The Miami Marine Transportation Cluster

Microeconomics of Competitiveness

Professors Michael Porter and Hirotaka Takeuchi

Project Advisor: Professor Jorge Ramirez-Vallejo

Julia Chabrier | Brian Hull | Daniel Rotman | Maxeme Tuchman | Justin Zorn

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EXECUTIVE SUMMARY

The United States has considerable strengths but growing vulnerabilities with regard to competitiveness. In the transportation and logistics cluster, it continues to benefit from extensive coastline, a high-degree of firm rivalry, unparalleled tertiary education institutions in engineering and mathematics, and extensive intermodal infrastructure networks. Yet national competitiveness in this sector is increasingly threatened by macroeconomic challenges that diminish both overall demand conditions and the nation’s capacity to upgrade aging components of its infrastructure. Competitiveness is further threatened by stringent industry regulations, an archaic legal system, underperforming primary and secondary education systems, and potentially rising protectionism.

The State of Florida epitomizes some of the same strengths and weaknesses. While it benefits from notable factor endowments including the longest coastline in the contiguous United States, close proximity to emerging markets and tourist destinations, overall favorable tax regimes, and several specialized educational institutions, its vulnerabilities have grown in recent years. These include weak demand conditions due to an unprecedented fall in housing prices, high consumer debt, and high unemployment. The transportation and logistics cluster has been a bright spot amidst Florida’s otherwise middling economic performance.

This report focuses on the globally competitive Miami transportation and logistics cluster, with a focus on marine transportation. This cluster comprises the interconnected firms and institutions that transport goods and people by sea. The key determinants of this cluster’s competitiveness are the high degree of firm rivalry in the locally based passenger cruise industry, a favorable local tax regime, and the presence of specialized educational programs and IFCs.
Our research makes clear that the cluster faces looming threats to its competitiveness if it fails to build capacity to (1) improve its intermodal transportation connections and coordination, (2) serve a larger class of cargo ships coming online after the expansion of the Panama Canal in 2014, and (3) increase its efficiency in cargo storage. At the state level, it will be necessary to (1) increase investment in upgrading broader infrastructure networks, and (2) help foster the conditions needed for innovations in logistics. Cluster actors including the port authorities, cruise lines, and key Institutions for Collaboration (IFCs) should also undertake federal-level advocacy to remove archaic regulations in order to revive the transshipment industry.

**UNITED STATES COMPETITIVENESS**

**U.S. Overview**

The United States remains a large and wealthy economy, with a population of approximately 311 million and a gross domestic product of approximately $15.5 billion.¹ The U.S. has over 12,000 miles of coastline and is adjacent to major world waterways including the Atlantic and Pacific Oceans and the Gulf of Mexico, which facilitates access to international markets.²

Barack Obama, a Democrat, was elected president in 2008 with 52.9% of the popular vote. During President Obama’s first two years in office, the Democratic Party also held majorities in both houses of the U.S. Congress. In 2010, the Republican Party gained control of the House of Representatives and expanded their minority in the Senate to 47 seats. As a consequence, the U.S. government has increasingly been locked in stalemate and has had difficulty passing major legislation.

**U.S. Economic Performance**

Despite some signs of recovery since 2008, U.S. economic performance has not yet returned to pre-recession levels. Per capita GDP (in real 2005 dollars) fell from a peak of $43,633 in 2007 to $41,640 in 2009, before rebounding to $42,346 in 2010. The U.S. unemployment rate more than doubled from 4.6% in 2007 to 9.6% in 2010, before falling to 8.9% in 2011.

Per capita GDP in the U.S. is higher than the average per capita GDP of the upper half of OECD countries, and this positive gap has grown since 2008 due to growth in labor productivity (OECD, 2012a). GDP per hour worked grew 2.9% in the U.S. from 2009 to 2010, compared to an average of 2.2% for the G7, 1.2% for the Euro-area, and 2.0% for the OECD (OECD 2011). In 2010, GDP per hour worked was $59.50 in the U.S., compared to an average of $51.70 for the G7, $49.10 for the Euro-area, and $43.80 for the OECD (OECD, 2011).

However, the U.S. lags the OECD with regard to the intermediate indicators and enablers of productivity, raising concerns for the country’s future competitiveness. U.S. domestic investment, export, and import performance are below OECD averages in both their level and growth (Porter, 2012a). Inbound and outbound foreign investment as percentages of GDP are

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also below OECD averages (Porter, 2012a). Additionally, the U.S. appears to be losing its position as the global leader in innovation. Between 2001 and 2011, the U.S.’s rankings for company spending on R&D and capacity for innovation fell from 2\textsuperscript{nd} to 7\textsuperscript{th} and 2\textsuperscript{nd} to 8\textsuperscript{th}, respectively (ISC, 2011). Given these figures, it is unsurprising that U.S. patent growth has stagnated, decreasing by -0.05\% from 1998 to 2009.\(^5\)

**Macroeconomic Competitiveness**

The U.S.’s macroeconomic competitiveness has experienced a significant decline. Respondents to the Harvard Business School’s U.S. Competitiveness Survey rated the complexity of the national tax code, political gridlock, the quality of K-12 education, and the efficiency of the legal framework as both weaknesses and areas of deterioration for the U.S. (Porter and Rivkin, 2012). Similarly, the 2011 Global Competitiveness Index ranks the U.S. 25\textsuperscript{th} for social infrastructure and political institutions, down from 15\textsuperscript{th} in 2001, and 29\textsuperscript{th} for macroeconomic policy, down from 1\textsuperscript{st} in 2001 (ISC, 2011). 

While persistent budget deficits and growing government debt are not a new concern, these indicators have worsened dramatically in recent years. After several years of decline,

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government deficits as a percent of GDP rose from 2.9% in 2007 to a peak of 11.3% in 2009 (OECD, 2012b). Government debt followed a similar trend, increasing from 62.0% of GDP in 2007 to 93.6% in 2010 (OECD, 2012b). Perhaps even more troubling has been the federal government’s inability to respond to these fiscal imbalances, as exemplified by the 2011 debt ceiling crisis.

**Social Development**

Relative to the size of its GDP, U.S. performance on social development indicators is poor. On the most recent PISA exam, average reading literacy scores in the U.S. were similar to and math scores were below the OECD average (Kerachsky, 2010). Despite the highest healthcare spending in the world, U.S. ranks only 26th in the quality of its healthcare services and 28th in life expectancy (ISC, 2011).

**Composition of the U.S. Economy**

![Figure 3: Net Job Creation by Traded Cluster, 1998-2009](image-url)
The U.S. has a diverse portfolio of traded clusters, with thirteen clusters each capturing more than ten percent of world export value. However, between 2000 and 2010, only Oil and Gas Products and Financial Services grew in their share of world export value. Between 1998 and 2009, total employment in traded clusters fell by over one million.

**Performance of the U.S. Transportation and Logistics Cluster**

The U.S. transportation and logistics cluster is the largest in the world, with a 10.35% share of world exports and a total value of $70.64 billion. However, the cluster’s share of world exports declined by more than three percent from 2000 to 2010. Germany and Japan have the second and third largest clusters, with shares of world export shares of 8.42% and 5.71% respectively, but China’s cluster is the fastest growing.

In spite of its declining share of world exports, the U.S. transportation and logistics cluster was one of only ten clusters in the country that were net job creators over the past decade. Between 1998 and 2009, the cluster experienced a net increase in employment of approximately 500,000. In 2009, the transportation and logistics cluster was the sixth largest in the U.S. in terms of its share of national employment but the second fastest growing.

**Quality of the National Business Environment**

Despite recent declines, microeconomic competitiveness remains an area of relative strength for the U.S. Between 2001 and 2008, the Global Competitiveness Index consistently ranked the U.S. as first or second in the world for microeconomic competitiveness (ISC, 2011). The U.S. has since declined to 11th, with parallel declines in U.S. rankings for company

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7 Institute for Strategy and Competitiveness, “U.S. Cluster Mapping Project.”
9 Institute for Strategy and Competitiveness, “U.S. Cluster Mapping Project.”
operations and strategy (now ranked 12th) and the quality of the national business environment (now ranked 14th). Nevertheless, respondents to the U.S. Competitiveness Survey rated the quality of universities, context for entrepreneurship, innovation infrastructure, sophistication of firm management, quality of capital markets, and strength of clusters as areas of strength for the U.S. (Porter and Rivkin, 2012). An analysis of the U.S. national diamond similarly reveals both areas of continued strength and signs of potential weakness.

**Figure 4: U.S. Diamond Analysis**

**Factor conditions:** The U.S. leads the world in the quality of its universities and continues to benefit from high rates of enrollment in tertiary education and large numbers of scientists and engineers. While the U.S. has an extensive logistical infrastructure, the quality of its roads, ports, and air transport infrastructure have been in decline. The recent financial crisis threatened the
soundness of the nation’s banks and exposed weaknesses in the regulation of securities exchanges.

**Demand conditions:** The U.S. has strengths in the size and sophistication of its market. It has the world’s largest domestic market and second largest foreign market and is ranked highly for both the sophistication of its buyers and for government purchases of advanced technology products. However, regulatory standards and environmental regulations have become less stringent in recent years.

**Context for firm strategy and rivalry:** The U.S. has a continued advantage in the flexibility of its labor market and a strong relationship between pay and productivity. While the country has benefited historically from relatively low tax rates, increasingly the tax system appears to be distorting employee and investor behavior. Tariff rates remain relatively high, and trade barriers have become increasingly prevalent.

**Related and supporting industries:** As a result of its decentralized political structure, the U.S. has developed a variety of strong clusters supported by state and regional institutions (Porter, 2008). However, the federal government has not yet adopted an economic strategy to support these clusters. While still highly ranked, the state of cluster development and the extent of collaboration in clusters are both in decline.

**FLORIDA COMPETITIVENESS**

**Florida Overview**

Florida is located in the Southeast of the United States, with the Atlantic Ocean to its east and the Gulf of Mexico to its west, and has the longest coastline of all the contiguous U.S. (Carpenter and Provisor, 1996). It is the 4th most populous state and the 8th most densely
populated. Florida’s current governor is Rick Scott, a Republican. The state has a 40 member Senate and a 120 member House of Representatives, both dominated by Republicans.

**Florida’s Economic Performance**

Florida has the 4th largest economy in the U.S., with a GDP of approximately $747 billion in 2010. The size of Florida’s economy is largely a reflection of its size rather than its wealth, as the state ranks only 38th in the nation in Gross State Product per capita (Porter, 2011). For the 2000-2010 decade, real GDP growth was 22.7%, but per capita real GDP growth was only 4.5%. The recent recession hit the state particularly hard, with GDP growth falling from 9.5% in 2005 to -2.0% in 2009. GDP growth has recovered somewhat since but remains sluggish. Real GDP per capita was $35,735 in 2010 (in 2005 chained dollars), down over 8.0% since the start of the economic recession despite modest growth after 2009.

Unemployment remains a persistent problem for the state. As of February 2012, Florida’s unemployment rate stood at 9.4%, the 7th highest in the nation and up from its historically low rate of 3.3% in the middle of 2006. While unemployment has dropped by 2 percentage points from its high in early 2010, at its current rate of decline, it will take an additional 6 years for unemployment to reach its pre-recession level.

Productivity in Florida is low compared to the rest of the U.S., with Gross State Product per labor force participant and average private wages both significantly below national benchmarks (Porter, 2011). Growth in productivity roughly tracks U.S. averages: Gross State

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Product per labor force participant grew 0.77% over the past decade, compared to 1.09% in the U.S., while private wages grew 3.38%, compared to 3.32% in the U.S. (Porter, 2011).

Florida has more than 220 trading partners worldwide, with a total value of international trade of $126.2 billion as of 2010. Exports account for 57.8% of international trade, making Florida fourth in the country in terms of export-over-import surpluses, primarily due to the state’s strong export trade to South America and the Caribbean but offset by a large trade deficit with Asia (Florida Seaport Transportation and Economic Development Council, 2011). Strong population growth projections for the Caribbean, and Central and South America are promising for the state (Florida Seaport Transportation and Economic Development Council, 2011).

Florida’s rate of innovation, as measured by patents per 10,000 employees, is less than half the national average, 3.1 versus 6.95. The state is ranked 32nd in the U.S. in terms of overall patents per employee. Isolating the transportation and logistics cluster, however, shows that Florida tops the list at 1.29 patents per 10,000 employees, compared to the national average of 0.56.

**Macroeconomic Competitiveness**

With no state income tax, Florida has one of the lowest tax burdens in the U.S. Sales and corporate income tax collections increased from Fiscal 2010 to Fiscal 2011, but state revenues still remain below pre-recession levels (NASBO, 2011b). Total state expenditures increased were approximately $62.0 billion in 2010, a slight increase from the previous year (NASBO, 2011a). State spending on transportation fell from approximately $6.0 billion in 2009 to $5.8 billion in 2010, a decline of 3.2%. However, the state still devotes a larger percentage of total expenditures to transportation than the national average, 9.4% compared to 7.7%.

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14 Institute for Strategy and Competitiveness, “U.S. Cluster Mapping Project.”
Social Development

Educational attainment in Florida is fairly similar to the national averages. Florida has higher proportions of residents 25 or older with only a high school diploma or GED (29.9% versus 28.5%) or an Associate’s degree (8.6% versus 7.6%) than the U.S. as a whole. However, he state lags the U.S. in the proportion of residents with a Bachelor’s degree or higher (25.8% compared to 28.2%). Life expectancy in Florida for 2010 was 79.7 years (compared to 78.6 years nationally), 14th highest in the nation (Lewis and Burd-Sharps, 2010). Infant mortality in Florida is 7.2 deaths per 1,000 births, higher than the national rate of 6.8. Twenty-one percent of Florida’s population was uninsured in 2009-2010, compared to 16% nationally.

Composition of the Florida Economy

Florida’s five largest traded clusters by employment are business services, hospitality and tourism, financial services, transportation and logistics, and distribution services. Each of these clusters is ranked in the top five nationally in terms of employment. However, Florida ranks only 49th in the U.S. in its share of employment in traded clusters, and its share of employment in traded clusters declined by more than 2% between 1998 and 2008 (Porter, 2011).

The state’s average traded wage is $11,780 below the national average. Moreover, nearly all of this difference is due to low wages in Florida’s clusters relative to national averages, as opposed to the state’s mix of higher and lower wage clusters (Porter, 2011). Only four of the state’s clusters have wages that are above national benchmarks: Hospitality and Touring, Fishing and Fishing Products, Analytical Instruments, and Power Generation and Transmission.

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19 Institute for Strategy and Competitiveness, “U.S. Cluster Mapping Project.”
**Performance of Florida’s Transportation and Logistics Cluster**

Florida’s transportation and logistics cluster is the third largest in the U.S. in terms of employment.\(^{20}\) Transportation and logistics was one of only a dozen traded clusters in Florida that experienced job growth from 1998 to 2009. Furthermore, the transportation arrangement and warehousing, airport, marine transportation, and transportation support operations subclusters all experienced positive job growth between 1998-2009.

Average wages in the transportation and logistics cluster are ranked only 25\(^{th}\) in the U.S. and are well below the national average ($39,913 compared to $44,659). However, the cluster experienced fairly strong growth in average wages over the past decade, with an annual growth

\(^{20}\) Institute for Strategy and Competitiveness, “U.S. Cluster Mapping Project.”
rate of 2.71%. Average wages in the marine transportation cluster, $39,830, are similar to the cluster as a whole but are considerably below the national benchmark of $57,893.

Among Florida’s key southern competitors, only Texas has more total jobs in the transportation and logistics cluster. However, both Louisiana and Texas have higher total employment in the marine transportation subcluster. Between 1998 and 2009, employment in the Florida’s marine transportation cluster grew 1.09% annually, compared to 0.68% in Louisiana, -0.12% in Texas, and 3.23% in Georgia.

Florida’s transportation infrastructure includes 19 primary commercial airports (Florida Agency for Workforce Innovation, 2010). Of the 15 seaports in Florida, all but one are deep-water ports; however, none of Florida’s ports have the 50-foot depth required for “Post-Panamax” vessels, although Port Miami plans to expand to this depth. There are 15 common freight carriers operating in Florida on 2,800 miles of main route rail lines, along with another 8 private freight carriers and 11 passenger carriers. Governor Rick Scott rejected plans for an 85-mile high-speed rail connection between Tampa and Orlando. Lastly, there over 12,000 miles of state highways. Florida’s major interstate highways include Interstate 95, which runs along the East Coast from Miami to Maine.

The relevant state agencies in charge of overseeing and planning transportation and logistics policies are the Department of Transportation and its Seaport Office, the Department of Environmental Protection which handles environmental regulations, and the Florida Seaport Transportation and Economic Council, which is focused exclusively on the competitiveness of the state’s seaports. The Department of Economic Opportunity is the state’s workforce, community, and economic development agency.

**Quality of Florida’s Business Environment**

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21 Institute for Strategy and Competitiveness, “U.S. Cluster Mapping Project.”
In spite of its large size, advantageous location, and natural endowments, Florida has struggled with high unemployment and low prosperity. The state’s low rates of productivity and innovation help explain its poor performance in these areas. The analysis of Florida’s diamond identifies additional challenges facing the state, as well as opportunities for future growth.

**Figure 6: Florida Diamond Analysis**

**Factor Conditions:** The state benefits from a strong university system with significant research and higher education programming beneficial to the state’s transportation and logistics cluster. However, the state’s clusters are plagued by low productivity, and this problem is particularly severe in the marine transportation subcluster.

Florida has a distinct location advantage being at the crossroads of East-West and North-South sea-lanes, connecting markets along the eastern part of United States, as well as Canada, the Caribbean, Latin America, Europe, Asia, and Africa. However, state spending on
infrastructure has declined in the past year, and Governor Scott has indicated an unwillingness to invest in upgrading.

Demand Conditions: Although state income and employment were hit hard by the recent recession, Florida continues to benefit from domestic and international travelers who come to enjoy its pleasant weather and tourist destinations. The federal government supports purchasing through both the military and NASA.

Context for Firm Strategy and Rivalry: Florida has no personal income tax and a low tax burden compared to other states. Two significant disadvantages are the burdensome permitting process and the duplicative state and federal regulations regarding port safety.

Related and Supporting Industries: Florida is noted for its strong tourism and agricultural sectors, a burgeoning health care cluster, and a computer subcluster. The decline in housing construction as a result of the recession has negatively affected the cluster.

THE MIAMI MARINE TRANSPORTATION CLUSTER

History and Evolution of the Cluster

In spite of its location at the nexus of North America, the Caribbean, and South America, Miami was not historically suited to serve as a major location for maritime trade. Biscayne Bay, which surrounds the city, was too shallow to enable construction of a port. A series of chance events changed these circumstances. Around 1887, a hurricane partially formed what is today the Norris Cut, granting easier access from the Bay to the Atlantic Ocean.\(^{22}\) In the early 1890s, industrialist Henry Flagler suffered the loss of his citrus crops due to deep freezes in north and central Florida, prompting his relocation to South Florida and investment in rail and the initial dredging of the Bay.\(^{23}\) In 1902, the US Congress appropriated funding to deepen the port. The

\(^{22}\) [http://www.aoml.noaa.gov/general/lib/biscayne_bay_bibliography.pdf](http://www.aoml.noaa.gov/general/lib/biscayne_bay_bibliography.pdf)

\(^{23}\) Chapman, Arthur. (1986) “Watch the Port of Miami.” University of Miami. p.6
City of Miami purchased to port from Flagler and made heavy investments. While the original port facilities were located on the Miami waterfront, real estate in this area was too scarce to permit large-scale container storage. Moreover, the area was not conducive to dredging beyond 30 feet, preventing larger passenger and bulk cargo ships from entering.

A spoil bank called Dodge Island was designated as the new site for the Port of Miami. In 1959, the newly-formed Miami-Dade municipal government invested $15.3 million in a five year project to develop the new island facility, which would include rail and highway connections. The New Port of Miami opened in 1964; a new Port Authority of Miami was created as a semi-autonomous branch of the county government. The development of expanded port facilities including seven new cargo buildings enabled a period of rapid expansion for the port. Crucially, the rapid acceleration of growth in trade between the U.S. and Latin America facilitated this rise. In 1960, prior to the opening of the Dodge Island facility, 411,170 gross tons of cargo was processed annually; by 1981, the figure was 2,757,374 tons (Chapman, 1993).

The first major modern cruise lines, including Eastern Shipping Company and Norwegian Cruise Lines, developed their business model in Miami, which largely came to be adopted by today’s industry leaders, Carnival and Royal Caribbean (Chapman, 1993). Key industry practices, including the negotiation of long-term contracts for use of passenger terminals as opposed to wharf or dockage fees, were developed in Miami.

In the 1990s, PortMiami expanded to Lummus and Sams Islands, nearly doubling cargo and cruise capacity. During this time, relevant educational institutions including Florida International University’s highly-ranked hospitality program and Miami-Dade College’s logistics management program matured. The Port undertook a $250 million redevelopment project in 1997 to make way for larger cruise ships as well as to improve freight logistics services. The

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24 Interview with Hydi Webb, Port Miami, March 29, 2012
emergence of “megaships,” starting with Royal Caribbean’s Voyager of the Seas in 1999, resulted in rapid increase in annual passenger processing.

**Cluster Actors**

While the Miami-Fort Lauderdale-Pompano Beach Metropolitan Statistical area includes Port Everglades as well as Port Miami, key interviewees noted that the two ports use largely distinct suppliers. Thus, this report focuses defines the cluster around the City of Miami. As illustrated in the cluster map below, the Miami marine transportation cluster is highly sophisticated, featuring a large number of shipping firms led by Maersk, COSCO, and Seaboard Marine and including twelve additional medium and large firms.

**Figure 7: Marine Transportation Cluster Map**

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25 Interview with Mayor Manny Diaz, March 5, 2012
Key firms on the cruise side include Carnival (including its subsidiaries Princess and Cunard), Royal Caribbean (including Celebrity), and Norwegian, all of which are headquartered in Miami, as well as eleven additional small and medium cruise lines. The core of the cluster features twelve major trucking firms, two cargo rail firms, and range of smaller transport firms including taxi companies operating out of the port.

The Port Authority, which has been a semi-autonomous arm of the Miami-Dade County Government since the mid 1960s, is the primary governmental actor in the port. The Port Authority has had a policy of encouraging long-term contracts for use of terminals, which has been particularly welcome by cruise lines seeking to brand their own terminal facilities. Both county and state governments have abandoned initiatives to tax cruise passengers over the past two decades. The University of Miami’s marine sciences institute collaborates closely with federal government’s National Ocean and Atmospheric Administration, which maintains a scientific research vessel on the port premises.

The key institutions for collaboration (IFCs) comprise research and advocacy organizations including the Beacon Council and Florida Ports Council, which are based in Miami and undertake multi-level legislative initiatives, advise the municipal government and Port Authority in strategic planning for economic development around the maritime sector, and compile statistics regarding trade and security. The Miami Downtown Development Authority, the Miami-Dade Chamber of Commerce, and the Florida Chamber Foundation work with the maritime sector more tangentially as engines of business development. These organizations have worked in coalitions to prevent local and state taxation of port passengers and activities as well as for infrastructure investments including the Panama Canal dredging project.26

Cluster Performance

26 Interview with Hydi Webb, Port Miami, March 29, 2012
Miami remains the top-ranked cruise port in the world by passengers, with approximately 4 million passengers in 2010. After five years of decline, cargo tonnage increased to approximately 7.4 billion tons in 2010.\(^\text{27}\)

In 2010, Miami ranked 107\(^{\text{th}}\) globally in container traffic. Overall processing increased steadily from the mid-1960s but began falling in 2003, only to begin rebounding slightly in 2010. The decline following 2003 was largely attributable to strategy of focusing exclusively on container rather than bulk processing; however, the more significant decline, which occurred after 2008, was attributable to a fall in demand following the recession and collapse of the real estate bubble. Cargo trade is expected to increase heavily in the coming decades due to the planned dredging of the Biscayne Bay to allow new “Post-Panamax” class vessels to enter the port after the widening of the Panama Canal in 2014 (PortMiami, 2011).

The efficiency of the Port of Miami, due largely to the presence of sophisticated cranes and loading infrastructure, enables an average regional cargo vessel turnaround time of between eight and twelve hours.\(^\text{28}\) This compares favorably to the industry standards set around major ports such as Hong Kong, which has an average turnaround time of fourteen hours.

**Key Competitors**

Over the past decade, Savannah and Norfolk have grown as competitors to Florida ports and—within Florida—Jacksonville and Port Everglades have grown as competitors to Miami.

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\(^{28}\) Interview with Kevin T. Lynskey, Assistant Director of PortMiami, April 26, 2012.
Ports including Tampa and Houston are not considered competitors as they specialize in bulk shipments rather than intermodal containers. The success of Miami’s competitors is attributable to a range of factors including quality intermodal transport links (distributions centers and connections to major interstate infrastructure) as well as the availability of warehouse space.

The Savannah marine transportation cluster—widely considered Miami’s prime competitor—benefitted more than any other from extensive available real estate and quality connections to interstate infrastructure. This availability of space encouraged Kmart and Target to build distribution centers onsite and direct a large proportion of their Southeast-directed goods to the port to be processed. While Miami-Dade County has 150 million square feet of warehousing space, it is largely in 50-100,000 square foot warehouses, and there are few warehouses and no distribution centers located on the port premises.29

<table>
<thead>
<tr>
<th>Port</th>
<th>Containers (TEUs)</th>
<th>Planned Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York/New Jersey</td>
<td>5,265,059</td>
<td>50</td>
</tr>
<tr>
<td>Savannah</td>
<td>2,616,185</td>
<td>48</td>
</tr>
<tr>
<td>Norfolk</td>
<td>2,083,276</td>
<td>55</td>
</tr>
<tr>
<td>Miami</td>
<td>828,349</td>
<td>52</td>
</tr>
<tr>
<td>Fort Lauderdale</td>
<td>985,095</td>
<td>48</td>
</tr>
<tr>
<td>Jacksonville</td>
<td>718,467</td>
<td>48</td>
</tr>
</tbody>
</table>

Lauderdale (Port Everglades) benefit from the large volume of processing that plentiful inexpensive nearby real estate provides. Yet, with the exception of Norfolk, these ports will be unable to accommodate the largest cargo vessels.30 While New York will have the capacity, its distance makes it an inopportune port of southeastern bound goods.

Cluster Competitiveness

29 Interview with Kevin T. Lynskey, Assistant Director of PortMiami, April 26, 2012.
The largest metropolitan area in Florida by population, Miami is notable for its linkages to Latin America and its strengths in banking and tourism. Despite the absence of a natural deep-water harbor, the area now has many relevant attributes including sophisticated local demand for cruise vacations, a high degree of competition among local firms, and extensive marine and intermodal transportation infrastructure.

**Figure 10: Marine Transportation Diamond Analysis**

- Strong research and educational institutions in relevant fields including hospitality and marine sciences as well as logistics
- Extensive highway system with limited toll roads
- Diverse population
- Inadequate connections to intermodal infrastructure
- Urgent need for additional dredging to remain competitive after 2014 Panama Canal widening
- Specialized maritime finance and professional services firms
- Multiple high capacity airports
- 306 multinational Corporations
- 69 Foreign Consulates and Trade Offices
- Declines in export-oriented industries, including food processing

**Context for Firm Strategy and Rivalry**

**Factor (Input) Conditions**

- South Florida Free Trade Zone enables firms to add value to foreign products tariff-free
- Favorable port tariff policies
- Continual investment in upgrading facilities
- South Florida-based cruise lines compete and collaborate intensively
- Perception of high corruption relative to U.S. standards

**Demand Conditions**

- Sophisticated local cruise market
- More international travelers than any other U.S. airport
- Sophisticated market for imported consumer goods

**Related and Supporting Industries**

- Large population
- Superior location as the closest major US port to the Caribbean, most of Latin America, and West Africa
- More than 3,745 miles of navigable waterways

**Endowments**

- Not a natural deep water port

**Factor Conditions**: Miami boasts sophisticated infrastructure, including a major international airport, extensive connections to the interstate highway system, linkages to the CSX east coast cargo rail line, and the TriRail regional rail linkage with Fort Lauderdale and West Palm Beach. Interviews with cruise industry experts underscored that proximity to key tourist
destinations as well as the dramatic built-environment surrounding, including a panoramic skyline, result in a large number of cruise lines operating in Miami.\textsuperscript{31}

There are drawbacks from a factor perspective, however: The area notably suffers traffic congestion and inadequate linkages between the port and key transit arteries. Following a nearly direct hit from Hurricane Wilma in 2005, the Port has been without a functioning rail bridge. This episode underscores a looming challenge that is common to many U.S. clusters: climate change and extreme weather. The threat is particularly pronounced in Miami, which is both a hurricane zone and federally-classified “highest vulnerability low-lying area” according to the U.S. Geological Service (PortMiami, 2011).

\textbf{Demand Conditions:} Demand conditions for both cruise vacations and imported consumer goods are strong. The Miami airport has the more international travelers than any other U.S. airport and supports a sophisticated market for tourism. Moreover, the local population is heavily comprised on retirees, who form a key demographic for the cruise industry. The city's diverse and multilingual labor force brings valuable knowledge about vital world markets and supports demand for imported food and consumer products, particularly from Latin America and the Caribbean.

\textbf{Related and Supporting Industries:} A large number of related suppliers support the cluster. Miami is home to specialized maritime finance and professional services firms, including two major international law firms specializing in maritime law, as well as 69 foreign consulates and trade offices involved in maritime trade matters. Hospitality is essential for the cruise industry, which brings upwards of four million visitors to the region annually.

The city boasts 25 international banks (making Miami a banking and financial center of the Caribbean Basin and Latin America region in addition to the Southeast United States),

\textsuperscript{31} Interview with Hydi Webb, PortMiami, March 29, 2012.
marine science research and medical device firms (centered around the University of Miami and its hospital and research centers), and world class sophisticated industries such as business services, aviation, and international Commerce and Trade. In all, approximately 1300 multinational corporations, including nearly half of the Fortune 500 corporations, operate in Miami, creating an ecosystem ripe for international trade and travel.

Context for Firm Strategy and Rivalry: The cluster is marked by a high degree of competition between a small number of very large cruise lines and a larger number of smaller (generally upmarket or downmarket) cruise lines headquartered in Miami. Since the 1990s, however, there has been a trend toward consolidation with Carnival and Royal Caribbean acquiring smaller firms such as Cunard and Celebrity Cruises. There is a relatively large number of both large and medium sized cargo shipping firms.

The Miami Free Trade Zone, located in and around the central business district enabled firms to add value to products tariff-free. PortMiami offers favorable port tariff policies, especially as it competes with neighboring Port Everglades in Fort Lauderdale. The competition between the two ports also encourages continual investment in upgrading facilities.

One weakness facing Miami is the perception of high corruption relative to U.S. standards, which may deter corporations from locating the city (Badenhausen, 2012). Moreover, while Port officials typically cite strong collaboration with officials in the state executive branch, there is a continued tendency in the state legislature to disburse funds among the state’s fifteen ports rather than focusing sufficient attention on major ports such as Miami that provide the preponderance of value to the state economy.

POLICY RECOMMENDATIONS

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We have identified action areas for cluster, state, and federal officials and firms, ranked in order of priority. In each area, we recommend key policy priorities at one or more level.

(1) **Inadequate connections to intermodal infrastructure (Highest Priority)**

In an era of uniformly low port tariffs, competitiveness in marine transportation depends on the provision of quality of intermodal transfer services so that passengers and goods can be moved safely, quickly, and inexpensively from marine to rail, auto, or air transport. Thus our highest priority recommendation pertains to the development of improved intermodal infrastructure.

The ports of Savannah, Jacksonville, Tampa, and Fort Lauderdale all enjoy superior access to the interstate highway system. PortMiami’s geographic location on an island makes such connections more costly, yet this should not excuse the lack of progress in this area. Moreover, after Hurricane Wilma destroyed the port’s already inadequate rail connection several years ago, funding for reconstruction has been delayed and inadequate.

**Recommendations:**

1.1 *Cluster level:* Focus available funding and state advocacy on funding for new railway bridge to Dodge Island as well as the MacArthur Tunnel to Miami Beach.

1.2 *State level:* Prioritize investment in key ports that can advance statewide economic goals rather than disbursed infrastructure investments in 15 separate ports.

Delegating decision-making on port infrastructure projects to an expert commission rather than the existing Transportation and Highway Safety committees in the legislature (which are heavily influenced by regional interests) could direct spending toward critical projects for ports, such as Miami’s, that have the largest impact on the statewide economy,
(2) Port depth insufficient for “Post-Panamax” vessels (Highest Priority)

The Panama Canal expansion presents an important opportunity but also a critical risk for the Miami marine transportation cluster’s competitiveness. Twenty years ago, West Coast ports processed approximately 80% of Asian waterborne traded goods destined for the East Coast of the U.S. Today, the figure is down to 62% and is slated to decrease much further in the coming years, given the widening of the Panama Canal. As Asian ports begin relying on larger “Post-Panamax” vessels with depths beyond 50 feet, ports will either need to dredge to the adequate depth or be prepared to accept a smaller share of this new cargo processing.

Due to environmental constraints related to a major reef, Port Everglades is not a viable candidate for dredging; moreover, the Ports of Jacksonville and Savannah are located up rivers that are less conducive to deep dredging. This leaves Ports such as Norfolk (Virginia), Baltimore (Maryland), or New York/Bayonne (New York/New Jersey) as the next viable East Coast options for unloading Asian containers. There is strong evidence that many ships could avoid unnecessary mileage by unloading in Miami. Currently, 60% of Florida’s Asian containers are processed in out-of-state ports. Expediting Miami’s deep dredge would strengthen the cluster and make shipping from Asia to Florida more efficient.

Recommendations:

2.1 Cluster level: Focus available funding on expediting deep dredge to 52 feet.

2.2 State level: Expedite clearing for the deep dredging project

2.3 Federal level: Expedite participation from the Army Corps of Engineers to take part in the project.

(3) Shortage of space as an artificial island port (Medium Priority)

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34 Interview with Kevin T. Lyskey, Assistant Director of PortMiami, April 26, 2012.
The development of extensive on-port warehouses and distribution centers for major retailers such as Kmart and Target has been another key competitive advantage for the Port of Savannah. More generally, ports in Savannah, Jacksonville, and Fort Lauderdale benefit from the growth potential that plentiful inexpensive nearby real estate provides. While Miami’s port cannot easily replicate these advantages, relevant stakeholders can take important steps to improve the efficiency of the port and increase access to such warehousing facilities. Currently, the port of Miami has only mediocre performance in terms of land-use efficiency measured by twenty-foot equivalent units (TEUs) per acre, a measure that signifies the number of standard intermodal containers that fit on a single acre of port property.

Recommendations:

3.1 Cluster level: Set a target to double the number of twenty-foot equivalent units (TEUs) per acre by acquiring new rubber tire gantry systems that have become the industry standard in high-efficiency ports like Hong Kong. Pursue development of a new close-proximity distribution center on the 400-acre parcel of land adjacent to the Hialeah intermodal yard.

3.2 State level: Encourage the development of distribution centers connected to PortMiami by intermodal transport following the model of the State of Georgia and the Port of Long Beach (California).

(4) Loss of viability in the transshipment industry (Medium Priority)

International ports including Freetown, Bahamas and Kingston, Jamaica have come to dominate the transshipment business, which is built around the activity of transferring cargo from larger vessels to smaller vessels en route to another port. The main form of transshipment—in which the goods never leave the port facilities—declined tremendously after
new security rules following the 9/11 attacks. However, the primary reason for the decline of this activity in U.S. ports, including Miami, is federal regulation. The Jones Act of 1920 requires that all goods shipped between seaports in the U.S. be carried by vessels built in the U.S. and owned and operated by U.S. citizens. Because very few ships are registered in the US and because there are increasingly few U.S. merchant sailors, ports like Miami are largely unable to engage in the domestic transshipment business.

Recommendations:

4.1 Federal level: Investigate regulatory changes to enable additional international transshipment without undermining security; overturn provisions within the Jones Act to enable U.S. goods from any ship to be carried in between U.S. seaports.

(5) Vulnerability to extreme weather and climate change (Longer-term Priority)

The Miami-Dade Climate Change Advisory Task Force (CCATF) predicted a rise in sea level of at least 1.5 feet. Even at the least extreme end of their prediction, the port—which is classified as part of a “highest vulnerability low-lying area,”—would experience frequent flooding and periods of inoperability.

Recommendations:

5.1 Cluster level: To maintain the viability of the port in the face of such changes as well as increasingly likely extreme weather, the Port should evaluate the structural integrity of key facilities and consider raising parts of Dodge Island’s elevation from 7.5 feet to 10 feet (FEMA’s recommended minimum base elevation for the foundations of coastal structures). Promoting technological advances and “green” transport to bring the carbon footprint down will be important in the short and long terms.
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**Required Disclosures:**

Two team members have lived for extended periods in Florida, one of whom is from Miami. This team member traveled to Miami during the project period.