OECS Ports

An Efficiency and Performance Assessment

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Abstract

Handling charges in Caribbean ports are two to three times higher than in similar ports in other regions of the world. In some cases, it costs significantly less to ship a container to Hong Kong SAR, China, or Europe than it does to ship to a neighboring island no more than 100 miles away. The reasons for high port-handling costs are linked to procedural inefficiencies along the logistics chain, high freight rates that shipping lines attribute to empty backhauls, and the poor performance of port management and operations. The Organization of Eastern Caribbean States shares the larger Caribbean region's advantages, challenges, and concerns related to the performance of port management and operations. Yet performance assessments have been difficult to make because of data constraints. This report seeks to provide such an assessment along four

distinct policy dimensions: (i) traffic development, (ii) the institutional and regulatory framework, (iii) infrastructure development, and (iv) performance, including pricing and finance issues. The report concludes by benchmarking the efficiency of Organization of Eastern Caribbean States ports against other Latin American ports using a stochastic frontier approach, and providing a list of next steps for further research and policy prioritization. To make the current analysis possible, a rigorous exercise in the collection of primary data was conducted, using standardized templates adapted specifically to the Organization of Eastern Caribbean States context. The collection of data proved to be particularly difficult on financial and performance metrics, since many of the ports lack strong statistical systems and institutions.

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Acronyms

AAGR	average annual growth rate
ASYCUDA	automated system for customs data
AW	ASYCUDA World
AUSAID	Australian Agency for International Development
CATT	Customs Assessment Trade Toolkit
CIDA	Canadian International Development Agency
CARTAC	Caribbean Regional Technical Assistance Center
FAS	free along side
GDP	gross domestic product
IFC	International Finance Corporation
IMF	International Monetary Fund
LAC	Latin America and the Caribbean
LCR	Latin America and the Caribbean Region
LIAT	Leeward Islands Air Transport
OECD	Organisation for Economic Co-operation and Development
OECS	Organization of Eastern Caribbean States
PPP	public-private partnership
RMF	risk management framework
SEMCAR	Supporting Economic Management for the Caribbean
SCASPA	St. Christopher Air and Sea Ports Authority
SLASPA	St. Lucia Air and Sea Ports Authority
SLMTL	St. Lucia Maritime Terminals Ltd.
SMF	strategic management framework
SOP	standard operating procedure
STS	ship to shore
TEU	twenty-foot equivalent unit
WCO	World Customs Organization
WTO	World Trade Organization

OECS Ports: An Efficiency and Performance Assessment

Introduction

There is no apparent cargo capacity problem in the Organization of Eastern Caribbean States (OECS) ports. Though estimates of available capacity and demand are imprecise, self-reported figures indicate that the ports are operating below their maximum capacity. One possible exception, as repeatedly reported by operators and shipping lines, may be the terminal of Kingstown in St. Vincent. Overall, expansion does not seem to be a pressing problem for the OECS ports.

Inadequate maintenance of existing facilities and equipment is drastically curtailing the efficiency and operational capacity of the OECS ports. While the nominal installed capacity appears sufficient for the cargo traffic being handled, in practice, the actual throughput of ports is much lower than it could be, in large part because equipment maintenance is inadequate. Fast-eroding assets exacerbate other inefficiencies, including those related to the ports' layout.

The connectivity of the OECS ports is limited by internal issues, not by the capacity of shipping liners or current route design. Port calls are limited by the quality and operational capacity of the existing ports and their aging and inefficiently operated equipment. Labor inefficiencies, too, have a significant impact on the functioning and competitiveness of the OECS ports.

Revamping ports to enable the efficient handling of containers—and to move past outdated break-bulk practices—is clearly overdue. Many OECS ports have failed to keep pace with the technological and practical innovations necessary to efficiently handle containerized goods and have failed to invest in requisite physical infrastructure. A significant amount of space along the piers of several ports is occupied by warehouses, which present a physical obstacle to the efficient movement of containers. Underdeveloped infrastructure and equipment constrains these ports from attracting potential business opportunities. Refurbishment investments need to be planned, taking into consideration the small size of these ports' markets. Caribbean ports overall have seen vessel traffic decline but cargo and container volumes recover since the global economic crisis in 2008. These developments may have implications for the efficiency of OECS ports. As fewer shipping lines are prepared to handle the container traffic of ports not properly configured for containers, costs and efficiency will be affected. Finally, given the low volumes of cargo at most OECS ports and the large investment required to operate shore cranes (including the need for a spare crane in case of a breakdown), the viability of such cranes is questionable in the context.

The OECS ports have not fully developed their infrastructure to satisfy the current and potential demand of cruise ships, forcing them to use cargo terminals for passenger traffic. One reason why the OECS ports are unable to respond adequately to increased cargo demand is the improper management of port facilities. Congestion is due not only to ports' layout—many OECS ports are designed for break-bulk and not containerized cargo—but also because priority is given to cruise ships. The efficiency of cargo handling in ports is largely defined by the behavior of the cruise ship passenger market. Although most ports have dedicated cruise terminals, due to high demand they have to use cargo terminals to receive passengers, forcing container ships to berth only after cruise ships have left and delaying the handling of cargo to overnight hours (when workers are paid overtime) or until the next day. In St. Vincent, for example,

the Kingstown cruise terminal has two berths for cruise ships, but the port is not fully equipped to accommodate a third vessel; additional vessels must dock at the Campden Park container terminal nearby. In Grenada, although the port has a separate terminal dedicated to cruises, the main cargo berth is used to dock cruise vessels during the high tourist seasons of April–May and October–November. Governments should focus on policies and regulations that separate cruise ship and cargo operations, to ensure that cruise ships’ schedules do not hinder cargo trade.

Institutions, legislation, and regulations are dated and, except in St. Kitts and perhaps Grenada, little progress has been made to modernize them. Outdated regulations allow uncertainty and a lack of transparency around the determination of fees and tariffs. With the exception of St. Lucia (Vieux Fort), all ports are operated and regulated by the government directly and not via a corporatized agency, with no regulatory guidance on how to implement internationally recognized accounting practices. One resulting problem is the *de facto* integration of port finances and government finances. In this context, even if there are no limits set on private participation, partners may be rebuffed by a perceived lack of transparency. The lack of modernized regulations and practices makes management less flexible and likely erratic when traffic suddenly spikes alongside seasonal changes or other events (such as construction booms due to the building of a new hotel, and so on).

Systematic, performance-based monitoring is for the most part nonexistent, making any operational and investment gaps difficult to identify, track, and prioritize. Data on port performance, finances, and other metrics are often absent or structured in such a manner as to make systematic analysis difficult or impossible. Ports’ financial reports are often mixed with those on extraneous infrastructure installations, such as airports, making any analysis of ports’ true costs and revenues virtually impossible. Other measures, such as the TEU¹ per hour of container loading and unloading, berth waiting time, and other metrics are not collected in a systematic way, depriving port management of valuable tools.

Emerging Policy Implications and Next Steps

1. **The OECS ports could benefit from looking at alternative means of financing and managing infrastructure.** A key element of port management is the creation of mechanisms to protect the public interest. In creating such mechanisms, it is important to keep public statutory and regulatory oversight responsibilities separate from commercial activities. The OECS service ports might benefit from introducing public-private partnership (PPP) arrangements to provide access to alternative means of financing and management, and to break the vicious circle of low productivity and high costs. There are good worldwide examples of ports that have benefited from various types of PPPs.
2. **The OECS ports face the challenge of finding a fiscally responsible way to upgrade port infrastructure and improve maintenance practices.** This issue relates to alternative sources of financing, such as through PPPs, but certainly merits further analysis on its own. Upgrading physical layouts that, as a legacy of the break-bulk era, have become an obstacle to ports’ basic container-handling needs must be reconciled with the very small traffic volumes and markets the ports serve. There are few international examples of small ports serving small economic areas that have made investments in such a low level of infrastructure profitable. It would be worth exploring institutional and port-sharing arrangements that invite innovation and private capital.

¹ Twenty-foot equivalent unit.

3. **Governments would do well to consider innovative ways to revamp the institutions, regulations, and legislation relevant to port operations.** The need for the reform of port institutions is evident. In this study we have identified four possible steps forward. First, the OECS governments need to carefully consider regulations and policies that would separate or establish sharing agreements for cruise ship and cargo operations, so that cruise ship schedules do not hinder cargo trade. Second, ports need to modernize institutional practices and procedures to allow them to deal with seasonal demand and one-off events in an efficient and cost-effective manner. Third, the OECS ports might benefit from the inception of independent regulatory bodies. Fourth, the introduction of the landlord model, concessions, or outsourcing for port management might boost productivity and draw new technologies and innovation.
4. **Labor reform is necessary to lower costs and improve efficiency.** When, how, and to what extent such reforms might be implemented merits further understanding of the local political and social environments and institutional constraints. The topic of labor reforms and unions is difficult in any context, and in the case of the OECS ports, also reflects the legacy of port practices during the break-bulk era.
5. **Achieving regional coordination could bring rapid benefits at a low financial cost.** There are many examples of possible benefits. First, in terms of market development, if OECS countries joined together to negotiate with international cruise liners, they might develop some market power. Nowadays, negotiations are done on a bilateral basis, which gives the upper hand to the cruise lines. Similar benefits may be gained around freight routes and tariff setting. Second, achieving reasonable returns on port investments in small markets is always a challenge. The OECS could, however, benefit from coordinated investments and port-sharing agreements that might help reduce investment costs, creating the basis for a subregional hub-and-spoke system, and making maintenance of valuable assets financially manageable. Port-sharing agreements would also improve regional resilience to climate-related events. Third, if the OECS were to pursue PPP alternatives, it would need to create conditions for successful PPPs. To do that, the OECS could benefit from fostering technical capacity for PPP management and transaction design at the regional level, perhaps through developing a pool of experts that would serve the emerging PPP transactions.
6. **The sector's capacity to collect, store, and process data must be improved—and soon.** The problem of unreliable statistics is not exclusive to ports, but everywhere it is encountered, it poses an obstacle to the monitoring and improvement of performance and cost-efficiency. Statistical capacity has been recognized as chronically deficient across all the OECS countries and sectors, and was experienced as a hurdle in the compilation of this study.
7. **Further analysis is needed to understand how market dynamics and infrastructure gaps are linked to performance and efficiency indicators.** This study provides a detailed description of traffic patterns in the OECS region in the years 2008–12 and provides the tools to engage in a deeper analysis of the impact of traffic development on efficiency and infrastructure gaps. Can regional ports develop transshipment capacities? What do they need to do to increase their market share—and is this an important step? Should they focus on attaining increased market shares? Can ports do more to increase their efficiency? These are just a few of the questions that require further research, now that a performance baseline has been made available.

1. Context

The island nations and territories of the Caribbean have long suffered high costs for moving goods both within and outside the region. Such costs are due to poor connectivity, a direct result of island geography—regional markets are effectively “locked in” by the sea—and individual economies too small to efficiently develop the capital-intensive infrastructure needed to overcome this constraint.

Meanwhile, the Caribbean constitutes a major crossroads for international maritime trade. Located near the Panama Canal, at a focal point of North and South Atlantic trade routes as well as trade up and down the east and northern coasts of South America, maritime transport and related logistics services are of vital importance to the region’s economy.

Despite their strategic location, it is striking that handling charges in Caribbean ports are two to three times higher than in similar ports in other regions of the world. The overall cost of transport and insurance in the Caribbean is approximately 30 percent higher than the world average. In some cases, it costs significantly less to ship a container to Hong Kong SAR, China, or Europe than it does to ship to a neighboring island no more than 100 miles away.

The reasons for high port-handling costs are linked to procedural inefficiencies along the logistics chain (for example, customs and trade facilitation), the poor performance of port management and operations, and also high freight rates that shipping lines attribute to one-way traffic (empty containers must be repatriated at the carrier’s expense).

The Organization of Eastern Caribbean States (OECS)² shares the larger Caribbean region’s advantages, challenges, and concerns related to potential trade flows and connectivity, and the performance of port management and operations. There is much potential to create conditions to foster much-needed economic growth in the region, including through investment and public-private partnership (PPP) interventions. Yet any projections or estimates are difficult to make because of data constraints: little has been systematically documented of the development, stock, and technical performance of the OECS ports and relevant maritime flows.

The continuing recovery of global trade since 2009, along with the growth of containerized traffic and a renewed push for investment in physical infrastructure around the world, make an assessment of OECS port performance timely.

This report seeks to provide such an assessment along four distinct policy dimensions: (i) traffic development, (ii) the institutional and regulatory framework, (iii) infrastructure development, and (iv) performance, including pricing and finance issues. The report concludes by benchmarking the efficiency of OECS ports against other Latin American ports using a stochastic frontier approach.

As a benchmarking exercise, this study identifies general areas in which a specific port outperforms or underperforms ports with similar characteristics or that are competing for similar markets. The findings open further opportunities for the exploration of each area, including assigning it priority in relation to other issues and considering interventions (such as engagement in a multi-stakeholder dialogue). The

² The Organization of Eastern Caribbean States (OECS) is comprised of nine nations, of which six are independent and three are British overseas territories. The independent member countries are Anguilla, Antigua & Barbuda, the British Virgin Islands, the Commonwealth of Dominica, Grenada, Montserrat, St. Lucia, St. Kitts & Nevis, and St. Vincent & the Grenadines.

benchmarking exercise concludes with a list of next steps for further research. The scope of the current study is six OECS countries and up to eight OECS ports (figure 1.1). These ports were selected since they are the main ports for international trade in the countries studied.

To make the current analysis possible, a rigorous exercise in the collection of primary data was conducted, using standardized templates adapted specifically to the OECS context.³ *To our knowledge this is the first time that a dataset of this type has been put together for the OECS ports.* The collection of data proved to be particularly difficult on financial and performance metrics, since many of the ports lack strong statistical systems and institutions. The research process that underlies this study itself highlights the need for OECS ports to invest in statistical capacity.

Figure 1.1 OECS Countries and Ports Covered in the Study

Country	City	Port Name
Antigua	St. John's	St. John's Harbor
Dominica	Roseau	Port of Roseau
Grenada	St. George's	Port of St. George's
St. Kitts & Nevis	Basseterre	Port of Basseterre
	Charlestown	Long Point Port
St. Lucia	Castries	Port Castries
	Vieux-Fort	Port of Vieux Fort
St. Vincent & the Grenadines	Kingstown	Port of Kingstown
		Campden Park

Source: Authors' compilation.

Note: OECS members in red. OECS = Organization of Eastern Caribbean States.

2. An Analysis of Traffic Patterns

a. Overall Activity

Patterns of freight and passenger traffic reveal two distinct and even competing dynamics. OECS ports act as the most important gateways for much of the region's trade, which consists primarily of imports. They are also a cornerstone for tourism, the islands' main economic activity. To put things in perspective, the overall contribution of tourism to the economy ranges from 24 percent of gross domestic product (GDP) in Grenada to 74 percent in Antigua and Barbuda. Moreover, two-thirds of the OECS islands' tourism can be traced to cruise activity—a share that is significantly higher than the 14–16 percent seen in leading Caribbean destinations such as the Bahamas, the Dominican Republic, or Jamaica (WTTC 2012). This makes ports pivotal to the economy, because of their function in both trade and tourism, and simultaneously creates tension: in the face of an apparent infrastructure gap, port authorities and operators tend to give priority to calls by cruise ships over cargo vessels.

The significant majority of OECS cargo calls is concentrated in three islands and involves containerized cargo. There is very little general cargo, and liquid cargo is mostly processed in private, enclave-like facilities. Dominica (Woodbridge Bay), Grenada (St. George's), and St. Vincent (Campden Park) together get two-thirds of the OECS cargo vessel traffic. Aside from container and liquid cargo, most of the bulk and general cargo calls are due to interisland traffic. Grenada has the highest number of vessel calls for general cargo, at 1,016 on average per year. Long Point has the lowest number of calls for general cargo, at four calls per year. Dominica, St. Lucia, and St. Vincent move dry bulk in very small quantities,

³ Original templates by Foster and Briceño-Garmendia (2009).

usually construction materials such as sand and cement imports. In Dominica the number of calls for dry bulk has been steady in recent years, while in St. Lucia and St. Vincent, it has decreased alongside a slump in construction investment (in, for example, hotels). Bulk cargo tends to be conducted in small vessels. Grenada has the highest number of vessel calls for liquid cargo.

The region's overall cargo vessel traffic is showing a declining trend: total vessel traffic contracted by 17 percent in 2008–12. This drop contrasts with a rising trend in cargo volume (table 2.4). The decline in cargo vessel traffic is most likely due to shipping liners using higher load factors on their vessels. It is also an indication that the OECS ports are slowly moving from break-bulk to containerized practices. Aside from Woodbridge Bay (which experienced 1 percent growth over the period) and Campden Park (11 percent growth), OECS ports' cargo traffic decreased over the period (table 2.1). Antigua's cargo calls dropped by half over the period, and the transshipment activities of Vieux Fort also fell significantly.

Table 2.1 Total Cargo Vessel Calls, 2008–12

Port	2008	2009	2010	2011	2012	Change Growth (%)	AAGR (%)
St. John's	711	613	506	470	378	-47	-15
Woodbridge Bay/Roseau	1,043	1,011	1,041	992	1,056	+1	0
St. George's	1,235	1,196	1,173	1,162	1,018	-18	-5
Basseterre	711	625	432	569	529	-26	-5
Long Point	403	464	437	344	295	-27	-7
Castries	323	316	350	308	288	-11	-3
Vieux Fort	599	549	560	521	447	-25	-7
Campden Park/Kingstown	646	777	896	753	720	+11	+4
Total	5,671	5,551	5,395	5,119	4,731	-17	-4

Source: Authors' own elaboration on primary data.

Note: AAGR = average annual growth rate.

Freight traffic is dominated by containerized cargo, which in recent decades has been handled by five main shipping lines. Tropical, King Ocean, CMA CGM, Sea Freight, and Geest Line together dominate the Caribbean market.⁴ Most of the routes covered by these shipping lines are “feeder routes” that use Miami as their main hub and Trinidad and Tobago and Vieux Fort as regional transfer hubs between vessels. In practice, there is very little interplay between the north and the south of the region. This dynamic is not unique to the OECS and extends to the entire Caribbean, in which cargo routes are clearly divided between northern and southern islands. In practical terms, this creates a hub-and-spoke system.

Most of the shipping lines that carry cargo to the OECS are considered “liner” services, and adhere to a predictable schedule.⁵ The typical schedule shows the same vessel plowing exactly the same routes over and over again each year. For example, King Ocean has two vessels that, on a 14-day rotation,⁶ travel the following route:

⁴ With the exception of Geest Line, which takes general cargo, other shipping lines carry containerized cargo. In addition, Crowley serves some islands (for example, Antigua and Grenada), mainly doing Ro-Ro (Roll on/Roll off), a method of ocean cargo service using a vessel with ramps that allow wheeled vehicles to be loaded and discharged without cranes (World Bank, 2007).

⁵ The term “liner services” is used here in contrast to “tramper services.” Liner services refer to shipping lines that take on fixed route schedules with their fleet and/or in partnership with other liners. Tramper services are by demand.

⁶ The route has a bigger vessel capacity of 550 TEU nominal (330 TEU actual) and a smaller vessel capacity of 500 TEU nominal (275 TEU actual).

Port Everglades (Miami), Philipsburg (St. Maarten), Basseterre (St. Kitts), Road Bay (Anguilla), Gustavia (St. Barths), Charlestown (Nevis), Roseau (Dominica), Bridgetown (Barbados), Castries and Vieux Fort (St. Lucia), Campden Park (St. Vincent), St. George's (Grenada), Plymouth (Montserrat), Paramaribo (Suriname), Georgetown (Guyana), and back up to Port Everglades

Contrary to cargo shipping lines, which have only a few specific routes and schedules, the cruise ship industry has multiple routes that vary widely depending on port availability. Around 30 cruise lines serve the OECS; each has several ships traveling to each island and serving different routes. Ship sizes and routes vary depending on the length of the trip, which can vary from 3 to 15 days. Schedules are planned and sent to each port two years ahead of scheduled arrival. St. Kitts (Basseterre), St. Lucia (Castries), and Antigua (St. John's) get calls from most cruise liners serving the Caribbean, while Dominica and St. Vincent are served by less than half of the cruise lines (table 2.2). The number of cruise lines serving each port, however, does not necessarily reflect the total annual number of cruise ships serving the port, since a cruise line can have more than one ship calling the same port.

The demand of cruise lines is exerting pressure on existing OECS port infrastructure, which seems increasingly insufficient in the face of demand. The cruise ship industry fosters a spontaneous economy around cruise terminal areas, usually located downtown from the main city. But in terms of infrastructure, the OECS ports—and even regional cities—are not developed to satisfy the capacity and the potential demand of cruise ships. In Basseterre (St. Kitts) another pier is being built in the cruise terminal, since the current pier can receive only two cruise ships at a time. In Antigua a separate cruise terminal (Heritage) holds four cruise ships at a time and, during periods of high demand, up to five. If a sixth cruise vessel arrives, it is sent to the cargo terminal.⁷ The Kingstown cruise terminal in St. Vincent is located next to the cargo terminal and has two berths for two cruise ships, but the port is not fully equipped to accommodate a third vessel. If a third approaches the island, it needs to dock in the container terminal. In Grenada, although the port has a separate terminal dedicated to cruises, the main cargo berth is also used to dock cruise vessels during the high season in April–May and October–November. Since Long Point Port (Nevis) is a relatively new port, the demand for cruises has not fully developed.

⁷ This happens more rarely, about once or twice a year.

Table 1.2 Cruise Lines Serving the OECS Ports

	St. John's	St. George's	Roseau	Basseterre	Long Point	Castries	Kingstown
Aida Cruises	X	X	X			X	
Azamara Club Cruises	X		X		X		
Carnival Cruise Line	X		X	X		X	X
Costa Cruises	X	X		X		X	
Celebrity Cruise Lines	X	X	X	X		X	
Compagnie de Ponant		X		X		X	
Club Med Marine		X				X	
Crystal Cruises	X						
Cunard Line				X		X	
Disney Cruise Line	X					X	
Fred Olsen Cruise Line	X	X		X		X	
Holland America Line	X	X		X	X	X	X
Island Cruises						X	
Mediterranean Shipping						X	
MSC Cruises		X				X	
Norwegian Cruise Lines	X			X		X	
Oceania Cruises Inc.	X		X			X	X
Ocean Village						X	
P&O Cruises	X	X	X	X		X	X
Passat Ship Management							
Princess Cruises	X	X		X		X	X
Regent Seven Seas Cruises	X	X		X			
Royal Caribbean Cruise Line	X		X	X		X	
Saga Cruises	X	X	X	X		X	
Seabourn Cruise Line	X		X	X	X	X	X
Silversea Cruises	X	X	X	X		X	X
Star Clippers Cruises	X	X		X	X		X
SeaDream Cruise		X			X		X
Thomson Cruises	X	X	X	X		X	
TUI Cruises	X	X	X	X		X	
Windstar Cruises	X	X		X	X		X

Source: Authors' compilation of data provided by port authorities and cruise agents.

Note: OECS = Organization of Eastern Caribbean States.

With the exception of St. George's (Grenada), which seems to be exemplary among OECS ports for protecting the cargo ship berthing window, ports give cruise ships precedence over cargo. This implies that, in practice, the efficiency of cargo handling in ports is largely defined by the behavior of the cruise ship passenger market. Although most OECS ports have dedicated cruise terminals, they are forced to use cargo terminals to receive cruises due to high demand; container ships must wait to berth until the cruise ship is gone. For example, in St. Lucia, Castries has a dedicated terminal for cruise ships (Pointe Seraphine) with two berths, but it is very common for cruise vessels to be sent to the cargo terminal during the peak tourist season. Cruise operations are between 6 a.m. and 6 p.m. (sometimes until 8 p.m.) and cargo operations can start only after the cruise ship leaves, delaying the cargo handling to overnight hours (when workers will be paid overtime) or until the next day.

In terms of cruise vessel calls, the ports of St. John's (Antigua), Basseterre (St. Kitts), and Castries (St. Lucia) together receive about 60 percent of OECS passenger traffic. Antigua has the highest

number of passenger calls, at 333 per year. This is most likely due to its position as the northernmost island in the OECS, which puts it closer to most cruise ships' original ports of embarkation, such as Miami, Florida. Also, Antigua's dedicated cruise terminal holds the highest number of vessels within the OECS, and has the most advanced cruise ship infrastructure. Although Grenada and St. Vincent together receive an important share of passenger vessel traffic, due to their location farther south, this share is still smaller. The Port of Long Point in Nevis receives the smallest number of vessel calls, perhaps because it is a relatively new port, established only in 1998. The port is still developing its infrastructure to attract more cruise tourism. Additionally, most of the cruise ships in St. Kitts and Nevis berth in the Port of Basseterre. The Port of Vieux Fort is dedicated to container transshipment and only gets the overflow of cruise ships calling Castries, which explains the smaller number of cruise calls (table 2.3).

The Port of Woodbridge Bay in Dominica is the only OECS port to be experiencing a visible decline in passenger vessel calls—21 percent between 2008 and 2012. This might be due to its underdeveloped dedicated cruise infrastructure. Dominica has a small dedicated pier for cruise ships in downtown Roseau, and also uses the Woodbridge Bay container port. Both piers, however, can hold only one ship at a time, and the cruise terminal does not have the same facilities as most other cruise terminals in the OECS. Combined, these factors may make these ports less attractive to cruise lines. Long Point in Nevis, on the other hand, has seen an increase in cruise traffic, but from a very low call level. Across the OECS as a whole, meanwhile, the flow of cruise ships has been stable despite regional economic difficulties and the global crisis.

Table 2.2 Total Passenger Vessel Calls, 2008–12

Port	2008	2009	2010	2011	2012	Change Growth (%)	AAGR (%)
St. John's	317	367	304	328	333	+5	+2
Woodbridge Bay/Roseau	213	241	250	194	168	-21	-5
St. George's	232	251	209	207	227	-2	0
Basseterre	204	234	172	305	267	+31	+13
Long Point	27	19	25	34	31	+15	+7
Castries	132	385	334	286	266	+102	+39
Vieux Fort	0	0	4	4	2	-50	-25
Campden Park/Kingstown	172	164	132	139	173	+1	+1
Total	1,297	1,661	1,430	1,497	1,467	+13	+4

Source: Authors' own elaboration on primary data.

Note: AAGR = average annual growth rate.

b. Container Traffic

OECS ports have finally recovered the level of container volume traffic that they had before the global economic crisis. This has occurred despite a notable reduction in vessel calls. Shipping liners are using higher load factors on their vessels. Container traffic is a good indication of trade intensity and, as such, is a sign of recovery. Nowadays, nearly 95 percent of finished consumer goods are transported in containers. OECS members, like most islands in the Caribbean, are net importers. Imports include nearly every consumable, including most foodstuffs, and supplies for the resort and hotel industries.⁸ The islands'

⁸ Beyond the regular consumables imported via the ports of the Organization of Eastern Caribbean States (OECS), container traffic also reflects ongoing construction and recovery projects. Traffic can rise over 20 percent during years of resort construction, or during hurricane recovery efforts.

dependence on such imports underscores the relevance of having efficient ports to make sure supplies reach their destinations. The larger hotels and resorts use their corporate purchasing power to source nearly all of their ingredients from cost-effective sources abroad.

During 2008–12, that is, the period following the economic crisis, aggregate container volumes increased by 8 percent (table 2.4). The main ports driving this increase were Woodbridge Bay in Dominica and Vieux Fort in St. Lucia. Both Castries and Vieux Fort in St. Lucia received more than half of total OECS container traffic, with the transshipment Port of Vieux Fort alone handling 46,000 TEU per year, equivalent to 30 percent of the total OECS traffic. Both ports also seemed to recover from the economic crisis.⁹ Dominica’s Woodbridge Bay port has also recovered: traffic increased by 58 percent between 2008 and 2012. Antigua, on the other hand, has seen a slump, mainly because of the economic impact of the collapse of Stanford’s businesses in a banking scandal in 2007. Stanford’s enterprises were the top employers in Antigua next to the airline LIAT and the Government of Antigua.

Table 2.3 Container Traffic, 2008 and 2012

Port	TEU		Growth	
	2008	2012	Change (%)	AAGR (%)
St. John’s	20,052	13,485	-33	-9
Woodbridge Bay/Roseau	12,611	19,905	+58	+13
St. George’s	17,799	13,920	-22	-6
Basseterre	7,100	7,801	+10	+2
Long Point	2,453	2,665	+9	+3
Castries	35,977	37,672	+5	+2
Vieux Fort	34,226	45,668	+33	+13
Campden Park/Kingstown	16,569	16,827	+2	0
Total	146,787	157,943	+8	+3

Source: Authors’ own elaboration on primary data.

Note: AAGR = average annual growth rate; TEU = twenty-foot equivalent unit.

Many OECS container traffic patterns are linked to construction projects, mostly in the tourism sector. In St. Vincent, Campden Park’s volume has been relatively consistent. It has been reported that much of the equipment and materials for the construction of Argyle International Airport is routed through the port (figure 2.1). Throughput in the Port of Long Point (Nevis) dropped after hurricane Omar’s significant damage to the Four Seasons Hotel in 2008. The hotel reopened two years later, in 2010, and with that traffic went back to its usual levels.¹⁰ Dominica, too, has seen new hotel construction; Secret Bay was ranked among the top new hotels in the Caribbean in 2012 by *Travel & Leisure Magazine*.¹¹ Ports must modernize institutional practices and procedures to allow them to deal with unexpected or occasional events in an efficient and cost-effective manner.

⁹ Though not reflected in table 2.4, Vieux Fort’s traffic experienced a significant drop in 2013 due to the breakdown of the port’s only crane and its spreader.

¹⁰ In addition, anecdotally it has been reported that the financial difficulties of the Port of Basseterre were in part caused by the waiving of all port-handling fees for the significant amount of cargo related to the construction of the Marriott St. Kitts Resort.

¹¹ <http://dominicanewsonline.com/news/homepage/news/economy-development/secret-bay-among-top-50-new-hotels-in-2012/>.

Figure 2.1 Container Traffic, 2008–12

Source: Authors' own elaboration on primary data.

Note: OECS = Organization of Eastern Caribbean States.

Container Trade Imbalance

A major issue relevant to container traffic is the balance of trade; a large number of containers are shipped back out of OECS ports empty. With the exception of St. Lucia, full containers leaving the islands make up only 5–13 percent of total container traffic (figure 2.2). St. Lucia's numbers reflect the transshipment operations of Vieux Fort, where full containers are deposited and then picked up later by another vessel; such containers compose over 66 percent of all containers shipped from that port. Antigua's data, meanwhile, may be skewed: shipping lines stored empty containers for free at the port until 2014, and a large number of empty boxes accumulated in the container yard. Overall, the disproportionate outflow of empty containers is seen as a key contributor to the high costs of shipping in the Caribbean.

Figure 2.2 Percentage of Full versus Empty Containers in Total Flow, 2012

Source: Authors' own elaboration on primary data.

Note: TEU = twenty-foot equivalent unit.

Container Transshipment Activity

Vieux Fort in St. Lucia is the only port in the OECS dedicated to transshipment and one of the few designed to be a container terminal. The rest are dedicated to trade, mainly imports. These ports host occasional transshipment activities, but these are small and yield very little revenue. Transshipment ports require that space for storing and shifting containers be designed and used in a highly effective manner, without obstructing warehouses in either the yard or the pier. Vieux Fort, the only true dedicated transshipment port in the OECS, is also the only one whose operations are set up to facilitate private participation (through a subsidiary of the St. Lucia Air and Sea Ports Authority that has yet to be privatized).

c. General Cargo

The tonnage of overall general cargo traffic in the region decreased by 24 percent in 2008–12. This indicates that the OECS ports are slowly moving from the break-bulk era into the containerization era. Except for Long Point (which experienced a 24 percent increase) and Woodbridge Bay (a 1 percent increase), the OECS ports showed a decline during this period (table 2.5). The Port of Vieux Fort experienced the largest decline, at 48 percent, during the period. General cargo in Vieux Fort, mainly imports, represented only 20 percent of the business of this dedicated transshipment port. Out of ten shipments, only two are bulk (and this includes dry and liquid bulk). Another reason why general cargo has declined in the region is that interisland transportation costs are very high, and maritime logistics are inadequate.

Most general cargo is for interisland trade within the Caribbean, moved by operators on small vessels called schooners.¹² As is the case with container traffic, the OECS countries are also net importers of general cargo. Imports are predominantly produce from Trinidad and Tobago; internal agricultural production is limited. Additionally, hotels generally import the majority of the goods for their operations, including food.

St. George is host to 45 percent of total general cargo traffic in the region (table 2.5). Imports to the region account for 90 percent of such traffic. Most imports into Grenada are from Trinidad and Tobago. Grenada's main agricultural exports include nutmeg and cocoa; the country has been trying to recover its market share since these crops were destroyed by Hurricane Ivan in 2004.

Table 2.5 General Cargo Traffic, 2008 and 2012

Port	Tonnes		Growth	
	2008	2012	Change (%)	AAGR (%)
St. John's	445,234	288,986	-35	-10
Woodbridge Bay/Roseau	26,962	27,142	+1	0
St. George's	503,887	461,479	-8	-2
Basseterre	151,917	105,313	-31	-8
Long Point	2,947	3,661	+24	+31
Castries	123,721	82,627	-33	-9
Vieux Fort	55,868	28,787	-48	-14
Campden Park/Kingstown	56,649	34,272	-40	-11
Total	1,367,185	1,032,267	-24	-7

Source: Authors' own elaboration on primary data.

Note: AAGR = average annual growth rate; OECS = Organization of Eastern Caribbean States.

¹² Schooners are typically sailing vessels converted into small cargo vessels.

With the exceptions of Antigua and Dominica, general cargo in OECS ports declined after 2008 (figure 2.3). The Port of St. John's, with the second-largest volume of general cargo in the region, experienced a sharp decrease in traffic from 445,000 in 2008 to 282,000 tonnes in 2010. Since 2011 the port has started to slowly recover its general cargo volumes. On the other hand, general cargo movements in Woodbridge Bay, Dominica, remained relatively steady even after the economic crisis.

Figure 2.3 General Cargo Traffic, 2008–12

Source: Authors' own elaboration on primary data.

The biggest general cargo imbalance is seen in Antigua (figure 2.4). Imports represent 93 percent of this island nation's general cargo traffic. Land in Antigua is arid, making it a marginal producer of agriculture highly dependent on imports, mainly from St. Maarten and Dominica. Besides produce, 7 percent of the traffic is composed of miscellaneous items such as soft drinks, bottled water, rum, and furniture.

St. Vincent exports the highest volume of general cargo in the OECS, composing 37 percent of total exports. Much of this traffic is headed to the Grenadine islands, including Canouan, Union Island, and Mustique. St. Vincent exports produce (such as bananas, taro root, sweet potatoes and yams, coconut, ginger, and plums) to Trinidad and Tobago, Barbados, and the United Kingdom. Exports also include breadfruit to the United States and Canada. Aside from primary goods the country has also started to export processed goods to Venezuela. Exports destined for Antigua and Grenada represent less than 10 percent of St. Vincent's total general cargo traffic.

Figure 2.4 General Cargo Trade Imbalance, 2012

Source: Authors' own elaboration on primary data.

d. Dry Bulk

The main driver of dry-bulk traffic in the OECS is construction projects. In this category, sand and cement are the products most often imported and exported. Most construction projects on the islands are related to the tourism industry, mainly hotel development. For this reason, dry-bulk traffic fluctuates from year to year, depending on construction needs and other industry factors. Road construction projects also increase dry-bulk traffic, mainly for the import of raw materials.

The OECS experienced an overall decrease of 22 percent in dry-bulk traffic in 2008–12; the Port of St. John's experienced a particularly sharp decrease of 67 percent in these years (table 2.6). As for the rest of the economy in Antigua, dry-bulk traffic was severely affected by the Stanford crisis. Dry-bulk volumes decreased by more than half. On the other hand the Port of St. George's, with the highest volume of dry bulk in the OECS, remained relatively steady with only a 1 percent decrease during this period.

Table 2.4 Dry-Bulk Traffic, 2008 and 2012

Port	Tonnes		Growth	
	2008	2012	Change (%)	AAGR (%)
St. John's	91,809	30,700	-67	-23
Woodbridge Bay/Roseau	249,444	211,679	-15	5
St. George's	253,279	251,266	-1	0
Basseterre	109,852	104,926	-4	3
Long Point	25,314	29,049	15	10
Castries	5,424	3,859	-29	36
Vieux Fort	174,243	93,682	-46	2
Campden Park/Kingstown	76,256	46,796	-39	-11
Total	985,621	768,098	-22	-5

Source: Authors' own elaboration based on primary collection.

Note: * Data for Castries from 2011. AAGR = average annual growth rate; OECS = Organization of Eastern Caribbean States.

With the exception of Woodbridge Bay and Vieux Fort, dry-bulk traffic in OECS ports is gradually changing. Woodbridge Bay in Dominica experienced a sharp increase of 71 percent in 2011 (figure 2.5), mainly due to a major construction project—the building of a new road to connect to Melville International Airport. In the case of Vieux Fort, a high volume of dry-bulk traffic was linked to the construction of a resort in 2007, but the project failed due to financial reasons. The Port of Castries experienced the lowest volume of dry bulk: 4,000 tonnes a year, on average, interrupted by a sharp increase of 16,000–20,000 tonnes per year in 2009 and 2010.

Figure 2.5 Dry-Bulk Traffic, 2008–12

Source: Authors' own elaboration on primary data.

The traffic imbalance for dry bulk is very high; most of the islands import at least 95 percent of their dry bulk traffic. St. Lucia is the exception; here, 65 percent of the dry-bulk traffic are exports of lumber, sand, and cement to other islands in the Caribbean. One reason some members of the OECS are importing sand from other countries is because the local sand quality is not adequate for construction.

e. Liquid Cargo

The mainstay of liquid-bulk traffic is fuel for power stations and automobiles. Across the OECS liquid bulk is handled outside ports, though the port authority has regulatory oversight power. Typically a jetty or a buoy, operated by a private company, is used to move liquid-bulk cargo; in some cases the port also provides facilities. Most liquid-cargo traffic is imports.

Liquid-bulk traffic increased by 8 percent overall in the OECS in 2008–12. Grenada had the highest volume of liquid-bulk traffic, mainly in imports, but experienced a 5 percent decrease during this period (table 2.7). Long Point also experienced a significant decrease, of 18 percent, in liquid-bulk traffic. In the case of Castries in St. Lucia, the port handles very little liquid bulk, around 4,000 tonnes, but traffic increased by 83 percent during this period.

Table 2.7 Liquid-Bulk Traffic, 2008 and 2012

Port	Tonnes		Growth	
	2008	2012	Change (%)	AAGR (%)
St. John's	—	—	—	—
Woodbridge Bay/Roseau	43,967	48,536	+10	+3
St. George's	85,076	81,061	-5	-1
Basseterre	68,161	81,296	+19	+18
Long Point	17,869	14,599	-18	-5
Castries	2,218	4,060	+83	+34
Vieux Fort	35,310	38,291	+8	+2
Campden Park/Kingstown	53,393	63,453	+19	+5
Total	305,994	331,296	+8	+5

Source: Authors' own elaboration on primary data.

Note: AAGR = average annual growth rate; OECS = Organization of Eastern Caribbean States.

— Not available.

Liquid-bulk traffic patterns remained relatively steady in the OECS in 2008–12. The Port of Basseterre (St. Kitts) was the only port that experienced a significant decrease in liquid-bulk imports in 2010 and a sharp increase in 2011 of more than 50 percent, from 41,000 tonnes to 90,000 tonnes (figure 2.6). Liquid-bulk imports to the Port of Castries doubled between 2008 and 2012, from 2,000 to 4,000 tonnes.

Figure 2.6 Liquid-Bulk Traffic, 2008–12

Source: Authors' own elaboration on primary data.

Note: OECS = Organization of Eastern Caribbean States.

f. Passenger Traffic

Passenger traffic across the OECS declined by 6 percent in 2008–12. The OECS ports have not yet fully developed their infrastructure to satisfy current and potential capacity needs, forcing ports to use their cargo

terminals for passenger traffic.¹³ The passenger experience at a cargo terminal does not live up to that at a dedicated cruise terminal, which may prompt cruise passengers to choose different destinations. In addition, in contrast to hotel-based tourism, the cruise ship segment of the tourist industry brings a large number of visitors who spend no more than a day on the destination island, and spend relatively little. Therefore, OECS countries are trying to attract increased investments in hotel properties. For example, prior to the economic crisis, St. Lucia was anticipating a 40 percent increase in hotel capacity by 2008, to be spurred by the investments of large chains (Bofinger and Millan-Placci 2012). Similarly, St. Vincent expect its completion of a new airport to increase investments in larger hotels.

The ports of St. John's, Basseterre, and Castries together host 74 percent of total OECS passenger traffic. Basseterre and Long Point are the only two ports where passenger traffic increased during the study period; Basseterre's increased the most, at 35 percent (table 2.8). Long Point's traffic increased by only 4 percent (this port has the lowest volume of passenger traffic in the OECS, receiving 4,000 passengers annually, or only 0.2 percent of the OECS total). Although Nevis is a relatively new port, more cruise ships are docking there as the cruise industry grows.

Dominica and St. Vincent experienced the largest decline in cruise passenger traffic during 2008–12. Traffic in Dominica decreased by 31 percent, possibly because of insufficient space for cruise ships. St. Vincent receives less traffic due to its location far south of the other islands, but the port is trying to increase traffic by attracting South American tourists.

Table 2.5 Passenger Traffic, 2008 and 2012

Port	Passengers		Growth	
	2008	2012	Change (%)	AAGR (%)
St. John's	597,124	567,707	-5	0
Woodbridge Bay/Roseau	378,963	262,814	-31	-5
St. George's	296,181	247,884	-16	-3
Basseterre	397,507	535,290	+35	+9
Long Point	3,857	4,020	+4	+4
Castries	610,343	571,894	-6	-1
Campden Park/Kingstown	116,709	77,179	-34	-8
Total	2,400,684	2,266,788	-6	-1

Source: Authors' own elaboration on primary data.

Note: AAGR = average annual growth rate; OECS = Organization of Eastern Caribbean States.

In 2009 all of the islands experienced an increase in passenger traffic, most notable in Antigua. With 700,000 cruise passengers, Antigua far surpassed the rest of region during the period 2008–12 (figure 2.7). This is perhaps because it is the first point of call for most cruise ships coming from Europe; it is also the northernmost island among OECS members.

With the exception of Castries, all members of the OECS experienced a decrease in passenger traffic in 2010. Antigua experienced the largest decline, or 22 percent of total traffic, mainly due the impact of the Stanford crisis on the country's economy. In 2012 Castries had the highest volume of passenger traffic, with 572,000 passengers. The Port of Woodbridge Bay/Roseau experienced a significant decrease in 2012, from 416,000 to 263,000 passengers.

¹³ No metrics were available on the frequency of cruise ships occupying cargo berths.

Figure 2.7 Passenger Traffic, 2008–12

Source: Authors' own elaboration on primary data.

3. Institutional and Regulatory Framework

A key element of port management is the creation of mechanisms to protect the public interest. In creating such mechanisms, it is important to keep public statutory and regulatory oversight responsibilities separate from commercial activities (World Bank 2007). In this context, governments provide economic and technical oversight without getting involved in commercial operations. Increasing private sector participation in the delivery of port services may be seen as an instrument to achieve well-defined public interest objectives.

One “best practice” for the management of smaller ports in developing countries is the landlord port model. In this model the port authority may still own the port, but infrastructure is leased out to private operators. Most, if not all, port functions remain in the private sector, including cargo handling. Contrary to this practice, the Organization of Eastern Caribbean States (OECS) islands operate on the service port model, in which a public authority (or public entity) provides most, if not all, port services, and owns the port outright.

The OECS ports are government-run service ports; all basic infrastructure and major superstructure is owned by the government. Governments have statutory responsibility for the management, development, and maintenance of the sea ports (table 3.1). Not surprisingly, the port authorities, which in most cases are also the operators, act as the regulatory agencies. There is no operational, independent regulatory agency governing the port sector. In Dominica, St. Kitts and Nevis, and St. Lucia the port authority also serves as the operator and regulator for airports. St. Lucia's port at Vieux Fort was a first attempt to move toward the landlord model.¹⁴ In 1995 the St. Lucia Air and Sea Ports Authority (SLASPA) created a subsidiary company called the St. Lucia Maritime

¹⁴ The other exception is the handling of liquid bulk, which is done privately in an enclave.

Terminals Ltd. (SLMTL) to run the Port of Vieux Fort. While the SLMTL was expected to have private management, it is still 100 percent owned by the SLASPA.

Table 3.1 List of Select OECS Port Authorities

Country	Port	Port Authority/Regulator/Operator
Antigua	St. John's	Antigua and Barbuda Port Authority
Dominica	Woodbridge Bay/Roseau	Dominica Air and Sea Ports Authority
Grenada	St. George's	Grenada Ports Authority
St. Kitts and Nevis	Basseterre	St. Christopher Air and Sea Ports Authority
	Long Point	Nevis Air and Sea Ports Authority
St. Lucia	Castries	St. Lucia Air and Sea Ports Authority
	Vieux Fort	St. Lucia Marine Terminals Ltd.
St. Vincent and the Grenadines	Campden Park/Kingstown	St. Vincent and the Grenadines Port Authority

Source: Authors' compilation.

Note: OECS = Organization of Eastern Caribbean States.

Because of a lack of independent regulatory bodies, adjustments to tariffs and fees are generally made on an ad hoc basis. With the exception of St. Kitts and Nevis and St. Vincent, all ports base fixed criteria for adjusting handling charges on periodic reviews, often separated by more than three years. Adjustments to handling charges in St. Kitts and Nevis are done freely, based on market conditions. In St. Vincent handling charges are adjusted upon petition from the regulatory board. In general, the process of tariff adjustments is not very clear. Authorities at St. Vincent report making adjustments by petition and, at St. Kitts, on a market basis; Dominica uses the free along side (FAS) system. With the exception of Antigua, all criteria for adjusting port fees are set by the port authority (table 3.2). In many cases, fees are contained in the law providing the port its authority, and changes by the port authority must be approved by parliament or another higher government level before being applied.

Table 3.2 Select Regulatory and Institutional Frameworks at a Glance

	Antigua & Barbuda	Dominica	Grenada	St. Kitts & Nevis	St. Lucia	St. Vincent & the Grenadines
Corporatization of service provision	No				Partial	–
Sector reform year	No reform	2007	No reform			
Legislation year	1973	2006	1978	1993	1983	1975
Decentralization	No					
Foreign owner restrictions	No					Yes
Port terminal concession	No					
Independent regulatory agency	No					
Criteria for tariff adjustment	At petition to the regulatory board	Other	Freely based on market conditions		Other	At petition to the regulatory board
Criteria for handling charges adjustment	Fixed periodic review of more than 3 years			Freely based on market conditions	Fixed periodic review of more than 3 years	At petition to the regulatory board
Criteria for port fees adjustment	Other	Set by port authority				

Source: Authors' compilation.

With the exception of Dominica, which undertook a sector reform in 2007, all ports have legal and regulatory frameworks that are over 20 years old. In 2007 Dominica introduced the so-called FAS system and proceeded with drastic workforce reforms to increase port performance. The FAS principle establishes a flat box rate per container; the shipping lines only incur charges related to ship handling, and the consignees assume all charges related to cargo handling. In addition, the management reduced the gang size serving vessels from 32 to 20 members, and also reduced wages by 30 percent by raising the required gang tonnage per hour from 12 to 16. In St. Kitts new port legislation and regulations are awaiting approval of the St. Christopher Air and Sea Ports Authority (SCASPA) prior to tabling in parliament.

Select private involvement has spurred incipient competition in ancillary services. For ancillary services—container, general cargo, bulk, and even passenger facilities—private sector participation is allowed, though with restrictions, in a limited number of port operations. In St. Kitts and Nevis, container-handling operations are conducted by private shipping agents. In St. Vincent stevedoring is also conducted by the shipping agents. In St. Lucia private participation is allowed in tug- and line-handling services. Also, Castries and Vieux Fort have lease contracts for line handling and towage. Antigua has lease contracts for dredging and line handling, while St. Vincent has lease contracts for towage.

Labor disputes are another issue relevant to port management and notable in the OECS. Most of the ports still operate under labor assumptions originating from the break bulk era prior to the onset of containerization in the 1950s and 1960s. While break bulk operations were highly labor intensive, requiring warehousing and expert loading and unloading of goods from ships, the containerization process moved the warehousing and packaging process out of the port. Unions then resisted the onset of the new technology, and where laws were protective enough, though the technology changed, the staffing has remained the same.¹⁵

The ports of Castries, St. George's, and St. John's face strong unions that challenge efficiency and productivity. In the OECS much legislation and regulation still reflects a protectionist view. The ports of Castries, St. George's, and St. John's have a large and expensive stevedoring and longshoring workforce. Newer ports—built after containerization became mainstream—such as Vieux Fort in St. Lucia and Long Point in Nevis, face considerably fewer challenges from unions.

The impact of workforce costs is evident in St. Lucia's Port of Castries. Stevedoring was once done privately, but both longshoring and stevedoring are now accomplished by labor paid directly by the port authority, with workers represented by four different unions. There is a minimum 4-hour work rule, requiring gangs to be paid for at least 4 hours even if a task takes only 30 minutes. While the number of workers needed per gang has fallen steadily from 16 to 2 as container technology has improved, for political reasons the required membership has been kept at 4. Reportedly, onshore crane breakdowns that require a

¹⁵ Overstaffing, in particular, has been a pervasive feature of most port organizations in both the developing and developed world. Achieving more cost-efficient operations will generally require significant reductions in the workforce. Therefore, reducing the workforce in a socially acceptable way must be a prominent concern of public authorities and an integral part of the reform process. Addressing the overstaffing issue as one of the first steps in the reform process, before involving the private sector in operations, will usually facilitate the overall reform process. Since overstaffing in ports is often the result of government policies that view port organizations as instruments of social policy and natural shelters for the unemployed, governments should take the lead responsibility in resolving this issue. Often this means creating programs to ease the transition of port labor into other sectors. Doing this, in turn, requires the application of significant financial and management resources early in the reform process (World Bank, 2007).

shift to ship's gear slow the workflow; intentional delays of container throughput result in overtime pay for the gangs.¹⁶ In a similar manner, morning work is reportedly slowed to take advantage of double pay during lunchtime. Changes in port productivity have been difficult to implement: wages have to be increased on a regular basis to keep ports operational.

Because of labor disputes in Grenada, shipping lines transferred the responsibility of contracting and managing stevedoring and longshoring to the Grenada Port Authority in 2000. The same four-hour minimum work rule found in St. Lucia is extended to a minimum of eight hours in Grenada, with high wages. Gang sizes are kept artificially high at 22 members per gang and, since the port does not have a crane and therefore uses ship's gear, the gangs are used for every vessel. The labor laws supporting these distortions were established when containers were introduced, to keep longshoremen's pay at the same level as when they were destuffing break bulk. These arrangements constrain Grenada from acquiring any sort of shore-based crane. In addition, though longshoremen and stevedores do not officially work for the port—and the port is reportedly open 24 hours, 7 days a week, for quayside operations—Tropical Shipping reports that when one of its ships arrives the line still has to negotiate with labor unions regarding the actual hours to be worked.

Labor considerations similarly affect the operations of customs departments. In St. Lucia roughly 4 percent of all commercial consignments are physically inspected; many of these inspections, however, occur after-hours or on weekends, often at a site designated by the receiver of the goods. The inspector thus is able to charge overtime for the inspection. An x-ray machine purchased for EC\$1 million was sitting unused for three years in the main cargo shed in the Port of Castries, even though Federal Express offered to pay a rental fee for its use. Another example from St. Lucia is the lax enforcement of manifest arrivals: St. Lucian law requires that manifests arrive before actual cargo, yet in 60 percent of cases the manifests arrive late, with no fine or other enforcement levied, since the delayed manifest results in overtime labor for customs agents.

Efforts have been made to improve port efficiency and productivity, and lower costs, through very incipient labor reforms. In Antigua there has been an attempt to reduce the number of employees. The port offered "redundancy packages" to 70 employees, but was able to pay only 20 due to the port's financial situation. Infrastructure has not yet been restructured in any of the ports. The formation of a newer, more aggressive union in St. Kitts prompted immediate intervention by the agents of major shipping lines, which hired Ports Services Limited to provide stevedoring services using its own selection of workers. Unlike most of the OECS, the Port of Basseterre has undertaken some reforms in labor management and staffing. The SCASPA in St. Kitts found itself in severe financial troubles in 2009 and initiated reforms, among them a retrenchment in port staffing. This was accomplished by offering voluntary severance packages that were generous enough to reduce the workforce from 500 to 253. In Dominica a court ruling in response to a strike gave management the upper hand in renegotiating terms of employment, gang size, and performance standards.

The OECS service ports might benefit from introducing private-public partnership (PPP) arrangements as an alternative means of financing and management, to break the vicious cycle of low productivity and high costs. In fact, many ports in the world have benefited from introducing various types of PPPs. One example is the Port of Cartagena in Colombia. After port labor practices were liberalized

¹⁶ The mobile crane does not require stevedores, while stevedores are needed for the ship's gear operations.

and most port services transferred to the private sector, large and rapid improvements in productivity were observed between 1993 and 2003. These included a shift from 7 moves per ship hour to 52 moves per ship hour; and lower fees per port user, from \$984 per container move to \$222; alongside very attractive returns for the concessionaires. Similarly, in Argentina, improvements following the concessioning of terminal operations in the Port of Buenos Aires have been dramatic. Port charges and shipping tariffs declined sharply, labor productivity increased from 400 to 1,000 tonnes per worker per year, and cargo volumes increased from 4,000,000 to 6,000,000 tonnes in a three-year period (1993–96) (World Bank 2007).

4. Infrastructure Development

a. Port Infrastructure

Most OECS ports were designed during the break-bulk era, and no major renovations have been made to properly handle containers. Such ports include the older ports of St. John's, Roseau, St. George's, Basseterre, and Castries. Here, a significant amount of space along the piers is occupied by warehouses, presenting a physical obstacle to the efficient movement of containers and limiting the space allocated to container manipulation. In Antigua, for example, the Port of St. John's has a large warehouse occupying 125 meters of the main quay, impeding proper container operations (table 4.3). The port in Dominica was built in 1976, with a concrete pier resting on deteriorated pylons. Dated port infrastructure and cost structures also raise operational costs.

Except for Long Point in Nevis, the OECS ports have multiple berths over several terminals, often used for multiple purposes. In many cases there are (often large) specialized cruise ship facilities, but some islands get so many cruise ships at the same time that the main berth used for container shipping doubles as a cruise berth. All ports have relatively acceptable road access, but only Long Point Port in Nevis has access to rail. Computer-based systems for truck appointments, vessel traffic management, and vessel windows are conspicuously absent.

Table 4.1 Physical Characteristics of Select OECS Ports

Country	Port	Terminal Area* (m ²)	Berth (#)	Berth Length** (m)	Maximum Berth Depth (m)	Maximum Ship Draft (m)	Maximum Length of Vessel (m)	Crane Capacity, Mobile Harbor >40 Maximum Lifting Capacity (tonnes)
Antigua and Barbuda	St. John's	61,715	3	366	15	10	160	104
Dominica	Woodbridge Bay/Roseau	43,000	2	244	11	8	200	No cranes
Grenada	St. George's	42,492	2	335	9	8	168	No cranes
St. Kitts and Nevis	Basseterre	101,171	2	133	12	11	120	No cranes
	Long Point	40,469	1	355	7	6	160	No cranes
St. Lucia	Castries	117,360	8	482	10	9	200	52
	Vieux Fort	50,000	3	373	11	10	200	80
St. Vincent and the Grenadines	Campden Park/Kingstown	63,749	2	495	15	11	167	110

Source: Authors' own elaboration on primary data.

Note: *Authors' estimates for St. Vincent based on Google Earth; ** Berth length includes all terminals. St. Vincent's berth length includes Campden Park and Kingstown terminal. m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States.

The OECS ports are very small when compared with most ports in Latin America and the Caribbean. On average, OECS ports are about 65,000 square meters, one-third the average across the Caribbean countries and between six and seven times smaller than the area of an average port in South America. Similarly, the average berth area of an OECS port is smaller than ports in any other region of the continent (table 4.1). The maximum lifting capacity is also very low, significantly limited by the available cranes that, when available, are all mobile.

Box 4.1 The Use of Spreaders versus Cables

In modern port management, the use of spreaders for loading and unloading containers is typical. Automatic spreaders quickly adjust to the container size, and safely lock on to the container before lifting.

Cables are considerably less expensive than spreaders, but require an entire crew to attach, with one worker at each corner of the container. Because workers have to climb on top of the container to attach the cables, their use is inherently more hazardous, and also more labor intensive. Spreaders require only one operator—the crane operator. The worst danger of cables is the spreading of tension within a loaded container, especially with longer, 40-foot containers. Heavily loaded containers have split open while being lifted with cables in the OECS, resulting in the loss of cargo.

While one shipping line serving the OECS insists that spreaders are the only viable option, another operator expressed the opinion that in some circumstances, in tight areas with little space, cables may be more appropriate. But cables should be used only on smaller containers (no more than 20 feet) if loaded.

Source: Authors' compilation.

Ports in St. Kitts and Nevis, Dominica, and Grenada do not feature onshore cranes, and only ships with their own cranes (“geared” vessels) can call on these ports. Ship owners prefer using shore cranes over vessel cranes, since the number of containers that can be loaded and unloaded per hour is much higher using onshore cranes, and fewer crew gang members are needed. A fully functional mobile crane with an automatic spreader would require only a gang of two to four (box 4.1). In the OECS, TEUs per hour are higher with onshore cranes, as seen at Vieux Fort Port in St. Lucia, and at Campden Park in St. Vincent. But since the ports in St. Kitts and Nevis, Grenada, and Dominica do not have cranes, and the OECS islands are generally serviced as a set on the same route, geared vessels are generally needed. In ports where an onshore crane exists, the ship’s gear is usually not used.

Except for Woodbridge Bay and St. George’s, expanding port capacity to accommodate more and bigger ships is not constrained by geography or location across the OECS (table 4.2). The maximum length of ships has in many cases been expanded through the use of dolphins (concrete pillars rising out of the water beyond the pier, used to hold vessel lines) to dock cruise ships. Dolphins can be found along virtually all cruise piers (recently installed in the cargo Port of Basseterre, and as part of the main port structure in Campden Park), but they are not used for cargo ships. Deepening the channel and berths does not seem to be a problem except at Castries, Long Point, and St. John’s. The port in St. Vincent is a natural deep-water port and requires no maintenance dredging.

Table 4.2 Characteristics of Select Port Channels

Country	Port	Entrance Channel Depth (m)	Entrance Channel Length (m)	Impediments to Deepening	Impediments to Port Expansion
Antigua and Barbuda	St. John's	11	5,557	Yes	Yes
Dominica	Woodbridge Bay/Roseau	—	—	No	No
Grenada	St. George's	9	1,300	No	No
St. Kitts and Nevis	Basseterre	—	—	No	Yes
	Long Point	—	—	Yes	Yes
St. Lucia	Castries	13	1,100	Yes	Yes
	Vieux Fort	9	—	No	Yes
St. Vincent and the Grenadines	Campden Park/Kingstown	—	1,112	No	Yes

Source: Authors' own elaboration on primary data.

Note: m = meters.

— Not available.

Because of inadequate maintenance and refurbishment, the infrastructure and equipment in most ports—including the newer ports of Campden Park, Nevis, and Vieux Fort—are aging very quickly. This problem may be observed both among mobile equipment and permanent structures. In Antigua the port has decaying surfaces. The pavement in the container storage yard has completely disappeared; it is now a dust surface that is becoming a health hazard for port employees and users. The ports of Long Point and St. John's have silting problems that will require dredging. Long Point has experienced silting to the point that the depth is now critical, and container vessels that have not been able to first unload cargo in Antigua can no longer dock in the port. Basseterre needs to make substantive investments in the surface of its pier and in cranes. Reach stackers and straddle carriers are aging in Vieux Fort and St. George's.

Dominica's Port of Roseau also requires heavy reinvestment in infrastructure. The main pier, constructed in 1976, is supported over water using iron tube pilings that now show advanced rust and other damage from wear and tear, and hurricanes. The condition of the pier cannot support the weight of a mobile crane. Between 150 meters and 240 meters of essential pier length are in need of urgent repair to prevent collapse. Recent estimates put the repair costs at \$12 million.

Disruptions in both St. Lucia ports, due to aging mobile cranes, are taking a toll on trade. A 2012 breakdown of the ports' sole mobile crane (dating back from 1993 and now a discontinued model) resulted in a one-year outage. The shipping line CMA CGM transferred operations to Trinidad, while the volumes of Bernuth Lines (now King Ocean) dropped to one-fourth of previous levels. The port has had to absorb 50 percent of the extra labor costs incurred by the outage, along with 50 percent of the increased labor costs caused by a breakdown of the spreader used to lift containers with the crane. Before the breakdown of the crane, the port was experiencing the highest annual volume of throughput since 1996.

Table 4.3 Qualitative Description of Six OECS Members' Port Infrastructure

<p>Antigua</p> <ul style="list-style-type: none"> • Port of St. John's is located northwest of the center of St. John's city within a protected harbor area. • Facilities: main cargo in St. John's; cruise ships and ferries in Heritage Quay and Redcliff Quay. • Antigua and Barbuda Port Authority oversees all port facilities. • Layout from the break-bulk era, with a large warehouse occupying 125 meters of the main quay. • Land footprint large relative to throughput. • Warehouse is one of the largest in operation in the OECS. • Warehouse operations do not recover costs. • Main vessel lines calling include Tropical Shipping, CMA-CGM, and Seabourne, with Geest Line playing a smaller and declining role.
<p>Dominica</p> <ul style="list-style-type: none"> • Port of Roseau located 1.4 miles from the center of Roseau, the capital city. • The Port of Woodbridge Bay is generally unprotected and has been damaged several times by hurricanes. • Facilities: cargo in Woodbridge Bay; cruise terminal and ferries in the center of Roseau. • Dominican Air and Sea Port Authority oversees all ports and airport facilities. • Layout from the break-bulk era, built in 1976 over a concrete pier resting on pylons. • The port has no cranes, and operates with two reach stackers. • The port is in danger of losing 150 meters or up to the entire length of the pier due to deteriorated pylons. • Main vessel lines calling include Tropical Shipping, CMA CGM, King Ocean, and Geest Line.
<p>Grenada</p> <ul style="list-style-type: none"> • Port of St. George's located in the center of the town of St. George's. • Layout from the break-bulk era, with a cargo shed on the pier close to the quayside. • Operations (except for car imports) are lo-lo (lift on/lift off containers); there is very little break bulk. • Ro-ro operations (cargo rolling in and out from vessels) are constrained by limited space and problems related to storage. • Main vessel lines calling include Tropical Shipping and Sea Freight (bringing in ZIM containers), with Geest Line also present. • Considered the most-expensive and challenged port in the OECS.
<p>St. Kitts and Nevis</p> <ul style="list-style-type: none"> • Port of Basseterre on St. Kitts island; Port of Long Point on Nevis island. • St. Christopher Air and Sea Ports Authority oversees port activities in St. Kitts. • Nevis Air and Sea Ports Authority oversees port activities in Nevis. • Basseterre handles mostly container traffic. Cruise facilities are able to hold up to two cruise ships, and ferry facilities also present. • Long Point handles container ro-ro traffic and ferry traffic. • Layout and functioning processes from the break-bulk era; warehouse/shed occupy a good portion of the main berth space. • Basseterre pier stems from 1982, and the surface has now deteriorated to the point that some large reinvestments are needed. • There are no cranes. Therefore the port is entirely reliant on geared vessels and container ro-ro operations. • Basseterre port uses two reach stackers for management of containers, and reports using spreaders, rather than cables, for lo-lo operations. • Stevedores hired directly by the shipping line's agents—Long Point one of the few OECS ports with no labor unions. • Cruise infrastructure insufficient to handle traffic. Cargo port used as a third berth, creating scheduling conflicts with cargo-passenger traffic. • Main vessel lines calling include Tropical Shipping, King Ocean, CMA-CGM, and Geest Line, with the frequency of Geest declining.
<p>St. Lucia</p> <ul style="list-style-type: none"> • Two main ports: Castries in capital city, and Vieux Fort in the south. • St. Lucia Air and Sea Ports Authority oversees all port facilities. • Castries is a multipurpose facility with six berths (with the cruise and ferry terminal Point Seraphine). • Harbor of Castries naturally protected. • Castries' layout from the break-bulk era, with main shed/warehouse occupying valuable space along the pier. • Castries River deposits silt in the port, creating need for periodic dredging. • Vieux Fort layout modern and adjusted to container activity. Only transshipment OECS port: 85 percent of throughput due to transshipment. • Vieux Fort has an old and unreliable crane. Crane broke down in 2012 creating important loss of business for Trinidad and Tobago.
<p>St. Vincent and the Grenadines</p> <ul style="list-style-type: none"> • Kingstown/Campden area with two big terminals: original Port of Kingstown (break-bulk facility) and Campden Park (container port). • Port is a natural deep-water port, requiring no maintenance dredging. • Kingstown facilities are 50 years old, with a design life of 30 years. • Kingstown facilities showing structural issues; an unfinished portion of the pier is in danger of collapsing. • Campden Park Container Terminal built in 1992, but became operational in 2007. • Container terminal features a high-capacity crane (100+ tonne-capacity Gottwald HMK 6406 mobile crane) and 20 reefer points. • Campden Park has only one berth and services one ship at a time. Cannot operate as a substitute for Kingstown due to lack of berth space. • Congestion in Kingstown a concern. There are potential plans to relocate the port. It could be shut down if Campden Park had more capacity. • Geest Line is the regular carrier bringing both containers and break bulk to the port.

Source: Authors' compilation.

Note: OECS = Organization of Eastern Caribbean States.

In Grenada the new power configuration of cruise ships has altered the water flow around the pylons of the main pier, causing pylon degeneration and the need for extensive repairs. In addition, the two reach stackers¹⁷ have worn out. Instead of replacing them with new stackers and incurring the high costs of disposing the old ones, they were refurbished. Though port authorities seem satisfied with the refurbished units, local stakeholders and shipping lines report reliability problems that affect the length of a ship's stay in the port.

b. Capacity and Demand

There is no apparent cargo capacity problem in the OECS ports. But estimates of available capacity and demand are imprecise. Self-reported figures indicate that there is no capacity problem in OECS ports (table 4.4). Gridlock occurs when demand exceeds 80 percent of capacity. St. George's (Grenada) and Long Point (Nevis) seems to have inadequate capacity for bulk cargo. The break-bulk terminal of Kingstown in St. Vincent is also reported to be congested. But bulk and general cargo are a minority of the cargo traffic in the OECS, and involve mostly interisland trade.

The inadequate maintenance of existing facilities and equipment drastically curtails the efficiency and operational capacity of OECS ports. While the nominal installed capacity for cargo handling seems sufficient for the cargo traffic handled, in practice, the actual throughput of ports is much lower than it could be, as is performance. Maintenance is indeed one of the main concerns of OECS port authorities. This concern is paired with the need for more efficient port layouts that align with modernized practices.

c. Master Plans and Investment Plans

The OECS governments are considering new investment and planning measures, some in partnership with the private sector, to address aging infrastructure and operational gaps. Yet such initiatives are isolated and lack a long-term planning framework. In fact, most OECS members do not even have port master plans or structured expansion plans, which also explains why reliable statistics on installed capacity are difficult to obtain. Castries (St. Lucia) has a master plan, but it is considered more political than strategic. Plans under consideration include the following.

- In Antigua, a new administration is promoting the first true private sector participation in commercial port operations in the OECS
- St. Lucia:
 - For the operation of warehouses in Castries, the government is considering having shippers and agents lease their own space out of the warehouse, and perform their own freight movements.
 - There are several investment plans for the long-range development and rebuilding of the older general cargo pier of Vieux Fort.
- St. Vincent:
 - Recent studies consider port development options, including closing Kingstown and expanding Campden Park. It is evident that Campden has no capacity to take cargo overflowed from Kingstown. A study completed on St. Vincent in 2013 has a master plan component

¹⁷ Reach stackers are mobile trucks capable of lifting containers on and off container stacks and bringing them shipside.

- The southern end of the break-bulk terminal of Kingstown was refurbished, but the funds to rebuild the rest of the pier, reportedly in the range of EC\$35 million (\$13.5 million), were reappropriated to construct the Argyle International Airport. There is the danger that eventually the unfinished portion of the pier will collapse.
- Dominica:
 - The Port of Roseau is in danger of losing 150 meters or up to the entire length of the pier due to deteriorated pylons. Reinvestment is urgently needed and—according to the latest estimates—amounts to \$12 million.
- St. Kitts:
 - The government of St. Kitts is advancing a sophisticated PPP for another cruise ship terminal.

Table 6.4 Capacity and Demand of Select Ports, 2012

Country	Port	Capacity	Demand (as of 2012)
Antigua and Barbuda	St. John's	40,000 TEU/yr	13,485 TEU/yr
		500,000 tonnes/yr (general cargo)	288,986 tonnes/yr (general cargo)
		200,000 tonnes/yr (dry bulk)	30,700 tonnes/yr (dry bulk)
		Not reported tonnes/yr (liquid bulk)	890,677* tonnes/yr (liquid bulk)
Dominica	Woodbridge Bay/Roseau	Not reported	19,905 TEU/yr
			27,142 tonnes/yr (general cargo)
			211,679 tonnes/yr (dry bulk)
			48,536 tonnes/yr (liquid bulk)
Grenada	St. George's	13,920 TEU/yr	13,920 TEU/yr
		421,568 tonnes/yr (general cargo)	461,479 tonnes/yr (general cargo)
		Not reported tonnes/yr (dry bulk)	251,266 tonnes/yr (dry bulk)
		81,061 tonnes/yr (liquid)	81,061 tonnes/yr (liquid bulk)
St. Kitts and Nevis	Basseterre	Not reported	7,801 TEU/yr
			105,313 tonnes/yr (general cargo)
			104,926 tonnes/yr (dry bulk)
			81,296 tonnes/yr (liquid bulk)
St. Kitts and Nevis	Long Point	30,454 TEU/yr	2,665 TEU/yr
		Not reported tonnes/yr (general cargo)	3,661 tonnes/yr (general cargo)
		26,506 tonnes/yr (dry bulk)	29,049 tonnes/yr (dry bulk)
		14,599 tonnes/yr (liquid)	14,599 tonnes/yr (liquid bulk)
St. Lucia	Castries	146,000 TEU/yr	37,672 TEU/yr
		Not reported tonnes/yr (general cargo)	82,627 tonnes/yr (general cargo)
		Not reported tonnes/yr (dry bulk)	3,859 tonnes/yr (dry bulk)
		Not reported tonnes/yr (liquid bulk)	4,060 tonnes/yr (liquid bulk)
St. Lucia	Vieux Fort	493,000 TEU/yr	45,668 TEU/yr
		Not reported tonnes/yr (general cargo)	28,787 tonnes/yr (general cargo)
		Not reported tonnes/yr (dry bulk)	93,682 tonnes/yr (dry bulk)
		Not reported tonnes/yr (liquid bulk)	38,291 tonnes/yr (liquid bulk)
St. Vincent and the Grenadines	Campden Park/Kingstown	Not reported	16,827 TEU/yr
			34,272 tonnes/yr (general cargo)
			46,796 tonnes/yr (dry bulk)
			63,453 tonnes/yr (liquid bulk)

Source: Authors' own elaboration on primary data.

Note: * Numbers for liquid bulk from Antigua need further review and validation. OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

5. Performance, Costs, and Financial Efficiency

a. Container-handling Systems

Compared with other Caribbean ports and Latin American ports in general, the OECS ports have very low throughputs. The average annual OECS throughput, at 18,000 TEU per year, significantly trails the 300,000–350,000 TEU/year found in the other regions of Latin America. Clearly, overall throughput levels depend on the size and capacity of the port, and OECS berth lengths and port areas are also smaller. Notably, there are no ship-to-shore (STS) gantry cranes at the OECS ports, a fact that has significant implications for the productivity of these ports, since STS gantry cranes are much more productive than mobile cranes. This contrasts with the Caribbean region as a whole, where the average country has two STS gantry cranes (table 5.1).

Table 7.1 Aggregate Benchmark of OECS Ports in the Latin American Context, 2010

Region	Ports	Statistic	Annual Throughput (TEU)	Berth Length (m)	Area (m ²)	Mobile Cranes with Capacity >14t (units)	STS Gantry Cranes (units)
Central America	21	Average	519,856	844	199,400	1.5	2.9
		Minimum	2,229	67	15,000	0.0	0.0
		Maximum	2,758,506	2,205	564,000	12.0	16.0
Caribbean	16	Average	246,816	604	134,495	1.6	1.6
		Minimum	2,852	133	15,740	0.0	0.0
		Maximum	1,525,532	1,688	477,428	7.0	10.0
OECS	8	Average	15,018	333	64,995	0.5	0.0
		Minimum	2,852	133	40,469	0.0	0.0
		Maximum	27,526	495	117,360	1.0	0.0
South America	32	Average	560,986	1,270	336,332	2.7	2.2
		Minimum	36,080	238	15,000	0.0	0.0
		Maximum	2,722,225	4,728	1,270,500	10.0	17.0
Total	69	Average	475,617	986	247,855	2.1	2.3
		Minimum	2,229	67	15,000	0.0	0.0
		Maximum	2,758,506	4,728	1,270,500	12.0	17.0

Source: Adapted from Sarriera and others (2013), based on authors' primary data collection.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; STS = ship to shore; t = tonnes.

Caribbean ports—and the OECS ports are no exception—post consistently poor growth and significant variations in cargo traffic. The throughput of Caribbean and OECS ports increased between 1999 and 2010, while remaining significantly less than ports in Latin America as a whole. But this figure is deceptive for the OECS, because throughput data are available for only two of the eight ports included in the sample in 1999 (table 5.2).¹⁸ During the 2008–10 period, when data for all eight OECS ports included in the sample are available and reflect the global economic slowdown, the OECS ports did slightly better (that is, they contracted less) than the non-OECS Caribbean ports. Still, their performance was below the Latin American average.

¹⁸ For the Organization of Eastern Caribbean States (OECS) ports, data are available for Castries and Vieux Fort from 1999; for Roseau from 2000; and for Campden Park/Kingstown, Long Point, St. George's, and St. John's from 2007.

Table 5.2 Growth of Annual Throughput, by Region

Region	Growth 1999–2010 (%)	Compound Annual Growth Rate 1999–2010 (%)	Growth 2007–10 (%)	Compound Annual Growth Rate 2007–10 (%)
Central America	302	12	-1	0
Caribbean	53	4	-24	-9
OECS	166	8	-18	-6
South America	542	17	4	1
Total	306	12	-2	-1

Source: Adapted from Sarriera and others (2013), based on authors' primary data collection.

Note: OECS = Organization of Eastern Caribbean States.

The OECS's average throughput of 10.6 TEU/hour in 2013 compares relatively well with the overall Caribbean average of 11.4, considering that, on average, Caribbean ports are much larger and have more capacity than the OECS ports. This average, however, hides a wide range of variability across countries. Grenada has the lowest average throughput per hour when compared with the other OECS ports, with a maximum TEU per hour that is half that observed in Vieux Fort (figure 5.1). Such averages also hide fluctuations in hourly throughput.

Throughput (as measured in TEU per hour) is highly volatile, not just in the OECS but in the region in general, making averages difficult. The reasons for this are not quite clear. In some cases, such as Vieux Fort, throughput variations can be attributed to crane and spreader outages; the delays in St. Lucia are attributable to unions. Throughput performance also points to other incongruences: the top two performers with the highest average TEU per hour are equipped with mobile cranes, but so is the one with the third-lowest average.

What such averages do not capture is the inefficiency embedded in these ports. Efficiency in the OECS is admittedly very low; for example, a typical container ship operated by ZIM will arrive at 6 a.m. and not leave until ten hours later, at 4 p.m. Because of variability, one measure of port performance may be the maximum monthly average container output achieved during the year. This would put Vieux Fort, a transshipment port, in the same league as other transshipment ports in the Caribbean (the Bahamas and Jamaica), but Castries, Kingstown, and St. George's would clearly fall into the slow category, with just over 10 TEU/hour maximum throughput.

Figure 5.1 Average and Maximum Throughput in OECS and Other Caribbean Countries (TEU per hour)

Source: Authors' elaboration on data provided by the Florida Shipping Association.

Note: TEU = twenty-foot equivalent unit.

b. Performance

Among the most salient performance issues in OECS are high labor costs and a work philosophy that stems from the break-bulk era. The size of the gangs in the break-bulk era ports (St. John's, Roseau, and Long Point) is between two and three times larger than for those newer ports that are structured physically and institutionally to handle containerized ports (Vieux Fort and Campden), despite their shockingly low berth utilization (table 5.3). Another important source of delays and inefficiencies is the practice of inspecting all—that is, 100 percent of—import and export containers rather than drawing a sample to

inspect. In the OECS, Antigua and St. Kitts have a practice of inspecting all containers; Grenada, Nevis, and St. Lucia are slowly moving to more selective and efficient inspection processes.

Table 5.3 Performance Indicators, 2012

Port		Dwell Time (days)		Turnaround Time (hours)		Average Workers per Gang (number)	Berth Utilization, Container (hours)
		Container	Transshipment	Container Vessel	Cruise Vessel		
Antigua and Barbuda	St. John's	5	1	6	12	11	6
Dominica	Woodbridge Bay/Roseau	5	—	6	7	20	6
Grenada	St. George's	14	—	—	11	22	—
St. Kitts and Nevis	Basseterre	7	—	8	10	—	—
	Long Point	5	—	—	—	16	—
St. Lucia	Castries	2	3	8	12	4	6
	Vieux Fort	3	1	5	—	6	5
St. Vincent and the Grenadines	Campden Park/Kingstown	—	—	—	—	4	—

Source: Authors' own elaboration on primary data.

— Not available.

c. Customs

The OECS governments, as in the case of many other governments around the world, tend to have different objectives for port operations than would private owners and operations. Port tariffs and other charges are important in countries that have difficulties raising revenues through standard taxes. To compensate for revenues that would normally be derived through traditional streams, the governments see the ports, with their unique role as sole gateways, as an alternative source, both through customs tariffs as well as through port operational charges themselves.

Moreover, it is not uncommon that port operations subsidize other infrastructure sectors. Both in Grenada and Dominica the ports end up cross-subsiding other infrastructure. In Grenada the main bus terminal in St. George's falls under the port authority, while in Dominica the Port of Woodbridge Bay subsidizes the airport, which loses EC\$1 million annually.¹⁹ In addition, the Dominican Air and Sea Port Authority is incurring losses at its ferry terminal: revenues consist of a docking fee of EC\$230 per vessel per trip (twice a day), and the Government of Dominica collects all passenger fees. By the same token, all passenger fee revenues collected from visiting cruise ships go directly to the Government of Dominica, though the port had originally been promised 30 percent of these revenues. Before the global recession Grenada's port was profitable and paid its government a dividend of roughly EC\$1 million annually. Some stakeholders report that the Government of Grenada sees the port as a main source of revenue.

The OECS customs authorities lack proper risk-management systems and have only partially implemented integrated information systems. Information systems are capable of receiving the electronic manifest before the cargo arrives, but are unable to assess risk in advance, implement facilitation measures, or formally share information with tax administrators to update the risk profiles of authorized operators. The control mechanisms of the OECS customs authorities are based primarily on physical

¹⁹ The revenues of Canefield International Airport barely cover security costs.

examinations of almost 100 percent of the entries, and efforts to promote voluntary compliance have not met with success.

Overtime payments for customs procedures are applied across the OECS. Typically the customs brokers pay customs compensation on behalf of importers/exporters to a customs officer who performs physical examinations on the importer's/exporter's premises. The broker will request the service by 3 p.m. of a supervisor officer, who allocates the overtime service to available inspectors. Once the working hours are finished at 4:30 p.m., the assigned inspector will go to the importer's premises to carry out the inspection. The transport costs are covered and the overtime compensation is based on an hourly rate. Once the examination is completed, the broker fills out a form for the customs inspector to sign. Upon completion of the paperwork, the overall compensation amount is deposited in a specific customs account. At the end of the month, the overtime compensation is paid (by a private party) along with the salary due (by the government) after the government deducts corresponding taxes. These mechanisms result in less work being done during regular hours, higher costs of trade, and greater time needed to complete the import process.

Box 5.1 OECS Customs: More than an Administrative Transaction

What are the key characteristics of customs best practices?

The concept of modern customs encompasses effective, efficient, transparent, and predictable operations consistent with broad strategies and goals to meet current needs (WCO 2007). Customs offices around the world are currently confronting a challenging environment featuring increased and more complex international trade, just-in-time distributions models, increased security threats and organized crime, higher expectations from the public as well as private sector, and trade facilitation negotiations. To face this changing and challenging environment, international organizations such as the World Trade Organization (WTO) and the WCO are promoting customs best practices. In this regard, the Revised Kyoto Convention provides a set of best practices whereby the role of the customs office is simultaneously defined as that of a:

- Policy advisor: to provide trade statistics for macroeconomic purposes and trade negotiations
- Policy implementer: to help to regulate trade agreements
- Trade facilitator: to facilitate doing business in the country
- Security provider: to contribute to national security at the borders

Where are the OECS countries in relation to customs best practices?

According to the Customs Assessment Trade Toolkit (CATT), the assessed processes of the OECS customs offices are far from best practices. The OECS customs performance was ranked low to medium for “in progress” performance, with average scores between 30 percent and 36 percent out of a maximum of 100 percent (World Bank 2010).

The CATT analysis showed a lack of effective feedback mechanisms between the trading community and the customs office to promote continual performance improvement. The latter is aggravated by the absence of formal standard operating procedures (SOPs). Overall, the transition costs of dealing with the OECS customs are high, especially in terms of time. The average amount of time it takes to release goods can reach more than ten times the international standard of eight hours in some cases.

Why have the OECS countries not embraced best practices?

While the Caribbean economies are highly integrated with the global economy, their customs performance is lagging behind. One clear pattern is that the OECS customs offices physically examine almost all entries—a practice far removed from trade facilitation best practices. This is likely the response to a widely accepted practice of overtime pay that sets out a distorting incentive structure. Overtime compensation is very attractive and pursued by customs officers to top up their salaries, and taken as part of the aggregate income for all financial transactions, including mortgage applications.

Other elements that are far from trade facilitation best practices have been identified by the CATT diagnostics in the OECS. Those elements include incomplete harmonization and dissemination of the valuation and classification rules, lack of SOPs, nonsystematic updates on customs regulations and procedures, lack of electronic payment options, and absence of operational benchmarks.

What has been done to improve OECS customs practices?

Most Caribbean countries, including those in the OECS, have implemented an integrated information system solution: the ASYCUDA World (AW) system, which has become the regional standard due to its functionality and reasonable implementation cost. The rollout of an integrated information system

is undoubtedly a positive move to support customs operations. The AW system facilitates information lodging, minimizes input mistakes, and makes information more consistent.

With the help of international players, the OECS customs offices have been working to improve their performance. Notably, the region has benefited from initiatives such as the Caribbean Regional Technical Assistance Center (CARTAC) for more than eight years, and recently the Supporting Economic Management for the Caribbean (SEMCAR) program launched by the International Monetary Fund (IMF) and the World Bank. The program aims to streamline tax, customs, and public financial management in the region.

The work of the CARTAC and SEMCAR customs offices points to two priority areas: strategic thinking and the adoption of risk management systems.

In the area of strategic thinking, the SEMCAR program has produced a Strategic Management Framework (SMF). At the core of this framework are efforts to help modern customs offices play the role of trade facilitator. The SMF allows for a participatory process, whereby customs offices interact with key players to deal effectively with issues as complex and politically sensitive as overtime practices, thus making it possible to find solutions supported by political will and resources.

On the side of risk management, the SEMCAR program has produced a Risk Management Framework (RMF). This framework promotes the adoption of risk management practices based on risk profiling of authorized operators and agile trade facilitation. One OECS country has piloted the RMF by setting up an information solution that enables data exchanges between the revenue agency and the customs office, to build up and update risk profiles of authorized operators. This approach to RMF is compatible with the existing core customs information system.

What else can be done to streamline OECS customs?

The implementation of integrated systems and the initial adoption of the SMF and RMF are positive steps toward building modern customs in the OECS, but these steps are only the beginning. Changing the idea that customs processes are means for fee collection is a difficult challenge to overcome. Dealing with distorting incentives that perpetuate and deepen inefficiencies in trade facilitation is another big challenge. For the OECS, critical next steps include:

- a) *Removing the practice of overtime.* This implies that the basic salary is the only compensation for customs inspectors. But this might give rise to corruption to compensate for the loss of overtime compensation.
- b) *Introducing a fee for customs services to be paid by the private sector.* To be effective this fee must not be linked to physical examinations and should contribute to an overall compensation fund. Since the private sector is already paying the cost of overtime, this should not be a problem for them.
- c) *Revising salary scales and incentives for customs officers.* This action might have important fiscal implications and should be implemented with a reform program oriented toward converting customs offices in the Caribbean into performance-oriented entities.

Source: Prepared by José Eduardo Gutierrez Ossio, based on Gutierrez Ossio and others (2013) and on Briceño-Garmendia and others (2013).

d. Pricing

With the exception of St. Vincent, the OECS ports are expensive. The Doing Business indicators contain a measure of costs for importing a container for nearly every country in the world, broken down by costs for document preparation, customs, port handling and terminal charges, and inland transport charges. On average the port and terminal charges alone in the OECS are 86 percent higher than in the Organisation for Economic Co-operation and Development (OECD) countries, and 34 percent higher than in Latin America and the Caribbean (LAC) (figure 5.2). Removing St. Vincent, an outlier, from the sample, the average price for the remaining five islands jumps to \$574 per container—more than double the OECD average and 50 percent higher than the LAC average.

Figure 5.2 Port and Handling Charges, 2013

Source: Doing Business Indicators 2014, World Bank.

Note: Port charges have been collected on-site in the OECS by the authors, and they are reasonably close to those found in the Doing Business indicators. The Doing Business indicators are presented here because they allow for regional comparisons. Avg = average; OECD = Organisation for Economic Co-operation and Development; OECS = Organization of Eastern Caribbean States; LAC= Latin America and the Caribbean.

Grenada's handling charges (reported at \$745 per 20' container and \$1,192 per 40' container) are among the highest in the region (table 5.4). With the introduction of the free along side (FAS) port charging scheme in 2001, Dominica reduced tariffs by 20 percent. Methods of setting container-handling charges vary across the OECS. St. Lucia does not charge per container, for example, but per tonne (the number per container presented in table 5.4 is an industry-estimated average). In addition, at many ports other charges, spread over each container (such as the usage of cranes, by hour), place the overall per container charge higher than the handling charges. In general, transshipment containers are charged at a significantly lower rate than imports and exports, with the exception of St. Vincent. General cargo and bulk dry cargo fees, charged by the tonne, also vary widely.

Table 5.4 Handling Charges by Type of Freight, 2012

Country	Port	20' Dry Container	40' Dry Container	Transshipment Container	General Cargo	Dry Bulk	Cruise
		(\$/container)	(\$/container)	(\$/TEU)	(\$/tonne)	(\$/tonne)	(\$/passenger)
Antigua and Barbuda	St. John's	237	474	141	12	12	—
Dominica	Woodbridge Bay/Roseau	415	933	69	89	7	5
Grenada	St. George's	745	1,192	—	4	4	5
St. Kitts and Nevis	Basseterre	452	904	20	33	33	5
	Long Point	322	642	—	36	5	13
St. Lucia	Castries	480	960	6	4	7	7
	Vieux Fort	480	960	30	4	4	—
St. Vincent and the Grenadines	Campden Park/Kingstown	167	333	267	9	9	15

Source: Authors' own elaboration on primary data.

Note: TEU = twenty-foot equivalent unit.

— Not available.

Per vessel fees, levied on each call, also vary widely across ports (table 5.5). This may have to do with the spread of costs being levied on each container, versus a one-time charge per vessel. In Dominica, for example, the higher call cost per vessel may be due to lower overall charges per container. Shipping lines are not complaining, however, since the vessel-related charges are all they are responsible for, whereas at other ports the shipping lines are also responsible for per-container handling charges. Overall, the wide variance of charges, per call and per container, and other charges is not unusual in the ports sector, where each port in effect becomes its own market with its own priorities.

Table 5.5 Port Fees, 2012

Country	Port	Cost per Vessel (\$)		Excess Storage Charges (\$/tonne/day)	
		Cargo	Cruise	Dry Bulk	General Cargo
Antigua and Barbuda	St. John's	741	333	8	8
Dominica	Woodbridge Bay/Roseau	1,317	892	2	2
Grenada	St. George's	413	833	0	2
St. Kitts and Nevis	Basseterre	516	837	2	2
	Long Point	100	—	4	4
St. Lucia	Castries	89	111	1	1
	Vieux Fort	89	—	1	1
St. Vincent and the Grenadines	Campden Park/Kingstown	—	—	3	3

Source: Authors' own elaboration on primary data.

— Not available.

6. Benchmarking the Efficiency of OECS Ports against Latin America

“Technical efficiency” is a measure of how well a port translates a set of inputs into an output, compared with what is optimal (“the frontier”). This type of analysis²⁰ is particularly useful because it quantifies port performance while permitting a comparison of this performance across regions and subregions and over time. The result is a comprehensive assessment of port performance in Latin America and the Caribbean (LAC) and in the OECS. Annex 1 describes how technical efficiency is computed.

South America has the best-performing ports in Latin America in terms of technical efficiency, while the OECS ports are among the worst performers. In Latin America as a whole, technical efficiency averaged 49 percent of the optimal frontier between 1999 and 2010. South America performed best, with 52 percent technical efficiency, followed by Central America (50 percent) and the Caribbean (44 percent).²¹ As a group, the eight OECS ports included in the sample performed worse than those in the Caribbean and South and Central America, with an average technical efficiency of 43 percent over these years. South America led the way with 11 ports in the top quintile of technical efficiency, followed by Central America with 6 and the Caribbean with 2. The OECS did not have any ports in the top quintile (table 6.1).

Technical efficiency improved slightly in LAC between 1999 and 2010, but the performance of the OECS ports declined. The average technical efficiency of the LAC ports rose from 46 percent in 1999 to 50 percent in 2010. While the OECS ports outperformed their Caribbean counterparts on throughput growth in recent years, the OECS ports performed slightly worse than the rest of the Caribbean and worse than the other LAC subregions in recent years in terms of technical efficiency. But the sparseness of the OECS data at the beginning of this period makes any analysis of trends in technical efficiency between 1999 and 2010 difficult.

The best-performing port during this period was Manzanillo in Mexico, with an average technical efficiency of 83 percent (table 6.1). In 2010 Manzanillo’s throughput was 1,509,378 TEUs, and the port had 8 gantry cranes and no mobile or quay cranes. The worst-performing port during the period was Santarem in Brazil.

The performance of individual OECS ports was various but generally poor. Two OECS ports — Castries (St. Lucia) and St. John’s (Antigua and Barbuda)—appear in the third quintile with technical efficiencies of 56 percent and 54 percent, respectively. Roseau (Dominica), Vieux Fort (St. Lucia), and Campden Park/Kingstown (St. Vincent and the Grenadines) appear in the second quintile, with scores of 48 percent, 41 percent, and 35 percent, respectively. St. George’s (Grenada), Basseterre, and Long Point (St. Kitts and Nevis) fall into the first quintile with technical efficiencies of only 18 percent, 8 percent, and 3 percent, respectively. Notably, the three worst performers in the OECS lack a mobile or quay crane, which all of their OECS counterparts (except Roseau) have.

The technical efficiency of the OECS ports also varied in the 1999 to 2010 period, with very poor performance in 2002 and 2003 and again in 2007 (figure 6.2). This variability is due, in part, to the lack

²⁰ The benchmarking of port efficiency included in this section is an extension of Sarriera and others (2013) to include the Organization of Eastern Caribbean States (OECS) ports. The revised estimates are also based on an expanded data set to add a year of throughput data for all countries, and to revise throughput figures as final rather than preliminary estimates for previous years.

²¹ Results reported are based on the second specification of the model as in annex 1(c).

of data on OECS ports at the beginning of the sample period. For instance, data are available only for St. George's and Long Point, the OECS's worst performers, beginning in 2007 (when the subregion's most recent decline in technical performance occurred). With this note of caution in mind, while the OECS countries were performing better than the rest of LAC in 1999 and the early 2000s and again after a 2002–03 dip in performance, the region has not yet managed to recover from its 2007 performance decline. The OECS ports had an average technical efficiency in 2010 that was 13 percentage points less than that of the LAC average. OECS ports' technical efficiency has remained about the same since 2008, and lags well behind that of Central and South America (figure 6.1). The OECS, however, performed almost on par with the Caribbean as a whole in 2010 after falling behind in 2007.

Table 6.1 Technical Efficiency of Ports in Latin America and the Caribbean, 1999–2010

	Ranking	Port	Tech. Efficiency (%)		Ranking	Port	Tech. Efficiency (%)
Quintile 4	1	Manzanillo	83	Quintile 2	41	Freeport	50
	2	Itajai	81		42	Paita	49
	3	Montevideo	80		43	Acajutla	49
	4	San Juan	78		44	Balboa	48
	5	Santos	78		45	Rio Haina	48
	6	Callao	77		46	Roseau*	48
	7	Lirquen	76		47	Puerto Cabello	47
	8	Puerto Limón	76		48	Progreso	43
	9	Belize City	75		49	Belem	42
	10	Salvador	74		50	Boca Chica	42
	11	Guayaquil	74		51	Vieux Fort*	41
	12	Sao Francisco do Sul	73		52	Valparaiso	37
	13	Puerto Barrios	72		53	Oranjestad	36
	14	San Antonio	72		54	Cartagena	36
	15	La Guaira	71		55	Campden Park/Kingstown*	35
	16	Puerto Cortés	70		56	Suape	35
	17	Puerto Quetzal	68		57	Barranquilla	34
	18	Port of Spain	65		58	Talcahuano	33
	19	Antofagasta	65		59	Buenos Aires	31
	20	Veracruz	64		60	Puerto Manzanillo	29
Quintile 3	21	Vitoria	63	Quintile 1	61	Corinto	28
	22	Puerto Caldera	62		62	Maracaibo	24
	23	Puerto Castilla	61		63	Ensenada	23
	24	Point Lisas	61		64	Santo Tomás de Castilla	22
	25	Rio de Janeiro	59		65	Caucedo	22
	26	Fortaleza	59		66	Santa Marta	21
	27	Buenaventura	59		67	Arica	21
	28	Rio Grande	58		68	Lazaro Cardenas	19
	29	Havana	57		69	St. George's*	18
	30	Altamira	57		70	Mazatlan	17
	31	Iquique	57		71	Zarate	16
	32	Castries*	56		72	Sepetiba	15
	33	Bridgetown	54		73	Kingston	12
	34	Manaus	54		74	Rosario	10
	35	St. John's*	54		75	Basseterre*	8
	36	Ushuaia	53		76	Tampico	5
	37	Pecem	53		77	Long Point*	3
	38	San Vicente	51		78	Salina Cruz	3
	39	Paranagua	51		79	Santana	1
	40	Coco Solo	51		80	Tuxpan	1
					81	Santarem	0

Source: Adapted from Sarriera and others (2013) based on authors' primary data collection.

Note: * Denotes OECS ports. OECS = Organization of Eastern Caribbean States.

Figure 6.1 Technical Efficiency in LAC and the OECS, 2008–10

Source: Authors' own elaboration on primary data.

Note: LAC = Latin America and the Caribbean; OECS = Organization of Eastern Caribbean States.

Roseau's technical efficiency improved the most among OECS ports between 2008 and 2010, gaining 9 percentage points. Campden Park/Kingstown and Basseterre also made some progress, both increasing 4 percentage points; Vieux Fort and Castries, in contrast, lost 14 percentage points and 9 percentage points in technical efficiency, respectively, in this period (figure 6.2). Long Point gained 2 percentage points, while St. George's and St. John's lost 2 percentage points.

Figure 6.2 Technical Efficiency of OECS ports, 2008–10

Source: Authors' own elaboration on primary data.

Note: OECS = Organization of Eastern Caribbean States.

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Annex 1. Stochastic Frontier Analysis—Methodological Details

The Model

The study uses stochastic frontier analysis to measure the technical efficiency of ports.²² This econometric technique models a production function for ports that consists of throughput as an output and terminal area, berth length, and cranes as the primary inputs. The residual term of the production function is modeled in two parts: a nonnegative term representing technical inefficiency and a random error representing statistical noise. The basic production function is:

$$\ln(Q_{it}) = \alpha + \beta_1 \ln(A_{it}) + \beta_2 \ln(B_{it}) + \beta_3 \ln(MC_{it}) + \beta_4 \ln(GC_{it}) + \beta_5(T_t) + \beta_6(Crisis_t) \\ + \beta_7(DMC_{it}) + \beta_8(DGC_{it}) + v_{it} + u_{it}$$

where $\ln(Q_{it})$ is the log of throughput (TEUs), $\ln(A_{it})$ is the log of terminal area (m²), $\ln(B_{it})$ is the log of berth length (m), $\ln(MC_{it})$ is the log of the number of small and large mobile cranes, $\ln(GC_{it})$ is the log of the number of ship-to-shore gantry cranes, T_t is a time trend, $Crisis_t$ is a dummy variable for the economic crisis year of 2009, and DMC_{it} and DGC_{it} are dummies for the absence of mobile and gantry cranes, respectively. These final two dummies are included to ensure that ports without mobile and quay cranes are not dropped from the estimation because the log of zero is not defined;²³ u_{it} is a random variable with a truncated normal distribution representing technical inefficiency and v_{it} is a random error.

The final specification of the model incorporates three additional dummy variables that are likely to significantly affect port productivity. The first indicates that a port uses ships' cranes intensively—an important factor in a port's ability to load and unload that is not captured by the mobile and gantry crane variables.²⁴ The second dummy indicates that a port specializes in transshipment, which could increase productivity because of the less-intensive use of port resources required by transshipment.²⁵ The final dummy variable indicates that a port specializes in container trade.²⁶ Finally, gross domestic product (GDP) (constant 2005 \$), a measure of connectivity (the liner shipping connectivity index), and a country's openness to trade (trade as a percentage of GDP) were included to control for exogenous factors that impact throughput. The final specification is:²⁷

$$\ln(Q_{it}) = \alpha + \beta_1 \ln(A_{it}) + \beta_2 \ln(B_{it}) + \beta_3 \ln(MC_{it}) + \beta_4 \ln(GC_{it}) + \beta_5(T_t) + \beta_6(Crisis_t) \\ + \beta_7(DMC_{it}) + \beta_8(DGC_{it}) + \gamma_1 Ships'Crane_i + \gamma_2 Transship_i \\ + \gamma_3 Container_i + \gamma_4 \ln(GDP_{it}) + \gamma_5 \ln(LSCI_{it}) + \gamma_6 \ln(Trade_{it}) + v_{it} + u_{it}$$

²² See chapter 9 of Coelli and others (2005) for an introduction.

²³ See Sarriera and others (2013) for more details on the inclusion of these dummies.

²⁴ Ports using ships' cranes intensively were identified using Sarriera and others (2013). St. George's and Long Point, which were not included in Sarriera and others (2013), were categorized as using ships' cranes intensively according to the criteria provided in Sarriera and others (2013). Campden Park/Kingstown, again not included in Sarriera and others (2013), was categorized as not using ships' cranes intensively.

²⁵ Transshipment ports were identified using Sarriera and others (2013). St. George's, Long Point, and Campden Park/Kingstown were categorized as not specializing in transshipment.

²⁶ Terminal type was identified using Sarriera and others (2013). St. George's, Long Point, and Campden Park/Kingstown were categorized as not specializing in container trade.

²⁷ The preferred specification of Sarriera and others (2013) includes a conditional mean model to explain the inefficiency term. Because the corruption index used in Sarriera and others (2013) is available for only three Organization of Eastern Caribbean States (OECS) countries (and four OECS ports), we have chosen a simpler specification. But as long as the production function is well specified, the addition of the conditional mean model is unnecessary to measure technical efficiency.

Data

Data are derived from Sarriera and others (2013), from surveys sent to managers of ports in the Organization of Eastern Caribbean States (OECS) countries, from the Containerization International Yearbook, and from the World Bank's World Development Indicators. The sample ranges from 1999 to 2012 and comprises 100 ports with 27 from Central America, 46 from South America, and 27 from the Caribbean, including 8 from the OECS countries. Data are incomplete in many cases: several ports are observed in some years but not others, and data are unavailable for certain characteristics. Data are particularly sparse after 2010, with throughput available for only 15 ports in 2011 and 7 ports in 2012. Thus, the final sample used in the preferred specification range, from 1999 to 2010, comprises 80 ports: 23 from Central America, 39 from South America, and 18 from the Caribbean, including 8 from the OECS countries (table A1.1).

Table A1.1 Ports Included in the Final Sample

Region	Country	Port
Caribbean	Antigua and Barbuda	St. John's*
	Aruba	Oranjestad
	Bahamas, The	Freeport
	Barbados	Bridgetown
	Cuba	Havana
	Dominica	Roseau*
	Dominican Republic	Boca Chica, Caucedo, Rio Haina
	Grenada	St. George's*
	Jamaica	Kingston
	Puerto Rico	San Juan
	St. Kitts and Nevis	Basseterre*, Long Point*
	St. Lucia	Castries*, Vieux Fort*
	St. Vincent and the Grenadines	Campden Park/Kingstown*
	Trinidad and Tobago	Point Lisas, Port of Spain
Central America	Belize	Belize City
	Costa Rica	Puerto Caldera, Puerto Limón
	El Salvador	Acajutla
	Guatemala	Puerto Barrios, Puerto Quetzal, Santo Tomás de Castilla
	Honduras	Puerto Castilla, Puerto Cortés
	Mexico	Altamira, Ensenada, Lazaro Cardenas, Manzanillo, Mazatlan, Progreso, Salina Cruz, Tampico, Tuxpan, Veracruz
	Nicaragua	Corinto
	Panama	Balboa, Coco Solo, Puerto Manzanillo
South America	Argentina	Buenos Aires, Rosario, Ushuaia, Zarate
	Brazil	Belem, Fortaleza, Itajai, Manaus, Paranagua, Pecem, Rio de Janeiro, Rio Grande, Salvador, Santana, Santarem, Santos, Sao Francisco do Sul, Sepetiba, Suape, Vitoria
	Chile	Antofagasta, Arica, Iquique, Lirquen, San Antonio, San Vicente, Talcahuano, Valparaiso
	Colombia	Barranquilla, Buenaventura, Cartagena, Santa Marta
	Ecuador	Guayaquil
	Peru	Callao, Paita
	Uruguay	Montevideo
	Venezuela, RB	La Guaira, Maracaibo, Puerto Cabello

Source: Authors' compilation.

Note: * Indicates an OECS port. OECS = Organization of Eastern Caribbean States.

Model Results

The results of the first and second specifications are similar: throughput increases with port area, berth length, and number of cranes (table A1.2). The basic model suggests that throughput increases more with the number of STS gantry cranes than with the number of mobile and quay cranes, though the difference between the two is no longer statistically significant in the second specification. Similarly, the coefficient on the dummy for the absence of a gantry crane is larger (in absolute value) than that on the dummy for the absence of a mobile crane, a difference that is statistically significant in both specifications. This suggests that ports get more throughput “bang for the buck” from gantry cranes than from mobile and quay cranes. As expected, the use of ships’ cranes, transshipment ports, and container terminals all positively impact throughput. Finally, throughput also increases with connectivity, though somewhat surprisingly it declines with GDP and openness to trade.

Table A1.2 Results of Maximum Likelihood Estimation of the Stochastic Frontier

Variables	(1)	(2)
ln area	0.161*** [0.034]	0.309*** [0.027]
ln berth length	0.549*** [0.047]	0.293*** [0.035]
ln large and small mobile and quay cranes+1	0.167*** [0.058]	0.373*** [0.053]
ln ship-to-shore gantry cranes+1	0.428*** [0.065]	0.402*** [0.056]
Linear trend	0.033*** [0.011]	0.008 [0.009]
Uses ships’ cranes		1.032*** [0.078]
Transshipment port		0.658*** [0.082]
Dummy for exclusively container terminals		0.663*** [0.060]
ln GDP		-0.102*** [0.035]
ln liner shipping connectivity		0.664*** [0.098]
ln trade openness		-0.103 [0.074]
Dummy for year 2009	-0.094 [0.123]	-0.097 [0.090]
Mobile/quay crane dummy	-0.038 [0.091]	-0.116 [0.076]
STS gantry crane dummy	-0.526*** [0.100]	-0.442*** [0.078]
Mu	-247.532 [341.959]	-192.399* [112.280]
Constant	7.100*** [0.427]	7.625*** [0.907]
Observations	796	752
Number of _puerto	85	81
lambda	28.27**	40.01***
sigma_u	16.32	14.08***
sigma_v	0.577***	0.352***

Source: Authors’ own elaboration.

Note: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. GDP = gross domestic product; STS = ship to shore.

Table A1.3 Characteristics of LAC Ports by Country, 1999–2010

	Average Annual Throughput (TEU)	Average Berth Length (m)	Average Area (m ²)	Average Mobile and Quay Cranes	Average STS Gantry Cranes
Antigua and Barbuda					
St. John's	18,361	366	61,715	1.0	0.0
Argentina					
Buenos Aires	1,234,465	4,450	1,148,656	7.9	15.8
Rosario	28,538	1,000	66,000	0.0	0.0
Ushuaia	37,907	1,194	12,000	0.0	0.0
Zarate	28,574	250	500,000	0.0	1.2
Aruba					
Oranjestad	60,425	250	130,000	0.5	1.0
The Bahamas					
Freeport	1,190,080	903	303,396	2.2	7.5
Barbados					
Bridgetown	77,984	476	73,333	1.1	1.0
Belize					
Belize City	32,118	66	175,000	2.7	0.0
Brazil					
Belem	49,625	1,610	19,620	2.0	0.0
Fortaleza	59,779	984	24,000	1.4	0.0
Itajai	504,143	833	86,000	3.0	0.0
Manaus	168,839	620	30,000	1.3	0.0
Paranagua	485,980	635	273,422	1.8	3.4
Pecem	142,561	700	380,000	0.0	1.0
Rio de Janeiro	354,508	1,078	322,500	0.1	6.2
Rio Grande	545,278	2,415	564,375	3.3	2.3
Salvador	181,941	269	40,000	3.5	1.3
Santana	500	200	16,182	0.0	0.0
Santarem	570	520	500,000	0.0	0.0
Santos	2,039,737	2,152	800,700	2.6	10.9
Sao Francisco do Sul	234,518	484	800,000	1.5	0.0
Sepetiba	149,373	761	400,000	1.6	1.6
Suape	164,371	783	230,750	0.0	2.2
Vitoria	184,090	692	110,500	1.5	1.5
Chile					
Antofagasta	61,274	1,230	15,000	2.0	0.0
Arica	74,745	1,050	193,000	1.0	0.0
Iquique	184,922	1,105	85,350	5.0	0.0
Lirquen	195,680	400	424,000	3.0	0.0
San Antonio	693,599	1,155	468,701	3.9	4.0
San Vicente	282,434	603	405,709	1.6	0.0
Talcahuano	14,787	155	61,270	0.0	0.0
Valparaiso	512,747	2,317	295,651	5.0	3.3
Colombia					
Barranquilla	82,610	1,058	933,000	0.9	0.0
Buenaventura	686,915	785	508,642	1.0	2.0
Cartagena	804,853	1,599	424,000	2.0	2.0
Santa Marta	88,467	1,085	133,000	1.0	0.0
Costa Rica					
Puerto Caldera	110,548	490	30,000	0.0	0.0
Puerto Limón	692,351	504	95,417	1.0	1.0
Cuba					
Havana	257,331	376	185,851	0.7	2.2
Dominica					
Roseau	10,785	249	43,000	0.0	0.0
Dominican Republic					
Boca Chica	18,600	300	15,740	1.0	0.0
Caucedo	375,875	600	500,000	0.0	5.0
Rio Haina	322,022	1,216	307,067	0.8	2.0

	Average Annual Throughput (TEU)	Average Berth Length (m)	Average Area (m ²)	Average Mobile and Quay Cranes	Average STS Gantry Cranes
Ecuador					
Guayaquil	582,511	1,334	225,750	1.7	1.8
El Salvador					
Acajutla	86,854	557	105,000	0.0	0.0
Grenada					
St. George's	16,419	335	42,492	0.0	0.0
Guatemala					
Puerto Barrios	256,496	610	15,000	1.0	0.0
Puerto Quetzal	226,793	450	90,256	2.0	0.0
Santo Tomás de Castilla	309,399	915	283,000	5.0	0.0
Honduras					
Puerto Castilla	76,019	150	80,000	0.0	0.0
Puerto Cortés	457,891	997	144,300	1.0	2.0
Jamaica					
Kingston	1,671,820	3,277	1,080,000	5.0	14.0
Mexico					
Altamira	310,181	992	406,272	0.9	4.2
Ensenada	73,546	300	70,000	0.8	2.3
Lazaro Cardenas	229,649	478	267,980	0.5	4.6
Manzanillo	1,199,443	2,205	316,571	0.9	7.1
Mazatlan	20,874	1,138	130,000	0.0	0.0
Progreso	63,084	306	84,417	0.3	0.7
Salina Cruz	3,364	275	74,000	0.3	1.0
Tampico	18,361	2,013	252,208	11.6	0.0
Tuxpan	206	300	4,000	1.0	0.0
Veracruz	608,624	468	403,833	0.8	5.5
Nicaragua					
Corinto	34,812	240	20,000	0.0	1.0
Panama					
Balboa	1,297,942	1,167	181,556	0.0	5.7
Coco Solo	577,939	612	25,000	0.0	4.8
Puerto Manzanillo	1,266,187	1,483	439,167	0.0	11.7
Peru					
Callao	795,058	4,000	441,080	0.0	0.0
Paita	94,497	730	37,123	0.0	0.0
Puerto Rico					
San Juan	1,716,646	1,688	286,667	0.0	6.0
St. Kitts and Nevis					
Basseterre	7,217	133	101,171	0.0	0.0
Long Point	3,159	355	40,469	0.0	0.0
St. Lucia					
Castries	26,111	339	50,531	1.1	0.0
	22,136	317	50,916	1.2	0.0
Vieux Fort	31,577	370	50,000	1.0	0.0
St. Vincent and the Grenadines					
Campden Park/Kingstown	16,608	495	63,749	1.0	0.0
Trinidad and Tobago					
Point Lisas	126,512	387	36,909	2.6	0.5
Port of Spain	330,152	783	171,333	5.1	2.7
Uruguay					
Montevideo	449,592	580	193,333	2.3	1.8
Venezuela, RB					
La Guaira	287,754	1,104	24,000	7.0	0.0
Maracaibo	31,120	774	24,000	6.0	0.0
Puerto Cabello	650,982	4,485	161,491	37.4	0.0

Source: Author's own elaboration on primary data.

Annex 2. OECS Ports at a Glance

Table A2.1 Summary of OECS Ports in Study

	Antigua <i>St. John's</i>	Dominica <i>Woodbridge Bay</i>	Grenada <i>St. George's</i>	St. Kitts <i>Basseterre</i>	St. Kitts <i>Nevis</i>	St. Lucia <i>Castries</i>	St. Lucia <i>Vieux Fort</i>	St. Vincent <i>Kingstown</i>	St. Vincent <i>Campden Park</i>
Type of Port	Lo-Lo container imports	Lo-Lo container imports	Lo-Lo container imports	Lo-Lo/Ro-Ro container imports	Ro-Ro container imports	Lo-Lo container imports	Lo-Lo container transshipment	Break bulk imports	Lo-Lo container imports
TEU, annual	13,485	19,905	13,920	7,801	2,665	37,672	45,668	2,000	15,000
Crane	Large mobile: Liebherr HLM 320	No crane	No crane	No crane	No crane	Large mobile: Liebherr HLM 320	Small mobile crane	No crane	Large mobile: Gottwald HMK 6406
Labor costs	Difficult to adjust	Somewhat adjustable	Difficult to adjust	Managed by shipping agents	Managed by shipping agents	Difficult to adjust	Somewhat adjustable	Determined by shipping agents	Determined by shipping agents
Port layout	Break bulk	Break bulk	Break bulk	Break bulk	Container	Break bulk	Container	Break bulk	Container
Container transport	2 reach stackers	2 reach stackers	2 reach stackers	2 reach stackers	5 th wheel & chassis	2 reach stackers	Straddle Carrier	1 reach stacker	2 reach stackers
Cruise ship scheduling conflicts?	No	Yes	No	Yes	No	Yes	No	No	No
20' container landing charge (US\$)	237	415	745	452	164	480	480	167	167
Infrastructure: pier condition	Abandoned building taking valuable space on pier cannot be torn down	Pier at risk of collapsing due to deteriorated pylons	Pier foundation recently serviced	Full resurfacing needed	Depth of port – needs dredging	No issues	No issues	Pier at risk of collapsing due to deteriorated pylons	No Issues
Customs	In beginning stages of reform	Poor coordination between port and customs, but customs themselves considered efficient.	Moving towards one-stop shop	Model moving towards trade facilitation	Model moving towards trade facilitation	Problem with overtime: Don't want to use X-Ray equipment, though there	On site, mainly transshipment port	Efficiency issues, may be understaffed, lots of overtime	Efficiency issues, may be understaffed, lots of overtime
Cross-subsidies	None	Port subsidizes two airports, ferry terminal, cruise terminal	Port subsidizes bus terminal	Port subsidizes one airport	Port subsidizes one airport	Port subsidizes two airports.	None	Port subsidizes international airport construction	Port subsidizes international airport construction
Institutional reform	New management considering introducing PPPs and other institutional reforms	Labor and charges reformed 2007	None yet, legislation under review	Staffing reduced 2011, new legislation waiting to be passed	None yet, new legislation waiting to be passed	None	Separate corporation	None	None
Employees	255	385	201	227	60	416	125	279	

Table A2.2 Port of Saint John's (Antigua) at a Glance

Institutional Characteristics																								
<ul style="list-style-type: none">Operated by Antigua Port AuthorityService portPort authority established in 1973Break bulk layout			<ul style="list-style-type: none">Limited transshipmentNo competitionStrong unionized labor																					
Physical Characteristics																								
<ul style="list-style-type: none">Terminal Area: 61,715 m²3 berthsBerth length: 366 mMaximum berth depth: 15 mMaximum ship draft: 10 mMaximum length of vessels: 160 m			<ul style="list-style-type: none">1 mobile craneCrane capacity: 104 tonnesEntrance channel depth: 11 mEntrance channel length: 5,557 mImpediments to deepeningImpediments to port expansion																					
Key Development Indicators																								
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)																		
– Lines serving the port (units)																								
• Cargo	5	5	5	5	5	5																		
• Passenger	22	22	22	22	22	16																		
– Calls (units)																								
• Cargo	711	613	506	470	378	591																		
• Passenger	317	367	304	328	333	183																		
II. Traffic	2008	2009	2010	2011	2012	OECS (2012)																		
– Composition																								
• Container (TEU/year)	20,052	17,365	14,878	14,006	13,485	19,743																		
• General cargo (tonnes/year)	445,234	367,856	281,507	282,873	288,986	129,033																		
• Dry bulk (tonnes/year)	91,809	64,489	40,827	32,882	30,700	96,495																		
• Liquid bulk (tonnes/year)	...	...	...	...	...	47,328																		
• Passengers (number)	597,124	709,795	557,030	604,506	567,707	323,827																		
– Trade Imbalances																								
• Container (empty/full ratio)	0.3	0.3	0.2	0.1	0	0.6																		
• General cargo (import/export ratio)	8.2	9.0	5.0	4.3	4.1	1.8																		
• Dry bulk (import/export ratio)			Only Imports			25.7																		
• Liquid (import/export ratio)			Mostly Imports			4.2																		
Handling Charges (2012)																								
	20' Dry Container (USD/container)	40' Dry Container	Transshipment Container (USD/TEU)	General Cargo (USD/tonne)	Bulk Dry	Cruise (USD/passenger)																		
Saint John's	237	474	141	12	12	...																		
OECS Average	412	800	89	24	10	8																		
A Benchmark of Port Efficiency (2010)																								
	Technical Efficiency (%)	Ranking (out of 69 ports)																						
Saint John's	50	38																						
Roseau (Dominica) – Best OECS	64	22																						
San Juan (Puerto Rico) – Best Caribbean	79	7																						
Manzanillo (Mexico) – Best LAC	86	1																						
OECS Average	33	...																						
Caribbean Average	37	...																						
LAC Average	50	...																						
			<table><caption>OECS Technical Efficiency (%)</caption><thead><tr><th>Port</th><th>Efficiency (%)</th></tr></thead><tbody><tr><td>Roseau</td><td>64</td></tr><tr><td>Castries</td><td>56</td></tr><tr><td>St. John's</td><td>50</td></tr><tr><td>Campden Park</td><td>36</td></tr><tr><td>Vieux Fort</td><td>31</td></tr><tr><td>St. George's</td><td>16</td></tr><tr><td>Basseterre</td><td>9</td></tr><tr><td>Long Point</td><td>4</td></tr></tbody></table>				Port	Efficiency (%)	Roseau	64	Castries	56	St. John's	50	Campden Park	36	Vieux Fort	31	St. George's	16	Basseterre	9	Long Point	4
Port	Efficiency (%)																							
Roseau	64																							
Castries	56																							
St. John's	50																							
Campden Park	36																							
Vieux Fort	31																							
St. George's	16																							
Basseterre	9																							
Long Point	4

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Table A2.3 Port of Woodbridge Bay/Roseau (Dominica) at a Glance

Institutional Characteristics						
• Operated by Dominica Air and Sea Ports Authority	• No transshipment					
• Service port	• No private sector participation					
• Port authority established in 2006	• No competition					
• Break bulk layout	• Progress with labor reform					
Physical Characteristics						
• Terminal Area: 43,000 m ²	• Maximum length of vessels: 200 m					
• 2 berths	• No crane					
• Berth length: 244 m	• No entrance channel					
• Maximum berth depth: 11 m	• No impediments to deepening					
• Maximum ship draft: 8 m	• No impediments to port expansion					
Key Development Indicators						
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)
– <u>Lines serving the port (units)</u>						
• Cargo	4	4	4	4	4	5
• Passenger	12	12	12	12	12	16
– <u>Calls (units)</u>						
• Cargo	1,043	1,011	1,041	992	1,056	591
• Passenger	213	241	250	194	168	183
II. Traffic	2008	2009	2010	2011	2012	OECS (2012)
– <u>Composition</u>						
• Container (TEU/year)	12,611	13,320	13,868	14,055	19,905	19,743
• General cargo (tonnes/year)	26,962	26,194	26,706	26,933	27,142	129,033
• Dry bulk (tonnes/year)	249,444	248,052	238,675	407,798	211,679	96,495
• Liquid bulk (tonnes/year)	43,967	44,414	52,768	48,985	48,536	47,328
• Passengers (number)	378,963	527,840	504,574	416,191	262,814	323,827
– <u>Trade Imbalances</u>						
• Container (empty/full ratio)	0.6	0.7	0.9	0.8	0.6	0.6
• General cargo (import/export ratio)	0	0	0.1	0.1	0.1	1.8
• Dry bulk (import/export ratio)	4.2	5.9	8.9	15.9	6.2	25.7
• Liquid (import/export ratio)	1.9	2.7	3.8	4.7	4.2	4.2
Handling Charges (2012)						
	20' Dry Container (USD/container)	40' Dry Container (USD/container)	Transshipment Container (USD/TEU)	General Cargo (USD/tonne)	Bulk Dry (USD/tonne)	Cruise (USD/passenger)
Woodbridge Bay/Roseau	415	933	69	89	7	5
OECS Average	412	800	89	24	10	8
A Benchmark of Port Efficiency (2010)						
	Technical Efficiency (%)	Ranking (out of 69 ports)				
Woodbridge Bay/Roseau	64	22				
Roseau (Dominica) – Best OECS	64	22				
San Juan (Puerto Rico) – Best Caribbean	79	7				
Manzanillo (Mexico) – Best LAC	86	1				
OECS Average	33	...				
Caribbean Average	37	...				
LAC Average	50	...

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Table A2.4 Port of Saint George's (Grenada) at a Glance

Institutional Characteristics						
<ul style="list-style-type: none"> Operated by Grenada Ports Authority Service port Port authority established in 1978 Break bulk layout No transshipment No private sector participation No competition Highly unionized labor 						
Physical Characteristics						
<ul style="list-style-type: none"> Terminal Area: 42,492 m² 2 berths Berth length: 335 m Maximum berth depth: 9 m Maximum ship draft: 8 m Maximum length of vessels: 168 m No crane Entrance channel depth: 9 m Entrance channel length: 1,300 m No impediments to deepening No impediments to port expansion 						
Key Development Indicators						
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)
– <u>Lines serving the port (units)</u>						
• Cargo	5	5	5	5	5	5
• Passenger	18	18	18	18	18	16
– <u>Calls (units)</u>						
• Cargo	1,235	1,196	1,173	1,162	1,018	591
• Passenger	232	251	209	207	227	183
II. Traffic	2008	2009	2010	2011	2012	OECS (2012)
– <u>Composition</u>						
• Container (TEU/year)	17,799	14,904	15,008	14,365	13,920	19,743
• General cargo (tonnes/year)	503,887	480,600	504,832	477,387	461,479	129,033
• Dry bulk (tonnes/year)	253,279	272,477	284,904	263,386	251,266	96,495
• Liquid bulk (tonnes/year)	85,076	80,248	86,827	75,742	81,061	47,328
• Passengers (number)	296,181	343,032	331,012	313,206	247,884	323,827
– <u>Trade Imbalances</u>						
• Container (empty/full ratio)	...	...	0.9	0.5	0.3	0.6
• General cargo (import/export ratio)	5.4	4.8	7.2	5.8	4.7	1.8
• Dry bulk (import/export ratio)	85.6	8.9	211.9	121.5	93.9	25.7
• Liquid (import/export ratio)			Only Imports			4.2
Handling Charges (2012)						
	20' Dry Container	40' Dry Container	Transshipment Container	General Cargo	Bulk Dry	Cruise
	(USD/container)	(USD/container)	(USD/TEU)	(USD/tonne)		(USD/passenger)
Saint George's	745	1,192	...	4	4	5
OECS Average	412	800	89	24	10	8
A Benchmark of Port Efficiency (2010)						
	Technical Efficiency (%)	Ranking (out of 69 ports)				
Saint George's	16	60				
Roseau (Dominica) – Best OECS	64	22				
San Juan (Puerto Rico) – Best Caribbean	79	7				
Manzanillo (Mexico) – Best LAC	86	1				
OECS Average	33	...				
Caribbean Average	37	...				
LAC Average	50	...

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Table A2.5 Port of Basseterre (St. Kitts and Nevis) at a Glance

Table 1: Port of Basseterre (St. Kitts and Nevis) at a Glance						
Institutional Characteristics						
<ul style="list-style-type: none">Operated by Antigua Port AuthorityService portPort authority established in 1993Break bulk layout			<ul style="list-style-type: none">Limited transshipmentPrivate sector participation in stevedoringNo competitionStrong unionized labor			
Physical Characteristics						
<ul style="list-style-type: none">Terminal Area: 101,171 m²2 berthsBerth length: 133 mMaximum berth depth: 12 mMaximum ship draft: 11 m			<ul style="list-style-type: none">Maximum length of vessels: 120 mNo craneNo entrance channelNo impediments to deepeningImpediments to port expansion			
Key Development Indicators						
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)
– <u>Lines serving the port (units)</u>						
• Cargo	7	7	7	6	6	5
• Passenger	19	19	19	19	19	16
– <u>Calls (units)</u>						
• Cargo	711	625	432	569	529	591
• Passenger	204	234	172	305	267	183
II. Traffic						
– <u>Composition</u>						
• Container (TEU/year)	7,100	7,511	7,214	7,312	7,801	19,743
• General cargo (tonnes/year)	151,917	133,838	97,767	102,279	105,313	129,033
• Dry bulk (tonnes/year)	109,852	102,352	73,588	111,954	104,926	96,495
• Liquid bulk (tonnes/year)	68,161	70,250	40,786	89,612	81,296	47,328
• Passengers (number)	397,507	450,752	475,000	600,131	535,290	323,827
– <u>Trade Imbalances</u>						
• Container (empty/full ratio)	0.2	0.5	0.3	0.1	0.2	0.6
• General cargo (import/export ratio)	0.7	1.1	0.8	0.8	0.8	1.8
• Dry bulk (import/export ratio)	Mostly Imports					25.7
• Liquid (import/export ratio)	Only Imports					4.2
Handling Charges (2012)						
	20' Dry Container	40' Dry Container	Transshipment Container	General Cargo	Bulk Dry	Cruise
	(USD/container)	(USD/container)	(USD/TEU)	(USD/tonne)	(USD/tonne)	(USD/passenger)
Basseterre	452	904	20	33	33	5
OECS Average	412	800	89	24	10	8
A Benchmark of Port Efficiency (2010)						
	Technical Efficiency (%)	Ranking (out of 69 ports)				
Basseterre	9	66				
Roseau (Dominica) – Best OECS	64	22				
San Juan (Puerto Rico) – Best Caribbean	79	7				
Manzanillo (Mexico) – Best LAC	86	1				
OECS Average	33	...				
Caribbean Average	37	...				
LAC Average	50	...				

OECS

Port	Technical Efficiency (%)
Roseau	63
Castries	56
St. John's	50
Campden Park	38
Vieux Fort	31
St. George's	15
Basseterre	9
Long Point	3

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Table A2.6 Port of Long Point (St. Kitts and Nevis) at a Glance

Institutional Characteristics						
<ul style="list-style-type: none"> Operated by Nevis Air and Sea Ports Authority Service port Port authority established in 1998 Container layout No transshipment Private sector participation in stevedoring Competition on labor No labor unions 						
Physical Characteristics						
<ul style="list-style-type: none"> Terminal Area: 40,469 m² 1 berth Berth length: 355 m Maximum berth depth: 7 m Maximum ship draft: 6 m Maximum length of vessels: 160 m No crane No entrance channel Impediments to deepening Impediments to port expansion 						
Key Development Indicators						
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)
– <u>Lines serving the port (units)</u>						
• Cargo	5	5	5	5	5	5
• Passenger	6	6	6	6	6	16
– <u>Calls (units)</u>						
• Cargo	403	464	437	344	295	591
• Passenger	27	19	25	34	31	183
II. Traffic	2008	2009	2010	2011	2012	OECS (2012)
– <u>Composition</u>						
• Container (TEU/year)	2,453	3,002	2,852	3,046	2,665	19,743
• General cargo (tonnes/year)	2,947	8,064	3,861	2,910	3,661	129,033
• Dry bulk (tonnes/year)	25,314	36,940	24,200	36,176	29,049	96,495
• Liquid bulk (tonnes/year)	17,869	17,270	18,164	14,952	14,599	47,328
• Passengers (number)	3,857	3,768	3,542	5,277	4,020	323,827
– <u>Trade Imbalances</u>						
• Container (empty/full ratio)	1.2	2.9	1.9	2.0	2.3	0.6
• General cargo (import/export ratio)	0	0	0	0	0	1.8
• Dry bulk (import/export ratio)			Mostly Imports			25.7
• Liquid (import/export ratio)			Only Imports			4.2
Handling Charges (2012)						
	20' Dry Container	40' Dry Container	Transshipment Container	General Cargo	Bulk Dry	Cruise
	(USD/container)	(USD/container)	(USD/TEU)	(USD/tonne)	(USD/tonne)	(USD/passenger)
Long Point	322	642	...	36	5	13
OECS Average	412	800	89	24	10	8

A Benchmark of Port Efficiency (2010)

	Technical Efficiency (%)	Ranking (out of 69 ports)
Long Point	4	68
Roseau (Dominica) – Best OECS	64	22
San Juan (Puerto Rico) – Best Caribbean	79	7
Manzanillo (Mexico) – Best LAC	86	1
OECS Average	33	...
Caribbean Average	37	...
LAC Average	50	...

Port	Efficiency (%)
Roseau	64
Castries	56
St. John's	50
Campden Park	36
Vieux Fort	31
St. George's	16
Basseterre	9
Long Point	4

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Table A2.7 Port of Castries (Saint Lucia) at a Glance

Institutional Characteristics						
<ul style="list-style-type: none">Operated by Saint Lucia Air and Sea Ports AuthorityService portPort authority established in 1983Break bulk layout	<ul style="list-style-type: none">Limited transshipmentPrivate sector participation in tug and line handlingCompetition for warehousingStrong unionized labor					
Physical Characteristics						
<ul style="list-style-type: none">Terminal Area: 117,360 m²8 berthsBerth length: 482 mMaximum berth depth: 10 mMaximum ship draft: 9 mMaximum length of vessels: 200 m	<ul style="list-style-type: none">1 mobile craneCrane capacity: 52 tonnesEntrance channel depth: 13 mEntrance channel length: 1,100 mImpediments to deepeningImpediments to port expansion					
Key Development Indicators						
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)
– <u>Lines serving the port (units)</u>						
• Cargo	5	5	5	5	5	5
• Passenger	24	24	24	24	24	16
– <u>Calls (units)</u>						
• Cargo	323	316	350	308	288	591
• Passenger	132	385	334	286	266	183
II. Traffic	2008	2009	2010	2011	2012	OECS (2012)
– <u>Composition</u>						
• Container (TEU/year)	35,977	30,186	27,526	29,500	37,672	19,743
• General cargo (tonnes/year)	123,721	100,636	93,358	88,325	82,627	129,033
• Dry bulk (tonnes/year)	5,424	16,538	20,068	3,859	3,859	96,495
• Liquid bulk (tonnes/year)	2,218	5,799	4,428	3,278	4,060	47,328
• Passengers (number)	610,343	619,680	670,043	630,444	571,894	323,827
– <u>Trade Imbalances</u>						
• Container (empty/full ratio)	4.4	3.6	2.2	2.2	0.5	0.6
• General cargo (import/export ratio)	7.1	6.1	3.3	3.5	4.4	1.8
• Dry bulk (import/export ratio)			Only Imports			25.7
• Liquid (import/export ratio)			Only Imports			4.2
Handling Charges (2012)						
	20' Dry Container	40' Dry Container	Transshipment Container	General Cargo	Bulk Dry	Cruise
	(USD/container)	(USD/container)	(USD/TEU)	(USD/tonne)	(USD/tonne)	(USD/passenger)
Castries	480	960	6	4	7	7
OECS Average	412	800	89	24	10	8
A Benchmark of Port Efficiency (2010)						
	Technical Efficiency (%)	Ranking (out of 69 ports)				
Castries	56	31				
Roseau (Dominica) – Best OECS	64	22				
San Juan (Puerto Rico) – Best Caribbean	79	7				
Manzanillo (Mexico) – Best LAC	86	1				
OECS Average	33	...				
Caribbean Average	37	...				
LAC Average	50	...

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Table A2.8 Port of Vieux Fort (Saint Lucia) at a Glance

Institutional Characteristics						
<ul style="list-style-type: none">Operated by Saint Lucia Marine Terminals LimitedLandlord portPort authority established in 1995Container layout	<ul style="list-style-type: none">Mainly transshipmentPrivate sector participation in tug and line handlingNo competitionNo labor union issues					
Physical Characteristics						
<ul style="list-style-type: none">Terminal Area: 50,000 m²3 berthsBerth length: 373 mMaximum berth depth: 11 mMaximum ship draft: 10 mMaximum length of vessels: 200 m	<ul style="list-style-type: none">1 mobile craneCrane capacity: 80 tonnesEntrance channel depth: 9 mNo impediments to deepeningImpediments to port expansion					
Key Development Indicators						
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)
– <u>Lines serving the port (units)</u>						
• Cargo	4	4	4	4	4	5
• Passenger	...	...	...	...	...	16
– <u>Calls (units)</u>						
• Cargo	599	549	560	521	447	591
• Passenger	...	...	...	...	...	183
II. Traffic	2008	2009	2010	2011	2012	OECS (2012)
– <u>Composition</u>						
• Container (TEU/year)	34,226	21,756	21,830	33,047	45,668	19,743
• General cargo (tonnes/year)	55,868	52,242	42,551	27,317	28,787	129,033
• Dry bulk (tonnes/year)	174,243	45,601	59,042	69,791	93,682	96,495
• Liquid bulk (tonnes/year)	35,310	34,715	39,900	37,413	38,291	47,328
• Passengers (number)	...	...	...	...	...	323,827
– <u>Trade Imbalances</u>						
• Container (empty/full ratio)	0.1	0.1	0.1	0.1	0.2	0.6
• General cargo (import/export ratio)	0	0	0	0	0	1.8
• Dry bulk (import/export ratio)	0	0	0	0	0.1	25.7
• Liquid (import/export ratio)	Only Imports					4.2
Handling Charges (2012)						
	20' Dry Container	40' Dry Container	Transshipment Container	General Cargo	Bulk Dry	Cruise
	(USD/container)	(USD/container)	(USD/ TEU)	(USD/ ton)	(USD/ ton)	(USD/passenger)
Vieux Fort	480	960	30	4	4	...
OECS Average	412	800	89	24	10	8
A Benchmark of Port Efficiency (2010)						
	Technical Efficiency (%)	Ranking (out of 69 ports)				
Vieux Fort	31	51				
Roseau (Dominica) – Best OECS	64	22				
San Juan (Puerto Rico) – Best Caribbean	79	7				
Manzanillo (Mexico) – Best LAC	86	1				
OECS Average	33	...				
Caribbean Average	37	...				
LAC Average	50	...

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Table A2.9 Port of Campden Park/Kingstown (Saint Vincent) at a Glance

Institutional Characteristics						
<ul style="list-style-type: none"> Operated by St. Vincent and the Grenadines Port Authority Service port Port authority established in 1975 Container layout No transshipment Private sector participation in stevedoring Competition for labor 						
Physical Characteristics						
<ul style="list-style-type: none"> Terminal Area: 63,749 m² 2 berths Berth length: 495 m Maximum berth depth: 15 m Maximum ship draft: 11 m Maximum length of vessels: 167 m 1 mobile crane Crane capacity: 110 tonnes Entrance channel length: 1,112 m No impediments to deepening Impediments to port expansion 						
Key Development Indicators						
I. Overall Activity	2008	2009	2010	2011	2012	OECS (2012)
– Lines serving the port (units)						
• Cargo	6	6	6	6	6	5
• Passenger	10	10	10	10	10	16
– Calls (units)						
• Cargo	646	777	896	753	720	591
• Passenger	172	164	132	139	173	183
II. Traffic	2008	2009	2010	2011	2012	OECS (2012)
– Composition						
• Container (TEU/year)	16,569	16,238	16,967	16,419	16,827	19,743
• General cargo (tonnes/year)	56,649	43,161	43,564	35,668	34,272	129,033
• Dry bulk (tonnes/year)	76,256	73,806	60,369	61,541	46,796	96,495
• Liquid bulk (tonnes/year)	53,393	60,927	59,113	58,927	63,453	47,328
• Passengers (number)	116,709	149,160	111,230	89,482	77,179	323,827
– Trade Imbalances						
• Container (empty/full ratio)	0.6	0.7	0.7	0.5	0.4	0.6
• General cargo (import/export ratio)	0.1	0	0.1	0.1	0.1	1.8
• Dry bulk (import/export ratio)	0.6	0.7	1.1	2.9	2.5	25.7
• Liquid (import/export ratio)			Only Imports			4.2
Handling Charges (2012)						
	20' Dry Container	40' Dry Container	Transshipment Container	General Cargo	Bulk Dry	Cruise
	(USD/container)	(USD/container)	(USD/ TEU)	(USD/ ton)		(USD/passenger)
Campden Park/Kingstown	167	333	267	9	9	15
OECS Average	412	800	89	24	10	8
A Benchmarking of Port Efficiency (2010)						
	Technical Efficiency (%)	Ranking (out of 69 ports)				
Campden Park/Kingstown	38	45				
Roseau (Dominica) – Best OECS	64	22				
San Juan (Puerto Rico) – Best Caribbean	79	7				
Manzanillo (Mexico) – Best LAC	86	1				
OECS Average	33	...				
Caribbean Average	37	...				
LAC Average	50	...

Source: Authors' elaboration on primary data.

Note: LAC = Latin America and the Caribbean; m = meters; m² = square meters; OECS = Organization of Eastern Caribbean States; TEU/yr = twenty-foot equivalent units per year.

Annex 3. Summary of Emerging Issues

St. John's (Antigua)

- Crane capacity is overstated in relation to the volume it handles. It is only being used five hours a day for three days a week.
- The port is facing severe financial difficulties. These can be traced back to bad investment decisions regarding the crane,²⁸ and also to the decision by the port to hire workers on a permanent versus temporary basis during a construction project with large shipping needs but also with a finite end. The lack of workforce adjustments are a severe obstacle to the functioning of the port.
- The port is currently not matching its expenses with appropriate sources of revenues; that is, it is providing services to consignees and other parties for which it is not collecting revenues.
- As with most of the ports in the Organization of Eastern Caribbean States (OECS), charge rates are still based on principles stemming from the break-bulk era.
- The port's infrastructure is mismatched to its purpose. A warehouse stands in the way of what should be open space for container operations, and the container area is too large for the port's volume and purpose. The vast yard area has caused shipping lines to "dump" empty containers into the port, which, under threat of a \$50 charge per empty container per day by new management, are now being removed. In addition, the surface of most of the container yard has deteriorated severely, to the point that the dust generated during operations is now considered a health hazard to workers.
- The port cannot unlock vital pier length because of structural issues related to an abandoned administrative building.
- The port has now installed a reform-minded manager who is introducing some of the region's first private sector participation in critical elements of port operation, such as warehouse management.²⁹

Woodbridge Bay/Rousseau (Dominica)

- The port management reforms in Woodbridge Bay could be seen as a good practice example in the OECS in terms of modernizing operations with minimal capital investments.³⁰
- Cargo operations at the port must be charged at a higher rate than optimal because the port subsidizes several non-cargo-related activities, including airfields (Canefield Airport and Manville Hall International Airport), the ferry terminal, and the cruise terminal. In terms of the cruise terminal, all per passenger head tax revenues go directly to the government, even though initially the port had been promised a 30 percent portion.
- Infrastructure reinvestment needs are large. The repair of the pier will cost \$12 million. This is a must-do investment, because there is a threat of losing perhaps the entire pier. In addition the roofs of at least three sheds are leaking, with the largest shed needing the most reinvestment.

²⁸ Anecdotally, the crane is reported to have cost \$6.9 million (EC\$18.6 million), while a crane of the same make and model was purchased for Castries in St. Lucia for \$2 million.

²⁹ New management was appointed in March 2014, and with that the circumstances surrounding the Port of St. Johns seem to be actively changing; improvements are being actively pursued. Hopefully these efforts will soon be reflected in the port's performance.

³⁰ This is based on qualitative interviews with shipping lines. In particular, representatives of Tropical Shipping and King Ocean consider Woodbridge the best-run port in the OECS. It uses minimal equipment. It uses reach stackers, and has a crumbling pier and leaky sheds.

- The port is generating revenues with its current equipment. While a mobile crane could increase container throughput, the pier in its current condition cannot support such a weight. In addition, containers are still being lifted off ships using cables rather than mechanical spreaders, which increases safety risks for both cargo and personnel.
- The port underwent important labor reforms, enabling management, through a judicial process, to set performance, gang size, and gang composition targets.
- The cruise terminal can take only one ship at a time, which makes it necessary to make the cargo port available for cruise ships. Cruise ship berthing has priority over cargo vessel berthing at the port, and cargo vessels have to wait outside the harbor at anchor until the extra cruise ship departs.

St. George's (Grenada)

- St. George's is one of the more expensive and challenged ports in the OECS. The port faces high labor costs and still operates on break-bulk principles.
- Regardless of the need for a crane, as based on throughput, the purchase and installation of a mobile crane might be politically challenging because of its impact on the workforce. Though Tropical Shipping Lines uses its own geared vessels, it requested an onshore crane and was refused by the port management. Admittedly, a crane would create job losses by reducing the gang size from 20 to 5.
- Gang sizes are large, with 22 members, containing such positions as an individual whose sole job is to provide drinking water to the other gang members.
- Though the reach stackers have been rebuilt, users of the port find them unreliable.
- There is an eight-hour rule: even if it takes one hour to unload a ship, stevedores and longshoremen get a full eight hour's pay.
- The port operates with double labor rates on Sundays and holidays.
- The port is seen as a source of revenue, not as a trade facilitator. Though operations were profitable before the global economic slowdown, the port is now operating at a loss. In the meantime the port is also responsible for a local bus terminal in St. George's; in other words, it is being used to subsidize other modes of transport.
- Port, maritime, and shipping legislation and regulations are now under review for potential revision.

Basseterre (St. Kitts and Nevis)

- The port has been undergoing a reform in recent years. After significant losses in the years leading up to 2010, employees were offered generous packages to leave, and debt was restructured. St. Kitts has new port legislation and regulations that have been drafted and are awaiting approval by St. Christopher Air and Sea Ports Authority (SCASPA) for tabling in parliament.
- The port has posted net losses for a long time; before restructuring, over 40 percent of revenues went to debt servicing. In 2013 the port, for the first time in many years, showed a profit; it also stopped subsidizing the airport.
- Since 2007 stevedoring has been handled by a firm owned by the shipping agents. This step was taken to prevent the formation of a stronger labor union than the one already in existence.
- The actual infrastructure, in particular the main working surface, has deteriorated, and investments need to be made in both the substructure (pylons supporting the port) and the surface itself.
- The port is still overstaffed, though staffing has been reduced by one-third.

Long Point (St. Kitts and Nevis)

- The depth of the main usable area for larger vessels is inadequate. Since a fully loaded vessel cannot visit the port, there are scheduling difficulties and an urgent need for dredging
- Volumes are low, and the port seems to be undermarketed. There has been an interest in local transshipment (Bernuth once approached the port for transshipment) but nothing has materialized; port authorities might do more to pursue such offers.
- The port is stuck in the break-bulk era: it (i) charges by tonnage and (ii) collects its statistics by tonnage, and not by TEU. Container numbers from the port had to be obtained from customs, since the port was still collecting statistics in tonnage.³¹

Castries (St. Lucia)

- Laws and regulations stem from the break-bulk era, evident in the high and nontransparent per container charges and outdated labor arrangements. Similarly, the port's layout is for the break-bulk era; sheds and warehouses take up valuable space by the pier.
- There is very little room for reducing gang sizes and costs.
- Customs at the port do not operate in a manner that is cost-effective for traders. Inspection times for containers often fall into overtime hours, and the x-ray machine (purchased for inspections at the cost of \$370,000) has never been used, ostensibly because this would reduce the amount of billable time for customs workers.
- The crane, though its lifting capacity exceeds the needs of the port, is also unreliable, and has caused bottlenecks during breakdowns.
- St. Lucia is a much-favored cruise ship destination. Cruise ships take priority in berth scheduling at the port, causing conflicts with arriving cargo vessels.

Vieux Fort (St. Lucia)

- The port has faced significant challenges due to the age and reliability of its crane. The port was out of commission after a crane breakdown for almost a year in 2012. This prompted the loss of CMA CGM's transfer business, which was shifted to Trinidad, and the reduction of King Ocean's volume to one-fourth of that prior to the breakdown. In addition, the spreader is not working, increasing labor costs.
- As exception among OECS ports, labor costs are not an issue of concern.

Campden Park/Kingstown (St. Vincent and the Grenadines)

1. The break-bulk terminal of Kingstown is insufficient and frequently congested.
2. The general drawback is that the Campden terminal has only one berth, and only one ship can be serviced at a time. Campden Park, therefore, in its current state, cannot operate as a substitute for the Kingstown terminal.

³¹ This appears to be a common issue with smaller, ro-ro only ports.