Containers port planning issues: Containerization determinants and bigger vessels arriving to Latin America and the Caribbean.

Ricardo J. Sánchez
Senior Economic Affairs Officer
International Trade, Infrastructure and Integration Division
United Nations Economic Commission for Latin America and the Caribbean
Source: UN ECLAC (2019); International Trade Outlook for Latin America and the Caribbean 2019: Adverse global conditions leave the region lagging further behind.
Trade: growth and behavior in 2019

Source: Clarksons, various editions.

*Note: Latin America includes Asia, North America, Europe-Latin America.

Source: Dynaliners
The evolution of containership nominal capacity & world and LAC throughput

Source: For Latin America, Maritime & Logistics Profile; For the world, Clarksons, various editions.
In 2010: all estimates were made on the basis of nominal capacity in TEU.

In 2019: estimates were made for TEU, LOA and DWT.

In the case of **TEU** estimation, the following models were used:

- Model 3: this is a pooled model in which the dynamic aspect is included through the incorporation of the lagged dependent variable.
- Model 5: is an error correction model for the east coast.
- Model 7: is an error correction pooled model.

For the **LOA** estimation, a pooled model in which the dynamic aspect is included through the incorporation of the lagged dependent variable.
Some explaining variables

➢ **Total port activity (Pa)**
Port activity (throughput) represents the amount of cargo attended in ports on the East and West coasts, respectively, and is measured in TEUS. As a derived demand from economic activity, the port activity shows a similar behavior with global GDP.

➢ **Gap with main trade routes (Gap)**
The gap with the main trade routes denotes the percentage difference between the maximum size (in TEUS or LOA) of the vessels that arrive to South America and those that, in the same period of time, navigate the main global trade routes.
Models with TEU

Model 3

\[ \text{MAX}_{\text{SAE}} = -245.84 - 745.17 + 0.77 \times \text{MAX}_{\text{SAE}}(-1) + 267.04 \times \text{PA}_{\text{SAE}} + 328.26 \times \text{GAP}_{\text{SAE}}(-3) \]

\[ \text{MAX}_{\text{SAW}} = 245.84 - 745.17 + 0.77 \times \text{MAX}_{\text{SAW}}(-1) + 267.04 \times \text{PA}_{\text{SAW}} + 328.26 \times \text{GAP}_{\text{SAW}}(-3) \]

Model 5

\[ D(\text{MAX}_{\text{SAE}}) = 1919.74 - 0.68 \times \text{MAX}_{\text{SAE}}(-1) + 427.72 \times \text{PA}_{\text{SAE}}(-1) + 0.79 \times D(\text{MAX}_{\text{SAE}}(-1)) + 1.06 \times D(\text{MAX}_{\text{SAE}}(-2)) - 853.97 \times D(\text{PA}_{\text{SAE}}(-1)) - 1193.55 \times D(\text{PA}_{\text{SAE}}(-2)) - 891.95 \times D(\text{PA}_{\text{SAE}}(-3)) - 423.78 \times D(\text{PA}_{\text{SAE}}(-4)) + 835.74 \times D(\text{GAP}_{\text{SAE}}(-2)) - 1068.50 \times D(\text{GAP}_{\text{SAE}}(-4)) \]

Model 7

\[ D(\text{MAX}_{\text{SAW}}(-0)) = -0.35 \times \text{MAX}_{\text{SAW}}(-1) + 396.64 \times \text{PA}_{\text{SAW}}(-1) - 0.67 \times D(\text{MAX}_{\text{SAW}}(-3)) - 169.63 \times D(\text{PA}_{\text{SAW}}(-2)) - 442.42 \times D(\text{GAP}_{\text{SAW}}(-1)) - 414.40 \times D(\text{GAP}_{\text{SAW}}(-3)) + 375.23 \]

\[ D(\text{MAX}_{\text{SAE}}(-0)) = -0.35 \times \text{MAX}_{\text{SAE}}(-1) + 396.64 \times \text{PA}_{\text{SAE}}(-1) - 0.67 \times D(\text{MAX}_{\text{SAE}}(-3)) - 169.63 \times D(\text{PA}_{\text{SAE}}(-2)) - 442.42 \times D(\text{GAP}_{\text{SAE}}(-1)) - 414.40 \times D(\text{GAP}_{\text{SAE}}(-3)) - 450.01 \]

Model with LOA

\[ \text{LOAMAX}_{\text{SAE}} = -2.90 + 1.88 + 0.80 \times \text{LOAMAX}_{\text{SAE}}(-1) + 7.51 \times \text{PA}_{\text{SAE}}(-1) - 6.77 \times \text{PA}_{\text{SAE}}(-3) + 122.85 \times \text{GAP}_{\text{LOA}_{\text{SAE}}}(-1) + 37.62 \times \text{GAP}_{\text{LOA}_{\text{SAE}}}(-2) - 89.94 \times \text{GAP}_{\text{LOA}_{\text{SAE}}}(-3) + 2.48 \times \text{TREND} \]

\[ \text{LOAMAX}_{\text{SAW}} = 2.90 + 1.88 + 0.80 \times \text{LOAMAX}_{\text{SAW}}(-1) + 7.51 \times \text{PA}_{\text{SAW}}(-1) - 6.77 \times \text{PA}_{\text{SAW}}(-3) + 122.85 \times \text{GAP}_{\text{LOA}_{\text{SAW}}}(-1) + 37.62 \times \text{GAP}_{\text{LOA}_{\text{SAW}}}(-2) - 89.94 \times \text{GAP}_{\text{LOA}_{\text{SAW}}}(-3) + 2.48 \times \text{TREND} \]
Evolution and projections of the maximum size of containerships in the world and east coast and west coast in Latin America (2010 study)

Model with LOA

Assumptions

<table>
<thead>
<tr>
<th>Pa_saw</th>
<th>Pa_sae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical</td>
<td>6%</td>
</tr>
<tr>
<td>Positive</td>
<td>7%</td>
</tr>
<tr>
<td>Negative</td>
<td>5%</td>
</tr>
<tr>
<td>Negative_2</td>
<td>3%</td>
</tr>
</tbody>
</table>

Historical Projection

Positive scenario

Negative scenario 1

Negative scenario 2
MODEL with TEU: Evolution and projections of the maximum size of containerships in the world and ECSA and WCSA (2019 study)

World megaships ports

South hemisphere? NCSA-WCSA: Cartagena, Posorja, Callao?
Current situation ECSA
GDP and containers (teu) per capita
### Spearman correlation (model 3)

<table>
<thead>
<tr>
<th></th>
<th>rate</th>
<th>urbanpop</th>
<th>LSCI</th>
<th>fdi</th>
<th>ga</th>
<th>ICEp</th>
<th>ICImp</th>
<th>MHVAsh-2</th>
<th>rhcepib2</th>
</tr>
</thead>
<tbody>
<tr>
<td>rate</td>
<td>1.0000</td>
<td>0.2261*</td>
<td>0.0000</td>
<td>519</td>
<td>519</td>
<td>519</td>
<td>519</td>
<td>519</td>
<td>519</td>
</tr>
<tr>
<td>urbanpop</td>
<td>0.2261*</td>
<td>1.0000</td>
<td>0.0000</td>
<td>519</td>
<td>519</td>
<td>519</td>
<td>519</td>
<td>519</td>
<td>519</td>
</tr>
<tr>
<td>LSCI</td>
<td>0.2658*</td>
<td>0.2708*</td>
<td>1.0000</td>
<td>348</td>
<td>348</td>
<td>348</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>fdi</td>
<td>0.1664*</td>
<td>0.0818</td>
<td>-0.1636*</td>
<td>1.0000</td>
<td>519</td>
<td>519</td>
<td>519</td>
<td>522</td>
<td>0.0022</td>
</tr>
<tr>
<td>ga</td>
<td>0.4803*</td>
<td>-0.2912*</td>
<td>-0.1391*</td>
<td>0.3014*</td>
<td>1.0000</td>
<td>519</td>
<td>348</td>
<td>519</td>
<td>519</td>
</tr>
<tr>
<td>ICEp</td>
<td>0.1344*</td>
<td>0.0209</td>
<td>-0.4569*</td>
<td>0.2782*</td>
<td>0.2262*</td>
<td>1.0000</td>
<td>519</td>
<td>519</td>
<td>519</td>
</tr>
<tr>
<td>ICImp</td>
<td>0.4330*</td>
<td>-0.2204*</td>
<td>-0.0281</td>
<td>0.0970*</td>
<td>0.4701*</td>
<td>0.3259*</td>
<td>1.0000</td>
<td>519</td>
<td>519</td>
</tr>
<tr>
<td>MHVAsh_ind-2</td>
<td>0.2479*</td>
<td>0.1914*</td>
<td>0.6019*</td>
<td>-0.3189*</td>
<td>0.1156*</td>
<td>-0.3508*</td>
<td>0.1018*</td>
<td>1.0000</td>
<td>519</td>
</tr>
<tr>
<td>rhcepib2</td>
<td>-0.4162*</td>
<td>-0.0716</td>
<td>-0.2929*</td>
<td>-0.1428*</td>
<td>-0.3821*</td>
<td>0.1275*</td>
<td>-0.2293*</td>
<td>-0.3433*</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

|       | 0.0000 | 0.1031 | 0.0000 | 0.0011 | 0.0000 | 0.0036 | 0.0000 | 0.0000   | 0.0000   |

- *: Significant at the 0.05 level

### Key

- rho
- Number of obs
- Sig. level
Thanks a lot !!!

Ricardo J. Sánchez
Senior Economic Affairs Officer
United Nations Economic Commission for Latin America and the Caribbean

+56 2 2210-2257
Ricardo.SANCHEZ@UN.org
http://www.eclac.org/transporte