

PERFORMANCE EVALUATION DESIGN REPORT (FINAL)

Evaluation Design and Implementation of Benin Port Project

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Acronyms

ANLC	National Anti-Corruption Authority
CEM	Country Economic Memorandum
CMA CGM	Compagnie Maritime d'Affrètement Compagnie Générale Maritime
DG	Director General
DOTS	Direction of Trade Statistics
ECOWAS	Economic Community of West African States
IFC	International Finance Corporation
GoB	Government of Benin
GUFE	Guichet Unique de Formalisations des Entreprises
IMF	International Monetary Fund
LSCI	Liner Shipping Connectivity Index
LOS	Level of Service
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MTPT	Ministry of Transport and Public Works
M&E	Monitoring and Evaluation
PEDR	Performance Evaluation Design Report
PAC	Port Authority of Cotonou
PIDG	Private Infrastructure Development Group
PoAI	Port of Amsterdam
PPP	Public-private partnership
RTG	Rubber-tired gantry
SOE	State-Owned Enterprise
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

This executive summary highlights major changes made to the evaluation design since the first draft of this report that was submitted to the MCC in September 2015.

This second draft of the Performance Evaluation Design Report (PEDR) was written after the NORC mission completed its fact finding mission to Cotonou. It contains both qualitative and quantitative information which was not available to the team when it drafted the original PEDR. Accordingly it contains a more realistic assessment of the nature of the issues, challenges and difficulties associated with completing the Monitoring and Evaluation work on the Port of Cotonou.

It documents, for example, that the traffic levels in the Port depend profoundly on trade and trade promotion policies affected by neighboring countries, including most significantly Nigeria, and that over the past 12 months adverse policies affecting both Niger and Nigeria have had a significant adverse effect on the level of traffic moving through the port. The PEDR is based on a much more in-depth understanding of the private sector which supports commercial activities in and out of the port and of the nature of the political economy which affects these activities.

Importantly as well, this PEDR deals in greater depth with the processes of private sector partnering which lead ultimately to the concessioning of the new container terminal build supported with MCC funding. The sequencing of the process vis a vis the completion of MCC investments, as well as the division of risks between the public and private sectors appear to fall far short of best international practices. In addition, institutional arrangements (e.g. arrangements essential for redefining powers and responsibilities of the port authority and organizational/managerial responsibilities for assuring that these powers are being effectively executed) necessary for assuring the productive use of MCC financed assets and for driving the devolution of controls over the concessionaire forward have fallen short of what might have reasonably been expected. As such, an analysis of the concession process was included in the institutional section of the methodology as an unanticipated impact to be assessed. Similarly, potential negative environmental impacts were discovered during the field mission, and a section analyzing this was also added to address the question of unanticipated impacts.

The section discussing the mission to Benin was updated to reflect the meetings and methods that were actually used. One change to note is the composition of the focus groups. The team originally envisioned conducting three focus groups with a) shipping agents, b) trade groups, and c) customs brokers. Instead, the team held the following focus groups a) a diverse group including shippers, customs brokers and a trade group, b) customs agents c) stevedore representatives and d) a local community group. Most of the stakeholders originally listed to be included in the focus groups were either interviewed individually (Benin Shipping Agency Association, Maersk, CMA, cotton exporters, Benin Chamber of Commerce) or as part of a focus group (MSC, Benin Chamber of Commerce, customs brokers).

The Financial Analysis Methodology was deemed to be redundant and therefore merged with the tariff and trade analysis. It was redundant given that the project evaluation analysis is fully covered and encompasses all Research Questions answered with other methodologies:

- Research Question 2b (Trade Volume)
2b. To what extent can changes in trade volume be attributable to MCC's intervention? – ANALYZED WITH TRADE ANALYSIS METHODOLOGY
- Research Question 4a (Costs)
4a. 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? – ANALYZED WITH TARIFF ANALYSIS METHODOLOGY

Accordingly the trade analysis section has been updated to better reflect the analysis that we will undertake now that we have a better understanding of the issues at hand and the data available.

Finally, the shipping and market analysis methodology was updated to include a description of our approach to assessing vessel deployment practices.

1. Introduction

The Millennium Challenge Corporation (MCC) has 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 and to investigate possible designs for potential impact evaluations.

1.1 Country context

Benin continues to enjoy a stable and democratic government. Since the end of the Marxist-Leninist regime in 1989, it has organized four presidential elections and four legislative elections peacefully. Current president Yayi Boni is fulfilling a second five-year term which ends in 2016. Legislative and local elections took place respectively in April and June 2015, and presidential elections are slated for 2016.

Benin's real GDP grew by 5.4% in 2012, 5.6% in 2013, and an estimated 5.7% in 2014 – a sharp increase from the previous five-year average of 3.7%.¹ Growth has been primarily driven by trade and agriculture.² Continued improvements at the Port of Cotonou have increased traffic and boosted efficiency, while favorable weather conditions have strengthened agricultural output. Cotton production was 240,000 tons in 2012/13, 307,000 tons in 2013/14 and is estimated at 350,000 tons for the 2014/15 season.³ On the demand side, investment increased sharply in 2013, spurred by a rise in oil exploration.⁴ However, this has had little impact on the demand for domestically produced goods.

Benin's fiscal stance remains stable, and the overall fiscal deficit is estimated at 3.1% of GDP in 2014 (cash basis, excluding grants), following 3.7% in 2013 and 2.4% in 2012.⁵ Customs revenues slightly underperformed over 2014 as have domestic tax revenues.⁶ This was due to a drop in informal re-exports to Nigeria. Thanks to prudent fiscal policy, the overall budget deficit and balance of payments deficit remain at acceptable levels, and sovereign debt continues below 30% of GDP.⁷ Inflation was moderate at about 1% in 2013, thanks in large part to low food price inflation.⁸

¹ World Bank Benin Country Overview, 2015, <http://www.worldbank.org/en/country/benin/overview>

² *ibid*

³ *ibid*

⁴ World Bank, Benin: Constraints to Growth, Diversification and Innovation, http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2009/07/21/000333037_20090721001130/Rendered/PDF/482330ESW0BJ0p1C0Disclosed071171091.pdf

⁵ *ibid*

⁶ World Bank Benin Country Overview, 2015, <http://www.worldbank.org/en/country/benin/overview>

⁷ *ibid*

⁸ *ibid*

1.2 Report Objectives

The objectives underlying this Port of Cotonou performance evaluation include the following:

- To assess the success or failure of the MCC investment in achieving the goals and objectives which it was originally designed to achieve;
- To determine what impacts and consequences the MCC investment in the Port of Cotonou had on port operating efficiency, competitiveness and trade enhancement; and
- To discover ways in which benefits resulting from the MCC could have been increased without additional cost through better methods of project preparation, prior institutional reform or better oversight and control during implementation.

2. Overview of the Compact and Intervention

2.1 Project Overview and Implementation Plan

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. One of these projects aimed at improving "access to markets" by eliminating physical and procedural constraints currently hindering the flow of goods through the Port of Cotonou.

The Access to Markets project completed several substantive activities, including: construction of a new south wharf; extension of a sand-stopping jetty estimated to save the Port over \$2.1 USD million spent annually on dredging;⁹ provision of a tugboat; construction of 2,462 meters of road, 1,584 meters of rail, 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.¹⁰

2.1.1 Program Participants

The primary participants in and beneficiaries of the project are members of the Port of Cotonou community. These include shipping agents and shipping lines, which call on the port, freight

⁹ Roussel questions whether this number was based on annual dredging costs alone or also on lost revenues due to blockage of port traffic during the process of dredging. The "MCC's Continuum of Results FACT SHEET", document "factsheet-2012-002-1095-01-mccs-continuum-of-results.pdf" states that, "Outcomes have been annual savings of \$2.1 million in dredging and maintenance costs and a decrease in average customs clearance time." Therefore it is our understanding that this figure has to do with overall savings, not only maintenance dredging. In the documents available to the NORC team, we were not able to find a more detailed breakdown or disaggregation of the \$2.1 million.

¹⁰ 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.

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 cargoes including both exporters and importers. In addition to these primary beneficiaries, the MCC has identified, in its Monitoring and Evaluation (M&E) Plan for Benin, Beninese rural and urban consumers as secondary beneficiaries. It was anticipated that port infrastructure and institutional improvement would decrease Port congestion, reduce shipment costs and thereby reduce prices of consumer goods and productive inputs imported through the port.

2.1.2 Geographic Coverage

The West African nation of Benin is bordered by Togo to the west, Nigeria to the east, and Burkina Faso and Niger to the north. It is the gateway into parts of all of these countries. As of 2011 Benin had an estimated population of 10 million inhabitants.¹¹ With the support of the MCC, International Monetary Fund (IMF), and the World Bank, Benin has been able to make important economic and structural reforms and thus sustain its economic growth rates over the last decade. Nevertheless, poverty is still widespread and the economy remains undiversified and vulnerable to external shocks.

The Port of Cotonou is the single most powerful driver of the Benin economy. However, the direction in which the port and its related trade activities have been driving the economy may not be sustainable.

The World Bank estimates that revenues generated from informal trade moving through the port account for fully 25% of government revenues and 20% of the country's GDP. Additional revenues produced by formal trade moving through the Port of Cotonou account for an additional 15% of government income.¹²

However, contributions, which the informal re-exporting sector makes both to the economy proper and to the national budget, are extremely fragile. 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, the fallout for the Benin economy and the Port of Cotonou will be greater and longer lasting.

2.2 Program Logic

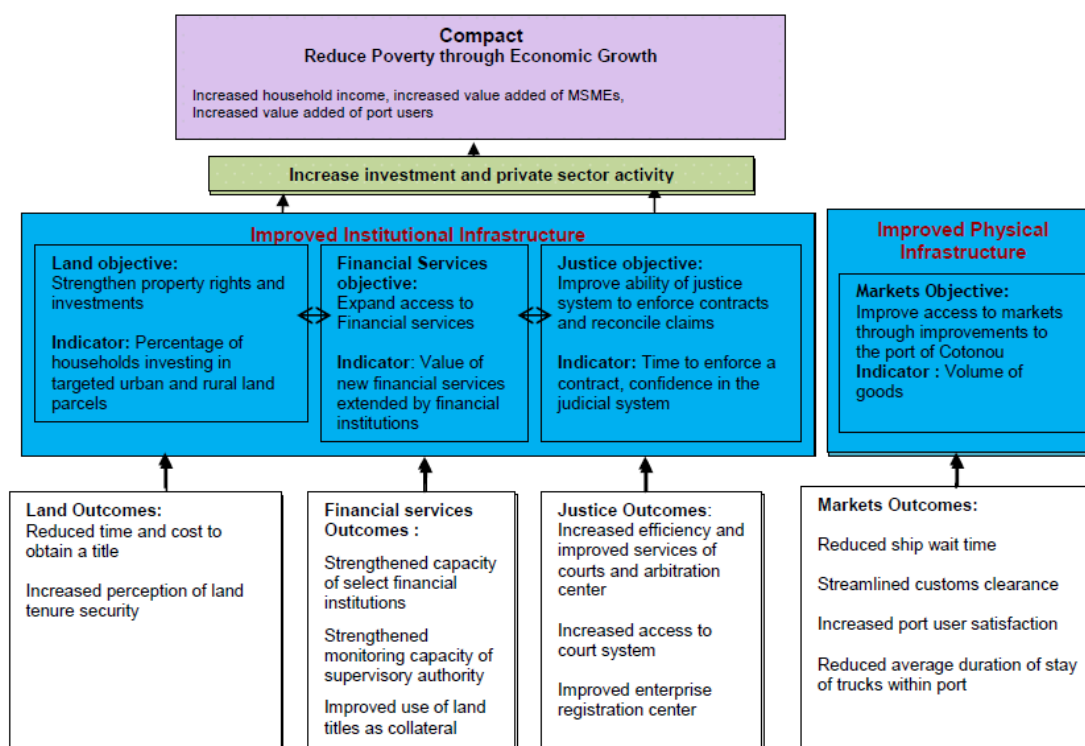
The Benin First Compact MCA Program aimed to reduce poverty through economic growth by increasing household incomes through investment and private sector activity. The Compact improved key institutional and physical infrastructures through four projects: "Access to Land," "Access to Financial Services," "Access to Justice," and "Access to Markets." The 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

¹¹ Benin Population Clock, <http://countrymeters.info/en/Benin>

¹² World Bank Benin Country Overview, 2015, <http://www.worldbank.org/en/country/benin/overview>

infrastructure would 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. These factors would increase household incomes, which in turn would reduce poverty. The ex-ante Estimated Economic Rate of Return (ERR) was calculated at 23.6%.¹³ Figure 1 below depicts the MCC program logic.¹⁴

Figure 1: MCC Benin Compact I Program Logic¹⁵



The MCC-reported outcomes to the Access to Markets project have been annual savings of \$2.1 million in dredging and maintenance costs and a decrease in average customs clearance time. The MCC estimated that when the compact closed in October 2011, Benin's entire population of 8.8 million would benefit, and the modernization would increase household income by \$262 million over 20 years.¹⁶

MCC has proposed the following list of evaluation questions in Table 1, which will be examined by the project team.

¹³ The MCC has requested that the NORC team propose a methodology to calculate a post-project ERR. However, we believe that this may be outside of the team's Base Year Scope of Work and would be a large task to undertake. Unless additional resources can be provided for this task, we propose saving it for the Option Years.

¹⁴ MCC/MCA-Benin Monitoring and Evaluation Plan, Version 4, September 2011

¹⁵ MCC/MCA-Benin Monitoring and Evaluation Plan, Version 4, September 2011

¹⁶ MCC's Continuum of Results Fact Sheet, May 23, 2012

Table 1: 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?
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?

Research Questions
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?

For the Benin port performance evaluation the project team proposes to follow the same program assessment logic, and to apply the same performance metrics, that the MCC applied in its own assessment of program results. Indicators that were used in that assessment will be applied again in this independent assessment.

Accordingly, NORC will analyze changes in the MCA's monitoring and evaluation (M&E) indicators, which were collected on a quarterly basis throughout the investment period. The MCA port project indicators are listed in the table below.¹⁷

¹⁷ Roussel questions whether price/cost should be addressed here as suggested in Table I as it is obviously another major factor in increased port volume. However, this table is based solely on the MCC's M&E indicators that were analyzed during the investment period; those indicators provide the baseline to estimate the effect after the investment has being made and the operations should have improved. If the indicators were not included in the MCC's M&E plan, they are not listed here--but the evaluation questions also ask to look at other factors like price/cost; specifically, this issue is analyzed extensively in section 3.5 of this report.

Table 2: MCA Compact Port Project Indicators¹⁸

Goal/Objective/Outcome	Indicator	Definition
Increase efficiency and volume of goods traffic through port	Volume of merchandise traffic passing through the Port of Cotonou	Total volume of exports and imports passing through Port of Cotonou
Streamlined customs clearance procedures	Average time to clear customs	Time associated with moving merchandise through customs procedures
Increased Port user satisfaction	Port user satisfaction level	Share of port users satisfied with Port operations
Reduced average duration of truck stay in Port	Average duration of stay of trucks at Port	Average duration of stay of trucks at Port
Increased port security	Annual number of theft cases	Annual number of thefts within the Port area
Increased port security	Internal port circulation time	Average time required for trucks to exit port after loading is completed
Waterside improvement	Container ship Waiting time at berth	Average container ship wait time at berth
Waterside improvement	Container ship Waiting time at anchor	Average container ship wait time at anchor
Port Security and land side improvement	Port meets ISPS standards	Port meets ISPS standards
Port Institutional and Systems Improvement	Execution rate of Training Plan	Percent of training plan executed
Port Institutional and Systems Improvement	Lot 1 completion rate (Jetty extension)	Level reached in Jetty extension construction (financial)
Port Institutional and Systems Improvement	Lot 2 completion rate (South berth construction)	Level reached in South berth construction (financial)
Port Institutional and Systems Improvement	Lot 3 (Zoning, Electricity and Lighting, Fire Protection, ...) completion rate	Level reached in Lot 3 construction (financial)
Port Institutional and Systems Improvement	Lot 3 A ((Zoning, Electricity and Lighting) completion rate	Level reached in Lot 3A construction

In general these parameters 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, truck delay, and truck

¹⁸ MCC Benin M&E Plan pp. 40-41.

turn time. In order to attract new cargo and hence generate higher throughputs, we are primarily interested in the time required to serve the vessel at the berth and LOS that the shippers experience.¹⁹ On the basis of changes in these indicators, NORC is able to assess how ranges of performance have changed over the course of the Compact period, as well as how these changes in port performance compare with those taking place in other countries in the region. With these comparators the NORC team is also able to assess how the M&E indicators met or varied from targeted levels.

Each set of indicators requires context setting explanation. These are in the form of qualitative assessments, which link quantitative indicators to specific institutional, macro-economic, political economic, corrupt practices and competitive developments. Section 4 below examines the research questions further and cross walks between qualitative and quantitative aspects of the research. This section further explains how key indicators will be used to evaluate each of the critical research questions.

3. Literature Review

3.1 Country context

3.1.1 Summary of the Existing Evidence

3.1.1.1 Benin Port Sector

According to the World Bank, the Port of Cotonou is the single most powerful driver of the Benin economy. However, the direction in which the port and its related trade activities have been driving the economy may not be sustainable.

The World Bank estimates that revenues generated from informal trade moving through the port account for fully 25% of government revenues and 20% of the country's GDP. Additional revenues produced by formal trade moving through the Port of Cotonou account for an additional 15% of government income.²⁰ This is corroborated by Wilbur Smith's Port of Cotonou assessment/due-diligence report from 2005, which estimated that the port accounted for 80% of revenue from taxes on trade, and that taxes on trade account for more than 50% of government revenue.²¹

However, contributions, which the informal re-exporting sector makes both to the economy proper and to the national budget, are extremely fragile. They depend in large part on the economic

¹⁹ Veilleux questions why the time required to serve the vessel at the berth is this highlighted as the primary data point and states that cargo dwell time at the port must also be analyzed. We focus on the time required to serve the vessel because dwell time depends on institutional issues (customs processing, other agencies permits, etc.), commercial issues (shippers delaying cargo clearance because storage is cheap), and other operational issues (availability of near port depots). It is, however, the element that the operator can control better through increased charges for each extra day of storage. Therefore, dwell time, under a modern port operation, is a factor that can be better controlled such as it does not affect the terminal capacity or eventually the throughput.

²⁰ Discussion with World Bank Country Economist

²¹ Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

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, the fallout for the Benin economy and the Port of Cotonou will be greater and longer lasting.

In its most recent Country Economic Memorandum (CEM) for Benin,²² 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.

According to the IMF, infrastructure remains significantly underinvested in Benin. In a recent study,²³ the Fund assessed that scaling up investment in infrastructure would have significant,

beneficial long-term growth 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.

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 would be required in order to preserve 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 to enable growth so that increased government revenue can match mounting fiscal burdens. The Fund's welfare analysis indicates that consumer welfare increases when the government is able to smooth the fiscal adjustments associated with higher borrowing.

Investment in the port by the Millennium Challenge Corporation has had a number of positive collateral consequences. For example, it has helped to attract private sector investment, it has encouraged tighter border security and it has improved the commercial orientation of port management. Importantly, as well, it seems to have contributed to increased customs receipts and to more rapid cargo processing capability, which in turn improved the private sector investment environment in Benin. Creation of an offsite customs clearance one-stop-shop has helped reduce corruption.

²² 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>

²³ IMF Working Paper, "Investment Scaling-up and the Role of Government: the Case of Benin," Matteo Ghilardi and Sergio Sola, March 2015.

3.1.1.2 MCC Compact

The MCC Compact included \$307 million in funding for four component projects: Access to Land, Access to Justice, Access to Financial Services and Access to Markets. The main goals of the Compact are to:

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

The Access to Markets component had a budget allocation of \$169.5 million.²⁴

Table 3: Total Compact Budget

Item	BUDGETED					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	2007	2008	2009	2010	2011	MCC
Total Compact Original Budget 11/2005	\$ 32,383,808	\$ 63,130,808	\$ 98,300,808	\$ 90,386,808	\$ 23,095,808	\$ 307,298,040
Access to Land Project	\$ 4,560,000	\$ 10,430,000	\$ 8,550,000	\$ 7,370,000	\$ 5,110,000	\$ 36,020,000
Access to Financial Services Project	\$ 3,150,000	\$ 5,420,000	\$ 5,410,000	\$ 4,710,000	\$ 960,000	\$ 19,650,000
Access to Justice Project	\$ 3,830,000	\$ 7,850,000	\$ 9,060,000	\$ 6,970,000	\$ 6,560,000	\$ 34,270,000
Access to Markets Project	\$ 9,444,000	\$ 30,131,000	\$ 66,293,000	\$ 62,363,000	\$ 1,216,000	\$ 169,447,000
M&E	\$ 3,190,000	\$ 1,690,000	\$ 1,240,000	\$ 1,240,000	\$ 1,420,000	\$ 8,780,000
Program Administration & Control	\$ 8,209,808	\$ 7,609,808	\$ 7,747,808	\$ 7,733,808	\$ 7,829,808	\$ 39,131,040
Compact Implementation Funding Original Budget						\$ 1,536,490
Sources: MCC/Benin Compact Agreement, mcc-err-benin-accessmkts_Orig.xls						

²⁴ “Expanding Markets through Benin’s Port of Cotonou,” January 24, 2011 from Benin Port Story.pdf

Table 4: Access to Markets Budget and Activities

Item	Amount
Total Compact Original Budget 11/2005	\$ 307,298,040
Access to Markets, Original Budget 11/2005	\$ 169,447,000
Access to Markets, Actual Amount Spent (Current \$)	\$218,425,641
Access to Markets, Actual Amount Spent (NPV w 10% DR)	\$142,827,299
Phase 1: Studies Activity	\$ 8,094,000
1) Initial Technical Studies	
a) Sedimentation of the harbor access / erosion control	
b) Dredging for the new South wharf	
c) Sampling / testing of sediments related to the wharf areas to be dredged as part of harbor access	
d) Needs / options for disposal of dredged material	
e) Evaluate the engineering to the pre-feasibility level	
f) Expanded cost-benefit analysis	
2) Feasibility studies for:	
a) Port container scanning system	
b) Dry port facility at Tori	
3) Environmental and Social Impact Assessments	
a) Landside improvements	
b) fish/seafood handling	
c) waterside improvements	
Phase 2: Institutional Activity	\$ 11,319,000
1) Computerization /streamlining of customs clearance procedures for merchandise including ITS, warehouse computer management system, and transit cargo system	
2) Improvements in the legal, fiscal and institutional frameworks	
a) restructuring concession agreements w stevedoring companies	
b) conducting independent financial audits and project reviews	
c) implementing the existing and new Port rules and regulations based upon consultant recommendations for port best practices	
3) Training for tug boat / ship pilots for night docking of petroleum cargo ships	
Phase 3) Port Security and Landside Improvements Activity	\$ 73,863,000
1) Plan for renegotiation of PAC concessions and reallocation of berths and land usage	
2) Implementation of any RAP	
3) Adoption of the EMP	
4) Implementation of the HIV/AIDS awareness plan	
5) Capital improvements: port security	
a) Integrated security system for compliance with ISPS standards, including oceanographic monitoring systems, video surveillance systems, and radio communications systems	
6) Capital improvements: landside improvements	
a) Front-end engineering and design	
b) Port road construction/rehabilitation: upgrading/expanding existing Port roads, illumination, gate system	
c) Constructing an east-side gate	
d) Rezoning by berth usage, land and warehousing to achieve efficient operation	
e) Construction of dry bulk conveyor system leading to storage/truck loading bins provided by private sector	
f) North wharf structural improvements including reinforcements to wharf substructure to accommodate rail mounted gantries and mobile	
g) Pollution control equipment to respond to significant discharges of hazardous materials in the Port and other equipment and activities related to the EMP/EMS	
h) Installation of fire control and prevention equipment	
i) Construction of inspection base for fish/seafood and facilities for efficiently off-loading /handling	
j) Technical assistance and training of regulatory agency staff in seafood/fish inspection / safety admin	
6) Fish/seafood inspection and handling facility ("BOC") services	
a) Management plan for the BOC incl. training + TA targeted at inspectors, employees, and user associations	
b) Improved design and procedures for BOC including mechanized off-loading	
c) Development and implementation of a user fee system	
Phase 4) Waterside Improvements	\$ 76,171,000
1) Front-end engineering /design for civil +mechanical facilities, works + dredging + dredged material disposal	
2) New South wharf construction of approximately 595 meters of berth space for new terminal operations, and mitigating measures associated with dredging and dredged material disposal	
3) Sedimentation control scheme at the Port entrance	
4) Acquisition of additional tug boat with necessary pilot training	
Additional Investments Added After Plan	
1) X-ray scanner	

Sources: MCC/Benin Compact Agreement, mcc-err-benin-accessmktts_Orig.xls, mcc-err-benin-accessmktts_Close.xls

The Access to Markets component 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 components of the project are broken down into four main project activities: Feasibility Studies/ Assessments and Port Institutional and Systems Improvements Activity, Port Security and Land-side Improvements, and Waterside and Improvements.

- According to the MCC Compact Agreement, feasibility study activity commenced with initial technical studies (engineering, economic, environmental) followed by the conduction of Environmental and Social Impact Assessments for port landslide 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.
- The port institutional and systems improvements were to consist of a fine tuning of legal and fiscal frameworks including the restructuring of concession agreements as well as enhancing the efficiency of customs procedures.
- The port security and landslide 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 capital were intended to serve as the catalyst for greater efficiency.²⁵
- The waterside improvements were originally slated to include the construction of a new South wharf and sedimentation control scheme designed to keep sand out of the port.

The NORC team's evaluation will test or confirm whether all of the intended investments were made, and if not, why.

Wilbur Smith's port of Cotonou assessment/due diligence report from 2005 identified that the main economic benefits were expected to include dredging savings for 18 years (\$1.18 million/year in past 8 years), decreased ship wait time (anchor and berth), decreased cargo delay costs, decreased container congestion surcharge costs, and decreased diverted cargo costs for transshipment and hinterlands traffic.²⁶ The report analyzed three implementation options: "Option 1 – The original 15 PAC proposed projects as a whole (excluding the X-ray scanner); Option 2 – The 15 original PAC projects plus the 7 Consultant recommended publicly-funded projects; and Option 3 – All 28 public and private sector funded projects (all 11 alternatives)."²⁷ However, for Option 1, the PAC proposed projects, demand would be greater than port capacity by 2009, and for Option 2, which also included 7 additional publically funded projects, demand would be greater than port capacity by 2015; for Option 3 it would take until 2029. The NPV for Option 3 is \$132 million with an IRR of nearly 25%. Total cost savings under Option 3 are estimated to be \$1.182 billion through 2030 (25 years).

According to an MCC report from 2011, the new MCC-financed South Wharf container terminal was expected to generate up to \$30 million in new revenues per year and attracted \$256 million in complementary private sector investments by the South Wharf container terminal concessionaire,

²⁵ We understand that these investments to a fish/seafood handling area did not materialize.

²⁶ Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

²⁷ Ibid, Section 8-1.

Groupeement Bolloré-SMTC;²⁸ the concession advised by the IFC was a condition precedent by the MCC Compact. Additionally, the concessionaire was expected to double container traffic by 2020, and to finance landside infrastructure improvements. The same document notes that the IFC estimated that the concession would have a \$1.5 billion fiscal effect for Benin over the 25-year concession period. However, Bollore is quoted in the same document as saying that “doubling container traffic to Benin cannot be achieved without significant reforms in both customs and port management,” thus highlighting the importance of Customs reforms. From the point of view of one knowledgeable agent, implementing these appeared necessary in order to generate a full measure of benefit, during the post-Compact period.

The MCC’s Country Closeout Brief written after the project’s completion declares that the "Access to Markets" component produced the following benefits:

- 1) The construction of a new wharf allows the port to accommodate more and larger container ships and led to the transparent and competitive bid for a private terminal operator who would bring investment into the port. These improvements have led to an increase in traffic from 4 to 7 million metric tons from 2004 to 2010.
- 2) The extension of a 300-meter sand-stopping jetty keeps sand out of the port entrance channel, saving \$2.1 million annually in dredging and maintenance costs.
- 3) The improvement of intra-port transport and security, including purchase of a tugboat, new roads, rail, fire protection, security systems and gates allows safe and efficient movement at the port.
- 4) Modernization of customs operations and investment in improved systems has led to the port receiving International Ship and Port Facility Security Code certification and has reduced the average customs clearance time from 4 days in 2006 to 2 days in 2010.
- 5) On the policy side, the MCC investment was accompanied by several policy reforms including:
 - a. Benin adopted the Program for the Verification of Imports in August 2011 which improved its customs processing, increased government revenue and reduced corruption.
 - b. Benin intended to reform its customs code with the expectation that a draft would be completed in early 2012.
 - c. Benin improved port security. The US Coast Guard inspected the port in October 2011 and verified its compliance with the International Ship and Port Facility Security Code.
 - d. The port's financial management was reformed with controls on automated systems designed to reduce fraud and corruption.

²⁸ “Expanding Markets through Benin’s Port of Cotonou,” January 24, 2011 from Benin Port Story.pdf

While Wilbur Smith's Port of Cotonou assessment/due-diligence report from 2005 estimated that the economic costs of the “Access to Markets” project would be \$169.9 million (of which MCC would fund \$110.4 million), the MCC Closeout Country Brief indicates that \$188.5 million was actually invested under the Access to Markets component.²⁹

The MCC’s internal, ex-ante review of the project identified the following direct beneficiaries of the project: ship owners, firms operating within the Port and truck operators transporting to and from the port. In addition, it identified indirect beneficiaries as Beninese consumers, rural and urban. The form, which these benefits were anticipated to take, included lessened congestion on the port terminal, reduced shipment costs and, through these cost reductions, lower prices for consumer goods and for productive inputs into local manufacturing.

3.1.2 Gaps in the Literature

The interviews conducted during the mission to Benin proved robust and insightful. Importantly as well, most of the information requested during the mission to Benin has since been delivered. What is still missing is the position of the Government of Benin (GoB) and in particular the country’s Ministry of Environmental Protection regarding the effects of the breakwater which was built with MCC funding in terms of the accelerated erosion of coastal land on the South of the city. Also, still missing are documents which the IMF offered to share with the NORC team regarding the findings and recommendations of its most recent August mission to Benin. These documents should become available for public review in December. Important additional documents have failed to arrive from the Bureau of the Union Economique et Monetaire quest Africaine which committed to send background papers regarding market dominance and anticompetitive practices in the Port terminal sector as well as additional analyses which estimate economic multipliers associated with port investment.

3.2 Competitiveness

3.2.1 Summary of the existing evidence

Port of Cotonou’s competitiveness

The MCC Port Advisor’s final report mentions Benin’s three comparative advantages, which if properly leveraged, could make Cotonou a competitive port in the region:³⁰

- (1) Its border with Nigeria, the largest market in Africa;
- (2) The Port of Cotonou offers the nearest access to the sea for several hinterland countries;
- (3) Its fertile soils and water resources.

According to the same report, there are three main structures that are heading the evolution of the competitiveness of the Port of Cotonou:

²⁹ Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

³⁰ 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.

- 1) The Beninese Customs
- 2) The Government Owned Stevedore Company [Société Béninoise des Manutentions Portuaires (SOBEMAP)]
- 3) The Autonomous Port of Cotonou (PAC)

Each of these three entities suffer (as of 2011) from what the World Bank refers to as “Chronic Instability” due to the significant changes of the General Managers in a short amount of time.³¹ These changes in the end have proven to be extremely disadvantageous to the overall strategic management of the administration, the loss of their most senior manager, and in turn the overall competitiveness of the port.

The World Bank’s Country Strategy for Benin mentions that the business climate in Benin is rather poor, partly due to the amount of corruption that is perceived in the country.³² Reforms must be put in place to reform practices which distort resource allocation, weaken the business and investment climate and thus reduce economic growth and slow the pace of poverty reduction. All these changes are needed in order to move Benin from a low level economic equilibrium to a higher one. However, due to limited public administration capacity Benin continues to struggle with the implementation of essential reforms needed to overcome the growth retarding obstacles that they face.

As mentioned in Wilbur Smith's Port-of-Cotonou assessment/due-diligence report from 2005, 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.³³ The Autonomous Port of Cotonou is a SOE and acts as the port authority with regulatory authorizes as well as operational responsibilities. PAC falls under the control of the Ministry of Transport and Public Works (MTPT). The port sets its own rates, and has paid up to 40% of net income to the MTPT in recent years.

In order to improve the competitiveness of the Port of Cotonou, the MCC required the port to grant a concession **for the management of the new South Wharf** in order to receive the full benefits of its investment.³⁴ The Compact required complementary private-sector investment and management of port operations as a condition for the MCC funding various landside and waterside projects.³⁵ The government of Benin hired the IFC as the lead advisor and DevCo as an additional advisor on a PPP for a new container terminal in 2008. A concession agreement was finalized in September 2009 with Groupement Bolloré (Bolloré of France and the Société de Manutention du Terminal à Conteneurs de Cotonou) for a 25-year concession to build/operate a 540,000 TEU South Wharf Container Terminal. Bolloré's proposal included an entry fee of US\$33 million, ongoing fees of US\$29 per TEU, guaranteed annual traffic levels, a commitment to pay \$200 million in concession fees in the first 8 years of operation and invest \$256 million in operating

³¹ World Organization of Customs (OMD): “Strategy of Reformation and Modernization for the Customs of Benin 2008 – 2010”; June 7th, 2008, pages 24/25.

³² World Bank: “Country Partnership Strategy FY13-17 for the Republic of Benin”; March 5th, 2015, page 11/116

³³ Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

³⁴ Benin I IFC SuccessStories_CotonouPort.pdf from 10/2009.

³⁵ See MILLENNIUM CHALLENGE COMPACT BETWEEN THE UNITED STATES OF AMERICA ACTING THROUGH THE MILLENNIUM CHALLENGE CORPORATION AND THE GOVERNMENT OF THE REPUBLIC OF BENIN Schedule 4.6

equipment/civil works over the 25 years. In structuring the concession agreement the IFC considered Benin's importance as a potential gateway to landlocked West African countries, and highlighted how high shipping costs, low efficiency, and poor logistical facilities have prevented Benin from realizing its potential in becoming a major trade route to these landlocked countries. The concession was estimated to create 450 jobs, have US\$200-300 million in fiscal impact, reduce transportation costs, double container traffic in the first 8 years from 300,000 TEUs to 723,000+ TEUs, allow the agriculture and fishing industries to develop external export markets, and expand exports for hinterland countries (Burkina Faso, Mali, Niger). During the visit to the Port of Cotonou, the NORC team attempted to corroborate the causal connection between the MCC investments and the structuring and subsequent performance of the concession.

The baseline user satisfaction survey conducted in 2007-2008³⁶ provides some insight into the main challenges faced by the port prior to the concession. 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. Port users were defined as importers and exporters and as agents and economic end-users of the port services operators. The other port stakeholders were considered operators. Phase 1 was conducted between November 2007 and April 2008. 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. 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

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 take too long.

The situation did not improve by the second port user satisfaction survey administered from December 2009 to August 2010.³⁷ 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, which may be attributable to obstacles to efficient port operation during the construction period. 49% claimed very high levels of corruption plus an additional 25% claimed high levels. On a positive note, the time in transit for

³⁶ « ETUDE SUR LES LITIGES, LA VALEUR AJOUTEE ET LA SATISFACTION DES USAGERS DU PORT DE COTONOU RAPPORT FINAL, » Feb. 2009.

³⁷ « Enquêtes de suivi de l'Etude sur les Litiges, la Valeur Ajoutée et la Satisfacation des Usagers du Port de Cotonou Rapport final de l'enquête de suivi n°1 »

customs fell to 2.29 days in 2009 from 2.90 in 2008 and 3.77 in 2007; the report has monthly customs times for 2008-2009 as well as other operational data and level of service indicators.

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%.³⁸ However, views on port competitiveness rose from 28% to 43%. While customs transit time had fallen from 2008 to 2009, it rose to 3.37 in 2011. The document includes similar data to the 2009 survey and also includes recommendations. Before improvements were made to the port, Cotonou operated at or near its full capacity, so opportunities for rent collection existed among the principle participants in the transactions that took place subsequent to its expansion. To this end, it is important to determine the benefit and cost transfers which occurred subsequent to the engagement of the Bolloré Group as concessionaire. Provision 6.8 of the Concession Agreement provides extensive pricing freedom to the Concessionaire, with the major proviso that equal changes are offered for comparable services. This provision offers the Port Authority a very narrow basis for oversight objection.

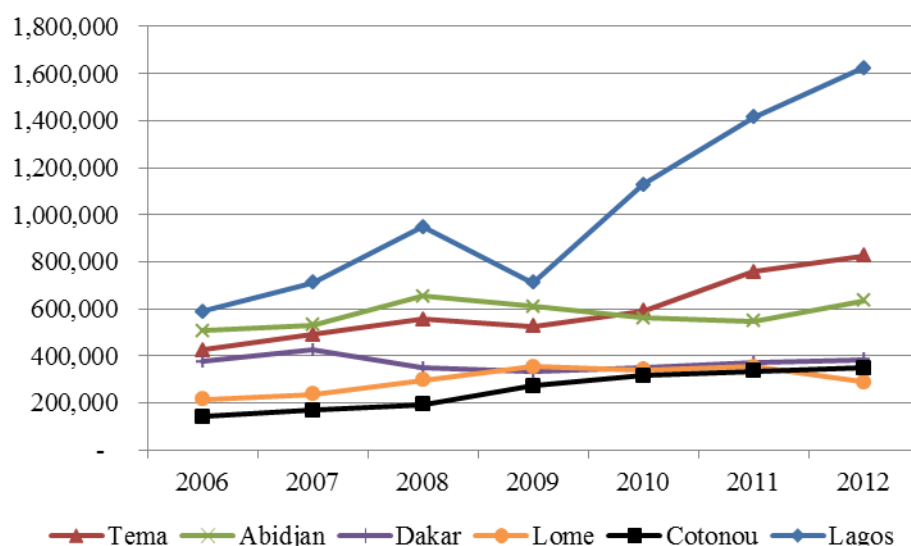
Because the Bolloré Group is also the container terminal concessionaire in most of the ports that compete directly with Cotonou, including Lome, Tema, Abidjan, and Dakar, it is not clear that an adequate incentive exists for the terminal company to hold down its prices vis-à-vis these other ports. If ships are diverted to other Bolloré-operated ports in the West African range, the Bolloré project corporation in Cotonou has little incentive to reduce prices in order to maintain volumes. Thus its interests in terminal operation may in fact be subordinate at the holding-company level to other interests. This monopoly/duopoly situation clearly diminishes incentives to improve Cotonou's competitiveness. This is particularly problematic in light of the failure of the project company to attain certain minimum performance standards; however, interviews with Bolloré and with Maersk Lines conducted during the mission confirmed that Bolloré was not yet obliged to make good its minimum traffic volume commitments or equipment commitments (rubber-tired gantry or RTG and gantry cranes) under the concession agreement because the Port of Cotonou had not yet satisfied its pre-conditions under the same agreement to complete the dredging of the approach channel into the harbor. Subsequent discussions with the Port staff confirmed that this situation did indeed prevail.

Port of Cotonou's competitiveness vis-à-vis regional ports

Cotonou competes with regional ports for traffic to the hinterland countries of Burkina Faso, Mali and Niger and for traffic to Nigeria; its main competing ports are Tema in Ghana, Lome in Togo, Abidjan in the Ivory Coast and Lagos in Nigeria. In both 2006 and 2012, 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 Lome (which saw its traffic fall from 2012 to 2011) with 348,190 TEU of container traffic.³⁹ Figure 2 depicts the evolution of regional container traffic from 2006 through 2012.

³⁸ Enquêtes de suivi de l'Etude sur les Litiges, la Valeur Ajoutée et la Satisfacation des Usagers du Port de Cotonou Rapport final de l'enquête de suivi n°2. Roussel notes that construction during this period intensified, with internal road and rail connections interfering with normal port operations.

³⁹ 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 2: 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.

The same study, written in 2013 and published in 2015, also calculated rankings for 6 West African ports. 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 5. West African Port Efficiency Rankings

Port	Rank	Average Score
Port of Tema	1	91%
Port of Abidjan	2	90%
Port of Lome	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>

3.2.2 Gaps in the Literature

We have reviewed various studies including van Dyck, G.K. (2015), MLTC/CATRAM (2013) and Nathan Associates (2013) which compare 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. These studies, along with data from the port authorities and our interviews with the shipping lines should allow us to assess changes in the Port of Cotonou's competitiveness vis-à-vis other regional ports.

3.3 Trade Volume

3.3.1 Summary of the existing evidence

A number of studies⁴⁰ 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 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.⁴¹ 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 landlocked countries. It has been documented, for example, that landlocked countries trade 30 percent less than countries with direct maritime access.⁴² 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 explain in terms of an infrastructure gap alone. Other factors appear to have a more significant effect on transport logistics cost, including governance under the terms of prevailing transit treaties, rent seeking on the part of authorities vested with responsibility for cross border goods movements, competitive efficiency of supporting transport and service markets and other political economy issues which operate on alternative sides of trade borders.⁴³ These conditions appear to have a particularly adverse impact on landlocked countries where transport costs are higher due to inefficient 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 from numerous rent-seeking activities that accompany the award of cargo control powers to multiple independent agencies.

Other studies have found that both lowering transport logistics costs and enhancing trade competitiveness have a positive impact on foreign direct investment (FDI) flows into developing countries⁴⁴. With increased FDI the competitiveness of specific transport corridors improves as economies of scope and scale are realized and as positive feedback loops kick in.⁴⁵ The converse, unfortunately, is also true. Even more than high transport-logistics costs, transit delays and a

⁴⁰ See for example: "Unlocking Trade for Low-Income Countries: Report of the Trade Facilitation Facility, 2009–2015", Dominique Njinkou and Olivier Hartmann, World Bank, 2015 and "Connecting Land Locked Developing Countries to Markets, "Jean-Francois Arvis, et al, World Bank, 2011.

⁴¹ "Infrastructure, Geographic Disadvantage, Transport Costs and Trade," Nuno Limao and Anthony Venables, World Bank Economic Review, 15, no13, 2001.

⁴² "Connecting Land Locked Developing Countries to Markets, "Jean-Francois Arvis, et al, World Bank, 2011

⁴³ Ibid

⁴⁴ Making Foreign Direct Investment Work for Sub Saharan Africa: Local Spillovers and Competitiveness in Global Supply Chains,

⁴⁵ Logistics Clusters: Delivering Value and Driving Growth, Yossi Sheffi, MIT Press, 2014

declining degree of reliability and predictability for inventory availability drive total logistics costs higher and market response time downward and thus create strong disincentives for FDI.

With that said, it is also true that trade activity is affected by a number of factors other than transport-logistics costs. 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, is particularly useful for developing a small economy like that of Benin with a narrow set of competitive advantages concentrated in agricultural production (e.g., cotton).

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. 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 value adding ITC and order fulfillment and storage services. In many cases, this places a responsibility on government to provide the necessary conditions that allow these activities to take place.

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 but these account for only a portion of the total logistics cost that an exporter or importer is obliged to absorb. The impact of low cost port operations may be further diluted when all of the buyer side and well as the seller side distribution chain costs are accounted for.

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.⁴⁶

3.3.2 Gaps in the Literature

The team has identified numerous sources of trade data including sources from the PAC, UN Comtrade, and others. However, we have not yet received data from customs, which is our preferred source because of its closeness to the source. If customs fails to deliver the data they committed to the NORC team, this would represent a significant data gap.

⁴⁶ http://www.na-businesspress.com/JMPP/BabatundeA_Web12_7_.pdf

3.4 Operational Efficiency

3.4.1 Measures of Operational Efficiency in the literature

Kent and Ashar (2010)⁴⁷ propose two categories of indicators that can be used to measure port performance, those for operational efficiency and those for level of service. 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.

In the interest of easing the data collection process when data is difficult to obtain or detailed historic information is scarce, Kent, Ayzanoa and Ashar (2014)⁴⁸ proposed to narrow the list of indicators by applying principal components analysis, which identifies the range of the selected indicators most reflective of overall performance and provides the basis for ranking terminals relative to operational performance. The end result is the emergence of two indicators, ship productivity and crane productivity, which researchers can focus on for performance monitoring, thereby confirming the potential for widespread application of port performance measurement, along with the ranking of terminals that are assessed. As the ultimate indicators are based on operations analysis, they provide more insight about port performance than other approaches and surveys and hence point to specific areas of port operations that have improved, or not.

For estimating port capacity, Ashar and Ayzanoa (1995) propose calculating the capacity of each terminal component (berth, yard, and gate) following industry standard methods.⁴⁹ Then, for each terminal, the component with most restrictive capacity will determine the terminal capacity.

3.4.2 Summary of the existing evidence at Cotonou

Prior to the investment, the stakeholders' main concern about the port was port congestion due to poor port layout and administrative bottlenecks attributable to the PAC and customs, which increase costs and the risk of business in Cotonou. Wilbur Smith's 2005 describes the situation at Cotonou prior to the MCC's investment. Traffic was pretty steady from 2002 through 2004. Days at anchor were especially poor in 2003, with 330 days at anchor for 476 ships. Ideally this number would be zero, and based on international benchmarks it would be no more than 6 hours or 0.25 days per ship, totaling 116.25 days for 465 ships, while the number was nearly 3x this rate at 330 days in 2003.

⁴⁷ 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.

⁴⁸ How Fit are Central America's Ports? An Exercise in Measuring Port Performance. Paul E. Kent, Gerardo Ayzanoa and Asaf Ashar. International Association of Maritime Economists (IAME) Conference, Norfolk, Virginia, July 2014.

⁴⁹ "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.

Table 6: Excerpts from Wilbur Smith's 2005 Report Depicting Ship, Volume, and Traffic Statistics for the Port of Cotonou

Container Ship Statistics
Port of Cotonou Assessment

	2002	2003	2004	2005 ¹	Total
Number of Ships	468	465	476	203	1,612
Days at Anchor	145	330	177	104	756
Days at Berth	390	435	460	215	1,500
Anchor/Berth Ratio	0.37	0.76	0.38	0.48	0.50

¹Through May 31, 2005

Container traffic projections
Port of Cotonou Assessment

Cargo Direction & Type	Cargo Tonnage & Containers			Avg. Annual Growth	
	2010	2020	2030	2010-2020	2020-2030
Tonnes					
Import	2,414,700	4,131,600	7,070,400	5.5%	5.5%
Export	<u>653,500</u>	<u>1,414,500</u>	<u>3,060,200</u>	8.0%	8.0%
Total	3,068,200	5,546,100	10,130,600	6.1%	6.2%
Laden Containers					
Import	201,200	344,300	589,200	5.5%	5.5%
Export	<u>54,500</u>	<u>117,900</u>	<u>255,000</u>	8.0%	8.0%
Total	255,700	462,200	844,200	6.1%	6.2%

Cargo Volume Projections by Growth Scenario
Port of Cotonou Assessment

Year	Imports			Exports		
	Base	Moderate	High	Base	Moderate	High
2003	3,809			469		
2004	4,013	4,028	4,042	506	509	513
2005	4,228	4,243	4,259	546	549	553
2006	4,454	4,471	4,487	589	592	597
2007	4,693	4,710	4,727	635	639	644
2008	4,944	4,962	4,980	685	689	694
2009	5,209	5,228	5,247	739	743	749
2010	5,488	5,508	5,528	797	802	808
2011	5,791	5,807	5,824	861	868	874
2012	6,110	6,128	6,146	930	938	945
2013	6,447	6,466	6,485	1,005	1,013	1,020
2014	6,803	6,823	6,843	1,086	1,095	1,102
2015	7,179	7,199	7,220	1,173	1,182	1,191
2016	7,575	7,597	7,619	1,267	1,277	1,286
2017	7,993	8,016	8,039	1,369	1,380	1,389
2018	8,434	8,458	8,483	1,478	1,490	1,501
2019	8,899	8,925	8,951	1,597	1,610	1,621
2020	9,390	9,418	9,445	1,725	1,739	1,751
2021	9,909	9,938	9,966	1,864	1,885	1,907
2022	10,456	10,486	10,516	2,013	2,036	2,060
2023	11,033	11,065	11,097	2,175	2,200	2,225
2024	11,641	11,675	11,709	2,349	2,376	2,404
2025	12,284	12,320	12,355	2,537	2,567	2,596
2026	12,962	13,000	13,037	2,741	2,773	2,805
2027	13,677	13,717	13,757	2,961	2,995	3,030
2028	14,432	14,474	14,516	3,198	3,236	3,273
2029	15,228	15,273	15,317	3,455	3,495	3,535
2030	16,069	16,116	16,162	3,732	3,775	3,819

As shown above, the study forecasted that about 3 million tons of container traffic would pass through Cotonou in 2010, of which imports would exceed exports by 3.7 times. In reality, based on actual statistics from the Port of Cotonou, the port saw about 3.7 million tons of container traffic in 2010 with a 4.6 import to export ratio. Actual total cargo figures for 2010 exceeded estimates for imports (6.2 million tons versus a base of 5.488 and high of 5.528 million tons) which exports fell short of the forecast (about 720,000 tons compared to a base estimate of 797,000 tons).

Evidence from the investment period is varied on the effects on operational efficiency, but this is to be expected as construction was still ongoing. According to the MCA Closeout Magazine in 2011, the implementation of fixed berthing windows in October 2009 (at the request of Maersk) initially had a positive effect on waiting times in the port and at the wharf for both container and bulk vessels, but in the end waiting time increased again. The average waiting time at the port for container ships decreased from 48 hours (September 2007) to 21.6 hours (September 2010), but then increased back to 43.2 hours (June 2011) compared to a target of 24 hours. Similarly, the average waiting time for bulk cargo decreased from 1.9 days (September 2008) to 1.08 days (March 2009) to 1.03 days (September 2010) but also rose back to 1.5 days (June 2011). The reason for this increase is unclear from the Closeout Magazine report. The Closeout Magazine

report also noted that the fixed berthing window system improved the productivity of loading and unloading containers from 17 tons/hour in March 2009 to 61 ton/hour in March 2010.

According to the World Bank Benin Country Strategy from 2012, the underperformance of the Port of Cotonou was mostly due to the managerial deficiencies and other governance problems. The reforms that are brought about by the government lose steam and ownership is lacking. Corruption in business practices were common and duties of the port managers needed clarification and enforcing. Over time, these weaknesses have resulted in long dwell times in the port, high transaction costs, unmanageable truck congestion inside the port and in Cotonou, and serious revenue leakages. The port reforms implemented in 2012 have had a significant effect on performance, but there is a considerable amount of work to be done.

A World Bank Africa Trade Policy note published in July 2013 based on a report provided to the Government of Benin in October 2012 expands on these issues. The report states that Cotonou's operational efficiency and transport facilitation rates poorly compared to its competitors. For example, the table below compares dwell time at Cotonou versus Lomé and Abidjan. High dwell times negatively impact port capacity, especially in ports like Cotonou which are limited in space (due to the proximity of the city). The report notes that reducing dwell time and improving efficiency would increase capacity without physical expansion investment.

Table 7: Average Dwell Time in Regional Ports

Port	Average dwell time (days)		
	2011	late 2011-early 2012	June-August 2012
Cotonou	21	25	20
Lome	18		12
Abidjan	14		16

Source: 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.

Challenges at Cotonou affecting port operations noted in the 2012/2013 World Bank Trade Policy note include:

- **Hours of operation:** private operators are reluctant to operate 24/7, which negatively affects congestion.
- **Cargo handling procedures:** vessels take too long (up to a month) to offload cargo and the port authority has no way to enforce penalties to increase performance. Port infrastructure is not the issue, but human resource capacity and poor practices (such as bagging of bulk cargo at the quay instead of bulk removal) slow cargo handling.
- **Intra-port cargo movement and storage:** truck traffic at the port, debris and waste, and poor state of port roads lead to congestion at the quay and problems finding containers.
- **Scanning and physical inspection:** inability to properly use the new scanners to inspect containers has led to delays and congestion at scanning facilities.
- **Port information system:** While the port information system developed by the MCC has capabilities to manage vessel traffic, stevedore operations, goods supplied to ships, and apron and shed management, it is not integrated with the truck appointment system or video surveillance system. Training is also an issue.

- **Truck scheduling and staging:** Formalization of truck entry/exit through registration and the development of the truck appointment system are improvements, but enforcement is lacking and trucks still arrive at the port without authorization, linger around the port without assignments, and remain in the port long after they drop cargo (trying to pickup import cargo). Congestion and traffic problems have therefore not been alleviated as anticipated.
- **Transit cargo arrangements:** Transit cargo is transported via convoys with military or customs escorts, despite the introduction of a GPS system that was later discontinued. Convoys are problematic because one truck's delay affects the entire convoy.
- **Capacity of port operators:** Clearing and forwarding agents lack capacity and professionalism which leads to delays in clearance and moving goods; shipping agents from the shipping lines and terminal operators are typically efficient.
- **Container stripping:** Unpacking and consolidating containers at the port instead of at inland container depots adds to congestion. The process itself also leads to overloaded trucks, which harm the roads.
- **Port Storage:** As the port doesn't impose storage fees or penalties, dwell time is high.
- **Port Governance:** The relationship and responsibilities of various parties (PAC, Ministries and Presidency) are unclear. The PAC doesn't have the final say and is overruled by other players, is not consulted, and doesn't have contractual responsibility over port operators, which allows decisions to be made in a non-transparent and uninformed manner.
- **Port Management:** the port has management capacity issues and appointments are not always made based on merit. Frequent changes in management lead to a lack of accountability, ownership and incentives to make a sustained effort at reform.
- **Adaption of New Reforms:** issues with implementation of reforms includes lack of ownership and engagement by stakeholders.
- **Competition:** inter-port competition is lacking due to market concentration; the port operator has little incentive to stop traffic from diverting to another port that it also operates.
- **Corruption:** corruption is high including between importers and customs over merchandise value, smuggling to Nigeria, contracts with port operators, and trucks paying to enter the port.
- **Political support and engagement:** Prior to April 2011, high level political support was lacking. Political interference has also been an issue, for example, with overturning port management on fining trucks for spending too much time in the port.

The policy note also provided recommendations to improve port efficiency:

- **Truck scheduling system:** Enforce truck scheduling, establish a waiting/parking area away from the port, and levy fines/penalties.
- **Truck time in port:** record truck entry and exit time, charging a fee for the time in port or excess time in port.
- **Hours of operation:** operate 24/7 at all levels, which would ease peak tariff congestion.
- **Port pricing:** excess berth and storage fees should be considered to reduce dwell time and congestion.
- **Renegotiate operator contracts:** while unclear to which operators they are referring, the report suggests revising contracts with operators to reflect best practices and improve contractual arrangements.
- **Container management:** container stripping and repacking should be done off-terminal.
- **Installation of weigh scales:** Weigh scales would reduce truck overloading and road deterioration and maintenance costs. Reducing truck overloading would also improve safety, decrease the number of breakdowns, and reduce issues at border crossings.
- **Rail system:** Improving the rail system so that goods could be quickly removed from the port would reduce traffic and transport time.
- **Establish inland clearing depots:** a dry port could alleviate congestion.

- **Streamline customs:** streamlining customs would lead to quicker goods clearance and reduced dwell time.
- **Strengthening M&E:** a dwell time monitoring system could easily be implemented by SEGUB/PAC/ALCO which would allow real time monitoring and alleviation of bottlenecks.
- **Stakeholder engagement and raising awareness:** the port should consider establishing a committee to discuss improving port performance and holding workshops to raise awareness.
- **Combating corruption:** reporting systems, hotlines and an anti-corruption team could be put in place to reduce and prosecute corruption in customs, at the port entry gate, etc.
- **Strengthen port management:** appointments should be based on merit with an evaluation of management position requirements to the candidate's competencies.
- **Strengthen port governance:** develop a single line of authority and give PAC responsibility over decisions related to the port, including contractual ones.

The World Bank notes that during the time between giving the report to the Government of Benin in October 2012 and publishing the policy note in July 2013 some improvements were made. The government implemented some of the World Bank's recommendations (from the above list) and port performance improved. Dwell times fell to 7 days, traffic increased 11% and government revenues increased as well.

Finally, the *Rapport Performance Ministere Gestion* (2013) lists port difficulties as including: inadequate legal/institutional framework, lack of port access for large WAFMAX vessels, no/small logistics platforms/dry ports and small port area, low rail capacity, complicated procurement procedures, and troubles attracting funding.⁵⁰

3.4.3 Gaps in the Literature

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

3.5 Costs and Tariffs

3.5.1 Summary of the existing evidence

3.5.1.1 Costs at the Port

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 1995.⁵¹ 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. It is unclear to us how this \$2.1 million was figured as the port was averaging \$1.1 million in costs prior to the works; this is something for the team to investigate and determine the actual annual cost savings since the

⁵⁰ Rapport Performance Ministere Gestion 2013 actualisu00E9 jan 2015

⁵¹ Benin I 2005 Nov WSA Due Diligence FULL REPORT.pdf

implementation of the jetty extension. The Wilbur Smith due-diligence report had projected that the jetty extension would have impact for 18 years.

3.5.1.2 Container Handling Charges

Wilbur Smith's 2005 report included Maersk's container handling charges, as copied below:

Table 8: Excerpt from Wilbur Smith's 2005 Report Depicting Container handling Charges for the Port of Cotonou

Container Handling Charges Port of Cotonou Assessment					
	Actual Rates (US\$)			Cotonou versus	
	Cotonou	Lome	Tema	Lome	Tema
Ship Handling Container Charges					
Laden					
TEU-Local	\$60	\$102	\$63	-41%	-5%
FEU-Local	\$102	\$170	\$119	-40%	-14%
TEU-Transit	\$60	\$102	\$45	-41%	33%
FEU-Transit	\$102	\$170	\$85	-40%	20%
Empty					
TEU	\$28	\$102	\$50	-73%	-44%
FEU	\$49	\$170	\$90	-71%	-46%
Transshipment					
TEU	\$61	\$57	\$42	7%	45%
FEU	\$75	\$91	\$80	-18%	-6%
Yard Handling Charges					
Local Consumption					
TEU-Import	\$142	\$151	\$14	-6%	914%
FEU-Import	\$234	\$245	\$27	-4%	767%
TEU-Export	\$66	\$66	\$11	0%	500%
FEU-Export	\$113	\$113	\$22	0%	414%
Transit					
TEU-Import	\$142	\$107	\$2	33%	7000%
FEU-Import	\$234	\$174	\$4	34%	5750%
TEU-Export	\$66	\$57	\$2	16%	3200%
FEU-Export	\$113	\$108	\$4	5%	2725%

Source: Maersk

FCFA per \$

530

A report from 2013 contains a more recent comparison of port costs at West African ports, which have been recounted in the table below. In general, Cotonou's costs are higher than at Tema, which is also one of the region's best performing ports.

Table 9. West African Port Costs, 2013 study (Euros)

	Port services and dues					On board handling				Quayside Handling							
						20'		40'		20'				40'			
	Tug fees	Pilot fees	Mooring fees	Port dues	Total	Full	Empty	Full	Empty	Full-Entering	Empty-Entering	Full-Leaving	Empty-Leaving	Full-Entering	Empty-Entering	Full-Leaving	Empty-Leaving
DAKAR	2,729	2,822	341	6,510	12,402	110	71	140	89								
BANJUL	1,005	555	122	22,218	23,900												
CONAKRY	7,974	2,779	128	0	0												
FREETOWN	0	0	0	20,284	20,284												
MONROVIA	17,987	4,996	600	4,336	27,919												
ABIDJAN 1	2,592	4,237	700	4,476	12,005												
ABIDJAN2	2,592	4,237	700	2,952	10,480												
SAN PEDRO	2,592	2,729	910	744	0												
TAKORADI	2,262	889	291	2,571	6,012												
TEMA	2,262	889	291	0	-	63.61	50.48	120.15	90.87	57.56	56.1	50.14	41	94.69	83	78.84	62.5
LOME	2,850	940	183	0	-					129.59	3.05	53.36	3.05	144.84	6.1	83.85	6.1
COTONOU	3,570	1,683	468	2,342	8,063	84	30	122	53	114	0	114	0	189	0	189	0
TIN-CAN	0	0	0	27,841	27,841												
LAGOS	0	0	0	19,963	19,963												
PORT HARTCOURT	0	0	0	26,660	26,660												
DOUALA	2,823	5,538	573	9,951	18,884	79	65	79	98								
BATA	5,076	1,296	1,693	4,741	14,231												
MALABO	9,911	2,085	183	4,302	19,797												
LIBREVILLE	4,024	7,222	543	16,517	28,306	90	50	135	80	160	20	160	20	240	40	240	40
PORT-GENTIL	4,383	4,856	543	7,231	17,012												
POINTE-NOIRE	6,313	1,416	0	2,850	10,579												
LUANDA	4,205	1,626	0	7,878	13,709												
WALVIS BAY	1,513	1,549	0	0	-												
DRC						87.96	0	131.93	0	367.5	61.5	526	61.5	367.5	123	526	123
Total	89,650	63,510	12,612	321,428	454,973												
Median	2,592	1,549	291	4,406	13,056												
Average	3,091	2,190	435	11,480	16,249												

Source: MLTC/CATRAM (2013) Market Study on Container Terminals in West and Central Africa. Maritime Logistics and Trade Consulting/Catram Consultants, Paris

3.5.1.3 Costs of Doing Business

A major issue, especially prior to the MCC's investment, was the length of time to pass through customs. The table below, taken from the IFC's Country Report for Benin in 2009, indicates that it takes an average of 9.6 days to clear direct exports through customs in Benin (and 22.5 days for large firms) compared to 6.5 days in the region and 7.1 days for low-income countries.⁵² Even worse, it takes 33 days to clear imports from customs, compared to 12.8 in Sub-Saharan Africa and 13.3 in low income countries. These delays greatly reduce the competitiveness of the port for hinterland countries choosing through which entry point to import their goods. The delays also place a burden on domestic companies relying on imports.

Table 10: Average time for customs clearance, Benin and selected countries

	Benin	Small Firms (1-19 Employees)	Medium Firms (20-99 Employee)	Large Firms (100+ Employee)	Sub-Saharan Africa	Low income
Trade Indicators						
% of Exporter Firms	16.4	17.0	6.8	78.0	9.7	10.2
% of Firms that Use Material Inputs and/or Supplies of Foreign origin***	63.9	52.6	84.9	82.8	60.6	60.6
Average Time to Clear Direct Exports Through Customs	9.6	10.1	2.2	22.5	6.5	7.1
Average Time to Clear Imports from Customs (days) ***	33.0	49.9	29.3	20.1	12.8	13.3
Losses during Direct Export Due to Theft (%)	0.0	0.0	0.0	0.0	1.0	1.3
Losses during Direct Export Due to Breakage or Spoilage (%)	0.0	0.0	0.0	0.0	1.4	1.5

Source: World Bank: "Benin Country Profile 2009"; August 2010, Page 14/15.

The MCC provided investments in support of institutional reform to customs, and the situation seems to have improved. The World Bank's *Doing Business Report 2015* for Benin indicates 25 days to import and export, but only 2 of these days are relevant to customs.⁵³ Similarly, the MCC's M&E indicators show that at the end of the compact, the time to clear customs was 2.9 days. However, despite improving, the indicators did not meet the goal of one day.

3.5.2 Gaps in the Literature

We would like to review additional literature on shipping, cargo handling, and land transportation costs before and after the investment. We have an example of Maersk's container handling costs from 2005, but it would be good to get similar snapshots from other shipping lines before and after the concession, and today.

3.6 Integration of internal markets

3.6.1 Summary of the existing evidence

Extending the benefits of containerization to inland destinations affords significant incremental benefits to exporters and importers.

⁵² World Bank: "Benin Country Profile 2009"; August 2010, Page 14/15.

⁵³ <http://www.doingbusiness.org/data/exploreeconomies/~media/giawb/doing%20business/documents/profiles/country/BEN.pdf>

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 develop 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 lading 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 have cited poor road conditions and poor truck quality in Benin as a major roadblock to using Cotonou port for hinterland trade.⁵⁴

3.6.2 Gaps in the Literature

Shippers and freight forwarders indicated in their interviews that the logistics chain in Benin is a major deterrent to shipping goods destined to the hinterland through Cotonou. Various interviewees provided some indications of logistics costs during the interviews, but promised additional and more concrete numbers, which we have not yet received.

3.7 Employment

3.7.1 Summary of the existing evidence

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

⁵⁴ Condition of the roads both within Cotonou and beyond, for example to the Burkina border, continue to hinder trade despite improvements made at the port as a result of the MCC.

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 of each of these forces offset and ultimately balance each other.⁵⁵

Between the formal and informal sectors, the Port of Cotonou employs a large number of Beninoise either directly or indirectly. As noted above, the MCC estimates that Bollore's concession will create 450 jobs.

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 (5,000). This 37,000 number shows a decrease in employment of about 6,000 from the Port Advisor's 2007 report, which estimated total employment to be just over 43,000. Table 8, below provides a copy of the employment table from the Port Advisor's 2007 final report.⁵⁶ Affiliated sectors not included in the below chart are Customs, Police, Gendarmerie, Security, food and fish sellers in the Fishing Port, etc; these positions appear to be included in the Port Advisor's 2011 numbers, which would indicate an even larger drop in employment. The 2007 report mentioned that the US Coast Guard suggested that "[t]he number of permanent Badges to users must be considerably reduced," and it appears that this was indeed the case. However, the 2011 figure is not broken down by employment type, so it is difficult to drill-down on where these changes may have occurred.

Table 11: Port employment, 2007

2007	Number	Average Manpower	Total Manpower
Companies and Users of the Port - Formal Sector -	1,014	31	31,434
Companies and Users of the Port - Informal Sector -	490	11	5,390
Other Companies of the Port			
A) Stevedores			
▪ SOBEMAP (Supervisors, etc.)	150		150
▪ SMTC (Employees, etc.)	560		560
▪ COMAN (Supervisors, etc.)	132		132
B) Administration			
▪ Autonomous Port of Cotonou	440		440
Total	2,786	-	38,106
Docker, etc.	5,000		5,000
General Total	7,786	-	43,106

Source: See Footnote 56.

⁵⁵ World Bank, Port Reform Toolkit. Labor Force Management Section

⁵⁶ 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 7. The report questioned the reliability of some of the numbers.

3.7.2 Gaps in the Literature

The latest report from the Port Advisor that we have seen is from 2011; if updated reports or data on employment on the port advisor, it would be helpful to have these documents. Without surveying port users to replicate the port advisor's methodology, it will be difficult for us to estimate the number of companies and users of the port at present in a similar way as done by the port advisor; this could be done during the Option Years. Therefore at this stage focusing on direct impacts, we would also like to ideally look at changes in employment 1) before the MCC compact, 2) during construction to capture temporary employment, and 3) at present as a representative of employment levels after the investment and concession. The table above provides data from 2007, which could be used as a baseline if data for 2005 or 2006 do not exist. We would like to see employment data from during the construction period; this is still outstanding as the data from 2011 are from the post-investment period. We also were able to gather some data for present employment, but from various sources and the data do not give a complete picture of the industry. Additionally, it became apparent during the field mission that there may have been a substantial shift from informal to formal sector employment as a result of the MCC investments. The field work provided enough information for a qualitative assessment; we also requested statistics from Guichet Unique de Formalisations des Entreprises (GUFE), which are still outstanding, but if received may allow us to quantify some of these effects on formal business creation.

3.8 Corruption

3.8.1 Summary of the existing evidence

Transparency International ranks Benin 94th out of 177 countries with respect to perceived perception of corruption.⁵⁷ High levels of corrupt practices, non-transparent transit and import procedures and processes, including negotiations between importers and Customs concerning the value and nature of merchandise being imported, and the informal, illegal smuggling of goods into Nigeria, pose serious governance concerns at the port.

Corrupt and non-transparent practices seem to occur at several levels from large contracts entered into with civil engineering companies, to the engagement of port service companies, to small individual contractual and procurement arrangements, to Customs practices, to the payment by truckers to gain port entry. Public procurement and project contracting are two of the most corrupt sectors in Benin. According to the World Bank Enterprise Surveys 2009, more than half of the surveyed companies stated that they expect to provide gifts in order to secure a government contracts. This pervasive and high level of corruption can raise costs, reduce government revenue, limit competition, and increase uncertainty. Corruption counters many of the benefits, which the project might have been expected to realize.

⁵⁷ https://www.transparency.org/country/#BEN_DataResearch

Table 12: Corruption Indicators for Benin and selected countries

	Benin	Small Firms (1-19 Employees)	Medium Firms (20-99 Employees)	Large Firms (100+ Employees)	Sub-Saharan Africa	Low income
Corruption Indicators						
Incidence of Graft index	42.8	23.4	83.4	10.6	18.3	24.9
% of Firms Expected to Give Gifts In Meetings With Tax Inspectors	26.8	12.8	84.8	0.0	18.3	26.6
% of Firms Expected to Give Gifts to Secure a Government Contract	60.6	27.4	85.8	0.0	38.3	44.2
% of Firms Expected to Give Gifts to Get a Construction Permit	47.3	2.2	96.1	14.6	26.8	35.9
% of Firms Expected to Give Gifts to Get an Import License	24.5	32.7	2.4	0.0	17.1	24.8
% of Firms Expected to Give Gifts to Get an Operating License	44.6	59.1	0.0	0.0	19.5	27.3
Crime and Informality Indicators						
% of Firms Believing the Court System is Fair, Impartial and Uncorrupted	9.6	4.6	29.0	0.0	43.3	40.3
Security Costs (% of Sales)	0.6	0.6	0.9	3.6	1.8	1.5
Losses Due to Theft, Robbery, Vandalism, and Arson Against the Firm (% of Sales)	1.9	2.3	0.1	0.0	1.7	1.3
% of Firms Formally Registered when Started Operations in the Country	87.9	90.9	73.3	91.9	82.2	86.7

Source: IFC Country Report Benin (2009).

User surveys, which the MCA conducted as part of its own program evaluation, confirm that the level of corruption remains high in the port and its immediate environment. Indeed surveys⁵⁸ conducted in 2009 and again in 2011 suggest that both the incidence and the cost of corrupt practices had increased significantly during the interim period. The MCA evaluation suggests that this increase may have been related in 2011 to upcoming elections. Apparently a well-established relationship exists within the Benin political economy between the needs of political parties for extraordinary revenues in the run-up to elections and the level of informal payments collected from port users.

With that said, some qualitative evidence exists in the form of testimonials from port users that over the last 3-4 years that the incidence of corruption has declined. This decline is alleged to be the result of several factors, several of which are related to the MCA investment. They include: i) the real time surveillance of activities taking place within the port; ii) increased rigor with respect to who can enter and leave the port. This rigor derives directly from the single gate scheduling and controlled access (access only by appointment) system which the port authority has installed. iii) increased work scheduling and job control systems which Maersk, Bollare and other private stevedoring companies have installed as part of their efforts to upgrade terminal management. Precise work planning and crew output measurements systems allow very little time for non-productive activities, such the collection of speed money; and iv) the new one stop payment system which the port authority and Customs both support. This system inhibits corruption with regard to the adjustment of customs and port fee payments because it substitutes automated interfaces which include rigorous controls over extraordinary valiances in payments for face to face dealings.

The government is aware of the corruption problem and is trying to counter it. Bribery is illegal in Benin and subject to up to ten years imprisonment. The Government has identified the fight

⁵⁸ Enquêtes de suivi de l'Etude sur les Litiges, la Valeur Ajoutée et la Satisfacation des Usagers du Port de Cotonou; Rapport final de l'enquête de suivi n°2; pp 61-70.

against corruption as a national priority. Government effort to fight corruption includes the creation in 2013 of a National Anti-Corruption Authority (ANLC). This authority is responsible for referring corruption cases to courts. By law, the ANLC has the ability to combat money laundering, electoral fraud, economic fraud, and corruption in the public and private sectors. Benin's State Audit Office is also responsible for identifying and acting against corruption in the public sector. Benin is a signatory to the UN Anticorruption Convention.

The Government has imposed administrative sanctions and removed some high profile corrupt individuals from office. None, however, have faced prosecution in Beninese courts. Corruption remains a systemic problem in areas including customs administration, government procurement, and the judicial system. The official procedures in Benin remain bureaucratic and inefficient. Observers note that instead of addressing complicated problems, the government only addresses those that are relatively easy to manage.

Piracy poses another challenge for the Port of Cotonou's growth and development. In 2011-2012, 156 pirate attacks were reported and most of the abducted ships lay at anchor, drifting, or engaged in ship-to-ship (STS) operations within 135 miles off the Port. High jacking of commercial vessels occurred every 10-11 days, during which the organized gangs transfer the captured cargo to "unmarked" vessels. Hence, some vessels conducted their STS operations beyond 135 miles offshore, as this was seen to be a safer – if more expensive – way to transfer loads. In response, Benin and Nigeria have begun joint patrols closer to their shores. However, the number of attacks has not subsided. Recently privates have moved their operations further out to sea and have begun to attack vessels moving well beyond the patrolled high-risk area and, indeed, pirates have expanded their area of operation west to Lomé.

Dockside piracy is even more rampant than piracy on high seas. Dockside piracy also exists within the Port of Cotonou. The pilfered fuel – which subsequently resurfaces on the black market in the main ports along the Gulf of Guinea – poses a significant problem. The effectiveness of the MCC investment in a port security system needs to be reviewed with respect to allowing the PAC to comply with the International Ship and Port Facility Security Code (ISPS).

3.8.2 Gaps in the Literature

An updated user survey, like the one last undertaken in 2011, would be useful in determining just how successful have been the several reform initiatives noted above in reducing corruption. 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. Moreover, reforms that have taken place since the last user survey are alleged to be effective. Still the fact remains that corruption continues to pervade multiple aspects of Benin's political economy.

3.9 Institutional Issues

It appears that institutional reforms essential for securing a full measure of potential benefits from the MCA project have not yet been undertaken. Indeed, the sequencing of investments and reforms appear to have taken place in the opposite order from which should have taken place. For example, the charter of the Port of Cotonou has not been amended to adapt it to its new role as concession regulator and, without strong and forceful oversight and indeed without the

conditions of the concession still unfilled on the government's side, the concessionaire operates unilaterally and without full accountability for productive use of the MCA provided investment in the new terminal.

3.9.1 Summary of the existing evidence

Three models of 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 front-line 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 which is popular in 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 for the sector. However, its adoption in Sub-Saharan Africa has so far been confined to Nigeria and Ghana alone. Benin's model appears to be the "intermediate model."

Institutional reform is a prerequisite for enhanced competitiveness. Positive signs of reform have appeared in West Africa, and the pace of reform appears to be increasing. However, much remains to be done. In general areas of additional opportunity include legislation, restructuring, policy oversight, and private sector involvement. Being able to modernize and adapt the institutional software, which ultimately controls a port and drives its change program, is sometimes difficult politically. However, it is nonetheless essential when a port attempts to change the way in which it operates as fundamentally as PAC has from a "service port model" toward a "landlord" port model.

If done correctly updating institutional arrangements is much less costly than investment in physical infrastructure and, over the long term, more effective in improving port competitiveness. Conversely, if done incorrectly, it can have the opposite effect and actually pull a port backward. Ideally, upgrading port institutional software and renewing its hardware should come in tandem. Institutional upgrading is complementary and multiplicative of investment in port infrastructure.

Institutional arrangements and organizational structures directly affect the speed, the value created, and the level of confidence within the larger port community with which decisions are made. Institutional arrangements represent 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 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) experience 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. Systematic and well-coordinated management processes 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 processes and, importantly, through the strengthening of port governance and the tightening of internal controls.

Improvements made in these areas can and do affect 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 project team anticipates that it will be able to drill down deeply enough to understand basic institutional arrangements, which can and should support increased PAC competitiveness.

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.

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. Apparently, the government, 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, engaged the IFC to act as its financial advisor and to prepare and implement the concession agreement. The engagement of the IFC took place on a sole source basis with the IFC essentially defining the terms and conditions of its financial advisory support. At that time little capacity existed within the government to either manage the concession tendering or to oversee effectively the activities of the IFC. In any case, in response to the tender two qualified firms prepared offers, Maersk Lines and Bolloré. However, the Maersk offer failed to arrive before the designated submission time and was consequently disqualified.⁵⁹ The IFC proceeded to negotiate a concession agreement with Bolloré, which is the agreement which is currently pending full implementation.

Apparently, 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 including the Private Infrastructure Development Group to conduct a due-diligence review of the legal and

⁵⁹ Roussel notes that “It might be interesting to note that, according to Bolloré, Maersk’s offer was substantially lower than that of Bolloré.” However, this information did not come out in the NORC team’s interviews with Bolloré and therefore we cannot substantiate this information.

institutional prerequisites for the transaction. These third parties found the prevailing institutional framework adequate to support the proposed concession.

However, a recent World Bank review of port governance⁶⁰ suggested that many decisions affecting the five key operating variables noted above appear to be poorly informed. Indeed, some appear not to be in the best interest of port operations and some appear to be unduly influenced by political considerations. The World Bank review suggests that many could be open to criticisms related to non- transparency and potential corruption.

In any case it would prove 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 are imposed without sufficient consultation with PAC staff and other stakeholders, and when decisions taken by PAC are reversed or altered by other layers of government. Such precedents exist in Benin. Apparently, according to the World Bank study, this has occurred in the past. Indeed, some change programs have been seen as being imposed from the outside. Change plans that do not fully engage those affected by reform are difficult to implement.

Implementation of radical reforms in an institutional environment where only limited capacity exists to implement these reforms is extremely difficult, particularly when significant resistance is incurred. 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.

The World Bank study represents a perfect storm of unfortunate coincidences including weak implementation capabilities, a lack of awareness and acceptance by stakeholders, an inexperienced private sector operator, and capacity constraints among various stakeholders, all of which resulted in the deterioration in port performance and sharply increased container dwell time.

The formal authorities 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

⁶⁰ <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, high transaction costs, unmanageable truck congestion inside the port and in Cotonou, 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.

governance issues) that limit their ability to control resources. Some of these include limitations with respect to allocating and assigning port labor and limitation with regard to 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.⁶¹

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.

Finally, in consideration of eventually disentangling the MCC Compact's benefits to Benin, in recent news, the Port of Amsterdam announced that some of their experts will work with Benin officials to develop a Port Master Plan and Implementation Plan.⁶² 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. It will be interesting to further investigate the PoAI's plans and goals, and how their investments will follow on to the MCC's investments. We will also have to keep their investments in mind for future Option Year evaluations as we seek to isolate impacts that can be attributed only to the Compact.

3.9.2 Gaps in the Literature

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.⁶³ What is missing, however, are studies, which deal with port institutional development specifically in a Benin context. Because the port director was out of the country for most of the NORC team's mission...returning from Washington only on the final day... it was not possible to have an in depth discussion with him about the basic institutional changes which are planned for strengthening port's capabilities, governance and accountability moving forward. His rebuttal of information collected from other sources would have been useful, as well.

⁶¹ Roussel notes that the management of containers was a very serious problem in 2011 and that container management should be addressed explicitly unless this is no longer a constraint. It is the NORC team's understanding that this has been addressed by the private operator, higher storage fees, and customs improvements that have led to greatly reduced container dwell times and better container management.

⁶² Port Financial International: "Port of Amsterdam to assist Benin's Port of Cotonou", January 30th, 2015, p. 1 of 1

⁶³ See for example: "Implementation of PPP's by GPHA: A GAP Analysis", World Bank and UNDP, 2015

4. Evaluation Design

4.1 Policy Relevance of the Evaluation

4.1.1 Infrastructure Improvements

Ports are a vital part of the many economies, and in the case of countries like Benin, are essential for facilitating trade, importing goods essential for food and industry, and creating jobs. The addition and rehabilitation of port infrastructure figures prominently in large-donor interventions and in the development literature. Djankov, Freund, and Pham find that each additional day required for a shipment imposes an “extra” economic distance equivalent to 70 km per day, thereby effectively moving markets further away.⁶⁴ Kent and Fox show that port inefficiencies, if removed, can increase GDP growth by nearly 0.5 percent.⁶⁵ The importance of port infrastructure is especially the case for Benin, whose economy is profoundly dependent on its port. Have the myriad of claims of social and economic benefits from this expensive allocation of resources materialized in the case of Benin? And can they be convincingly attributed to the MCC Compact? The importance for policy of the answers to such questions is why the present evaluation is so relevant and timely.

4.1.2 Institutional and Organizational Improvements

A critical area for the evaluation is to determine whether the physical port improvements were adequately supported by institutional reforms and not impeded by oligopolistic market structure, especially where hoped-for performance benefits were not realized.

Institutional arrangements and organizational structures directly affect the speed, the value created, and the level of confidence within the larger port community with which decisions are made. Institutional arrangements represent 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 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:

- experienced and competent managers;
- clearly defined responsibilities and accountabilities; and
- sufficient levels of checks and balances to assure that public resources are delivering public goods efficiently.

Systematic and well-coordinated management processes are important, as well. Efficiency gains and improvements in service can both be achieved and tradeoffs between the two shifted through

⁶⁴ Djankov, Simeon, Caroline Freund, Cong S. Pham, *Trading on Time*, World Bank, Washington, D.C., 2006.

⁶⁵ Kent, Paul E. and Alan Fox, “Is Puerto Limon a Real Lemon? The Impact of Port Inefficiency on a National Economy”, in *The International Handbook of Maritime Economics*, edited by Kevin Cullinane, 2011.

the embrace of superior procedural, managerial and administrative processes and, importantly, through the strengthening of port governance and the tightening of internal controls.

Improvements made in these areas can and do affect 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:

- service/cost tradeoffs;
- capital budgeting decisions;
- work scheduling and the deployment of manpower;
- efficient inland transport linkages to the hinterland; and
- 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 project team anticipates that it will be able to drill down deeply enough to understand basic institutional arrangements, which can and should support increased PAC competitiveness.

4.1.3 Future MCC Procurements

In instances where there are many needs competing for the same funds, it is difficult to decide whether to focus on improving physical infrastructure or the business enabling environment. But oftentimes both types of investments are needed, and it is hard for one to succeed without the other. And even if funding is available to cover both, it is still a complicated process to implement institutional reform simultaneously with physical infrastructure investments. In the case of Cotonou port, the MCC both funded physical improvements at the port and influenced the institutional structure at the port through the requirement of a concession agreement to engage a private partner not only to operate the container terminal once its construction was complete, but also to complete the infrastructure development which the MCC had begun. The MCC can learn valuable lessons with relevance to future port development projects from Cotonou concerning the timing and synchronization of its own capital development and product planning efforts with the concession development and regulatory oversight efforts of the government entity which is the MCC’s primary counterparty. Additional useful lessons can be learned about how best to strengthen and upgrade institutional capacities within beneficiary organizations alongside with funding for physical infrastructure improvements. Finally, the MCC required the PPP concession of the South Terminal as a prerequisite for the release of some of the project funding, but left the implementation of the PPP transaction to the GoB. Our evaluation will look at this process and will provide advice on how the MCC should approach future situations. In particular, should the MCC have provided technical assistance or played a larger role in overseeing the PPP transaction?

4.2 Evaluation Overview

4.2.1 Summary of Evaluation Questions and Outcomes

The project team grouped together the evaluation questions proposed by MCC by theme and type of analysis as shown in Table 13. The questions and the methodology that will be used to answer them is examined in more detail in the remainder of Section 4.

Table 13: Research Questions and Analysis Methodologies

Research Question	Shipping/Market Analysis	Trade Analysis	Institutional Assessment	Port Operational Analysis	Cost/Tariff Analysis
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?				■	
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?			■		

Research Question	Shipping/Market Analysis	Trade Analysis	Institutional Assessment	Port Operational Analysis	Cost/Tariff Analysis
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 been implemented/sustained?			■		

Research Question	Shipping/Market Analysis	Trade Analysis	Institutional Assessment	Port Operational Analysis	Cost/Tariff Analysis
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 c) 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, and institutional reform can be made for future MCC port investments and evaluations?			■		

4.2.2 Summary of Evaluation Approach

The evaluation approach which the NORC team has adopted entails two sets of quantitative comparisons: i) critical measures of mission success before and after the MCC investment⁶⁶ and ii) comparisons of mission critical performance vis a vis benchmarks or “best in class” global standards for ports of the same size as Cotonou. Quantitative assessments have been contextualized, explained and elaborated using qualitative analysis in the forms of expert opinions solicited during interviews, focus group views and perspectives and application of survey data from several sources.

4.2.2.1 Approach to Evaluating Operational Performance and Efficiency

The assessment of changes in operational performance and efficiency will focus on two categories of parameters related to operational efficiency and level of service.⁶⁷ Operational efficiency assesses how productively the port uses its assets, as measured by ship productivity, crane productivity, and berth throughput productivity. Level of service assesses the quality of service provided at the port by looking at indicators such as ship delay, truck delay, and truck turn time.

⁶⁶ A note that our methodology does take into consideration an assessment in comparison to the counterfactual, as mentioned here and other places in the report.

⁶⁷ Veilleux raises concerns that our approach overlooks the relationship between cargo dwell time and operational performance efficiency, level of service and on evaluating institutional control issues. As also addressed in previous comments, dwell time is not our focus as it can be managed fairly easily by private operators and is technically not the defining issue regarding terminal capacity (and finally throughput).

Both areas of assessment require data from before and after the investment. The field work and follow-up conversations with stakeholders is essential for collecting relevant and good quality data for both time periods, and preferably in time-series form. Collecting robust and continuous before-and-after data will be their primary objective for all datasets. However, for some datasets like congestion or pricing, this may prove difficult. In these instances the project team will resort to more subjective assessments provided by reliable witnesses and based on ranking or order methodology to assure comparability among sources.

4.2.2.2 Approach to Evaluating Institutional Control Issues

A key set of issues to drill down into during the Cotonou mission involves institutional capacities and organizational frameworks. Related issues are the PAC's relationship to other branches of government, corporate governance of the PAC itself and the effectiveness of the controlling relationship between the PAC and the concessionaire. Interviews conducted during the mission, suggest that the institutional foundation which the MCC investment requires in order to produce productive results is still "in process" and that the concession agreement with the private terminal operator who is managing the primary asset created with the MCC credit has not yet been fully implemented because the GoB has not made good its commitments to complete dredging operations. As this stand, the PAC appears to lack formal as well as effective management capacities to provide effective oversight over the concessioned operation. 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.

In order to address these issues the project team investigated:

- 1) What authorities and controls over port operations exist within the PAC?
- 2) What authorities over the performance of the concessionaire exist within the PAC?
- 3) What governance mechanisms apply in overseeing PAC's own management decision-making?
- 4) What are the competencies and capabilities of PAC's management team?
- 5) How effective is PAC in regulating and controlling the concessionaire who operates the container terminal?
- 6) What additional reforms are required in order to increase the productivity of the MCC investment?
- 7) What useful lessons can be taken away from MCC project implementation with respect to PAC institutional developments?

4.3 Port Operational Analysis

4.3.1 Evaluation Questions and Outcomes

Port operational analysis is relevant to answer two important research questions:

- How has the competitiveness of the port evolved?
- To what extent do the completed works mitigate/resolve observed constraints to port capacity and improve the efficiency of port operations?⁶⁸

To address these questions, we propose respectively:

- a detailed analysis of port performance based on the calculation of key indicators; and
- the estimation of port capacity based on the disaggregation of port infrastructure components to estimate past and current capacity and determine which constraints (“bottlenecks”) were resolved as a result of MCC’s intervention.

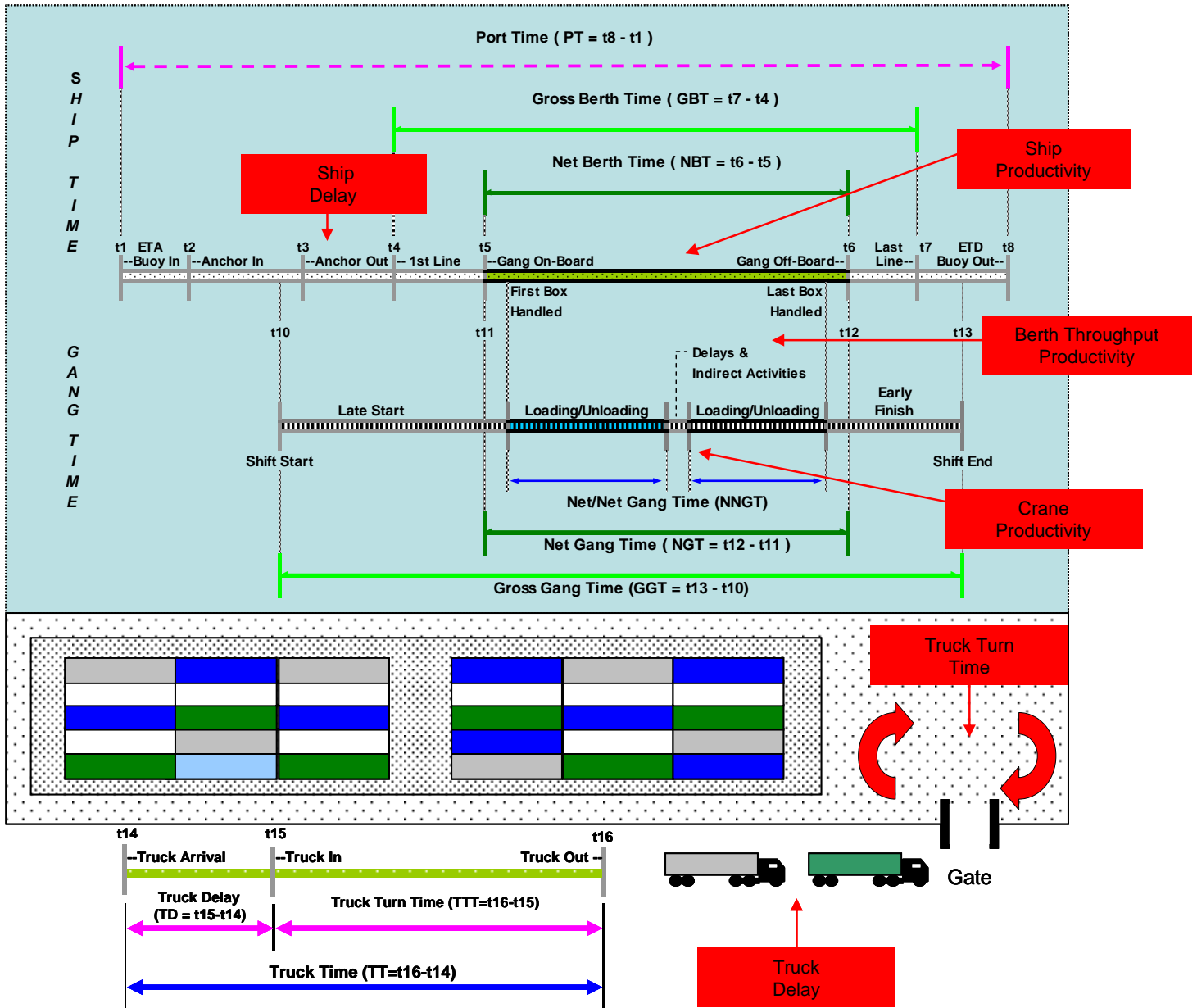
4.3.2 Methodology

As a first but crucial step in orienting the Benin port evaluation we propose to follow the disaggregation of port performance developed in Kent and Ashar (2010)⁶⁹ and applied in our work on the regulatory module of the World Bank’s Port Reform Toolkit. Kent and Ashar propose two categories of indicators as mentioned above, those for operational efficiency and those for level of service. As noted above, 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), however, we are mainly interested in the time required to serve the vessel at the berth and LOS that the shippers experience. On the basis of these indicators, we can assess how ranges of performance have changed over the course of the Compact period, as well as how they compare to other ports in the region based on regional and/or international benchmarks. The detailed description of these indicators follows.

⁶⁸ The team does not intend to assess how improvements in security impacted operational efficiency as it is too difficult to quantify. Of course, an orderly terminal, with circulation of only authorized personnel will perform better, but this is a self-evident fact.

⁶⁹ 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.

Figure 3: Port Time Accounting System and Operational and Level of Service Indicators



Source: Kent and Ashar (2010)

4.3.2.1 Operational Efficiency

Ship Productivity. Probably the most important measure of terminal performance, ship productivity is based on the number of moves per hour during a vessel's *net berth time* (see Figure 3). 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. So 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.

Crane Productivity. Crane productivity is affected by the skill levels of the port workers as well as the technology that is applied. In Cotonou we will separately analyse the productivity of mobile cranes operating in the North terminal and gantry cranes operating in the South terminal. Gantry crane productivity is superior to mobile crane productivity, and mobile crane productivity is superior to ship's gear. The calculation of crane productivity should therefore be distinguished by the types of cranes that load or discharge the containers. 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.

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. However, as vessel sizes have increased, berth sizes are 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.

4.3.2.2 Level of Service

Ship Delay.⁷⁰ 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.

Truck Delay. The difference between the truck appointment time and commencement of gate processing is calculated as truck delay. Truck delay is more readily calculated if there is a truck appointment system. Otherwise, truck operators can indicate what the typical gate queuing time is. For terminals that have truck appointment systems, the calculation of truck delay assumes the truck arrives (pre-gate) ideally 30 minutes before the appointment time.

⁷⁰ The MCC questioned how sizes of trucks and ships factor into ship and truck delays. Regarding ship sizes, the appointment system (berth windows) take care of the time needed to process larger cargo volumes. Regarding trucks, the size is standard: a truck pulls a trailer and that is the standard unit (the trailer can have a 20', or 40' container or a regular trailer even larger than 40').

Truck Turn Time. This indicator 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. Ideally, truck turn time would not exceed one hour, but exceeding this time is justified if the truck is engaged in both discharge and loading inside the terminal, requiring about 30 minutes more. However, in test runs of this indicator, we find that data distinguishing trucks that are only loading, only discharging, or both discharging and loading are not readily available.

In the interest of easing the data collection process when data is difficult to obtain or detailed historic information is scarce, Kent, Ayzanoa and Ashar (2014)⁷¹ proposed to narrow the list of indicators by applying principal components analysis, which identifies the range of the selected indicators most reflective of overall performance and provides the basis for ranking terminals relative to operational performance. The end result is the emergence of two indicators, ship productivity and crane productivity, which researchers can focus on for performance monitoring, thereby confirming the potential for widespread application of port performance measurement, along with the ranking of terminals that are assessed. As the ultimate indicators are based on operations analysis, they provide more insight about port performance than other approaches and surveys and hence point to specific areas of port operations that have improved, or not.

For estimating port capacity, Ashar and Ayzanoa (1995) propose calculating the capacity of each terminal component (berth, yard, and gate) following industry standard methods.⁷² Then, for each terminal, the component with most restrictive capacity will determine the terminal capacity. Industry benchmarks will be used to differentiate between “theoretical” and “practical” demand as actual port throughputs are not only a function of equipment, layouts and operational procedures but also of a variety of scheduling, management and human factors that can only be accounted for in a detailed simulation. Consider the calculation of each port terminal component in turn:

Berth 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 (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 and is applied for all the terminals included in this evaluation as all assign 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 at values between 0.4 to 0.8 of a berth equipped with gantry cranes (180,000 to 360,000 TEU annually).

Patio Storage (Yard) Capacity. The calculation of yard capacity has to assume the yard equipment deployed. For example, the benchmark of 40,000 TEU annually per hectare is assumed as a

⁷¹ How Fit are Central America’s Ports? An Exercise in Measuring Port Performance. Paul E. Kent, Gerardo Ayzanoa and Asaf Ashar. International Association of Maritime Economists (IAME) Conference, Norfolk, Virginia, July 2014.

⁷² “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.

practical standard for rubber-tired gantry (RTG) patio crane. Depending on the equipment deployed at the port, industry standard benchmarks will be applied.

Gate Capacity. The calculation of gate capacity assumes also practical industry benchmarks. Standard assumptions are 3 minutes per transaction and 16 hours of operation. When calculating the port terminal gate capacity, these operational assumptions and the number of gates will be defined after the site visit.

4.4 Shipping and Market Analysis

4.4.1 Evaluation Questions and Outcomes

Shipping and market analysis is relevant to examine the following research question:

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

4.4.2 Methodology

In the container trades, documenting the strategies of vessel operator services and deployments, such as load centering, slot sharing, transshipment and feederage, 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 but trade growth is an issue that should be analyzed independently. 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 being equal, a port’s infrastructure and equipment improvement should lead to better shipping services or connectivity (increased supply).

We propose to use port connectivity 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. LSCI should be also a good indicator of a port’s ability to serve other cargos, especially general cargo.

By UNCTAD’s definition, LSCI captures how well countries are connected to global shipping networks. It is based on five components of the maritime transport sector: number of ships, their 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, the five components are averaged for each country, and the average is divided by the maximum average for 2004 and multiplied by 100. The

index generates a value of 100 for the country with the highest average index in 2004. The index has been calculated and is available for the period 2004-2015 Benin, Cape Verde and the neighboring countries of Ivory Coast, Ghana, Nigeria and Togo. Therefore, changes in shipping connectivity can be measured before and after the Compacts were in place and regional comparisons can be made.

LCSI base data and estimates will be reviewed and analyzed to serve as a solid base for interviews with liner and feeder service operators and shipping agents on the field. The interviews will document the change in the competitiveness of the subject ports caused by changes in the shipping service patterns and fleet characteristics relevant to the region. Our interviews will also address how the service conditions have changed and influenced change in the vessel fleet profile. Vessel deployments will be described relative to the fleet size and characteristics (crane requirements) to include also vessel capacity utilization for Cotonou port.

The current competitiveness of Cotonou will be also analyzed documenting as much as possible the strategies of vessel operator services and deployments, such as load centering, slot sharing, transshipment and feedering. The interviews with major liner, feeder, and cabotage service operators will be used to determining local, regional, and international aspects of vessel deployment patterns

Current vessel deployments will be described relative to the fleet size and characteristics. Interviews with shipping lines and vessel operators will be 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. If shifts are identified the team will assess if the change is associated with vessel efficiency or productivity requirements or by demand and shipper preferences for speed and reliability.

4.5 Trade Analysis

4.5.1 Evaluation Questions and Outcomes

Trade analysis is relevant to examine the following research questions:

- How has the competitiveness of the Port evolved since 2006/2005 in terms of attracting trade to hinterland countries?
- 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 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?

4.5.2 Methodology

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 micro-economic level, we would expect the greater availability and lower prices of imported inputs to stimulate local production, increasing private sector income.

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

We will then attempt to measure whether these changes in trade volumes correspond to changes in port productivity and/or port capacity. For variables where data are available (such as port capacity), we will use correlation analysis or multivariate regression analysis to try to make this connection, but in most cases, this assessment will be more qualitative in nature. Observations of changes in trade volumes following changes in productivity enable us to determine the extent to which the Port is a constraint for trade growth in Benin. It also 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 can be concretely tied to increases in trade volumes beyond the level of capacity prior to the investment.

To further our attempt at answering the question of “attribution”, we will also forecast domestic import and export cargo to determine the relationship between trade volume and GDP. A common methodology for forecasting domestic cargo (imports/exports) is based on the relationship between trade volumes and GDP. Many studies^{73,74} 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. And in most cases, regression analysis provides a good basis for

⁷³ 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.”

⁷⁴ 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.

measuring the extent to which these relationships are correlated. Trade volumes were forecasted from 2005 to 2014 based on volumes prior to 2005 and GDP forecasts⁷⁵ from 2005 to 2014 that were forecasted prior to 2005.⁷⁶ We will then compare the forecasted trade volumes with actual trade volumes. 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.

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,⁷⁷ and the actual numbers are estimated to be up to 70%.⁷⁸ 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.⁷⁹ Therefore we will test two forecast models: one based on Benin's GDP, and one based on both Benin and Nigeria's GDP.

Given the difficulty in isolating the impact of the port project on trade volumes compared to other variables, we will also qualitatively assess other factors that may have impacted trade volumes, adjusting our findings as necessary, including whether attribution to the project could be justified.

Finally, an important determinate of trade volume—particularly formal trade—is customs processing time. In our assessment of port operational performance, we will analyze changes in customs processing time (the average time to clear customs) over time, including safety and security.

4.6 Institutional Assessment

4.6.1 Evaluation Questions and Outcomes

Qualitative analysis will contribute to answering the following list of evaluation questions:

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

⁷⁵ As GDP may also have been impacted by the investment, as discussed in the next paragraph, the best data for this comparison would be GDP forecasts from 2005-2014/2015 that were forecasted/projected in or prior to 2005.

⁷⁶ As GDP may also have been impacted by the MCC's investment, the best data for this comparison are GDP forecasts from 2005-2014/2015 that were forecasted/projected in or prior to 2005.

⁷⁷ PAC.

⁷⁸ Nunez and Hoareau (2011)

⁷⁹ 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.

- 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?
- 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?
- To what extent has the port project contributed to achieving an overall compact objective of increasing the integration of internal markets?
- What net change can be observed in employment among the permanent and non-permanent employees in the port sector following completion of the works?
- What has been the cost of corruption?
- All the monitoring and process related questions.

4.6.2 Methodology for Qualitative Analysis

The relationship between the quantitative analysis described above and the qualitative analysis which the project team will undertake is the following: The qualitative analysis will provide context for the quantitative work. It will identify the contingencies and the conditions which affect specific outcomes and outputs in addition to MCC investment both directly and indirectly. In addition, qualitative analysis should provide deeper level insights into the possible hypothetical causes for change in outputs and outcomes than quantitative analysis alone.

Thus, qualitative analysis should complement and extend the quantitative analysis both as an exploratory instrument and as an instrument for testing, confirming and elaborating specific hypotheses once these have been tested statistically and been found to be significant. For example, conclusions that investment in brick and mortar infrastructure and inadequate and only partially successful can and should be explored in more detail the ontology of interactions between the political economy in Benin, the institutional foundations on which port reform is based and the nature of relations between the private concessionaire and the public port authority.

4.6.3 Employment

While there is little doubt that employment temporarily increases during the construction phase of port improvements, the real question is whether it increases once the port improvements entered into operation. There are two dimensions here, temporary and permanent workers. In each case, it is not enough to look at total employment of port workers. The team will gather data on the number of people employed directly in port related activities⁸⁰ at different time points, preferably before the project, during construction, and at present. Employment statistics will ideally cover all employment directly related to the port including public and private sector port workers, stevedores, and transporters. Data collection for such figures will likely come from a variety of sources; the team will take care to make sure the data are as consistent as possible and not overlapping before combining data from various sources. The data gathered may not allow for an extensive quantitative analysis, but should allow us to do a qualitative assessment with some

⁸⁰ Several studies by the Port Advisor appear to have employment figures covering both direct and indirect employment. During the Base Year, we will not analyze indirect employment effects. In the Option Years, it may be appropriate to do so, which will require replicating the Port Advisor's methodology and likely conducting surveys.

quantitative indications of changes in employment. Whether we can conduct quantitative analysis will depend on whether various stakeholders follow-up with our requests for statistics, and whether the statistics we receive present a full, industry-wide picture over different periods of time.

Additionally, an extremely large share of Benin's productive population works in the informal sector where they pay no taxes, have very little access to third party financing and operate below the radar in a poverty trap with extremely limited opportunities for productivity enhancement. Growth multipliers in the informal sector are very low, while those in the formal sector are significantly higher. Investment in formal sector port services jobs tends to create additional jobs in the collateral sectors and to improve the productivity of the entire commercial ecosystem surrounding the port. The investments made in the Port of Cotonou both directly and indirectly tilted incentives and opened opportunities for increased participation in the formal sector by the members of the informal sector. The NORC team will attempt to sort through not only first order job creation impacts associated with the MCC investment but with second order impacts as well, particularly ones associated with informal to formal sector transition incentives.

4.6.4 Costs of corruption

It is this factor that is likely to be the weak link in the Compact's project design, as it relates to institutional and not hardware improvements. Nonetheless, our team will carry out extensive key informant interviews with those likely exposed to corruption, e.g., freight forwarders, brokers, shippers, truckers, and customs agents to see if unusual charges are applied in doing business with the port. Likewise, corruption must be addressed through the computerization of customs and processing of shipping documents. Successful evaluation of project impact requires two components: detection techniques and modeling change. We plan to use a number of methods to infer the degree of corruption and its costs.

First and foremost, we will draw on the rounds of corruption perception surveys funded through the Compact. If these prove to be statistically powerful we will likely suggest that an additional round is administered as part of an endline for the evaluation – probably in Option Year 1, should it be contracted.

Second, Arvis *et al.* at The World Bank (2014) use the following indicators in their Logistics Performance Index:

- The efficiency of customs and border clearance (“Customs”).
- The quality of trade and transport infrastructure (“Infrastructure”).
- The ease of arranging competitively priced shipments (“Ease of arranging shipments”).
- The competence and quality of logistics services—trucking, forwarding, and customs brokerage (“Quality of logistics services”).
- The ability to track and trace consignments (“Tracking and tracing”).
- The frequency with which shipments reach consignees within scheduled or expected delivery times (“Timeliness”).

We will take advantage of this framework in our qualitative work as well as complement our own analysis with what changes over time in these indicators (and their associated sub-indicators) reveal.

As a separate exercise, salaries of port employees could also be examined to determine potential for corrupt practices.

Finally, we would also look at third-party indicators that include corruption such as those prepared by the *World Competitiveness Report* (World Economic Forum, various years), the *Costs of Doing Business* (World Bank, various years) and *Corruption Perception Index* (Transparency International, various years).

4.6.5 Unanticipated Impacts⁸¹

4.6.5.1 Assessing the Merits/ Demerits of the Concessioneering of the MCC Funded Assets

Economics of PPP Transfers

The transfer of control over port service activities from the public to private sector can take place in a number of ways....for example on an ad hoc, incremental basis without an explicit strategy designed to realize competitive advantage through the engagement of global, strategic partners—such as PSA International, Hutchinson Port Holdings, APM Terminals or DP World. These world class terminal operators have the capability to uplift the quality of port services, to enhance the service reputations of the ports they operate or to transfer into their client ports the most advanced cargo management technologies available. An alternative strategy entails the preselection of qualified high level if not world class terminal operators and their engagement through the offer of PPP contract terms which are first market tested to assure their economic attractiveness and then presold through missionary engagement with prospective investors. As discussed below best methods for port PPP development have been analyzed extensively and best practice standards developed. Comparing the methods used by the GoB with these global best practices is the best way to determine whether the value created through the MCC investment was needlessly dissipated through deficient PPP transaction preparation and implementation.

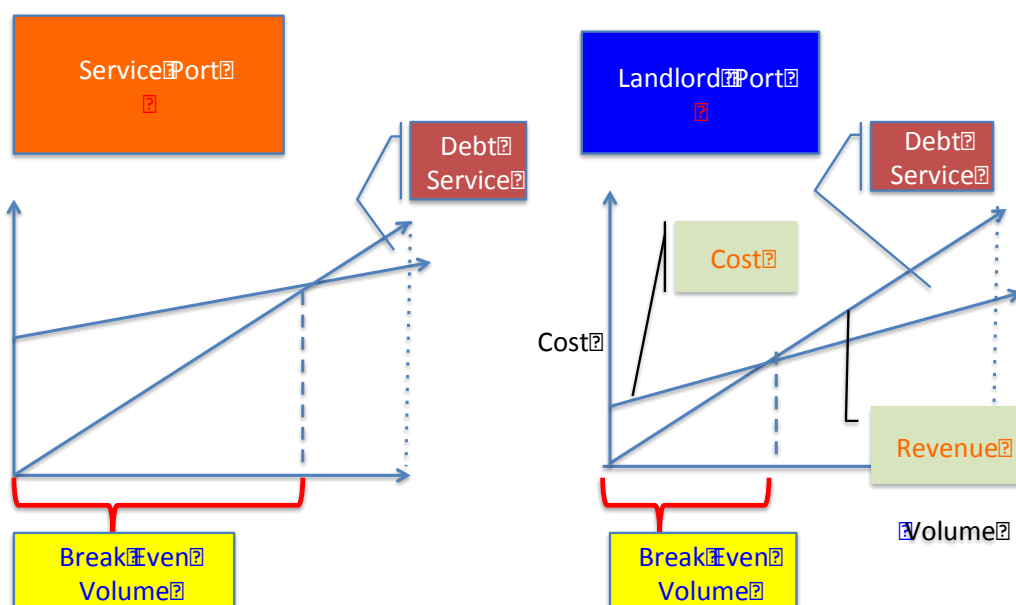
In general by effecting increased reliance on private sector service providers, port authorities attempt to achieve economic gains of the following kinds: i) **Improvements in both labor and capital productivity**, with the result that more cargo can be lifted with the same or lesser labor and/or capital input. Capable private terminal operators are able to tradeoffs gains in labor and cost productivity optimally based on local factor costs and their experience with technologies, which allow the substitution of capital for labor. Once installed the new production functions which best-in-class, private operators are able to implement, can cause unit costs per TEU or per ton to decline; ii) **Increased volume variability of the cost structure for port operations**. Increased volume variability comes from reductions in the fixed cost portion of total port operating cost and corresponding increases in variable cost portions. This shift in cost structure

⁸¹ We thank a peer reviewer for pointing out that a parking lot was an unanticipated impact (not planned), as well as a few other items that did not come up in the team's extensive interviews (e.g., Lot 3 restructuring, a shutdown to avoid a gas explosion). The team will have its in-country staff investigate these further. If this reveals that these led to first-order impacts or permanent changes on the ground the team will endeavor to address them analytically.

comes from the ability of private operators to reduce the levels of management overhead and to shift resources into productive activities, which are directly related to cargo handling. The net result should be a breakeven level for overall operations which is lower under a landlord port model than under a service port model; iii) **improved gross margins per unit (ton or TEU) handled**. Gross margins should improve as a result of combined revenues generated from annual franchise or concession fees and from revenue shares which private operators pay to the port authority for each unit of service sold. Increased unit margins cause the break-even economics of the port authority to shrink further and the ports economic performance to improve accordingly.

The net result of these three sets of economic gains should be the faster accumulation of free cash flow from operations, improved debt coverage and corresponding increases in debt capacity. The diagram below represents the combination of these anticipated economic effects.

Figure 4: Comparison of “Service” and “Landlord” Port Economics



In order to test the economic consequences which a conversion from a “service port” to a “landlord” port have had in Cotonou, it is necessary to review a minimum of three years of port income statements, cash flow statements and balance sheets before and after the business model conversion date. With three years of data, parameters can be calculated which demonstrate unit productivity gains (or losses) , changes in the volume variability of cost structures, decreases or increases in breakeven levels and increased or decreased debt service capacity.

Under the best of circumstances PPP’s can be used as strategic repositioning tools. They can help a port move onto the frontier of best international performance and can enhance its competitiveness vis à vis other ports in its range. When any organization---port authorities included-- do not make the best use of their resources or of their strategic partners, or, indeed, if they fail to adopt appropriate technologies which increase their productivity or, conversely, if they invest in too much capacity....in capacity which exceeds actual demand and thus reduces productivity...

the organization will perform below its full potential and will recede from the optimal performance frontier.

GAP Analysis

GAP analysis is intended to identify deficiencies in management processes, and in this case, specifically in the use of PPP's, which can and should cause the performance and the competitiveness of PSA to improve. GAP analysis entails management parameter--by- parameter comparison of actual performance with potential performance. It measures the “gap” between best possible management processes, best resource allocations and best use of strategic partners and actual management processes, resource allocations and use of partners. Its objective is to reveal areas that can be improved.

GAP analysis naturally flows from benchmarking and from other types of comparative assessments. However, it is primarily qualitative....and not quantitative. It deals with management process assessment. It can be performed either at the strategic or at the operational level of an organization and, indeed, it can be conducted conjunctively at several levels.

The management process levels which make up the full project life cycle for PPP implementation--- the process life cycle which the author has subjected to GAP analysis include nine discrete steps. Ideally, each of these process steps should include strategic, tactical and good governance elements:

- i. Project Identification and Approval for Undertaking Preparation
- ii. Project Feasibility Planning
- iii. Testing the PPP Business Case
- iv. Selection of Strategic Partners and Prequalification of Potential Bidders
- v. Completing the Tender
- vi. Overseeing Completion of Civil Works
- vii. Regulating PPP Performance and Managing Prices
- viii. Anticipating and Managing a Potential PPP Contract Default
- ix. Anticipating and Managing Facility Hand Back

Using data collected from an interview conducted with the IFC project manager who managed the Cotonou concession, other interviews with Bollore the concessionaire, still others with Bollore competitors in the terminal operating business in Cotonou, several pre-transaction feasibility studies which have been reclaimed and copies of the concession agreement, the NORC project team will endeavor to complete a GAP analysis of the Port of Cotonou Concession.

4.6.5.2 Environmental Impacts

One of the findings which emerged from the NORC team's field work is that the MCC's investment and port improvements may have resulted in unanticipated negative impacts on the environment. Local citizens living and operating businesses on the East side of Cotonou opposite the port have expressed concern that the jetty extension that blocks sand from entering

the port also prevents sand from accumulating on their shores and restoring them. This situation appears to have caused or increased erosion of the beaches to the east of the port.

The NORC team met with a citizen's group which represented the coastal neighborhood where shore erosion has accelerated dramatically over the past few years since the new sea wall was built and observed at close hand the adverse effects of the receding shore on adjacent properties. The neighborhood association, Quartier Jak, presented the team with a packet of information including photographic evidence of the changes in beach erosion over time. The citizen's group has retained legal counsel and with the advice of that counsel is pursuing appropriate legal remedies with the Ministry of Environmental Protection and with the Port Autonome de Cotonou. However, after a year of effort the neighborhood association was unable to secure compensation or appropriate remediation and accelerating shore erosion continues to undercut property values and to threaten shore-side structures.

Ex-post evaluation of environmental impacts were not part of our original methodology, but will be considered in our performance evaluation as an unanticipated impact. While the scope of the performance evaluation and our availability of resources does not allow for a full environmental impact assessment during the base year performance evaluation, a more rigorous evaluation will be considered for the option year.

For the performance evaluation, the team will review the secondary information which the team gathered during the field mission including: materials provided by neighborhood group Quartier Jak, 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. The team will also review a series of reports produced for the MCC containing modeling completed prior to the approval of the jetty and the trend of very substantial erosion that has been observed and measured due to the construction of the original jetty.⁸²

We will also critically assess information gathered from stakeholders at the port and in the community via interviews in our assessment. The assessment will be mainly qualitative in nature, and will focus on determining potential negative environmental impacts and their extent, and linking these impacts to the MCC's investment.⁸³

In particular, we would like to assess whether the jetty extension resulted in any measurable change to the rate of erosion; however, it is unclear that project resources or data available will

⁸² The necessary documents for the review of modeling and trends were provided by MCC in June, 2016.

⁸³ Roussel suggests that the evaluation team take a more quantitative approach than qualitative. However, to date, the team has not seen nor been provided with any quantitative data on this subject. Team interviews with the PAC only resulted in environmental studies related to the port, and the team was told that no further studies exist looking at erosion of the areas outside of the port. Due to time and resource constraints, the team does not believe that an extensive quantitative study can be undertaken during the Base Year, but instead suggests that such an analysis be considered in the Option Years.

allow for such an assessment during the Base Year. Such an assessment will likely require scientists and more extensive field work than the Base Year allows.

If data allow, we will also quantify the number of people and businesses affected based on population figures and inputs from community members.

If no such data are available but the team finds negative impacts attributable to the MCC's investment, we will propose a methodology to quantify these impacts during the option years, which may require conducting more extensive survey work.

4.7 Cost/Tariff Analysis

4.7.1 Evaluation Questions and Outcomes

Tariff analysis is relevant to examine the following research questions:

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

4.7.2 Methodology

This analysis aims to calculate direct savings for port users. A methodological assessment has to be made depending on data availability: port costs both for shipping lines and shippers are aggregated costs charged by multiple service providers. If possible, aggregated, total cost will be estimated and then expressed in unit terms (USD per container or USD per TEU).

We will estimate the aggregated tariff (total port cost) for a basket of essential port services before and after works completion and before and after the concession. The review of the tariff structure and port fees will rely on evidence from interviews of key stakeholders or focus group discussions. As part of the analysis, the team will review the tariffs to see if there have been any structural changes in the tariffs over time. How much have tariffs increased over time and are the increases correlated with inflation or cost trends?

We will also compare these estimates of total port costs with those from neighboring ports or regional/international benchmarks.

Port charges have a relative effect as part of the total transport cost that includes shipping and trucking. Assuming that shipping costs are similar for all the port destinations in a region (a common practice for most shipping lines), port congestion charges are a good indicator of how shipping lines factor in a port's inability to provide optimum services. Total transport costs will then be calculated by adding port congestion charges, port costs (calculated for a basket of essential port services as explained above) and trucking costs for typical destinations (e.g. Niamey, Niger, where transit cargo for Nigeria is transferred).

4.8 Monitoring and Process Questions

In addition to the above analyzes, the NORC team will also address various monitoring and process questions including:

- 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?
- 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?

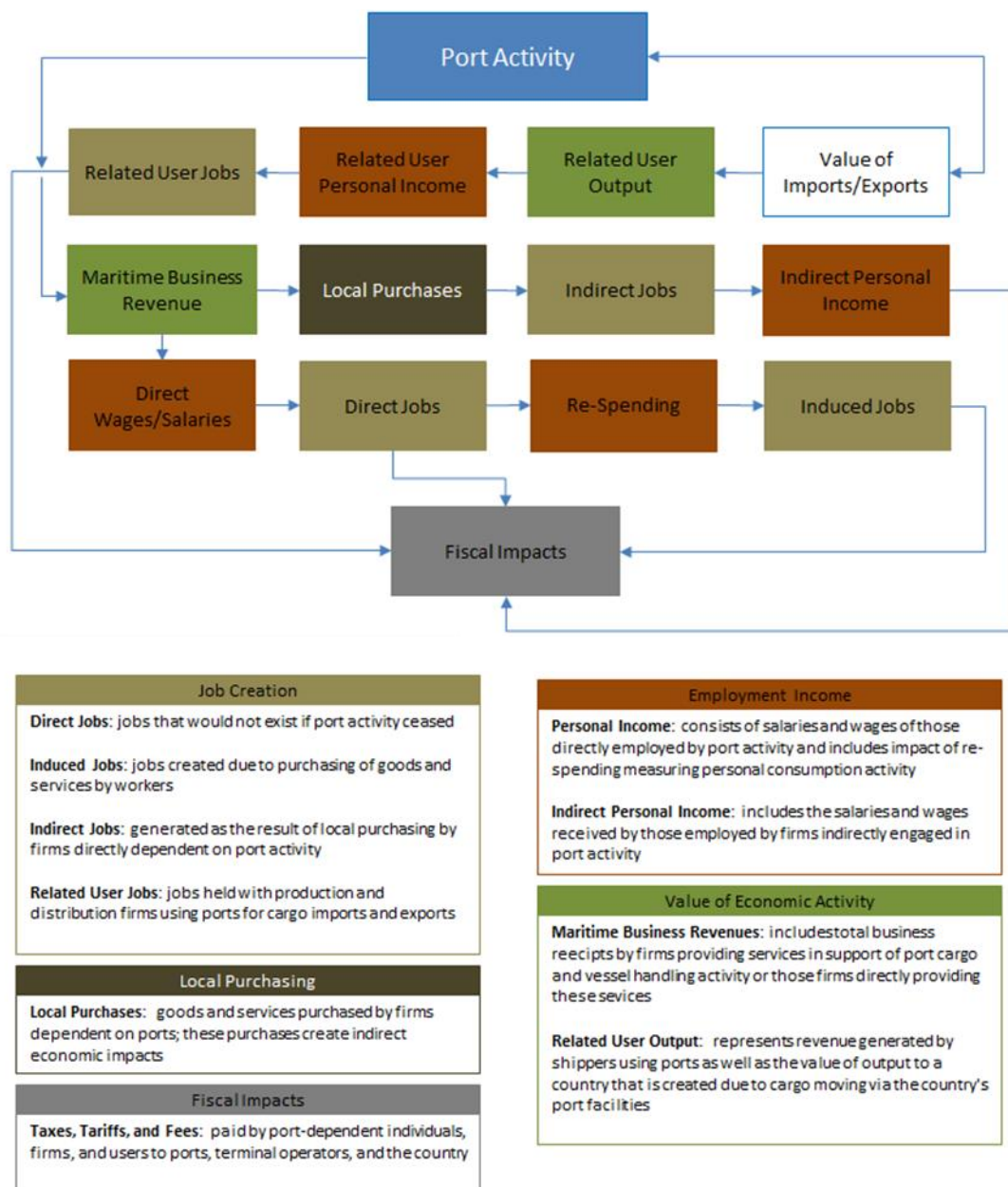
These questions will be answered mainly on a qualitative basis as the result of our field interviews, focus groups, and observations.

4.9 Timeframe of exposure

The total economic impact of the port investments on the economy consists of the direct, indirect and induced effects. Figure 3 depicts a simplified flow of specific impacts relevant to this project. The jobs, salaries, and output that result from activities at the port that are related with the MCC investments are termed the direct economic impacts. The primary or direct impact is the new value added, in the form of new wages, salaries, rents and profits, by the project itself, i.e. its contribution to the GDP of the country. During the Base Year, the analysis will focus on these direct economic impacts.

The direct economic impacts in turn stimulate other economic activity. Subsequent purchases of supplies and services generate other rounds of indirect impacts. The induced impacts are the purchases that arise, in turn, from the increase in the aggregate labor income of households. Both the indirect and induced economic impacts demonstrate how the requirements of the direct effect reverberate or ripple through an economy.

Figure 5: Flow of Impacts



Depending on the specific investments funded by the MCC at the port, the analysis of the direct impacts for this project can be framed in three distinctive stages:

- Pre investment operation period from start of operation (or selected baseline) to start of investment;
- the investment stage in which investments are being made and impacts progressively materialize;

- the post investment stage when the full impact of the investments occurs.

Based on the adequacy of the available data and nature of the investments, the team will address whether it is possible and/or necessary to calculate impact during each of the stages or from endline to baseline using a before and after framework.

4.10 Limitations and Challenges

There are two principal limitations or challenges to the success of the present port evaluation, attribution and data availability.

Attribution. Ideally, an evaluation wishes both to identify impacts as well as to attribute them (and hopefully to the client). With the current technologies of data collection changes in outcomes generally can be measured. Unfortunately, the rigorous (statistical) attribution of said impacts is often much harder since some acceptable counterfactual is required. The MCC defines assessments as “impact evaluations” when, *inter alia*, the counterfactuals used derive from an experimental design (i.e., where treatment units have been randomly assigned to either treatment or no treatment). When this is not the case – and regardless of the alternative’s degree of sophistication or rigor – the MCC defines the assessment as a “performance evaluation”.

In the present case and *at the level a port*, finding a matching counterfactual is not really possible. Even if one were found, the sample would be so small as to render statistical analysis absurd. This leaves us a number of alternative design options of varying degrees of rigor and statistical power, and all based on an array of different unit(s) of analysis – and lower-level than the treatment units (which were the Port Authority, the wharves, etc.):

- Apply a design-based approach to the alternative unit(s);
- Apply a quasi-experimental approach to the alternative unit(s);
- Apply a model-based approach to the alternative unit(s);
- Use qualitative methods to suggest credible causation;
- Use qualitative methods and descriptive econometrics to suggest credible causation; and/or
- Use qualitative methods and some combination of a. through c.

To appreciate these options, several points should be made. First, examples of sub-port-level analytic units might include traders, vessel visit, trucks, trade transaction, traded good, port laborer.

Second, we have differentiated between a model-based approach and descriptive econometrics. The distinction we wish to make here is that former purports to infer whether changes in outcomes can be attributed to the Compact – say, using a continuous treatment-variable model – while the latter simply seeks to document outcome changes while accounting for non-intervention exogenous factors.

Under a model-based approach, a causal relationship is hypothesized, mathematically specified, and then statistically estimated. Hypothesis tests are then carried out subject to the measures taken to limit Type I and Type II errors. Briefly, the null hypothesis in this case is that the model’s parameters associated with the treatment variables (interacted with the survey round) are zero – there is no impact. If they are statistically significantly different from zero – and the model is correctly specified – one (temporarily) accepts causality. Under this formulation, each analytic unit at baseline contributes to our understanding of the counterfactual by allowing us to infer

whether differences in the amount of Compact assistance (the “dosage”) influences – and, therefore, impacts on – the observed outcomes of the analytic unit. If it does then by construction Port performance must have improved.

A key challenge to a model-based approach concerns the correctness of model specification and, more specifically, the degree to which endogeneity (reverse causality and selection bias) has been properly (convincingly) accounted for. Since this is not the place to detail how state-of-the-art econometric and statistical methods may assist in this task, suffice it to say that NORC will apply such methods to the fullest so that its performance evaluation is able to take maximum advantage of the data available.

It is worth stressing that neither the design-based nor the model-based approach dominates the other as a preferred method of attribution; it depends on the situation. While the design-based approach is generally “light” on assumptions, that feature can actually be a disadvantage to the evaluator in certain cases. First, it requires a significantly greater amount of data – double or triple what a model-based approach requires. Second, the lack of a model structure to disentangle co-varying influences means that it is hard to draw nuanced lessons from a design-based application. Third, having a parametric model facilitates the application of findings to populations outside the sample analyze – that is, it strengthens external validity.

In light of these design options, an overall evaluation strategy was agreed between NORC and MCC. During the Base Year of study Option e. and, where feasible, Options b. and c. will be utilized, combined with Option d. Likewise, at the end of the Base Year and drawing on the findings and information gleaned, an assessment will be made on the degree to which there are additional, fruitful, evaluation opportunities utilizing Option a. (and Option c, if it required more time or resources than were available in the Base Year).

Data availability. As detailed in Section 5 the evaluation approach intends to draw on both qualitative and quantitative data. The former includes key informant interviews, focus groups discussions, and interpretations of legal, regulatory, and project documents. Based on our review to date, documentation availability would appear to be excellent and is not likely to impose a constraint on analysis.

For the present purposes quantitative data can be thought of as existing or yet to be collected through survey administration. There are no plans to undertake the latter during the Base Year; such needs and opportunities will be detailed in the proposed evaluation design for Option Year 1. Existing data reside with the Benin governmental, private sector, international trade organizations, and international multilaterals. The team is confident of access to the international sources. We also hope that with one exception the Benin government – primarily the Port Authority, Bureau of Statistics, and the Ministry of Finance – will be forthcoming with the pertinent data they possess. The one exception may be contracts between the Bolloré concessionaire and the shippers. Containing price information of great importance to the evaluation, it is also of high commercial value and proprietary. It remains to be seen whether an agreement can be reach, perhaps using anonymization, so that the evaluation can benefit from this critical information.

Finally, while the MCC has had ostensive success in conducting corruption perception surveys with port stakeholders, their accuracy remains to be seen. (NORC has developed some cutting-edge sensitive-question protocols that ensure response anonymity and thus a lower likelihood of

bias; these would be made available for any future round of such surveys). Likewise, we do not know how successful the team will be in eliciting truthful responses during key informant interviews and focus group discussions on sensitive topics related to fraud. Our experience in other countries leads us to be optimistic in this regard, especially if members across the range of respondent types listed in Section 5.1 can be interviewed.

5. Data Sources and Outcome Definitions

5.1 Data Collection Plans

During the mission to Benin, the project team used number of data collection methods, including interviews, observations and measurements conducted during site visits and focus group interviews with groups whose interests and stakes in project outcomes are complementary. In addition, members of the team collected both quantitative and qualitative data which do not exist in the set of information resources already supplied by MCC.

The objective of the field trip was to:

- Collect the necessary information to conduct a comparative assessment of the implications of the MCC investment on port performance;
- Determine operational practices before and after the execution of MCC investments;
- Visit port and project-funded operations to observe and assess current performance;
- Understand the relevance of MCC investments for strategic decisions in terms of port operation;
- Secondary and primary data collection regarding the following topics:
 - Economic significance of investment
 - Changes in operational performance and level of service
 - Effects on trade
 - Institutional arrangements
 - Incidence of benefits
 - Corruption
 - Integration of service markets.

5.1.1 Key Informant Interviews

To gain a better understanding of the investment and available data, the team met with MCC/MCA staff in Benin including the port director, who is also the MCA-Benin national coordinator.

To evaluate the operational performance and competitiveness of the port, we interviewed stakeholders including:

- Port Autonome de Cotonou
 - General Manager (Directeur General)
 - Operations (Direction de L'Exploitation Portuaire)
 - Infrastructure/Maintenance (Direction Technique)
 - Commercial Division (Direction Commercial)
 - Human Resources (Direction des Ressources Humaines)
 - Executive Director
 - Environmental team

- And others
- Bolloré Africa Logistics, Port of Cotonou
- Shipping companies (Maersk, CMA-CGM, MSC)
- Société Béninoise des Manutentions Portuaires (SOBEMAP)
- Benin Shipping Agency Association

To evaluate impacts on trade we interviewed:

- The Niger Shippers Association in Cotonou
- The Burkina Faso Shippers Association in Cotonou
- Cotton Exporters Association
- Benin Chamber of Commerce
- National Statistics Office (INSAE)

During the mission the project team members that will be conducting the qualitative aspects of the project met with and interacted with the following persons:

- World Bank
 - Resident Mission Director
 - Country Economist
- IMF local office
- ECOWAS - Chief of Mission in Cotonou
- Port Autonome de Cotonou
 - Executive Director
 - Director of Human Relations
- MCC Resident Mission Director
- Director of the Bolloré Project Company
- Head of the Niger Shippers Association in Cotonou
- Head of ANLC: Guy Ogoubiyi

The team was unable to schedule meetings with Customs or the Ministry of Maritime affairs.

5.1.2 Visual Port Inspections

The evaluation team will use observations from a tour of the port and facilities to assess the completion and effectiveness of the port investments. The project team will also observe queues, congestion, traffic patterns and work flows. Queue observations and corresponding tabulation will include the following:

- ships at anchor
- vessels turn time

- trucks waiting for loads
- rate of flow of trucks at route critical interchanges on city streets

5.1.3 Focus groups

Focus groups afford an effective method for testing hypotheses when they are conducted among a diverse set of participants whose economic interests and whose points of view diverge. In this context interviewers are able to test positions against the views and opinions of multiple stakeholders which though their discourse tend to be self-correcting and convergent. Focus group interactions are also effective tools for discovering new knowledge and in particular for collecting basic information concerning the distribution of opinions regarding various issues of relevance to program evaluation.

In this context the views and opinions of participants tend to open doors and to evolve ancillary collaborative or provocative responses from other participants and thus contextualize, broaden and deepen existing knowledge. To these useful ends, the NORC team applied focus group methods in four different setting in Benin, when it interviewed:

- shipping agents whose interests were peripheral to the two major competitors in Cotonou's marine terminal operating subsector;
- customs brokers and freight forwarders;
- the staff and management of the state owned stevedoring company and largest single employer in the Port and
- members of the East Cotonou community whose property is being threatened by the ocean currents which they allege have been diverted and redirected as a result of the MCC investment in an extended jetty west of them at the port.

In the first application the team was able to glean insights into the impact of the MCC investment on existing competitive balances within the port political economy and some idea of whom emerged as net "winners" and "losers." From the second set the NORC team was able to glean additional information about the impact of the MCC investment and of collateral investments on the structure, nature of competition and organization of the customs and freight forwarding industries in Benin. From the third focus group interaction, the NORC team was able to learn a great deal about the labor force impacts of the investment and from the four about the environment impacts.

5.2 Proposal to Measure Implementation Fidelity

We understand fidelity here as referring to the degree to which the initial infrastructure project design was followed. Toward this end we plan to examine the documents upon which implementation was to be based. Through our site visits and related on- and off-port inspections we will determine whether these initial plans were followed. Where they were not – and this is an important opportunity for lessons learned – we will draw on the key informant interviews and focus groups, as well as our own extensive field experience, to hypothesize (and, where feasible, test) why the expectations of MCC's engineers and designers were not fulfilled.

5.3 Data Needs

In order to begin to measure economic impacts directly related with enhanced operational conditions at the port, the NORC team must determine the collateral effects of the MCC investment on employment and ancillary business development. The dual challenges that Benin faces are the challenges of having an extremely weak private sector investment environment—most commercial activity is linked to cross border trading—and supporting a very large informal sector that affords only slow growth potential. Consequently the kinds of port sector and cross sector elasticities that are relevant in Benin cannot be inferred from cross-country analyses. Benin's economic conditions are unique.

5.3.1 Data sources for quantitative

As we will need to compare changes over time (before and after the investment), time series data and panel data are the preferred data types for the quantitative analysis, when they are available. When time series data is not available or of good quality, data from points in time before and after the investment will allow us to make an assessment, although likely using less rigorous quantitative methods.

Assessing the usefulness of existing time-series data sources will be of great importance, as this will serve as the backbone for the econometric analysis. These will include time-series data sets that were mentioned in the RFP, such as: MCA-managed Port User Satisfaction Surveys (2008, 2010 and 2011) and those we mention, below. We currently have access to the Port User Satisfaction Surveys, but not to the underlying data. Other data of interest would be price data on key consumer categories, labor market data on employment and wages, and import data on primary materials, capital and intermediate firm inputs, and consumer goods.

We also expect that additional time series data would be available. NORC also will use existing data sources to supplement the data that was collected under the Benin compact, such as: International Trade Data, Benin Port Authority Volume Data, Benin Customs Data and World Bank Container Port Traffic Data. Port operational, tariff and level of service data should be available from Bollore and the PAC. The analysis will also require detailed commercial information from the port operator regarding the types of cargo that the move through the port. This information includes volumes of cargo by type of commodity and revenues derived from cargo handling by type of commodity; these data should be discriminated by type of flow (import, export, transit) to allow the identification of economic activities directly related to the port and their level of dependency from it.

We expect to find data on domestic prices and employment from the respective country's statistical office or relevant ministry (e.g., agriculture, labor, commerce), and trade data from international agencies such as:

- Direction of Trade Statistics (DOTS) of the International Monetary Fund (IMF)
- World Bank's WITS (World Integrated Trade Solution); and/or
- UN Comtrade databases.

Additional potentially relevant annual data should be available from national accounts and on comparative country port performance from:

- the World Bank Ports Infrastructure Database
- World Economic Forum's Port Efficiency data
- OECD Maritime Transport Cost Database

Finally, the Indicator Tracking Table associated with the M&E Plans are available as well as Containerization International/UNCTAD series for trans-Atlantic and trans-Pacific rates, which expresses freight rates as the price to transport one container of goods (USD/TEU) from one port to another.

5.3.2 Data sources for qualitative

Qualitative data needs will include the following:

- a. Copy of Container Terminal Concession Agreement;
- b. Copy of Enabling Legislation for PAC;
- c. Copy of Government Procurement Guidelines or Procurement Law;
- d. Description of Hierarchical Decision Making Relationships among Different Agencies of Government for Concession Agreement Drafting and Negotiating, for Concession Term Enforcement and for Pricing of Services Specified in Concession Agreements;
- e. Organizational Chart for the PAC, with beginning and ending dates and description of services provided;
- f. List of all Private Contractors Working for the PAC, their functions, length of term of contract and description of procurement process used to engage them;
- g. Ten year of data on Imports and Exports broken out into 3 digit STCCT Codes;
- h. Ten years of data on transshipment and transit traffic moving through PAC, and comparable data for Lomé, Tema, and Abidjan;
- i. Ten years of time series data on PAC average port handling costs per 20ft and 40ft containers, broken out into specific line items;
- j. Timeline representing major events which have taken place with regard to PAC reorganization and organizational changes;
- k. Ten years of audited financial statements for PAC; and
- l. Ten years of time series data average port charges for handling a 20ft and 40ft container, broken out into chargeable components.

6. Administrative

6.1 Summary of IRB Requirements and Clearances

NORC's Institutional Review Board (IRB) will review the project team's research, determining whether it qualifies as human subjects research, and ensuring that human subjects do not suffer any harm from the research, are fully informed, provide consent to participate in the research, and that their identity is protected. This review will take place prior to the start of any data collection.

6.2 Preparing Data Files for Access, Privacy, and Documentation

As the project team will not be collecting any primary survey data from human subjects, the project team does not foresee the need to anonymize datasets. Measurement data collected from visual port inspections will be documented according to the MCC data documentation guidelines and delivered to MCC.

6.3 Dissemination Plan

The project team will utilize a participatory approach to the design of the evaluation, sharing the performance evaluation's objectives and implementation approach and soliciting feedback on the performance evaluation design through an in-country workshop with key stakeholders.

Upon completion of the evaluation, the project team will again share evaluation results and lessons learned with key stakeholders through an in-country workshop to solicit feedback prior to finalizing the evaluation report. The project team will also present evaluation results to MCC staff, providing an oral overview of the background and program logic of the port investment, the performance evaluation's objectives, the methodology, how and what data was collected and utilized, and the results and recommendations for future port project design, implementation, and evaluation activities. Lastly, the project team will work with MCC to prepare results summaries for public dissemination.

6.4 Evaluation Team Roles and Responsibilities

The project team is comprised staff from three different organizations, NORC at the University of Chicago and its subcontractors Nathan Associates Inc. and Agland Investment Service Inc, who are highly qualified in designing and implementing performance and impact evaluations of port infrastructure, and who have demonstrated experience working in sub-Saharan Africa and other developing countries. Below, we present staff profiles and roles and responsibilities; we provide contact information in Section E.

6.4.1 NORC

Jeffrey Telgarsky (Home Office Manager) is an economist and experienced senior manager with a strong background in development policy, finance, economic development, and monitoring and evaluation. Since 2005, Mr. Telgarsky has been NORC's Senior Vice President and Director of

the International Projects Department; previously, he was the Director of the Urban Institute's International Activities Center. In both positions he was responsible for all aspects of program management and development for international research and technical assistance activities. He has worked with MCC, USAID, the World Bank, UNDP, and the Inter-American Development Bank. Mr. Telgarsky brings to his managerial role a strong background in a variety of technical areas, including monitoring and evaluation. During 2005-2011, he managed and coordinated work under an impact evaluation task order issued by MCC for Benin that is assessing the effects of rural land reform and improved access to banking services through micro-finance institutions (MFIs) by rural small-holders and small and medium enterprises (SMEs). He is also NORC's Project Director on three impact evaluations concerning agricultural programs – a food security program involving rice farmers in Burkina Faso and Sri Lanka, a capacity-building program for cotton farmers in six African countries, and a technical assistance and investment program promoting increased value-added for cashew growing and processing in five African countries.

As Home Office Manager, Mr. Telgarsky will serve as MCC's point of contact to resolve any contractual or financial issues related to the task order between NORC and MCC. He will also manage the overall budget and, with the Technical Lead, identify and resolve any bottlenecks and problems ensuring that work plan activities are advancing in a timely manner. Mr. Telgarsky, in conjunction with the NORC Program Manager/Technical Lead, will ensure the timeliness and quality of all deliverables and will be responsible for ensuring that all contract obligations are met within required timeframes. He will also ensure that contractual arrangements for subcontractors and consultants are put in place in a timely manner and monitored to ensure efficient implementation. As NORC's Senior Vice President and Director of International Projects, Mr. Telgarsky has the authority to mobilize quickly any necessary resources within NORC's International Projects department and elsewhere within NORC to address any need that might emerge during the course of the contract.

Clifford Zinnes (Technical Lead), a senior fellow at NORC, is a specialist in applying quantitative methods and institutional economics to improve aid effectiveness and economic reform in developing countries. Dr. Zinnes has a dozen years of experience designing and overseeing impact evaluations using econometric, experimental and quasi-experimental approaches in infrastructure, irrigation, agriculture, game conservancies, public sector transparency and governance, water and sanitation (both rural and urban), and children's nutrition, among other areas, for AusAID, CIDA, DFID, MCC, FAO, USAID, USDA, UNIDO, World Bank, Soros Open Society, and the Bill and Melinda Gates Foundation. Dr. Zinnes most recent field work has focused on Cabo Verde, Colombia, Dominican Republic, Ecuador, Lesotho, Namibia, and Zambia. He has also conducted food security and agricultural export modeling in Morocco and water pollution regulation in Egypt. At the same time he has kept up his publications and academic activities, teaching and shepherding dissertations at Harvard University, the University of Maryland, and several overseas. Dr. Zinnes received his Masters in econometrics and his PhD in international economics from the University of Pennsylvania, and speaks fluent Romanian and Spanish and has a working knowledge of French.

As the Technical Lead, Dr. Zinnes will be responsible for providing leadership in quantitative methods and economics to the port experts, designing the performance and impact evaluations, overseeing the performance evaluation implementation process, and ensuring quality control. His focus will be to ensure that the various high levels of expertise embodied by each team member

are maximally taken advantage of and that the results are methodologically and empirical consistent.

Mawadda Damon Gartner (Performance Evaluation Specialist), a Principal Research Analyst at NORC, is an evaluation specialist with over five years of experience in the design, management, and implementation of impact, performance, and implementation evaluations. Her experience includes the development of results frameworks and indicators; the design of in-depth interview and focus group guides and survey instruments; training of interviewers; descriptive analyses of quantitative survey data; the use of NVivo software to organize, code, and analyze large amounts of qualitative data; and report writing. Ms. Damon's experience in evaluation includes leading focus groups with farmers and conducting key informant interviews for a food security project in Burkina Faso and leading a three-year performance evaluation of an olive sector project in Morocco where she worked exclusively in French to design the methodology of the evaluation; develop the data collection instruments for farmers, farmer organization leaders, and olive press owners; train interviewers; conduct key informant interviews in the field; analyze both the qualitative and quantitative data; and write reports. Ms. Damon has also managed and supported data collection for a series of impact evaluations using a range of randomized-control trial, quasi-experimental, and pre-post designs. Ms. Damon has eight years of experience managing international projects and communicating with counterparts and project beneficiaries in Africa (Burkina Faso, Ghana, Uganda, Rwanda, and Morocco), the Middle East, Latin America, and Asia. Ms. Damon holds a Master in Public Policy from the Harvard Kennedy School of Government. She is fluent in French, Arabic, and Turkish.

As the Senior Performance Evaluation Specialist, Ms. Damon will primarily be responsible for the ongoing implementation of the evaluation, assisting the Program Manager/Home Office Manager with management of the budget, subcontracts, and deliverables; and assisting the Technical Lead with reporting. She will work with the technical specialists on the design and implementation of qualitative aspects of the evaluation, such as the development of interview protocols for KIIs and FGDs, work with local consultants to implement the FGDs, and lead the qualitative analysis of interview transcripts from the FGDs as necessary.

6.4.2 Nathan Associates, Inc.

Gerardo Ayzanoa (Senior Port Operations Specialist) is a port and logistics operations expert with more than 20 years of experience in the analysis of waterborne freight logistics and the development of forecasting, operations and financial simulation models to assess the feasibility and performance of ports, waterways and intermodal systems. His research and project experience has involved examining the performance and productivity of transport operations and the design and development of simulation models to optimize intermodal transportation networks, including all the physical components and interfaces of the logistics chain (rail/truck, port, vessel, transfer centers) used by containerized, general and bulk cargos. Assisted by his wide-ranging knowledge in the fields of mathematical modeling and management of information systems, Mr. Ayzanoa has designed, built and analyzed large databases on commodity flows, port facilities and vessel costs to support modeling and planning efforts.

Mr. Ayzanoa began his professional career in 1992 at the National Institute for Ports and Waterways, the only academic and research center in the United States dedicated to performing technical-economic evaluations for the planning of maritime and river terminals and waterway

navigation systems. He has experience both in the United States and internationally, and has worked on assignments ranging in scope from national planning efforts to particular development projects. In 2010, Mr. Ayzanoa joined Nathan Associates as a Principal Associate in the Infrastructure Planning and Economics Group. As a project manager he has directed multi-disciplinary teams on large economic impact and regional demand analysis projects. Between 2010 and 2012 he directed one of the most important studies on the economic impact of maritime clusters development, the “Economic Impact Study of the Panama Canal on the Panamanian Economy,” where the economic relationship between the port, maritime and logistics industry and other sectors of the economy was estimated. Mr. Ayzanoa was involved in the 2005 MCC’s assessment of Port of Praia when he assisted on the financial, economic, and sensitivity analyses for several alternative port developments. He is fluent in English, Spanish and has working knowledge of Portuguese. He received his Bachelor of Science degree in Computer Science from the University of Maryland and a Master’s degree in Engineering Management from George Washington University.

Mr. Ayzanoa’s has recently performed the following analysis as part of port development and shipping studies: (1) market analysis for the “Port Rationalization Study”, Trinidad & Tobago, 2013-2014; Northern Port Market Assessment Study, Colombia, 2014; El Salvador Ports Market Consultancy, El Salvador, 2010 -2013; Logistics/Port Operations Specialist, USAID Trade Facilitation Project, Peru, 2012; Panama Canal Bulk Market Segment Study, Panama, 2011-2012; (2) shipping analysis for Study Coordinator and Trade, Shipping, Port Operations and Economic Modeling Specialist, Port Rationalization Study, Trinidad & Tobago, 2013-2014; Market Analyst and Port Planner/ Team Leader, El Salvador Ports Market Consultancy, El Salvador, 2010 -2013; Port Planner/Team Leader, Market Assessment for the Port of Ancon, Peru, 2010; Market Analyst and Traffic Projections Specialist, Development of a Container Terminal in Port of Callao, Peru, Agencias Universales S.A. (AGUNSA), 2005-2006; ; Port and Trade Analyst, Market Study for the Port of Cortes, AGUNSA, Honduras, 2004; Maritime Systems Specialist, Study of the Panama Canal Impact on the Liner Container Shipping Industry and the Transshipment Activity, Panama Canal Authority, Panama, 2002 – 2003; (3) port operations analysis for Study Coordinator and Trade, Shipping, Port Operations and Economic Modeling Specialist, Port Rationalization Study, Trinidad & Tobago, 2013-2014; Port Operations Specialist, Technical Advisory Services for the Enfidha Industrial Zone, Al-Mal Investment Company, Tunisia, 2008 – 2009; Port Operations Specialist, Technical Assistance to the Government of Mozambique for the Evaluation of the Moatize Coal Mining Concession, The World Bank – Ministry of Transport and Communications of Mozambique, Mozambique, 2008; Co-author "How Fit are Central America’s Ports? An Exercise in Measuring Port Performance", IAME 2014 Conference, July 15-18– Norfolk, VA, USA; (4) financial analysis: Port Planner, Arbitration Case Dubai Ports vs. Peru, Callao Terminal, 2012-2014; Trade Maritime Specialist/Financial Analyst, Technical Assistance for the Planning, Implementation and Financing of the Superpuerto Project at Bocas de Ceniza, Sociedad Portuaria Bocas de Ceniza S.A., Colombia, 2006 – 2007.

As Senior Port Operations Specialist, Mr. Ayzanoa will be responsible for assessing the performance of all the marine terminal components with respect to competitiveness (both qualitative and quantitative analysis), trade volume (quantitative analysis), port operational efficiency, port costs (quantitative analysis), and tariffs and fees. Mr. Ayzanoa will be part of the evaluation teams traveling to Cabo Verde and to Benin.

Daniel Perea (Senior Transport and Logistics Specialist) is an Economist focused on transport infrastructure and international trade. Currently an Associate at the Infrastructure Planning and Economics Practice in Nathan Associates Inc., Mr. Perea has been closely involved in the implementation and design of infrastructure projects covering maritime transport, logistics, corridor analysis, and power generation. Mr. Perea has carried out detailed analyses and research covering economic impact, financial and engineering due diligence, master planning and institutional review for multimodal transport, urban transport and logistics assessments. Mr. Perea has provided project management support for more than 25 infrastructure projects worldwide. He has conducted research and transport logistics chain competitiveness assessments in Asia, the Caribbean, Central America, South America, Southern and West Africa. Mr. Perea has worked on projects in several countries, including Colombia, Ecuador, Ethiopia, Guatemala, Nigeria, Panamá, Philippines, South Sudan, Uganda, United States, and Uruguay. Mr. Perea holds a Master of Business Administration from the University of Maryland, a B.A. in Economics from the Universidad Externado de Colombia, and Certificate Programs in Economic Policy and International Business and Trade from American University.

His recent work as a macro-economist modeler for the International Finance Corporation (IFC) “Economic Impact Assessment for the El Bosque Terminal in Cartagena, Colombia, 2013” study contributed to the development of a methodology to assess the impact of port development investments in the country’s economy. Mr. Perea is the Project Director and co-developer of the new version of a transport performance evaluation toolbox named FastPath 2.0 (FP2), designed to provide quantitative analysis of transport logistics chains in terms of time, cost and reliability; he is the Project Director of the FP2 first implementation, a study in the Philippines analyzing logistics chain of banana, mangoes, and other perishable exports to Europe.

As the Senior Transport and Logistics Specialist, Mr. Perea will be responsible for evaluating the impact of port performance improvements and related cost savings on competitiveness (through analysis of productivity and level of service indicators), qualitative assessment of changes in volume, value, and composition of trade (external and internal), financial analysis of port costs, and quantitative analysis of changes in employment and other unanticipated effects. Mr. Perea will be part of the evaluation team traveling to Cabo Verde.

Kristen Harkins (Transport Economist) With nearly 10 years of experience, Ms. Kristen Harkins is an applied economist with expertise in the transport sector and quantifying and evaluating impact. Ms. Harkins is currently a Managing Associate with the Infrastructure Planning & Economics group at Nathan Associates Inc. She specializes in applying econometric and statistical techniques to solve business problems, providing economic advice on legal and policy matters, and evaluating economic impacts of industry events and socio-economic interventions. For private clients and donors, Ms. Harkins provides economic and statistical expertise for transport, litigation, and regulatory matters. She has extensive experience analyzing, manipulating and summarizing complex transaction level databases using statistical software. Ms. Harkins is currently the project coordinator and Infrastructure Economist for an economic impact evaluation of a port and rail investment in Mozambique. She also recently conducted data analysis and research support for a study of the Brazilian port sector and for a Peruvian port arbitration matter. She also drafted recommendations for strengthening Myanmar’s competition bill. She is currently managing Nathan’s research support for a three year study to assess the impacts of competition enhancing reforms in the staple food and bus transport sectors in India, the Philippines, Ghana and Zambia.

She spent a year at Nathan's office in Chennai, India, which is one of the leading economic consulting firms in India and the top economic consulting firm in the area of competition law. At Nathan India, she was responsible for managing the analysis conducted by a team of local economists, coordinating proposals for new business, and developing the skills of the office staff. During her tenure, Nathan India prepared the economic assessment for India's first Form II (long form) merger application to the Competition Commission of India (CCI), which was approved by the commission. She also managed and drafted Nathan's economic assessment of Etihad Airway's acquisition of a share of Jet Airways, which was also approved by the CCI. Prior to her work at Nathan India, Ms. Harkins worked with both the international development economics and litigation departments of Nathan Associates in Arlington, VA. Ms. Harkins' work experience also includes forecasting liability and valuing claims for the product liability at the consulting firm Analysis Research Planning Corporation (ARPC), serving as Summer Associate for the Reinsurance Litigation unit at American International Group (AIG), and working with a member of the Congress for Local and Regional Authorities at the Council of Europe in Strasbourg. She has a bachelor's degree (with Highest Honors) in Economics and International Relations from Lehigh University, and a Master's degree in Applied Economics from Johns Hopkins University.

As Transport Economist, Ms. Harkins will support the activities of the senior port specialist and senior transport and logistics specialist. She will perform the preliminary data collection, review and quantitative analysis necessary for the evaluation of port performance improvements, port costs, tariffs, trade volumes and port competitiveness. Ms. Harkins will be part of the evaluation team traveling to Benin.

6.4.3 Agland Investment Services, Inc.

Ronald Kopicki (Senior Ports Specialist) is an international expert in port and logistics systems with extensive international experience in enhancing the productivity of private and public investments in ports, in strengthening the import and export markets which ports support, and in designing innovative forms of port organization, governance and regulation through; (1) business process refinement, (2) new logistics services: (3) alignment of port operations with ancillary service providers (such as shipping agencies, customs and customs brokers, forwarders and inland shipping companies); (4) reengineering of systems and functional capacities within ports to improve asset utilization, information flow, work flow, cargo flow, and coordination of activities on and off terminals, rapid payment and fail safe cash management, detection and control of corrupt practice and effective service quality control; and (5) creation of new port centered distribution channels which enhance opportunities for penetrating specific, service sensitive export markets.

Mr. Kopicki has worked in over 20 developing economies on the staff of the World Bank with a focus on infrastructure, ports and logistics. He recently completed an Egyptian multimodal transport strategy study funded by the IFC. He recently was the Transport Infrastructure Advisor for the World Bank and the Supply Chain Advisor for the FAO of the UN. Mr. Kopicki is the author of a several World Bank Country Economic Memorandum studies, which elaborate strategies for improving port operations and for facilitating export trade. Importantly, as well, he is the primary author of the World Bank's first Port Reform Toolkit which deals with a diversity of regulatory, competitiveness, private sector investment and port layout, design and operational issues and he has put many of these principles to work in designing World Bank investment projects which

supported Chinese Port Modernization, Indian Port Restructuring, and the Reorganization of the Ports of Karachi, Tema, Takaradi and Colombo. In addition, he is a contributor to another World Bank book which deals with the development of third party logistics services and related third party information services which facilitate trade. Mr. Kopicki is also the primary author of a WB book, which diagnosed underlying causes of the 2008 rice market crisis in South East Asia and which recommended port investment, logistics and procurement policy reforms designed to avoid similar food crisis in the future.

From 1996 - 2000, he was the Lead Advisor on World Bank sponsored port modernization projects in Port au Prince, Colombo, Karachi, Aden, two ports in China, Jeddah, Accra, Takeradi, two ports in Dar es Salam, two ports in Argentina, and two ports in Costa Rica. He also analyzed ports in Cabo Verde and Benin. He is currently preparing a work shop which the World Bank will offer in Ghana to African officials which will deal with the financial, operational and risk management design of workable port oriented PPP projects.

Mr. Kopicki's consulting work for ports has frequently been linked to support import/export sectors in which transport/port services represented an important source of competitive advantage. He led the WB team, which consulted the Dubai Port Authority in the development of its new Dubai Food City, which is a regional food distribution center designed to support emergency food relief operations throughout the Middle East and he lead the World Bank effort to design and launch a new PPP financed air/water multimodal distribution center in Durban, SA. While at the World Bank he also developed a strategy for attracting private investment and for restructuring the cargo handling operations of the Ports of Ras el Hamah. In addition, he developed inter-island food distribution strategies for the Maldives and recently assessed the feasibility and the merits of port investment projects for private investors in Albania and the Philippines.

Mr. Kopicki has a great deal of hands-on expertise in designing and developing various types of transport and transport regulatory institutions, which support efficient port operations. He is the primary designer, for example, of the dry port networks, which operate in China, Nepal and India. These were developed under World Bank credits. He also advised several countries (e.g. Philippines, Egypt and Brazil) about how to regulate their multimodal transport systems, in ways, which encouraged private investment and the offer of seamless multimodal services.

He has taught short courses on Port Management at the US Maritime Academy, on Supply Chain Management at Ohio State, on transport operations management at the University of Vermont Business School and on structuring Transport Sector PPP's Transactions at the University of Pennsylvania, Wharton School.

Mr. Kopicki will serve as the lead technical specialist on many of the qualitative aspects of the evaluation, including qualitative aspects of the assessment of effects on trade, operation efficiency, institutional arrangements relating to costs, and assignment of benefits arising from port operations and corruption. He will also work with the other technical specialists to develop quantitative analyses related to other aspects of the evaluation, such as integration of internal markets, employment, and unanticipated effects. He will also lead efforts to address the monitoring/process aspects of the evaluation. Mr. Kopicki will be part of the evaluation teams traveling to Cabo Verde and Benin.

6.4.4 LOCAL PERSONNEL

Hervé Akincho (Local Field Coordinator, Benin) holds a Master's in Public Economics and Applied Statistics at the Institute of Empirical Research in Political Economy (IERPE) and a Master's in Mathematics at the University of Abomey-Calavi. He works on microeconomic data collection and analysis. His research focuses on issues relating to political violence, interpersonal trust and early childhood care and development, democracy and governance. He was the field coordinator of Monitoring and Evaluation for the project "Early Childhood Care and Development" at the Ministry of Education in the Gambia. In addition, Mr. Akincho was part of the Gambian Graduates Tracer Study research team, conducted by the World Bank. Previously, Mr. Akincho was a researcher for the firm, Leadership Development (LEADD). Specifically, he was the primary data manager of LEADD, giving him practical experience in microeconomic survey-based data collection and processing on several projects in health and education. Mr. Akincho is co-founder of the Central Executive of the Center for Research and Opinion Polls (CROP), the National Partner of Afrobarometer network in Togo.

Mr. Akincho will assist with key informant interviews, field logistics during the Benin field visits, and he will serve as the liaison between Benin stakeholders and the NORC/Nathan/Agland team. Mr. Akincho will also provide local context input into the evaluation design and assist with the collection and review of existing datasets in Benin.

6.5 Evaluation Timeline

NORC signed the evaluation contract modification on June 2, 2015 and officially began activities on June 15, 2015. The base year evaluation activities are expected to be completed by June 30, 2016. The weekly evaluation work plan is provided as a separate excel document annex to this report.

6.6 Reporting Schedule

In addition to monthly progress reports, the project team will be submitting draft and final versions of the Performance Evaluation Design Report and Performance Evaluation Final Report in addition to an Impact Evaluation Proposal Report according to the below schedule in Table 14. The project team will submit three drafts of the Performance Evaluation Final Report. The first draft will be completed before the team travels to Benin to present their findings to stakeholders in country. The second draft will be completed after incorporating stakeholder feedback and submitted to MCC for comments. The third draft will be completed after incorporating MCC feedback. Any remaining feedback or comments will be incorporated before a final version is submitted by the end of the period of performance, June 30, 2016.

Table 14: Reporting schedule

Report Description	Expected Delivery Date
Monthly Progress Reports	On the 15 th of every month, covering activities during the preceeding month.
Draft Performance Evaluation Design Report	August 28, 2015
Final Performance Evaluation Design Report	November 23, 2015
First Draft Performance Evaluation Final Report	March 21, 2016
Second Draft Performance Evaluation Final Report	May 20, 2016
Third Draft Performance Evaluation Final Report	June 17, 2016
Impact Evaluation Proposal Report	June 17, 2016
Final Performance Evaluation Final Report	June 30, 2016

7. References

The project team has compiled an extensive repository of background documents and data that have been reviewed. This list is regularly updated as the team collects additional information.

Table 15: List of documents reviewed

Document Description	Notes/Comments
Benin Port Plan	One page map/plan
Port of Cotonou Assessment (2005)	
Benin I ATM Feasibility Study <ul style="list-style-type: none"> • ANNEX TO SECTION 10 (<i>Port plans/prints/graphics</i>) • ANNEX TO SECTION 7 (<i>equipment for pollution</i>) • ANNEX TO SECTION 3 (<i>Port plans/prints/graphics</i>) • ANNEXES TO SECTION 5 (<i>Meteorological equipment</i>) • ANNEXES TO SECTION 9 (<i>in French, pier/dock plans, foundation characteristics</i>) • MASTER PLAN UPDATE, DETAILED FEASIBILITY STUDY, BASIC ENGINEERING AND ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PORT OF COTONOU (<i>just a coversheet</i>) 	We seem to be missing the actual feasibility study. Can we get it in English?
Benin I Compact Background.zipx <ul style="list-style-type: none"> • Cotonou Port IFC Success Stories Brochure (<i>2 pages</i>) • Closeout Country Brief (<i>10 pages, high level summary</i>) • Compact Agreement between government of Benin and US (<i>largely legal document, with early outline of project</i>) • Expanding Access to Markets through Benin's Port of Cotonou (<i>brochure</i>) • Benin Compact Closure Factsheet (<i>brochure / program logic</i>) 	
Benin I Concession Agreement.zipx <ul style="list-style-type: none"> • The significant points of the Concession Agreement on the development and operation of a Terminal to containers in the Port of Cotonou between the Government of Benin and the Group Bolloré/TCMS (<i>3 pages</i>) • CONCESSION AGREEMENT ON THE MANAGEMENT AND OPERATION OF A CONTAINER TERMINAL AT PORT COTONOU BETWEEN THE GOVERNMENT OF THE REPUBLIC OF BENIN Cotonou Port Authority AND The Bolloré Group AND SMTC • CONCESSION AGREEMENT REGARDING MANAGEMENT AND EXPLOITATION OF A CONTAINER TERMINAL IN THE PORT OF COTONOU (<i>IN FRENCH</i>) 	
Benin I Final Construction Supervisor Reports.zipx <ul style="list-style-type: none"> • PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 1 – Groyne 	

Document Description	Notes/Comments
<ul style="list-style-type: none"> • PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 2 - Quay • PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 3A – Port Infrastructure • PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 3 – Port Infrastructure 	
Benin I ITTs.zipx <ul style="list-style-type: none"> • Indicator Tracking Table with MCC Comments and Questions • Indicator Tracking Table 	MCC program monitoring data
Benin List of Key Positions	One page outline of major project actors
Final Report of the Port Advisor of MCA-Benin to the General Manager of the Autonomous Port of Cotonou <ul style="list-style-type: none"> • Report cover sheet • Report cover sheet • Report back page • Report back page • Report Filler page • Table of Contents • Report part 1 • Report part 2 • Report part 3 • Report part 4 	
MCC Benin IST Post-Compact Completion Report	
MCA Benin Compact Closeout Magazine	
MCC/ MCA-Benin Monitoring and Evaluation Plan Version 4 September 2011	
MCC Economic Rate of Return: Compact Closeout	Economic Rate of Return Calculations ex-post
MCC Economic Rate of Return: Compact Ex-Ante	Economic Rate of Return Calculations ex-ante
Design Review Report (100%) Lot 1 – Groin 30 June 2010 Progress Report	Self-explanatory

Document Description	Notes/Comments
Rapport d'examen des études de conception (100%) Lot 1 – Epi 30 Juin 2010 Rapport d'avancement	Design report in French (above document)
Design Studies Review Report Lot 2 – Quai December 15, 2010 Progress report	The final 150+ pages of annexes are in English (mission reports, review notes, minutes/letters)
Design Studies Review Report Lot 2 - Quai December 18, 2009 Progress report	Again, the Annexes, which comprise most of the document, are in English
Design Studies Review Report (100%) Lot 3 - Port infrastructure June 7, 2011 Progress report	Again, the Annexes, which comprise most of the document, are in English
Design Studies Review Report (50%) Lot 3 - Port infrastructure December 15, 2010 Progress report	Annexes in English
Design Studies Review Report (100%) Lot 3A - Port infrastructure June 6, 2011 Progress report	Annexes in English
Design Studies Review Report (50%) Lot 3A - Port infrastructure March 11, 2011 Progress report	Annexes in English
Close-out Report Project Completion (volume 1) 08 February 2012 Final	Self-explanatory
Port of Cotonou Development Project Close-out Report (volume 2) Evaluation Report 30 April 2012 Final	Self-explanatory
OPERATIONS VESSELS ON GOODS AND OCCUPATION OF PORT AREA (DUTY)	Duty collected by month for 2013 and 2014 (in French)
Design Review Report (100%) Lot 1 – Groin 30 June 2010	Repeat of “9T6819-R021-KA-Rott, LOT1-100%.pdf” in previous document delivery

Document Description	Notes/Comments
Progress Report	
Design Review Report (50%) Lot 1 - Groin 17 December 2009 Progress Report	Self-explanatory
Design Review Report (20%) Lot 1 - Groin 17 December 2009 Progress Report	Self-explanatory
Design Review Report (100%) Lot 2 – Wharf 15 December 2010 Progress Report	Self-explanatory
Design Review Report (50%) Lot 2 – Wharf 18 December 2009 Progress Report	Self-explanatory
Design Review Report (90%) Lot 2 – Wharf 6 July 2010 Progress Report	Self-explanatory
Design Review Report (20%) Lot 2 – Wharf 18 December 2009 Progress Report	Self-explanatory
Design Review Report (100%) Lot 3 – Port Infrastructure 15 June 2011 Progress Report	Self-explanatory
Design Review Report (50%) Lot 3 – Port Infrastructure 15 December 2010 Progress Report	Self-explanatory
PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 3 – Port Infrastructure 30 September 2011 Final Report	Self-explanatory
Design Studies Review Report (50%) Lot 1 - Epi December 17, 2009 Progress report	Annexes in English
Project Management Consultant Port of Cotonou – Benin Inception Report	Self-explanatory
Cotonou Port Development Project Final Report of the Front Lot 2 - Quai September 22, 2011 Final Report	Annex in English

Document Description	Notes/Comments
Cotonou Port Development Project Report of the Final Receipt of Lot 3 - Port infrastructure September 30, 2011 Final Report	Completely in French
Cotonou Port Development Project Report of the Final Receipt of the Lot 3A - Infrastructure port September 28, 2011 Final Report	Annexes in English
Cotonou Port Development Project Final Report of the Front Lot 1 - Epi March 15, 2011 Final Report	Annexes in English
Study Tracking Surveys Litigation Value Added and the Satisfaction of Users of the Port of Cotonou Final Report of the investigation tracking # 2	Completely in French
Study Tracking Surveys Litigation Value Added and the Satisfaction of Users of the Port of Cotonou Final Report of the Monitoring Survey No. 1	Completely in French
EXTRACT OF PERFORMANCE REPORT 2013 MEMIP	8 page summary in French
STUDY ON LITIGATION , VALUE ADDED AND SATISFACTION USERS OF THE PORT OF COTONOU FINAL REPORT	Completely in French
TABLE OF PERFORMANCE INDICATORS OF PORT OPERATIONS FIRST AND SECOND PARITY	Completely in French
TABLE ON PERFORMANCE INDICATORS OF PORT OPERATIONS	Completely in French
Vessel traffic, import, export data, 2005-2014	Completely in French
Design Review Report (90%) Lot 3 – Port Infrastructure 7 April 2011 Progress Report	Self-explanatory
Design Review Report (20%) Lot 3 – Port Infrastructure 5 February 2010 Progress Report	Self-explanatory
Design Review Report (100%) Lot 3A – Port Infrastructure 6 June 2011 Progress Report	Self-explanatory
Design Review Report (50%) Lot 3A – Port Infrastructure 11 March 2011 Progress Report	Self-explanatory
Design Review Report (90%) Lot 3A – Port Infrastructure 22 April 2011	Self-explanatory

Document Description	Notes/Comments
Progress Report	
Design Review Report (20%) Lot 3A – Port Infrastructure 9 March 2011 Progress Report	Self-explanatory
PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 1 - Groyne 15 March 2011 Final Report	Self-explanatory
PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 2 - Quay 22 September 2011 Final Report	Self-explanatory
PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 3 – Port Infrastructure 30 September 2011 Final Report	Self-explanatory
PORT OF COTONOU DEVELOPMENT PROJECT Final Acceptance Report Lot 3A – Port Infrastructure 28 September 2011 Final Report	Self-explanatory

8. Annexes

8.1 Stakeholder Comments and Evaluator Responses

This annex will be completed after the project team's trip to Benin.