

## What is the Tipping Point for Bringing Back Production to the Domestic Market?

**Logistics Costs as Percent of Total and Infrastructure Costs are the Two Key Drivers, says MIT's David Simchi-Levi**

SCDigest Editorial Staff

With the dramatic rise in fuel prices and thus transportation costs, there is growing evidence that some companies are relooking at the numbers and in some cases deciding to bring back production from Asia to domestic sources or "nearshore" low cost countries, such as Mexico for the US or Eastern European countries for Europe.

"For every company and product, there is of course a "tipping point" where rising logistics costs negate the unit cost advantages of China or other Asia countries," says **Dr. David Simchi-Levi** of MIT, who has been doing research in this area.

Earlier this year, Simchi-Levi did an analysis for Supply Chain Digest that showed how rising transportation costs would impact optimal network design as the price of oil reached progressively higher levels. (See [Oil Prices and Supply Chain Network Design](#).) In one case, using real customer data, the analysis showed that as the price of oil went over \$150 per barrel, triggering a corresponding increase in transportation costs, one consumer goods company should move a substantial amount of production volume from Mexico to a factory in Omaha to have the lowest total supply chain cost. Even though the US unit manufacturing costs were higher, they were offset by lower shipping costs to customers.

"Now, what we are starting to see is that what we predicted might happen then actually beginning to occur," Simchi-Levi said. He added that he has seen a number of companies that either put Asian offshoring plans on hold or in some cases brought production back to domestic or nearshore sources.

***Simchi-Levi says that to facilitate this analysis, it is helpful to consider two variables in a simple 2 by 2 matrix. First, are logistics costs to move products from Asian factories as a percent of total supply chain costs high or low? Second, are the costs or barriers to move infrastructure from Asia high or low?***

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### Impact of Logistics Costs

Simchi-Levi said he has been looking at a variety of macro-economic data for the past 4-5 years. He said that during that time, transportation costs have risen by about 40% - and not surprisingly, inventory carrying costs have also risen about 50%.

Why? In the constant trade-off between transportation and inventory costs, rising fuel costs ultimately mean it is cheaper on the margin to hold more inventory if doing so can reduce other logistics costs.

### Two Decision Drivers

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**Offshore to Onshore Decision Drivers**

<b>Cost to Move Infrastructure</b>	High	Unlikely to be moved back	In-between case
	Low	In-between case	Most likely candidates for move back from Asia
		Low	High
		<b>Transportation Costs As Percent of Total Supply Chain Cost</b>	

Adapted from discussion with Dr. David Simchi-Levi, MIT

matrix. First, are logistics costs to move products from Asian factories as a percent of total supply chain costs high or low? Second, are the costs or barriers to move infrastructure from Asia high or low?

While each company may define the boundaries differently, such as matrix can be used to visually assess where a companies products fall. For example, products with high logistics costs as a percent of total costs and with low costs or barriers to moving the infrastructure are the prime candidates for moving sourcing back from Asia. Conversely, products with low logistics costs and high costs to move infrastructure likely won't make sense to reconsider.

Those products in-between the two extremes

need to be evaluated in even more detail, though in some cases the inability to move the infrastructure may preclude any sort of move. For example, if the domestic supplier base is gone, it may be impractical to return to domestic sourcing even if the physical factory itself could be easily and cheaply reconstituted in the home country.

"If logistics costs are relatively low a percent of total supply chain costs, then clearly even a substantial rise in those costs is not likely to have a large impact on optimal sourcing decisions," said Simchi-Levi.

Simchi-Levi says he has already seen makers of products such as furniture and televisions bring production back from Asia to either the US or Mexico. In the case of furniture, the primary factor is high

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relative logistics costs. With high end televisions, it is part logistics costs, and part the cost of the long lead times associated with Asian sourcing.

"With flat panel televisions, for example, the market price can decline by as much as 8-10% per month," Simchi-Levi said. "So, with 40-50 day cycle time from China, the product could lose 15% of its value. With Mexican sourcing, the cycle time may be only 7 days, and there is little loss in the value of the inventory."

Simchi-Levi says we are early in this trend, and it is not clear, especially with volatile oil prices, how permanent it will be. However, he said it is important for companies to be aware of the "tipping points" where Asian sourcing no longer is the best choice, and have enough flexibility in the supply chain to react accordingly.

"There is always a tipping point," said Simchi-Levi. "What is important is to monitor



**David Simchi-Levi**