TCO/Reshoring: Simplify your Lean Journey, Improve Employee Morale

Lean Accounting & Management Summit

Harry Moser
Founder & President
Reshoring Initiative

Some Definitions

- **Reshoring/Backshoring/Onshoring/Insourcing:** Bringing back manufacture of products that will be sold or assembled here.
- **FDI:** Similar logic. Different owner.
- **Localization:** Producing near the consumer.
- **Nearshoring:** Mexico or Canada.
- **Biggest beneficiary:** U.S.
Relevant Trends

- **eCommerce**: Requires immediate replenishment
- **Rapid design changes**: Need to test products, collaborate with influencers, fulfill consumer expectations
- **Advanced technologies**: Minimizes impact of higher wages. Lessens production time
- **Heavy retail discounting**: Requires lower inventory, smaller MOQ
- **Rising offshore wages**: Reduces the price gap
- **Preference for Made in USA**: Helps with volume/margin
- **Mass and local customization**: Requires quick response
- **Lean**: Commitment to eliminating waste

Sources: Mostafiz Uddin, Dhaka Tribune; Bill D’Arienzo, Apparel Magazine; Janice Wang, Sourcing Journal

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The Tide Turned in 2016

<table>
<thead>
<tr>
<th>Manufacturing Jobs/Year</th>
<th>2000-2003 Annual Average</th>
<th>2016</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Offshoring</td>
<td>~240,000</td>
<td>~50,000</td>
<td>-75%</td>
</tr>
<tr>
<td>New Reshoring &amp; FDI</td>
<td>12,000</td>
<td>77,000</td>
<td>+ 500%</td>
</tr>
<tr>
<td>Net Jobs Gained</td>
<td>~-220,000</td>
<td>~27,000</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Reshoring and FDI Mfg. Jobs Announcements

Year

1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017

Historical

Current

Expon. (Historical)

BLS Manufacturing Employment, 000s

y = 18486e^{-0.401x}

R² = 0.9123

Manufacturing is Beating the Trend
Flawed Company Sourcing Models

60% of manufacturers:
- Apply “rudimentary” total cost models
  - Wage Arbitrage
  - PPV (Purchase Price Variance)
  - Landed Cost
- Ignore 20% or more of the total cost of offshored products

Also applies to BOP, call centers & IT

Source: Archstone Consulting survey, American Machinist Mag., 7/16/09

US: Unit labor costs in manufacturing in US$

Source: Oxford Economics/Haver Analytics
The Industry-Led Reshoring Initiative Provides

- Online Library of 5,400+ reshoring articles
- Case Study template for posting cases.
- Motivation for skilled manufacturing careers
- Summary of 15 surveys on consumer preference for Made in USA
- Free Total Cost of Ownership (TCO) software for:
  - Companies for sourcing
  - Suppliers of parts and equipment for selling

TCO Comparison Example
Chinese ex-Works Price, % of U.S.

Source: Reshoring Initiative TCO Estimator user database

Chinese Price and TCO, % of U.S.
CDF (Cost Differential Frontier)

What is the real value of producing close to demand?

- Based on lead time and variability in order rates
- Quantifies the cost of excess inventory, obsolescence and lost orders
- Developed by Prof. Suzanne de Treville, Univ. of Lausanne
- Can add 15% to 20% to the offshoring costs identified by the TCO Estimator

http://cdf-oplab.unil.ch/
Retail/Consumer Products: Reshoring Saves $ & Creates Customer Value

- Retail’s stockout/overstock losses: worldwide $1.1 trillion/year / U.S. $250 Billion/year
- Smaller runs of garments that sell at full-price are better than volume runs of garments that have to be sold at discount.
- Reshoring’s emotional connection with consumers is delivered by how, where and by whom the product is made
- Documenting the societal benefits of reshored products → more sales at higher prices

Sources: Various. Available.

Customers Value Made in USA

How important is it to you that the clothing you buy is "Made in the USA?"

John Shook on Total Cost

“it was also the inability to see the total costs—the engineers in the U.S. and factory managers in China who can’t talk to each other; the management hours and money flying to Asia to find out why the quality they wanted wasn’t being delivered. The cost of all that is huge.”


Deming on Total Cost

“End the practice of awarding business on the basis of price tag. Instead, minimize total cost.”

### Offshoring Multiplies Waste

<table>
<thead>
<tr>
<th>Toyota Wastes</th>
<th>Offshoring Contributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overproduction</td>
<td>Large batch shipments, filling containers</td>
</tr>
<tr>
<td>Waiting</td>
<td>Uncertain delivery/Inconsistent quality, port, customs, shared “awake time” window for discussions</td>
</tr>
<tr>
<td>Transport</td>
<td>12,000 mi. inbound, 6,000 return (boat ½ full)</td>
</tr>
<tr>
<td>Overprocessing</td>
<td>More packing and unpacking, customs paperwork</td>
</tr>
<tr>
<td>Inventory</td>
<td>In transit, cycle, safety stock, uncertain delivery and quality, less ability to check and count</td>
</tr>
<tr>
<td>Motion</td>
<td>Increased cost over time – repetitive motion injuries or additional labor to compensate</td>
</tr>
<tr>
<td>Defects</td>
<td>Higher than local sources, extra inspection (materials &amp; tolerances), customers unhappy longer</td>
</tr>
</tbody>
</table>

### Bringing Value to the Customer

- Measuring accurately eliminates waste and reveals opportunities.
- The customer puts value on quality, delivery, Made in USA, sustainability and price, not on Made in China.
- Why accept:
  - Complexity
  - Short and long term business and personal uncertainty
  - Waste
- The challenge is to use TCO to see for which products the values delivered and costs avoided by domestic sourcing offset the higher FOB price.
- Our tools help identify and quantify some less physically obvious wastes.
Walk the Whole Gemba

- I believe most U.S. companies focus their lean efforts on domestic operations.
- ≥50% of product, parts, etc. is imported, mostly from other companies.
- A lean effort by an offshore supplier will not question exporting to the U.S.
- By accepting the imports as a given and not using TCO, lean practitioners are ignoring most of the gemba.

Some Reshorners
Circuit Boards

- Woodridge, IL
- Supplies heavy equipment companies
- Had quality issue with a Chinese component
- Found local IL source
- Result:
  - Quality problem fixed
  - Inventory cut by 94%
  - $60M order

Negative Issues Offshore: Top 10

<table>
<thead>
<tr>
<th>Rank</th>
<th>Negative Reasons Offshore</th>
<th># of times cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality/rework/warranty</td>
<td>292</td>
</tr>
<tr>
<td>2</td>
<td>Freight cost</td>
<td>196</td>
</tr>
<tr>
<td>3</td>
<td>Total cost</td>
<td>147</td>
</tr>
<tr>
<td>4</td>
<td>Delivery</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>Inventory</td>
<td>91</td>
</tr>
<tr>
<td>6</td>
<td>Rising wages</td>
<td>88</td>
</tr>
<tr>
<td>7</td>
<td>Supply chain interruption risk/Natural disaster risk/Political instability</td>
<td>78</td>
</tr>
<tr>
<td>8</td>
<td>Intellectual property risk</td>
<td>64</td>
</tr>
<tr>
<td>9</td>
<td>Communications</td>
<td>61</td>
</tr>
<tr>
<td>10</td>
<td>Green Considerations</td>
<td>53</td>
</tr>
</tbody>
</table>

Source: Reshoring Initiative Library, December 2017
### Positive Reasons to Reshore: Top 10

<table>
<thead>
<tr>
<th>Rank</th>
<th>Positive Reasons to Reshore/FDI</th>
<th># of times cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Government Incentives</td>
<td>527</td>
</tr>
<tr>
<td>2</td>
<td>Proximity to customers/market</td>
<td>493</td>
</tr>
<tr>
<td>3</td>
<td>Skilled workforce availability/training</td>
<td>446</td>
</tr>
<tr>
<td>4</td>
<td>Image/brand Made in USA</td>
<td>398</td>
</tr>
<tr>
<td>5</td>
<td>Eco-system (supply chain) synergies</td>
<td>336</td>
</tr>
<tr>
<td>6</td>
<td>Lead time/Time to market</td>
<td>251</td>
</tr>
<tr>
<td>7</td>
<td>Infrastructure</td>
<td>239</td>
</tr>
<tr>
<td>8</td>
<td>Automation/technology</td>
<td>211</td>
</tr>
<tr>
<td>9</td>
<td>Manufacturing/engineering joint innovation (R&amp;D)</td>
<td>155</td>
</tr>
<tr>
<td>10</td>
<td>Higher productivity</td>
<td>141</td>
</tr>
</tbody>
</table>

Source: Reshoring Initiative Library, December 2017

### Benefits of Balancing the Trade Deficit

- Increase manufacturing: 40% (5M jobs)
- Restore the middle-class and SME manufacturers
- Strengthen skilled workforce recruitment
- Reduce global pollution
- Increase capital investment by ≈ 20% for 20 years
- Allow productivity and growth in mfg. employment
Virtuous Cycle: Reshoring/Productivity

Reshoring
Capacity Utilization
Competitiveness
Investment
Productivity

Reshoring and Skilled Workforce

Education Pays

Unemployment rate in 2011 (in %)

- Doctoral degree: 2.5%
- Professional degree: 2.4%
- Master's degree: 3.6%
- Bachelor's degree: 4.9%
- Associate degree: 6.8%
- Some college, no degree: 8.7%
- High school diploma: 9.4%
- Less than high school diploma: 14.1%

Average: 7.6%

Median weekly earnings in 2011 (in $)

- Doctoral degree: $1,551
- Professional degree: $1,665
- Master's degree: $1,263
- Bachelor's degree: $1,053
- Associate degree: $768
- Some college, no degree: $719
- High school diploma: $638
- Less than high school diploma: $451

Average: $797

### Local Skilled Workforce Recruitment

<table>
<thead>
<tr>
<th>Issue</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Trades” and “vocations” image</td>
<td>Call them “Professions”</td>
</tr>
<tr>
<td>Manufacturing career image due to offshoring</td>
<td>Help media report the local reshoring cases of the month. Use our Case Studies feature.</td>
</tr>
</tbody>
</table>

### Employee Morale

Concern for country, community, family, ethics, sustainability, transparency, job security

<table>
<thead>
<tr>
<th># of non-compliances seen</th>
<th>% looking to leave job</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>29%</td>
</tr>
<tr>
<td>1</td>
<td>59%</td>
</tr>
</tbody>
</table>

Source: Gartner survey [https://www.industryweek.com/talent/employees-likely-leave-job-if-they-see-compliance-violations?NL=IW-07&Issue=IW-07_20180820_IW-07_927&slvc4enews=42&cl=article_3&utm_rid=CPG03000001456438&utm_campaign=28643&utm_medium=email&elq2=16bcd1bf32874c12902e0a84c82d56e3](https://www.industryweek.com/talent/employees-likely-leave-job-if-they-see-compliance-violations?NL=IW-07&Issue=IW-07_20180820_IW-07_927&slvc4enews=42&cl=article_3&utm_rid=CPG03000001456438&utm_campaign=28643&utm_medium=email&elq2=16bcd1bf32874c12902e0a84c82d56e3)
**Objective:**
Policy Tide that Uniformly Lifts all Industries

<table>
<thead>
<tr>
<th>Policy</th>
<th>Model</th>
<th>Δ Price Advantage</th>
<th>Time to Implement, Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled Workforce</td>
<td>Germany and Switzerland</td>
<td>5%</td>
<td>10 - 20</td>
</tr>
<tr>
<td>15% Corp. Tax rate</td>
<td>Ireland</td>
<td>2%</td>
<td>1</td>
</tr>
<tr>
<td>15% VAT</td>
<td>≈ the World</td>
<td>15%</td>
<td>1</td>
</tr>
<tr>
<td>$ Down 20%</td>
<td>≈ the World</td>
<td>10%</td>
<td>3</td>
</tr>
<tr>
<td>Less Regulations</td>
<td>?</td>
<td>3%</td>
<td>5</td>
</tr>
<tr>
<td>Healthcare Costs Down 30%</td>
<td>Germany</td>
<td>3%</td>
<td>15</td>
</tr>
<tr>
<td>100% use TCO</td>
<td></td>
<td>10%</td>
<td>4</td>
</tr>
<tr>
<td>Make duty rates =</td>
<td></td>
<td>3%</td>
<td>3</td>
</tr>
<tr>
<td>Innovate / Automate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>51%</td>
<td></td>
</tr>
</tbody>
</table>
Chinese Price and TCO, % of U.S.

% of Cases vs Relative Price or TCO

- China Price % US
- China TCO % US

Relative Price or TCO: China % US

1% Price Reduction → ≥150,000 Mfg. Jobs

<table>
<thead>
<tr>
<th>Desired Goods Trade Deficit, % Reduction</th>
<th>Number of Mfg. Jobs Brought Back</th>
<th>Required Δ U.S. Price if Price Used</th>
<th>Required Δ U.S. Price if TCO Used</th>
<th>Time to Steady State*</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>1 million</td>
<td>-10%</td>
<td>0%</td>
<td>10 years</td>
</tr>
<tr>
<td>40%</td>
<td>2 million</td>
<td>-15%</td>
<td>0%</td>
<td>15 years</td>
</tr>
<tr>
<td>60%</td>
<td>3 million</td>
<td>-20%</td>
<td>-5%</td>
<td>20 years</td>
</tr>
<tr>
<td>80%</td>
<td>4 million</td>
<td>-25%</td>
<td>-10%</td>
<td>25 years</td>
</tr>
<tr>
<td>100%</td>
<td>5 million</td>
<td>-30%</td>
<td>-15%</td>
<td>30 years</td>
</tr>
</tbody>
</table>

* Mainly to develop the skilled workforce

Assumes: Gains only from reduced imports
Use MAC to Manage the $

- $ consistently overvalued
- MAC: Market Access Charge
- Charge foreign financial investors a market access fee when:
  - Dollar overvalued
  - Trade deficits
- MAC charge rises as trade deficit rises.
- MAC falls as trade deficit falls.
- Permanent trade balance, maximum employment, and benefits of global trade.

Source: Dr. John Hansen, International Economist, CPA

Selling using TCO:
Help the Customer see the Value

- Focus on profit impact, risk management, strategic benefits
- Ask about products that are causing the customer problems
  - Late deliveries, poor quality, intellectual property theft, excess inventory, lost orders and travel costs.
- Overcome mandates
- Work with natural allies:
  - Lean, Green, Compliance, Quality Champions
- Maximize the advantages of proximity
- Match “Chinese” price or ......?
Lean Investment using TCO

- By understanding:
  - The advantage of producing near the consumer, and
  - The small TCO gap instead of the large price gap
- U.S. companies can:
  - Justify domestic investment, process improvement, automation, training, etc.
- And do not have to sacrifice quality, delivery, time-to-market, or employees to be competitive and profitable.

Compete With Imports

- Import Substitution Program – Substitute domestic production for imports
- We can provide data on importers of the products you produce or could produce domestically:
  - Consignee company
  - Address
  - Product
  - Tons/year
  - $/year
  - Offshore supplier
- Train your team to sell using TCO
First National Sewn Products Reshoring Award

- Eligibility:
  - Sewn products
  - Contract manufacturers, brands/OEMs, textile producers
  - Reshored to the U.S.: 1/1/13 to 1/31/19
  - For apparel: Reshoring includes any significant new or increased production that inevitably replaces imports
- Application Site: [https://seams.org/reshoring-award/](https://seams.org/reshoring-award/)
- Deadline: January 21, 2019
- Announce Winner: 2019 SEAMS Spring Conference

Second Annual Metalworking Reshoring Award

- Sponsored by: AMT, NTMA, PMA and Reshoring Initiative
- Eligibility:
  - Process: Metal forming, fabricating, casting or machining, including additive machining
  - Reshored to the U.S.: 1/1/2013 and 12/31/2018
  - Reshored from outside N. America to N. America
  - OEMs/branded product companies and job shops/contract manufacturers.
- Apply: [www.amtonline.org/reshoringaward](http://www.amtonline.org/reshoringaward)
- Deadline: 1/31/19
- Winner announced: MFG Meeting, 3/8/19
BOP Reshoring Research Project

- Purpose: Show that Back Office Processing can also be reshored
- Seeking company to participate
- During the research period:
  - Free Robotic Process Automation Software
  - 75% discount on consulting
- Expectation:
  - Ongoing annual cost 50% below offshore
- Criteria:
  - Offshoring $150,000+/year
  - Accounting, HR or IT
  - Must document results

Cooperation

- Would love to cooperate with attendees on:
  - Testing:
    - Made-in-USA impact on volume and price
    - How to help consumers find Made-in-USA products
  - Documenting reshoring cases
  - Enabling reshoring
  - Incorporating TCO in your lean efforts
Questions for you!
Mark and Pass in your Business Cards!

- Who:
  - Wants to reevaluate offshoring? A
  - Has a reshoring case to report? B
  - Might compete for an Award? C
  - Is interested in BOP study? D
  - Would cooperate in market test? E

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- MSSC
- STARRAG
- SEAMS
- WIM
- Women in Manufacturing
- LEGACY

Use TCO. Reshore. Simplify your Lean Journey!

Contact:
Harry Moser
Founder and President
847-867-1144
harry.moser@reshorenow.org
www.reshorenow.org

Useful links:
- ACETool
- Cost Differential Frontier
- Total Cost of Ownership Estimator™
- Skilled Workforce
- Economic Development