Latin American Update: Innovation

AAPA Finance Seminar
New Orleans, Louisiana
April 8, 2014
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Moffatt & Nichol Economics Group
Moffatt & Nichol Background

- ENR Top 100 company, founded in 1945 in Long Beach, California
  - Offices: North America, South America, Central America, Europe, Middle East, and the Pacific Rim
  - More than 600 Employees

- M&N combines the expertise of technical and commercial specialists gained over 65 years of planning and engineering experience on over 8,000 projects:
  - Freight planning and market analysis
  - Economic analyses of investment/privatization
  - Strategic development plans
  - Port selection/network analysis
  - Coastal engineering
  - Port and waterside construction (marinas)
  - Terminal design for freight and passenger movement
  - Railroads and capacity expansion
  - Environmental issues/emission modeling

American Society of Civil Engineers
John G. Moffatt – Frank E. Nichol Harbor and Coastal Engineering Award
Summary

**Ugly**
- Dependent on raw material exports
- Dependent on Asian demand but competing with Asian suppliers
- Africa is resource rich and an emerging competitor
- Borrowed in US$ to finance infrastructure

**Bad**
- Ports have long dwell times and slow truck turn times
- Intermodal freight is the exception not the rule
- Regulatory frameworks discourage investors

**Good**
- Manufactured goods exports (near-shoring) are growing
- Dredging in most major and many minor LatAm ports
- Panama Canal expansion
- Ambitious plans for freight infrastructure improvements
LatAm is a young region in an aging world

Economic growth is driven by population and output per capita growth. Countries with younger populations grow faster than countries with older populations. Younger people spend more of their money on goods than on services. UN demographic projections indicate LatAm has a younger population than most regions and is estimated to remain one of the “youngest” for many decades.

Source: International Monetary Fund, Moffatt & Nichol
LatAm population growth 2010-2030
Overall population growth is estimated to be 19%, increasing the population to 700 million

If not China, then where?

It is unlikely that manufactured goods which are labor intensive will be manufactured in the US. South/Southeast Asia and Central America appear to be well-positioned to take up the slack. South/SE Asia favors East Coast ports. Central America, Mexico in particular could hurt port volumes.

Manufacturing Wage Comparisons in US$ in 2008 and 2012E

Low wages in Latin America indicate they are prime locations for “near-sourcing”

Low wages in South and Southeast Asia indicate they are prime locations for off-shoring
The Panama Canal is a major LatAm direct and feeder services link
A substantial share of Latin America’s global trade flows through the Panama Canal. The southern half of the East Coast of South America connects via the Cape of Good Hope.

Source: ACP, Moffatt & Nichol
Existing and new dimensions of Panama Canal locks and ships

Maximum size of vessels in existing Locks: 4,400 – 5000 TEU

Maximum size of vessels in new locks: 13,200 TEU

Source: Panama Canal Authority
Latin America’s Port Infrastructure: Top Down Perspective
Countries with better ports, hinterland connectivity and direct services to major ports have higher export contributions to GDP.

Export Contribution to GDP

Source: World Trade Organization, International Monetary Fund, Moffatt & Nichol
Latin America’s Port Infrastructure Is Rated Below Average

Port investment in Latin American has been increasing, but sufficient channel capacity, productivity and berthing delays continue to be an issue.

Source: World Bank
Larger container, bulk and ro-ro vessels are gaining share
Ocean carriers are ordering larger vessels to offset fuel costs and remain competitive. Ports everywhere need to be able to turn ships much faster than ever before via densification, automation and dwell time reduction.

Global Container Vessel Fleet Composition by Capacity

<table>
<thead>
<tr>
<th>% &gt; 10K TEUs</th>
<th>Jul-13</th>
<th>Jan-14</th>
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<tbody>
<tr>
<td>Fleet</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Order Book</td>
<td>44%</td>
<td>51%</td>
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"Post-Panamax"

"Panamax"

Source: Alphaliner
Mexico is developing an impressive track record of infrastructure investment milestones, not just new marine terminals and dredging, but rail investments and highway improvements. However, recent policy announcements give pause.

Source: New York Times
Colombia’s Trade is Diversifying

Imports of consumer and construction related goods have grown, but exports of mining, agriculture and industrial products remain large, staple trade volumes

**Development Curve**

Emerging Economies:
- Industrial production for local consumption
- Low consumer related import demand
- Limited international trade except for naturally endowed commodities

Developing Economies:
- Investment in freight movement infrastructure
- International trade growth mixed with export volumes of manufactured and naturally endowed goods, as well as growing import volumes of construction and consumer related goods

Source: Dane, UN ComTrade
Santos handles 780,000 tons of goods a day and is severely congested. The average wait time for vessels arriving in Santos is about 3 days. Due to inland infrastructure issues, it can take about 7 days to get shipments into and out of the terminals. The dwell time for containers is 21 days, while internationally this would take 2-4 days. Truckers may also need to wait 12-24 hours outside of ports, and this leads to extra costs and knock-on effects for all cargo moving through the ports, including finished vehicles. The Port of Long Beach targets one hour turnaround time for trucks.
Brazil Is making a major infrastructure development policy change

Brazil’s exports have underperformed but a major infrastructure development policy is in the process of being rolled out. Panama Canal expansion could be a game changer for Brazilian soy exports as the government seeks to develop inland ports on rivers feeding into the Amazon River for transshipment to large bulkers transiting the canal.
Brazil could overcome US agricultural export competitiveness

Agricultural productivity is rising in the Americas but weakening in Asia. The US can benefit from this, if US can get products to the market, but its competitors are gaining. Brazilian exports are likely to benefit from the Panama Canal expansion. Press reports indicate Brazil soy exports could decline 34% and have a $180 per ton advantage from the Cerrado to Shanghai over Davenport to Shanghai.

<table>
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<tr>
<th>Costs of transporting soybeans, U.S. vs. Brazil. Price per metric ton in 2012 – Q3</th>
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<tbody>
<tr>
<td>Davenport to Shanghai</td>
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<tr>
<td>-----------------------</td>
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<tr>
<td>Truck</td>
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<td>Barge</td>
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<td>Rail</td>
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<td>Ocean</td>
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<td>Total Transportation</td>
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<td>Farm Value</td>
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<td>Customer Cost</td>
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Source: U.S. Department of Agriculture
Infrastructure investment obstacles in LatAm

BNamericas surveyed participants in LatAm infrastructure to identify the main obstacles. If these can be overcome... look out above!
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Moffatt & Nichol was founded in 1945 to provide engineering and consultancy services to the world's maritime industry.

Today, Moffatt & Nichol supports port and maritime projects, transportation infrastructure, coastal and environmental restorations, and waterfront developments worldwide.

Our capabilities allow us to take a project from conception, through the critical study and analysis process and on to design, engineering and program management. Clients can expect thoroughly integrated projects, completed under exacting quality control standards, with the innovation and creativity for which our firm is known worldwide.

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