unknown
Increased port security	Internal port circulation time	Average time required for trucks to exit port after loading is completed	Hours	2	6.5	0.5	No	Less than 1 hour (Benin Terminal)	Yes
Waterside improvement	Container ship time at berth	Average container ship wait time at berth	Days	2	1.3	1	No	1.4 (2014), 1.2 (2015 Benin Terminal)	No
Waterside improvement	Container ship Waiting time at anchor	Average container ship wait time at anchor	Hours	16	34.6	4	No	48 (2014), 45 (2015 Benin Terminal)	No
Port Institutional and Systems Improvement	Execution rate of Training Plan	Percent of training plan executed	%	0	96	100	No	N/A	N/A

[a] M&E Baseline Data for Volume of merchandise are from 2004. Data provided to the team from the PAC vary slightly, showing 4 million tons of traffic in 2004.

[238] MCC Benin M&E Plan pp. 40-41.

Project performance is further discussed below based on the same parameters that the MCC applied in assessing the results of its investment. These parameters include:

ix) asset utilization including most importantly truck utilization, container utilization and the utilization of ocean going vessels. The faster the turnover of these asset categories the lower the cost of serving inland markets via the Port of Cotonou.

x) service reliability and timeliness. The shorter and more predictable the order to delivery time for goods moving through the Port of Cotonou the more valuable its service.

xi) incidence of corruption, rent collection and unanticipated costs associated with random delays and losses of cargo. Predictability and the conformance of actual transit time with expected transit time and additional secure and certain delivery of goods to beneficial owners is the source of additional logistics value.

The project measured up to or actually exceeded several of the performance measures which the MCC had originally anticipated achieving. The most significant achievements to date include the following:

- Acceptance of larger, gearless vessels using the gantry cranes as measured by larger average ship sizes and increased volumes per ship.
- Increased ship-handling capacity as measured by increases in ship calls and volumes.
- Increased ship and crane productivity measured in moves/hour, meeting or exceeding the efficiency of other regional ports' gantry cranes.
- Cost for importing/exporting cargo (port plus transport plus admin fees) reduced at a more pronounced rate after the port investments were completed, keeping Cotonou competitive with other main regional ports.
- Reduction in truck congestion both within the port and within the community, as measured by reduced time in port and turn time.
- Reduced customs processing time due to the Port Single Window and improved customs policies.
- Improved security, secure gate access, and the Port Single Window have reduced the incidence of corruption at the port.

On the other hand, the project failed to measure up to or fell below several other performance measures. The most significant failures to date include the following:

- Operational improvements have not led to fully realized reductions in the time at berth due to lack of pilot training and availability which leads to significant delays and increased time at berth for container ships, despite improvements in operational efficiency due to the use of gantry cranes and RTG.
- Investments have not yet led to extensive calls by the largest ships because government's complementary dredging/widening of the access channel has not been completed. While ship size has increased recently, there were significant delays getting to this point and poor communication led to issues with shipping line scheduling.

- The engineering design of the south terminal could have better taken into consideration ship size. The South Quay berth is only 540m long so two 300m ships cannot call at once and the berth can only handle two 250m ships at once, not two 260m ships, due to the gantries, which can only reach 511m.
- Container dwell time had decreased, but increased again.
- Bolloré has not met its obligations in providing all of the required equipment including 2 gantry cranes and several RTG.
- The project neglected to understand the importance of connections to hinterland. The rail to Niger is not yet constructed and the roads are in poor condition, which means that Cotonou is still not the preferred route to the hinterlands. If, and when the rail to Niger is built, traffic to the hinterlands should increase.
- The project may have had a negative environmental impact on the area surrounding the port, especially in regards to erosion due to the 300m extension of the port-protecting jetty, which should be further investigated and remediated if necessary.

Parameters associated with each of the three performance values noted above were assessed in comparison with other ports and corridors and further assessed over time with the expectation that improvements in both resulted from the MCC investment. Thus, for example, the average duration of truck detention on the port has decreased from 24 hours in 2006 to less than 7 hours in 2015. The productivity of the port itself has increased from 10 container moves per hour in 2006 to 45 in 2016 (for the South terminal). Asset utilization associated with ship turn times has similarly improved from 2 days from ship arrival to departure in 2006 to 1.2 days in 2015. Comparative assessments vis-à-vis other West African ports presented in Section 5 of this study demonstrate similar improvements.

The NORC project team did not see similar improvements in service reliability and timeliness.

Importantly as well, the NORC team documented reductions in corrupt practices, cargo loss and damage, and rent-seeking activities.

Higher-level strategic objectives, ones which depend on port-centered activities to drive growth in the larger economy have not, however, been as successfully achieved. Though the MCA Program was relatively well aligned with the national development strategy that the GoB had begun to pursue at the time the MCA project was conceived, the objectives associated with accelerated formal, service-sector-driven growth, which the GoB embraced in its national development plan have not been achieved.

Project Implementation

The project was designed and implemented primarily through the efforts of expatriate consultants who developed feasibility studies for various aspects of port layout, the facility design, economic impact and engagement of qualified concessioners. Project officers with the MCC liaised with counterparts within both within Ministry of Development and the PAC and used the third party consulting reports as points of reference in conducting negotiations which lead to project imple-

mentation plans and a final compact. The institutional reform and PAC reskilling and reorganization implications tacit in the project were not taken fully in to account. An owner's manual for the new container port and to managing the relationship between the new concessionaire and the PAC was not developed a priori and is still being worked out. Because the MCA lacked deep knowledge of the port's political economy and because the PAC played only a subsidiary role in implementation and planning, the investment's full impacts on the business ecosystem which supports the port was neither anticipated nor managed for benign results.

Once Bolloré had secured the concession agreement, also late in the port infrastructure implementation process, it insisted in having its voice heard as well. Bolloré wanted to be able to handle larger vessels in the terminal that it would be operating. To that end, it insisted that as a condition for the concession that the turning basin and approach channel leading to its facility be deepened.[239]

Other issues material to port operations and competitiveness were managed on an ad-hoc basis as they surfaced later in the process. For example, the reason that additional works investments were required for dredging after the final compact was negotiated was because the third party consultants had only thought about increasing the number of ships, not the size of the ships. This miscalculation not only led to the need for additional works such as dredging and widening the access channel, but also led to a reduction in the maximum ship size that can call on the South Terminal. If the concessionaire had been consulted earlier, they could have tried to work it out so that two 300m ships could call at one time, but instead the berth is only 540m.[240] Further, only one 260m ship can call at one time due to the reach of the gantry cranes (only a total of 511m compared to a 540m berth). Other issues with port operations include issues with the tugs and pilots. Ideally, the tugboat operations also would have been privatized. Instead, they are still run by the PAC, and pilot shortages have led to delays and increased berth time, despite the introduction of gantry cranes and other new equipment.

Lessons Learned

Benin is betting much of its economic future on its ability to develop logistics services designed to support neighboring countries, e.g. transit transportation, warehousing, trade facilitation, transshipment, and third party logistics services of various kinds. This approach does not ignore Benin's own trade. It so happens that opportunities for cross border service are much larger, by an order of magnitude, than opportunities for local trade support. Moreover, developing a regional distribution capability does not involve an "either or" decision since as Benin's transport and logistics service industries offer better value for its neighbors, they will also enhance the value that they provide to the country's own importers and exporters. However, the services required to support

[239] The sequence of these events were communicated to the team during meetings with the PAC as well as other entities.

[240] It should be noted that the original design in fact included a single, much shorter berth. As was described to the evaluation team from one of the reviewers, it was only due to the availability of funds from other slower-moving projects that the original plan for berth improvements expanded to the extent that it was.

other economies are generally more complex than those required to support Benin's own import/-export sector. For one thing cross border trade requires cross border cooperation and coordination among several agencies of government both on the receiving and the forwarding side of the trade.

The fact remains that the scale of Benin's own import/export economy is tiny compared with that of its neighbors. The volume of trade, which supports Benin neighboring economies, is several times greater than the volume of trade required to support its own economy. Moreover, its neighbors are not well served by their own or indeed, by alternative third country trade logistics arrangements…ones that do not involve Benin. During the NORC mission several knowledgeable agents pointed out that to ensure Benin's long term economic development it was essential that its port continue to offer services superior to those on offer from Lagos, Lomé and Tema and at prices lower than those on offer from those same ports.

In its quest for superior service, it is Benin's private sector which is best able to play the key role. Private firms typically demonstrate superior ability to serve customers whose service demands are changing rapidly, to adopt appropriate technologies, and to adjust to competitive circumstances. Without an active and vibrant business ecosystem the PAC competes at a grave disadvantage.

Hence the government needs to adopt a holistic strategy which clearly delineates the roles of its public and private sectors, which allows private companies to work with government to adopt superior technologies and management methods that synchronize with government border management functions, and ones designed to collaborate with regional trade partners, as well, to improve service over the most efficient corridors which link them to the Port of Cotonou.

In order to rise to this challenge, Benin must be able to offer more than expanded terminal facilities. As a result of the MCC investment PAC now has adequate container facilities on offer, ones, moreover, which competent operators manage. As a result of the MCC investment the interface between the port and truck service providers has improved, while a railway line may be extended to Niamey and, in the near future. However, all of these improvements are being matched or bettered by competing ports. On their own they provide no long term source of competitive advantage, which could serve as a magnet for the development of a regional distribution center.

With that said, it is essential to understand that the competition in which Benin is involved vis-à-vis its neighboring ports is not a single event. Rather it is a marathon, which entails a holistic, long term approach and coordination in the design and delivery of multiple transport/logistics services, trade management systems and coordinated cross border procedures. Successful competition in this kind of marathon entails more than brick and mortar superiority. Delivering a truly competitive ensemble of trade logistics services requires strong strategic focus, multiple partnerships with multiple private sector service providers and enhanced service management skills on the part of the PAC.

Expansion of the Port of Cotonou with the support of the MCC provides no guarantee that Cotonou will be able to secure a larger market share of transit traffic to and from the landlocked countries which it serves, particularly considering that competing transport and logistics developments are underway or planned, and that the same container terminal operator who won the concession for

the Port and the Railway in Benin is the same operator who has been awarded similar concessions in all of the ports that compete with Benin.

Increasingly, competitive success in West African transit markets will be determined on a corridor basis and not simply on the basis of standalone investments in port facilities. Target performance parameters and supportive regulatory regimes which assure that cross border markets operate efficiently need to be developed bilaterally e.g., between Benin and its trading partners, as well as cooperatively with lead private sector service providers in each corridor. To this end, competitive pressures must be unleashed based on open market entry, reciprocal truck operating rights, rights to offer multimodal bills of lading and adequate incentives to drive private sector investment and service modernization.

With the implementation of the ECOWAS common market, moreover, the East-West road corridor, which links Benin to its neighbors, is likely to become even more critical as a determinant of relative competitiveness, as will the further development of the country's North-South road corridors. The future value of these corridors will, in turn, largely depend on the efficiency and responsiveness of the transport markets which grow up around them. Fostering truly competitive and dynamic markets for a whole array of transport/logistics services is the single most important role, which the Port Authority needs to take up in cooperation with other branches of government.

Corridor development and the cultivation of a robustly competitive commercial transport/logistics ecosystem centered on the Port needs to be made a first priority for development in Benin, a priority which needs to trump simple capacity development in the Port of Cotonou. To this end, the MCC should have invested as a first priority in strengthening the capacities of the government to engage the private sector as well as in the business ecosystem in and around the Port. The concessioning of the new container terminal was undertaken in a way which provided little incentive to the government and even less knowledge about how to sustain a private sector development effort. Consequently, the Port of Cotonou remains constrained in its development somewhere between a service port and a landlord port with little prospect of evolving beyond the landlord model into an organization which is capable of developing across broad corridors.

Neither does the recent decision to extend the Benin railway to Niger bode well for Benin's ability to sustain its competitive advantage vis-à-vis other regional ports and their corridors. The process through which the rail concession was granted was less transparent and less contestable than the process through which the port was concessioned through the intervention of a third party (e.g. the IFC) to the same investor group (Bolloré). No assurances exist at this point that Bolloré will be able to mobilize the large investment required to rehabilitate the railway and even less assurance exists that Bolloré will be willing to use the railway to realize competitive corridor advantage for Benin, in direct competition with the other railway corridors which it has developed. The narrow gauge of the railway is the cause, in any case, of a long term competitive disability vis-à-vis other regional standard gauge railways. Even less assurance exists that future pricing of railway services which Bolloré may offer will support combined transport, multimodal services in ways which sustain a source of competitive advantage for Benin.

Transit to the landlocked countries of West Africa is heavily congested around ports and efforts to facilitate traffic flows can realize gains in specific instances where large investments have been made. Large copycat congestion relieving investments in new ports, however, diminish the competitive advantages associated with each incremental investment. Moreover, more recent copycat investments appear to be motivated more by their ability to enhance the status of particular political regimes rather than by the sustained economic gains which they can realize.

Given the complexities of the prevailing competitive port dynamics in the region determining what economic benefits are sustainable for the specific countries becomes all the more difficult. Potential economic gains are discounted away from primary beneficiaries located within investing countries to secondary beneficiaries located in land locked countries. Most port authorities in the region, for instance, afford discounts and privileges to the landlocked countries they serve in order to secure their traffic…this in the form of lower handling fees, longer grace period for storage, yard or warehouse space within port limits, etc. Regional port authorities also maintain permanent liaison offices in the landlocked countries. Conversely, landlocked countries are present in all or most coastal ports through permanent branches of shippers' councils and through these branches attempt to influence trade and transport policy in the countries that serve them. Transit continues to be handled more as a matter of accommodative international relations than as a matter of bottom line economics.

There has been a growing regional imbalance with respect to container-port capacity supply and demand. Containerized traffic in the region is particularly contested. West African liner services on average call at more ports along the coastline than typically occurs in other regions. Some rationalization of these liner services appears to be inevitable. Ports, which retain the larger volumes are likely to remain hub ports, whereas ones with smaller volumes are likely to become feeder ports or to be relegated to secondary loops served with smaller vessels. This demotion in service access will translate into higher freight rates for the feeder and secondary ports and longer shipping time compared to mainline ports.

Most of the ports within the West African range have responded with "me too" tactics which entail large container terminal development project. Several container terminal projects are underway along Cotonou's range of ports, which will increase current capacity further, well beyond current demand, for example:

- Second terminal in Abidjan
- Extension of Tema port
- Extension of the container terminal in Lomé plus the creation of the second terminal
- The extension of the container terminal in Cotonou which has just been commissioned
- The planned extension of the container terminal in Lagos
- The plan to develop new ports around Lagos on greenfield projects (one in the West of Lagos, one in the East)
- The plan to build a new port at Sèmè Kpodji (Benin).

It is not easy to determine an appropriate balance between medium and long term container terminal demand and supply capacity. The game theoretic tradeoffs are different between first movers and followers. Moreover, the variables involved in calculating at winning equilibrium are subject to significant uncertainties. A number of projects are still at the drawing board stage and these are subject to speculation regarding their actual capacity and the time it may take to be operational, while are still under development but with differences between announced and actual capacity, plus capacity reserves for existing terminals. One fact is clear, however: planned (or announced) container capacity will exceed demand in the medium term.

For the whole West African coastline, a review of container terminal development commissioned by the French Development Agency reviewed the adequacy between current and future demand and supply. ECOWAS also recently commissioned a study of the factors which have apparently lead to excessive investment in port container terminals in the region. Several lessons which can be taken from these preliminary studies and from the MCA's own experience in Cotonou include these:

- It is important to undertake a more "participatory" approach which allows stakeholders to feel engaged and take ownership of the project—and to feel that it is benefiting them.
- A refined balance between investments in physical aspects of the port "hardware" and "software"—the institutional framework—allows for much greater benefits to be realized at lower cost.
- The way in which private operators are engaged and the identity of the operator, e.g., their strategic interests, their financing capacity, and their experience, are both essential for success. To that end, including technical advisory services to support a major port development project is highly desirable. In this case, the MCC could have recommended to Benin to include more robust technical advisory services for the implementation of the PPP transaction as part of the Access to Markets project. This could have been very beneficial. In addition, insisting that a beneficiary country put in place proper PPP legal/regulatory frameworks before trying to conduct a PPP transaction is essential.
- Creating a preliminary design plan before the concession is awarded is important. However, the plan needs to be flexible enough to take into account the concessionaire's thoughts/needs.
- Before implementing a concession, it is essential to ensure that a regulator is in place to monitor and regulate the concessionaire's behavior and make sure they abide by the concession agreement stipulations.
- Lessons are available to be learned from other container port concessions and these "best practice" lessons can, and should, be applied to creating either intra- or inter-port competition.

Recommendations for Future MCC Port Investments

Based on its project evaluation, the NORC team was able to develop insights into the project appraisal process used by MCC. The following recommendations follow from that those insights.

Economic Logic

The program logic, which MCC applied in appraising its investment in the Port of Cotonou appears to be fundamentally flawed. The MCC logic was based on the assumption that strong and direct causality linkages exist between the efficiency of a port's cargo handling capacity and the import/-export dependent economy's ability to accelerate its growth and specifically to growth in its export sector. As discussed in previous sections of this paper, this assumption does not always or indeed normally apply.

This MCC's flawed logic suggests that investment in incremental port capacity should lead directly to positive economic returns measured in terms of job creation in Benin's manufacturing, agri-business processing and non-port service sectors. As already discussed, an extensive literature suggests otherwise: investment in port infrastructure is a necessary but not sufficient condition for economic growth.

Unfortunately, neither port capacity nor port efficiency turn out to be the primary constraints limiting Benin's real sector growth. Other factors including the quality and capacity of the private sector which operates in the country and which extends trading and value adding services beyond the port are more important factors. As argued in this report and confirmed in a conversation with the WB country team, developing a strong cluster of private sector firms, which possess the management, financial and incentive driven capacities to respond to emergent opportunities with superior trade facilitation services at lower cost is what is most likely to drive the Benin service economy.

Other factors, in addition, to port capacity and port efficiency turn out to be more important in fostering sustainable economic growth and diversification away from dependence on the nation's informal sector trade and cotton exports. In both these sectors Benin's economy is trapped in a low level equilibrium. Redoubling bets on factor inputs (e.g., capital inputs) which are not limiting parameters underlying this equilibrium does not afford a break-out strategy. The MCC project failed to take these considerations into account. [241]

With that said, a potential indirect cause and effect linkage may exist between the MCC investment in the Port of Cotonou and the ultimate goal which the project was designed to achieve, i.e., pro-poor economic growth. However, the path between the cause and effect is indirect and more subject to various contingencies than the project designers anticipated in their project preparation. A clearer theory of change with explicit linkages between the investment and expected outcomes could have improved the program design.

A more effective economic logic would have envisioned the port as a part of a multi-modal logistics chain and not as an end in itself. The phasing and coordination of port investment with other matched components in that chain were essential for success. Investments in rail and roadway infrastructure have lagged behind the port development and their delay has negatively affected corridor competitiveness.

Monitoring and Evaluation Indicators

The M&E indicators did not contain any measures of port operational efficiency, which are key measures of port performance. There are also concerns about the timing of the baseline data for

[241] Based on an interview with the World Bank country economist for Benin.

port volumes (using data for 2004 instead of 2006) and target year of 2011 which was while the concession process was still ongoing. Other indicators measuring truck turn time were only collected intermittingly and should have been collected on a more systematic basis. Data should have been collected at least through 2014 to assess the full impact of the MCC's investment after the opening of the South Terminal.

Engineering Design

Engineering design plans need to be subject to several checks, including ones from shipping agents and major container lines. Inputs from potential concessionaires are particularly important since the concessionaire will have to live with the operational flexibility and cost consequences of the facility design for the entire term of the concession. For that reason, engineering design plans should be finalized only after the concession is awarded.

Major shipping lines are the best source of information about plans to deploy larger vessels. Hence their inputs are essential as well. Consideration needs to be given not only to the number of ships expected to call in the future but also to the size of ships. In the case of Cotonou's development, PAC was obliged to make an unforeseen complementary investment in widening/deepening the access channel in order to allow for larger ships to call. Similarly, the South Quay berth was designed at 540m for a single vessel, which does not allow two 300m ships or a 300m and 250m ship to be served simultaneously. This being said, it is important to note two things. First, as of 2015 the largest vessels calling the port were approximately 265m, thus assuming vessels with a maximum size of 265m, two ships are able to berth on the South Quay. Second, it is unclear whether there would have been room for additional berth space as the port is limited in area. Another design process issue involves matching berth and lift capacities in order to ensure full capacity utilization. The gantry cranes sourced for the South Quay do not allow for servicing two 265m ships (511m across).

Lengthening the quay appears to have had a negative environmental impact on the area beyond the port. While environmental impact evaluations were done of the port and immediate area, it does not appear that the studies and modelling completed successfully studied how the changes in the current would impact on the erosion problems that were already evident. Avoiding serious environmental degradation should be a primary directive for all future MCC port projects.

Port Operations

While operational efficiency for containers at the South (Benin) Terminal has improved significantly, these improvements have not had as much impact as they should due to issues with level of service. Issues with level of service appear to be coming from long waits for pilots. Some of these issues should be resolved once the construction works and dredging are completed; as our mission was a year ago, this may have already occurred. The other main issue was pilot availability and training. PAC should make pilot hiring and training a priority, and should also consider privatizing the piloting services.

Additionally, improvements in port operations focused on the South Terminal. Issues with congestion remain for bulk and general cargo at the North Terminal. Operational efficiency at the North Terminal will not improve much unless gantry cranes are purchased; whether this is necessary depends on berth utilization and capacity utilization at the South Terminal in the coming

years, but it also must be kept in mind that larger ships will still not be able to call on the North Terminal as the draft is only 10m.

Finally, best practices would have a separate entrance gate for trucks accessing the container terminals. This would further reduce the time in port for trucks loading/unloading containers.

Logistics Chain

As noted above, there is an increasing focus on the performance of the entire logistics chain, of which the port is just one component. With the importance of transit traffic to Benin's port volumes, there should have been at minimum assessment of constraints to reducing overall transport time and trade. As noted above, complementary investments in road or rail transport could have improved the impact of the investment.[242] Further, other types of investment, for example in dry ports, cargo tracking systems and other forms of logistics management software could have worked as well to leverage investment in hardware.

Private Sector Participation

Economic development succeeds best when it is driven by private sector investment, by private sector entrepreneurship and by competition among private companies based on innovation in business models, technology, service designs and strategic partnerships.

In the context of port development, it is essential that port administrations foster dynamic commercial ecosystems and use their control over service contracting, licensing, tariff inclusion, and/or concession implementation to achieve strategic goals. In order to engage the private sector strategically port authorities need to invest in three essential elements: i) a clear strategic visions which entail the use of private sector resources to move faster, to improve operating efficiency and to deliver greater value to shippers than competing ports; ii) internal management competencies in designing and implementing public private partnerships and in outsourcing services to competent private partners; iii) regulatory authorities which assure that private sector outsourcing is executed in ways which are open, contestable and fair and that service markets centered around ports remain competitive and dynamic.

The MCC under estimated the need for a focus on private sector development as an essential cornerstone of its Cotonou Port project. Both the IMF and the World Bank have underscored the need for the GoB to depend more on private sector funding for infrastructure development and less on public sector funding, a PPP legal/regulatory framework has not yet been adopted and each PPP transaction undertaken continues to be executed on a one-off basis.[243]

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[242] According to a reviewer who was part of the Compact decision-making process, "these [complementary investments] were considered and rejected due to serious policy and political challenges." While there may have been valid political/strategic rationales for this internal decision by Compact leadership, the impact of the project could have been greater if not for the lack of inclusion of other components of the logistics chain.

[243] In its most recent country report the IMF recommended a more gradual and prioritized approach to raising investment. This would provide more time to further improve public financial management, which is crucial to ensure high-quality investments with a strong impact on economic growth. Directors also recommended caution regarding the sharp increase in domestic financing, stressing that the higher fiscal costs of such financing compared to concessional financing, as well as the associated macro-financial risks from sovereign-bank linkages, need to be closely monitored. See: http://www.imf.org/external/pubs/ft/scr/2016/cr1606.pdf

Although it required that the South Terminal be concessioned, it did not drill down deeply enough into the means and modes with which this superficial objective was to be achieved. It provided neither sufficient funding for technical assistance with which to create internal competencies in PPP design and development nor did it condition its investment support sufficiently with regard to the kind of PPP partner best qualified to realize a full measure of benefits from the MCC investment. The port has started with some hesitation to privatize selected ITC operations. However, others could still be privatized in beneficial ways such as the pilot/tug, handling equipment leasing, inland dry port operations, etc. The next major step should be to concession the North Terminal.

Institutional Reform

Through the entire process of MCC investment and project implementation, PAC has remained unchanged in its chartered responsibilities, in its organizational structure, in the competencies and functional capabilities of its staff and in the day-to-day discharge of the functions delegated to them. PAC has announced plans to transform itself from a service port into a landlord port and, in this way, to assume increased indirect responsibility over private sector service operators in their provision of services and thus to surrender direct operating responsibilities over various aspects of port operations. However, to date these plans remain more visionary than real, with little movement on either the legislative or administrative fronts to make them real.

At the same time, reporting relationships between the Ports Executive Director and other agencies of government remain ad hoc with the country's president intervening directly in port affairs and contravening the nominal reporting relationship of the executive director to the minister of transport. The result has been a more insular, tactical and political focus on the port as a stand-alone entity and less of a systemic, strategic and precedent setting aspects of its governance and control.

In the meantime, the governance and performance management relationship between the PAC and its concessionaire defined in the Container Terminal Concession agreement have not yet been firmly set in place. The result is a significant attenuation of control over the concessionaire and a failure to establish strong precedence of control early in the term of the contract.

The division of responsibility between private sector service providers and public sector service providers continues to evolve in Benin. Activities undertaken, as a result of the MCC investment, have had the effect of shifting the boundary line between the two sectors. They have also had the important collateral effect of creating a learning opportunity for the GoB to discover how to go about the outsourcing of essential port services and related logistics services to qualified private companies. In the opinion of the NORC team, it is the latter MCC contribution rather than the former, which is likely to realize the most significant long term benefit for the people and the economy of Benin.

MCC's ability to impose reform conditions on the GoB in the maritime and port sector have progressively attenuated as the capital improvement program which it funded moved forward. Best international practice suggests that institutional reform should have been antecedent to and not contemporaneous with major infrastructure investment. To this end, plans should have been formulated during project preparation, agreed with the government and established as a condition for the pay out of project tranches. In this context sequencing is of prime importance. Institutions require time not only to be established but also to learn into their new responsibilities. In accordance with global best practices, the PAC should have transformed itself from an operating port

into a landlord port as a result of which PAC should have strengthened its regulatory function and correspondingly diminished its operational function.

Importantly as well, institutional reforms should have resulted in a more participatory process which included regular exchanges of information between PAC and major shippers, shipping agencies, major ocean carriers, cross border trading partners and other key private sector logistics service providers.

Annexes

Annex 1: Qualitative Data Sources

Theme	Data Source	Data Coverage	Data Quality	Auxiliary Data
Competitiveness ▪ Within the Business Ecosystem of the Port itself	Data Collected During "Focus Group Interview" Conducted in Cotonou.	Market share data regarding shipping lines and stevedoring companies before and after the MCC investment	Reliable. Team drilled down deeply into this issue during the focus group interview	Accuracy cross checked in subsequent interviews with other sources
▪ Among Other Ports In the Region and, in particular, Among Other Gateway Ports (Nathan Associates Will Lead Task with Agland Collaboration)	Transit Traffic Market Shares for Cotonou, Lomé, Tema and Abidjan provided by PAC and Data Collected for the WB Abidjan-Lagos "Trade & Transport Facilitation Project"	Before and after the MCC investment	Reliable	Data developed for prior Nathan Associates studies of other ports including other West African Ports
▪ International Port Benchmark Comparisons (Nathan Associates Will Lead Task with Agland Collaboration)	Proprietary Data Complied by Nathan Associates on efficiency, asset utilization, dwell time and shipping service network connectivity parameters from Nathan Associates, UNDP and WB Data Bases	Cross Section Comparisons vs. Global Benchmarks	Reliable	WB publication " Connecting to Compete: Trade Logistics in the Global Economy," 2014 Data developed for other studies by Nathan Associates, including studies of West African Ports
Trade Volume and Product Mix ▪ Benin Trade Level	Government Statistical Office	Annual Data for 2005-14	Reliable	General trends assessments provided during interviews confirmed data trends as did specific anecdotes and examples provided in interviews with C of Cs for Burkina, Mali and Niger
▪ Benin Trade Product Mix (Nathan Associates Will Lead Task with Agland Collaboration)	Government Statistical Office IMF	Annual Data for 2005-14 Annual Data for 2005-14	Good Good	

▪ Trade Levels of Neighboring (e.g. Transit) Countries				
Integration of Internal Markets ▪ Intermodal Transport Market Integration ▪ Regional Trade Market Integration	Interviews with shipping lines and shipping agents Interviews with C of Cs for Burkina, Mali and Niger	Circumstances before and after MCC investment Circumstances before and after MCC investment	Interviewees Provided Specific Examples Interviewees Provided Specific Examples	WB Trade Facilitation Study, ECOWAS Trade Corridor Study completed by RJK for WB
Corruption ▪ Informal Regional Trade, e.g., cross-border trade with Niger and Nigeria ▪ Customs Corrupt Practices ▪ Extortion on Roadways ▪ Petty Corruption Within the Port ▪ Etiology which Explains Declining Corruption Incidents	Interviews with ANCL, as well as with C of Cs for Burkina, Mali and Niger ANLC and World Bank Interviews ANLC Interview ANLC and Maersk Lines Interviews Interview with Maersk Moller Lines, focus group interview with shipping agents	Description of transit trading activity before and after MCC investment Annual incidence data for several years during and after MCC Investment Annual incidence data for several years during and after MCC Investment Explanation of factors before and after MCC investment which affected on terminal operations Explanation of changing circumstances which effect various forms of corruption	Anecdotal and judgmental. However, accuracy cross checked with other sources Good. Accuracy cross checked against other data Good. Sound survey data available from Borderless Alliance Anecdotal Judgmental Assessment but from Creditable Sources	Transparency International: Overview of Corruption and Anti-Corruption in Benin (2014); Data Collected for the WB Abidjan-Lagos Trade & Transport Facilitation Project; Data Compiled by the Borderless Alliance; WB Trade Facilitation Study
Unanticipated Impacts ▪ Environmental Impacts ▪ Collateral Investment Impacts ▪ Employment Impacts	Two interviews with Cotonou community political action group Interviews with two logistics information service provider companies	Pictures and Description of Concrete Environmental Impacts Background stories regarding three collateral investments in logistics systems	Before and After Investment Accounts, Descriptions and Pictures Description of two successful and one unsuccessful ancillary port services, business development efforts.	na na na

▪ Political Economic Impacts within the Port Community ▪ Policies Changes Among Neighboring Countries ▪ Need for Complementary Investment in Inland Transportation ▪ Effects of Bolloré's Market Dominance	Interviews with the State Owned Stevedoring Company. Focus group interview with shipping agents Interviews with World Bank, IMF and C of Cs for Burkina, Mali and Niger Interviews with World Bank, IMF and C of Cs for Burkina, Mali and Niger Maersk Lines Interview and Focus Group Interview	Before and after estimates of employment Description of port political economy before and after investment Description of more or less supportive regional trade policies before and after investment. Comparative corridor assessments Description of prevailing market power relations before and after investment	Estimates of employment impacts within formal and informal segments of the port community Before and After Investment Descriptions Before and After Investment Accounts, Descriptions Before and After Investment Accounts, Descriptions Before and After Investment Accounts, Descriptions	na na na Correlation with information provided by the Pan African Development Fund: Fund Promised to Send Studies but to date They have Failed to Arrive
Project Impact Monitoring ▪ Port Monitoring of Concessioned Terminal Operations ▪ MCA Project Monitoring	Interview with IFC transaction advisor; reviewed concession agreement itself, reviewed concession offering memo MCA interview	Description of transaction designs and offering process; Review of concession terms and of regulatory framework. Description of project monitoring protocols	Good Good	na Na
Project Preparation and Implementation Processes ▪ Project Feasibility Testing ▪ Division of Responsibility for Project Preparation	Review of Project preparation documents, Interview with MCA, interview with Ministry of Planning Interview with Ministry of Planning	Reviewed project preparation process and preparation studies Reviewed project preparation process	Judgmental Assessment based on Prior Experience Judgmental Assessment Based on Prior Experience	na na
Lessons Learned ▪ Methods of Private Sector Engagement	Maersk Lines, MCA and IFC interview	Anecdotal Based on Interviews.	Good Good	Na. na

▪ Timing and Control of Complementary Investments	Maersk Lines Interview, Focus Group Interview	Anecdotal Based on Interviews.	Good	na
▪ Division of Responsibility for Project Preparation	Interviews with Port Authority Staff and with Ministry of Planning	Anecdotal Based on Interviews.	Good	na
▪ Timing and Sequencing of Institutional Strengthening	Ministry of Planning, Focus Group Interview, MCA staff interview, Port Authority Staff	Anecdotal Based on Interviews	Good	na.
▪ Need to Assess and Improve (if need be) Port Management Competencies before Making Investment	Focus Group Interview, MCA staff interview, Port Authority Staff	Anecdotal Based on Interviews.	Good	na
▪ Need to Impose Conditions on the MCC Investment, a priori versus a posteriori	Ministry of Planning, PAC staff.	Based on Interviews.		

Annex 2 Cotonou Tariffs

	CFA						Current USD [a]			
	1-Sep-10		May 2,2015		Percent Change		1-Sep-10		May 2,2015	
Cost Item	20'	40'	20'	40'	20'	40'	20'	40'	20'	40'
Terminal Handling Costs (PAC)										
Stevedoring-Imports										
Home-deported container (truck-delivered client /output)	82,500	136,400	103,950	171,864	26%	26%	$ 156.75	$ 259.16	$ 176.72	$ 292.17
Container offloading (seaport and out of port)	93,750	155,000	118,125	195,300	26%	26%	$ 178.13	$ 294.50	$ 200.81	$ 332.01
Transfer (Platform stripping out at seaport)	20,000	30,000	25,200	37,800	26%	26%	$ 38.00	$ 57.00	$ 42.84	$ 64.26
Stevedoring-exports										
All container exports	41,684	73,560	52,522	92,686	26%	26%	$ 79.20	$ 139.76	$ 89.29	$ 157.57
Storage export / day (first week after deductible 15 days after receipt container)	1,200	1,200	1,512	3,024	26%	152%	$ 2.28	$ 2.28	$ 2.57	$ 5.14
Storage export / day (second week after deductible 15 days after receipt)	2,400	2,400	3,024	6,048	26%	152%	$ 4.56	$ 4.56	$ 5.14	$ 10.28
Guarding of imports (after deductible of 08 days)										
By day, days 9-13	660	660	832	832	26%	26%	$ 1.25	$ 1.25	$ 1.41	$ 1.41
By day, days 14-18	1,320	1,320	1,663	1,663	26%	26%	$ 2.51	$ 2.51	$ 2.83	$ 2.83
By day, days 19+	2,640	2,640	3,326	3,326	26%	26%	$ 5.02	$ 5.02	$ 5.65	$ 5.65
Electric										
Reefer plugs (05+ days)	29,000	29,000	36,540	45,675	26%	58%	$ 55.10	$ 55.10	$ 62.12	$ 77.65
Miscellaneous costs (positioning and repositioning)										
Positioning for customs	11,034	13,486	13,903	16,992	26%	26%	$ 20.96	$ 25.62	$ 23.64	$ 28.89
Positioning exports			18,900	31,500					$ 32.13	$ 53.55
Positioning imports			11,340	17,010					$ 19.28	$ 28.92
Various handling										
Lifting empty or full container			18,900	37,800					$ 32.13	$ 64.26
Transferring empty or full container			12,600	25,200					$ 21.42	$ 42.84

[a] Exchanges rates from oanda.com based on date of tariff sheet.
[b] Using consumer price index from World Bank WDI. Data for 2015 are not yet available so 2014 data used for 2015.

Annex 3 Time Line

2001 March - Presidential elections: none of 17 candidates receives an overall majority. Kerekou is declared re-elected in second round.

2002 - Benin joins the Community of Sahel-Saharan States.

2002 December - First local elections since the end of the single-party regime more than 10 years ago.

2003 March - Legislative elections: Parties supporting President Kerekou win 52 of the 83 elective seats.

2003 December - Lebanese charter plane crashes after taking off from Cotonou, killing some 140 people. French investigators subsequently find that the plane was overloaded.

2004 July - Benin, Nigeria agree to redraw their mutual border.

2005 March - US telecommunications company is fined after it admits to bribery in Benin. The company was accused of funnelling millions of dollars into President Kerekou's 2001 election campaign.

2005 July - International Court of Justice awards most of the river islands along the disputed Benin-Niger border to Niger.

2006 March - Political newcomer Yayi Boni, running as an independent, wins the run-off vote in presidential elections. The incumbent, Mathieu Kerekou, is barred from the poll under a constitutional age limit.

2006 March, April - World Bank and the African Development Bank approve debt relief for several countries including Benin, as part of measures agreed at a G8-Nations summit at Gleneagles, Scotland, in 2005.

2006 May - Students protest against visit by French Interior Minister Nicolas Sarkozy who introduced a bill making it more difficult for unskilled workers to migrate to France.

2007 April - President Yayi's coalition wins control of parliament in elections.

2007 July - President Yayi leads thousands of supporters on a march against corruption.

2008 April - Local elections held. Nation-wide, parties allied with President Yayi win a majority of local council seats, but the major cities in the south are all won by opposition parties.

2008 Oil discovered

2009 February - Benin announces discovery of "significant quantities" of oil offshore near Seme, a town on the Nigeria-Benin border.

2009 April - European Union bans all of Benin's air carriers from flying to the EU in a regular update of its air safety blacklist.

2010 August - Benin marks 50 years of independence.

2010 Fifty of parliament's 83 MPs demand that President Yayi be charged over an alleged swindle

in which thousands lost their life savings.

2010 October - Flooding affects much of the country. Thousands are made homeless.

2011 March - President Yayi is re-elected. His main challenger, Adrien Houngbedji, alleges widespread fraud

2011 May - President Yayi's party and its allies regain control of parliament in elections.

2011 August - London's marine insurance market adds Benin to list of areas deemed high risk due to an escalation of pirate attacks in the area.

2011 Parliament abolishes death penalty.

2011 November - Pope Benedict visits.

2012 January - President Boni Yayi elected chairman of African Union for a year, beating Nigeria's Goodluck Jonathan.

Plot claims

2012 October - A prominent business and several alleged accomplices are accused of attempting to assassinate President Boni Yayi by switching his medication for poison. They are later pardoned.

2013 August - President Boni Yayi names a new cabinet after sacking its predecessor. The new cabinet does not include the post of prime minister.

2014 May - West African leaders agree to increase co-ordination in the fight against Nigerian Islamist group Boko Haram.

2014 September - President Boni Yayi criticises the cost of staging elections and indicates a lack of funds for an upcoming poll, prompting fresh claims he is trying to cling on to power.

2015 May - The party of President Boni Yayi wins parliamentary elections but fails to secure an absolute majority.

2015 June - President Boni Yayi appoints the French-born investment banker Lionel Zinsou as prime minister - a position that had remained vacant since August 2013. As the Benin constitution bars presidents from seeking a third term in office and Mr Zinsou's appointment came less than a year before the end of President Boni Yayi's second term, some analysts view the new prime minister as the president's chosen successor.

2016 March - Businessman Patrice Talon is elected president, defeating Mr Zinsou, the candidate backed by outgoing President Boni Yayi.