An Overview of Import Supply Chains

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Elements of Asia – USA Supply Chains

- Asian Factories
  - Vessel to Port of Entry
  - Local Regional Distribution Center (RDC)
    - Import warehouses
      - Cross-docks (optional stage)
    - Local RDC
  - Domestic Rail or Truck to other Regions
  - Local RDCs in other Regions
  - Retail Outlets in other Regions
- Retail Outlets
  - Domestic Container/Trailer

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Asia – USA Imports
April 21, 2010
## What’s in the import containers?

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Percent of Total Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture &amp; Bedding</td>
<td>17.1%</td>
</tr>
<tr>
<td>Electronics</td>
<td>8.3%</td>
</tr>
<tr>
<td>Machinery</td>
<td>8.0%</td>
</tr>
<tr>
<td>Toys, Games &amp; Sporting Goods</td>
<td>7.5%</td>
</tr>
<tr>
<td>Clothing</td>
<td>6.8%</td>
</tr>
<tr>
<td>Auto Parts &amp; Motorcycles</td>
<td>6.1%</td>
</tr>
<tr>
<td>Plastic Goods</td>
<td>5.0%</td>
</tr>
<tr>
<td>Steel Goods</td>
<td>3.9%</td>
</tr>
<tr>
<td>Shoes and Boots</td>
<td>3.5%</td>
</tr>
<tr>
<td>Leather Goods (Handbags)</td>
<td>2.4%</td>
</tr>
<tr>
<td>Rubber Goods</td>
<td>3.3%</td>
</tr>
<tr>
<td>Wooden Goods</td>
<td>2.3%</td>
</tr>
<tr>
<td>All other</td>
<td>26.0%</td>
</tr>
</tbody>
</table>

Source: PIERS, WTA and PMA 2005 data
Value Distribution of 2005 Asia - USA Waterborne Containerized Imports

Percentage of Total TEUs

Declared Value ($ per cu. ft.)

- 0.0% - 4.0%
- 4.0% - 8.0%
- 8.0% - 12.0%
- 12.0% - 16.0%
- 16.0% - 20.0%
- 20.0% - 24.0%
- 24.0% - 28.0%
- 28.0% - 32.0%
- 32.0% - 36.0%
- 36.0% - 40.0%
- 40.0% - 44.0%
- 44.0% - 48.0%
- 48.0% - 52.0%
- 52.0% - 56.0%
- > 56.0%

- 0.00% - 10.00%
- 10.00% - 20.00%
- 20.00% - 30.00%
- 30.00% - 40.00%
- 40.00% - 50.00%
- 50.00% - 60.00%
- 60.00% - 70.00%
- 70.00% - 80.00%
- 80.00% - 90.00%
- 90.00% - 100.00%

- 25% Inexpensive Imports
- 25% Moderate-value Imports
- 50% Expensive Imports

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Box Types

• **Marine container** - holds up to 2,700 cu. ft. of cargoes

• **Domestic container or trailer** - holds up to 4,000 cu. ft. of cargoes

• Transportation savings – contents of 5 marine containers can fit in 3¼ domestic containers
Marine Stack Train
Domestic Stack Train
Alternative Supply Chains

• **Push System (a.k.a. Direct shipping)**
  - ship marine boxes directly from Asian factories to RDCs
  - Offers low transportation and handling cost

• **Push-Pull System (a.k.a. Consolidation - Deconsolidation)**
  - operate import warehouses and cross-docks at port(s) of entry, allocate imports and re-ship to RDCs in domestic boxes
  - Offers low inventory cost
  - Variants: Push-Pull - All at San Pedro Bay, Push-Pull - Four Corners, Push-Pull Five Corners
Push Supply-Chain Strategy

- Potential port of entry
- Regional distribution center

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Push-Pull Supply Chain – All at San Pedro Bay

Potential port of entry
Regional distribution center
Comparison of Supply Chain Strategies

- Push Systems offer low transportation and handling costs, while Push-Pull Systems offer low inventory costs.
- Each strategy suitable for different markets:

<table>
<thead>
<tr>
<th></th>
<th>Push-Pull 4 or 5 Corners</th>
<th>Push-Pull All at San Pedro Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheapest Imports</td>
<td>Moderate-value Imports (50% of total)</td>
<td>Expensive Imports (25% of total)</td>
</tr>
<tr>
<td>(25% of total at present)</td>
<td>(50% of total)</td>
<td></td>
</tr>
</tbody>
</table>
## Who Uses What Supply Chain

<table>
<thead>
<tr>
<th>Push</th>
<th>Push-Pull 4 or 5 Corners</th>
<th>Push-Pull All at San Pedro Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nation-wide Importers of Inexpensive Goods</td>
<td>Large Nation-wide Importers of Moderate-value Goods</td>
<td>Original Equipment Manufacturers of Expensive Goods (Nation-wide sales)</td>
</tr>
<tr>
<td>Small and Regional Importers</td>
<td></td>
<td></td>
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</tbody>
</table>

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Asia - USA Imports
Import Mix at San Pedro Bay

53% Push

47% Push - Pull

(Nation-wide, it’s 64% Push, 36% Push-Pull)
Import Mix at San Pedro Bay (cont.)

- Inland Point Intermodal (IPI) 41% (marine box leaves region on train)
- Local Region 23% (imports consumed in greater local region)
- Trans-load/Re-shipment 36% (imports leave region in domestic containers or trailers)
A “Big-Box Stores” Example

- **500 boxes** off-loaded from vessel containing goods ultimately sold by Big-Box Stores, Inc.
- **100 OEM boxes** of expensive goods
- **30** drayed to local RDC (Local Consumption)
- **110** IPI (Out of Region Consumption)
- **100** drayed to OEM import warehouses
- **28** Domestic containers drayed to rail ramps
- **14** Trailers trucked out of region
- **63** Domestic containers drayed to rail ramps
- **6** Trailers trucked out of region
- **170** drayed to Big-Box import warehouse
- **110** IPI (Out of Region Consumption)
- **3** drayed to local RDC (Local)
- **18** Trailers drayed to local RDC
- **140 boxes** of inexpensive goods (Push)
- **260 boxes** of moderate-value goods (Push-Pull 5 Corners)
- **81** drayed to cross-dock
- **260 boxes** of moderate-value goods (Push-Pull 5 Corners)
- **140 boxes** of inexpensive goods (Push)
- **37** Trailers drayed to local RDC
- **54** domestic containers drayed to rail ramps
- **8** Trailers drayed to local RDC
- **6** Trailers trucked out of region
- **140 boxes** of inexpensive goods (Push)
- **260 boxes** of moderate-value goods (Push-Pull 5 Corners)
- **140 boxes** of inexpensive goods (Push)
Re-cap of the Big-Box Example

• Out of 500 containers for Big-Box arriving on a vessel:
  - 116 went IPI
  - 33 drayed to the local RDC
  - 270 drayed to import warehouses
  - 81 drayed to cross-docks

• From the import warehouses and cross-docks:
  - 63 domestic trailers drayed to Big-Box’s local RDC
  - 24 domestic trailers trucked out of region
  - 145 domestic containers drayed to rail ramps

• Even if all 116 IPI boxes are handled on-dock, the other 384 boxes for Big-Box generate **616 truck trips** in the Basin, not counting deadheads to pick up and return empties, and not counting distribution from the RDC!
Capacity and Congestion

• Port terminals, rail terminals, freeways, rail lines, warehouses
  - As more volume is added to a given capacity, congestion grows and container flow times stretch out
  - How much they stretch out is a function of variability
Capacity and Congestion (cont.)

- Port terminals are especially sensitive
  - Drays are mostly controlled by consignees
  - Some importers have negotiated a lot of free time
Policy Implications

- To serve large importers well, the whole portfolio of landside services is needed: IPI, cross-docks, import warehouses, domestic-container rail ramps
- There is an awful lot of local trucking for Push-Pull imports (1.6 trips per imported box)
Policy Implications (cont.)

- At present, nation-wide, Push is 64% and Push-Pull is 36% (resulting in them being about equal at San Pedro Bay)
- But what happens after interest rates rise? After the Asian currencies are re-valued? After the market shares of the large, nation-wide retailers increase?
Value Distribution of 2005 Asia - USA Waterborne Containerized Imports

- 25% Expensive Imports
- 25% Inexpensive Imports
- 50% Moderate-value Imports

Percentage of Total TEUs

Declared Value ($ per cu. ft.)

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Asia - USA Imports

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Value Distribution of Asia - USA Containerized Imports, 2005 Actual vs. After 15% Increase in Values

- **19%** Inexpensive Imports
- **49%** Moderate-value Imports
- **32%** Expensive Imports

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Policy Implications (cont.)

• At present, nation-wide, Push is 64% and Push-Pull is 36% (resulting in them being about equal at San Pedro Bay)

• But what happens after interest rates rise? After the Asian currencies are re-valued? After the market shares of the large, nation-wide retailers increase?
  – More Push-Pull!
Policy Implications (cont.)

• Local trucking is going to rise faster than imports rise, if:
  – More Push-Pull
  – New warehouses are located further away

• Should we take facilities location as a given?

• Or should we try to promote re-engineering of the supply chains for more efficiency?
  – More in the policy discussion …