



Improving Your Strategic Sourcing Decisions:
Total Cost of Ownership and Total Risk Profiling



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Introduction

Manufacturers have many options to evaluate when it comes to the sourcing of manufacturing production. Among those options is the decision to determine whether production will be kept in-house (company facilities, machinery, systems and personnel) or outsourced to a third party (such as contract manufacturing organizations, or CMOs).

Another key decision relates to the location of the manufacturing production. The most common location options used in today's sourcing decisions are onshoring, offshoring, reshoring, or nearshoring. These options each have their associated benefits, risks and costs. Every company must decide which option – or mix of options – has the greatest likelihood of helping the company execute its core strategy and attain its business objectives, including customer service and profitability.

Additionally, recent trends have made analyzing and evaluating the hidden risks and costs of a company's supply chain an important component to making the right sourcing decision:

- In today's uncertain economic times, job costing and profit analysis are valuable disciplines for the survival of a firm
- Rising energy and commodity costs are squeezing already tight margins, and manufacturers are looking for ways to cut costs through sourcing decisions
- Major product safety recalls have heightened concern over supplier pre-qualification and ongoing compliance to avoid product liability
- The increasing frequency and severity of supply chain disruptions (natural disasters, political instability, labor strikes, etc) are causing manufacturers to rethink their sourcing strategies. For example, the aftermath of the March, 2011 earthquake in Japan, tsunami and resulting radiation disaster continue to ripple through the automotive and technology supply chains months after the actual event.

The growing industry discussion over the benefits of reshoring versus offshoring gives manufacturers an excellent starting point to conduct a Total Risk Profiling and Total Cost of Risk Analysis. This paper is designed to show how risk profiling and risk analysis can help foster better alternative sourcing decisions. The thought leadership and tools developed by the Reshoring Initiative (www.reshorennow.org) have created an objective, comprehensive and consistent platform for considering the various known and hidden risks and associated costs useful in evaluating the relative advantages and disadvantages embedded in each alternative sourcing option.

A small furniture manufacturer in the United States closed its last domestic plant in 2007, ending a decade long process of moving operations overseas. The CEO was quoted as saying, "I don't want to go overseas, but I can't pass up the 20 to 25 percent savings."¹



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The globalization trend has had a major impact on the manufacturing industry for over 50 years. One major effect has been the relocation of manufacturing production and employment to foreign countries with lower labor costs. Offshore savings have lured companies of all sizes to move some or all of their manufacturing to China, Korea, India, Vietnam and other developing countries. In the competitive global marketplace, manufacturing in the U.S. is often perceived as too costly, especially so by companies operating with razor-thin margins.

Yet this view appears to be changing for several reasons. Emerging economies such as China have become hot growth markets, which results in rising labor costs. A study by Boston Consulting Group² states that wages in China have been climbing by 15 to 20 percent a year. Events like the aftermath of the recent Japan earthquake and tsunami, political instability in the Mideast, Icelandic and Chilean volcano eruptions and piracy in international waters have heightened concerns about the fragility of the global supply chain. In its April 13, 2011 report, the U.S. Federal Reserve noted that 41 percent of manufacturers surveyed by the Minneapolis Fed indicated the March earthquake in Japan was affecting them negatively.³

Rising labor costs and supply chain disruptions are just a few of the struggles U.S. manufacturers have experienced with offshoring. Others include:

- Lack of flexibility for product customization or customer change orders
- Unapproved substitutions in materials and subcontractors/sub-tier suppliers, causing lower quality products
- Damaged parts upon delivery requiring expensive air delivery of replacement parts to meet customer delivery timelines
- Rigid and burdensome financial terms, including 100% upfront payment in some cases
- Increased costs of shipping because of rising oil prices, including fuel surcharges
- Increased minimum order size by vendors, requiring more on-shore storage and otherwise unnecessary increased inventories
- Counterfeiting of products, with no legal recourse in foreign countries
- Delays in getting product to market quickly resulting in missed profit targets

More manufacturers reevaluating offshoring strategy

Challenges like these have motivated an increasing number of U.S. companies to take a closer look at the hidden risks and costs of offshoring, and to determine if it makes sense to reshore some – or all – of their manufacturing back to the United States. A January 2010 Grant Thornton survey, published in *Supply Chain Solutions*, found that 51 percent of companies that offshored found no financial advantage, and that 20 percent brought work closer to home in 2009. For example, Caterpillar recently announced it was building a new 600,000-square-foot hydraulic excavator manufacturing facility in Victoria, Texas. NCR Corp. is another industry leader that is bringing production back to America and manufacturing its ATMs in Columbus, Georgia.

“Hidden” costs of offshoring to consider include:

- Packaging
- Duty
- Freight: air, surface, emergency risk
- Inventory: en-route, safety stock, obsolete
- Quality / rework
- Product liability
- Intellectual property risk
- Technological obsolescence
- Impact on innovation
- Travel cost to support the offshore source
- Prototyping
- Wage inflation and currency appreciation
- So-called “Black Swan” events with less than 1% chance of occurring

The global marketplace is only becoming more complex, competitive and unpredictable. Customers have high expectations of manufacturers’ performance, and there is increased pressure exerted on manufacturers to provide more flexibility, speed and reduced cost. To meet these customer demands, manufacturers must approach their sourcing decisions on a product-by-product and vendor-by-vendor basis. It is imperative that manufacturers consider and analyze the benefits, risks and costs of all available sourcing options in order to meet business and profit goals, including:

Offshoring

Complete or partial manufacturing sourced overseas

Reshoring (also known as backshoring or onshoring)

Bringing back to the U.S. the manufacturing of products that will be sold here

Nearshoring

Shifting manufacturing from offshore or the U.S. to Canada, Mexico and Central America

Outsourcing

Work done by another company, wherever located

In-house

Work done in the company’s facilities, wherever located

Reshoring becoming more attractive

Reshoring is a sourcing strategy that is being deployed by an increasing number of U.S. manufacturers in the last few years. Certain trends in the U.S. are making reshoring a more attractive option for manufacturers than ever before. Government incentives and flexible work rules are making states like Mississippi, South Carolina and Alabama increasingly more competitive. Workers and unions are showing willingness to accept wage or work-rule concessions to bring jobs home. And for the first time in many years, the U.S. may be closing the gap on the cost of manufacturing domestically compared to China. The Boston Consulting Group report noted that by 2015 unit labor costs (adjusted for differences in productivity) in major Chinese cities are expected to be only 30 percent cheaper than in low-cost U.S. states. By the time other hard costs such as inventory and shipping are factored in, product sourced in China for sale in the U.S. could end up costing as much as manufacturing in the states.

“Getting closer to the customer” is a new planning approach used by manufacturers to increase their flexibility and respond to changing product requests. A recent survey conducted by Accenture among 287 manufacturing companies revealed that in order to compete effectively, manufacturers are seeking to rebalance their supply chain footprint to achieve a better match with demand location.⁴ Just over sixty percent of these manufacturers indicated that they are considering shifting operations closer to customers to improve response times and accelerate growth.

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Reshoring production (also known as homeshoring, onshoring, backshoring, and repatriating) is a way to get closer to the customer. Bringing supply operations back to the U.S. can benefit companies in a number of ways including:

- Decreasing time to market for new products
- Increasing response time for delivering current products
- Improving product quality
- Reducing intellectual property risk, such as counterfeit products and copyright or trademark infringement
- Eliminating or reducing risk of currency fluctuations
- Enhancing collaboration between Research & Development and manufacturing operations
- Reducing costs relating to inventory
- Lowering operating costs
- Reducing international travel time and costs

In order to objectively analyze your sourcing strategy, and determine what products or parts should be reshored if any, it's critical to have a thorough understanding of your company's Total Cost of Ownership (TCO). Equally vital is to measure the known and hidden risks associated with your company's sourcing strategy and decisions.

Profiling your company's Total Risks in sourcing

It is important for manufacturers to consider what they are risking by shifting production overseas. There are a myriad of business questions that need to be addressed when deciding whether to offshore, onshore or reshore, including:

- Do your overseas business partners share your company's commitment to anti-corruption, ethical business standards and legal compliance with intellectual property right protections?
- Do these partners have financial strength and stability to execute on production obligations?
- Will these partners have sufficient managerial talent, skilled labor and requisite operating systems to meet the needs of your firm and your customers?
- Will your partners be able to grow with your company to meet the needs of your firm and your customers?
- Can you ensure and document for your customers that the overseas component materials and parts incorporated into your finished products meet contractual standards (e.g., material grades, precision variances, quality specifications, as well as social responsibility, green manufacturing and sustainability requirements)?

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

Source: “4th Key Principle for Management,”
Out of the Crisis, W. Edwards Deming

Obtaining a picture of your company's Total Risk Profile should include an analysis of:

- **Risk of natural disasters:** Evaluating the potential foreign country and the locations of your production partners for the expected frequency and severity of natural disasters, such as hurricanes/cyclones, earthquakes, seasonal flooding and tsunami events and volcanoes.
- **Manmade and technological risks:** These include quality of electrical power, telephone and other utility systems; water, sanitation, and transportation infrastructure; proximity to hazardous waste sites and nuclear power generation stations, etc.
- **Compliance risks:** such as the consequences of not meeting accounting, legal, tax, environmental and other regulatory requirements, as well as not complying with ethical standards associated with business practices
- **Insurance risks:** Either outsourcing and offshoring production will be concentrated in the areas of adequate coverage and limits for transit and contingent business income (CBI) from dependent premises. CBI can provide worldwide coverage for a manufacturer whose named or unnamed suppliers (depending upon policy terms and conditions) suffer a named property peril resulting in a supply chain disruption that causes a loss to the manufacturer's income from the disrupted production
- **Political stability of country:** Consider factors such as the stability of the country and the region, trade policy challenges such as embargos, and excessive or changing regulatory statutes
- **Economic stability of suppliers:** Risks from raw material dependencies, labor availability, as well as stability of the suppliers' suppliers
- **Lost opportunities:** Potential lost orders, lost customers, and slow customer response times if supply chain is disrupted
- **Product liability non-recovery cost:** Companies have limited to no recourse in their ability to collect economic and other damages for breach of contract or in legal suits or subrogation for product liability claims.
- **Quality risks:** These include the cost of resourcing parts or reworking products that do not conform to specifications or that need to be withdrawn from the market due to voluntary or forced recalls
- **Intellectual property risks:** Trademark, copyright and patent infringements from counterfeiting and loss of shared knowledge or best practices
- **Transportation risks:** Port strikes, piracy, mishandling and damage during shipment, and the cost of emergency air freight to obtain critical parts
- **Reputation risks:** Damage to your company's brands and corporate reputation and the costs associated with brand and reputation restoration, including crisis management communications and public relations expenses

A key area of emphasis in a comprehensive evaluation of your company's total risk profile is supply chain risk.

Importance of supply chain risk assessment

A key area of emphasis in a comprehensive evaluation of your company's total risk profile is supply chain risk. Thoroughly understanding supply chain risks allow your organization to make informed sourcing decisions to help mitigate these risks.

The benefits of a supply chain risk assessment include:

- Helps protect your profits, balance sheet, brand and company valuation against the significant implication of supply chain disruption
- Positions the strategic importance of supply chain risk management in the eyes of senior management
- Provides greater understanding of the reliability and potential financial exposure posed by key suppliers
- Quantifies scenario-based financial impacts for potential disruptions to your production
- Reviews exposures and business continuity plans throughout tiers in the supply chain
- Includes a deeper analysis of the key suppliers beyond tier 1, where appropriate (Note: the majority of supply chain failures do not occur at the tier 1 level)
- Employs assessment tools developed by a combination of supply chain and business risk professionals over a period of many years

Here are just a handful of discoveries made by companies as part of a supply chain risk assessment:

- A manufacturer learned that even though an immediate supplier was in stable financial condition, two key suppliers at the next level in the supply chain were in significant financial trouble.
- A company identified that all of a key supplier's production facilities were situated in an earthquake zone, as were the facilities of the alternative supplier, thereby increasing vulnerability to a major disruption.
- A manufacturer determined that its true business interruption exposure due to a supplier's potential failure was nearer \$10 million versus the \$1 million initially estimated.

Integrating total risks into Total Cost of Ownership (TCO)

Once your organization has outlined all of the potential risks of offshoring, you can start to ascribe a Cost of Ownership to these risks. According to a 2009 survey by Archstone Consulting, 60 percent of OEMs and manufacturers use only rudimentary total cost models and ignore 20 percent or more of the true costs of offshoring.⁵ These companies often decided to offshore based on either lower labor costs and/or Free-on-Board (FOB) shipping prices. Are your company's supply chain managers rewarded for achieving savings on lower labor costs or the FOB price level only? If so, this practice may result in ignoring a broad range of other risks and associated costs. Perhaps supply chain managers should be incentivized to achieve a reduction in total cost of ownership (TCO) expenses and risks.

Supply chain risk questions to answer:

1. Do you know who your critical suppliers are, and how much their failure would impact your company's profits?
2. Have you fully mapped your critical supply chains upstream to the raw material level and downstream to the customer level?
3. Have you integrated risk management processes into your supply chain management approaches?
4. Do you have routine, timely systems for measuring the financial stability of critical suppliers?
5. Do you understand your tier 1 production facilities and logistic hub exposures to natural catastrophes?
6. Is supply chain risk management integrated into your enterprise risk management approach?

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Beyond low labor cost advantages and FOB shipping, there are a multitude of non-labor costs to analyze for true cost savings potential. These other risks and costs are called "hidden costs." Too often, a company only evaluates its total costs after a traumatic event like the earthquake in Japan or a sudden spike in fuel costs. The common mistake made by many manufacturers is becoming fixated on finding the lowest labor costs, without projecting what offshoring's total impact will be on revenue, overhead costs and the balance sheet. As labor cost's percentage of total cost has decreased, the importance of the hidden costs has risen. Determining your organization's Total Cost of Ownership (TCO) can help guide sourcing decisions.

Here's an example of how a TCO analysis helped uncover the hidden costs of offshoring. Sourcing consultant Gibb River Group compared the U.S. and Chinese TCO of a low labor content, machined stainless steel gear. At FOB price level, the U.S. cost was 15 percent higher than the Chinese cost. However, costs were the same for producing the steel gear in each country after adding duty, freight, quality and inventory cost. The U.S. cost was 8 percent lower after allowing for end-of-life inventory and prototyping cost differences – a 23 percent swing just by calculating total cost. Calculation of intellectual property risk, proximity to R&D and carbon footprint would have widened the U.S. advantage even more.

A robust tool to determine Total Cost of Ownership

The Total Cost of Ownership Estimator™ is a complimentary tool provided by the non-profit organization Reshoring Initiative. (Available by download at www.reshorennow.org) The tool takes into account multiple risk and cost factors. It consolidates all of the data into one total cost so a company can make straightforward comparisons of sourcing options that are comprehensive, objective and consistent.

Unlike standard sourcing that is predominantly driven by price, the basis for sourcing decisions with the Total Cost of Ownership model is aggregated risk and cost factors. The Total Cost of Ownership is calculated in present time, and then a forecast is provided based on user-projected wage inflation differentials and exchange rate changes.

The Total Cost of Ownership Estimator™ can work for any manufacturer of a part or component. Some typical risks and costs associated include but are not limited to the following factors:

- Price
- Risk
- Balance sheet impact (inventory, retained liabilities and lost margins from actualized opportunity costs)
- Non-responsiveness to customer and distributor needs
- Reduced innovation by separating production from Research & Development.

Supply chain risk questions to answer:

7. Do you record the details of supply chain incidents and the actions you have put in place to avoid future incidents?
8. Do your tier 1 suppliers have business continuity plans that have been tested in terms of their viability?
9. Have you provided risk training to your supply chain management team?
10. Is risk on the agenda at performance meetings with your strategic suppliers?
11. Do you routinely use Total Cost of Ownership when making sourcing decisions?
12. Do you accumulate the hidden costs associated with each supplier: travel costs, inventory carrying costs, warranty and rework costs, etc.?

The Total Cost of Ownership approach was developed for comparing alternative sources for items to be sold or assembled in the United States. Relevant items include components, finished products and/or custom tools (molds and dies). The Total Cost of Ownership system will have less impact on decisions regarding non-custom commodity items carried in catalogs or inventoried locally by distributors. Finally, the Total Cost of Ownership is applicable to any end-market country. For example, the system could be applied with Germany or China as the destination country.

Some additional considerations for using the TCO Estimator:

- Group parts or products into family of parts with similar characteristics
- Start with one item from each family that is most likely to make sense to offshore or reshore
- Fill out as many of the input tab cells as possible. Some items will require estimates. The more items you have to estimate, the more clear it should be that total cost data is not available in your organization.
- Your estimates do not have to be perfect, but should be consistent. For example, the products with the highest from IP risk must be assigned a higher IP risk cost, products with frequent design changes should be assigned a higher innovation cost, etc.
- Use the pull-down menus to identify the offshore country and whether the product is a part or a tool such as a mold or die.

Total Risks Analysis + Total Costs Analysis = Sustainable Future

A manufacturing organization that has identified, prioritized and managed all its risks and costs is one that is well on its way to a more financially sustainable future. An organization that focuses only on the most obvious risks and on just one cost such as labor is one that does not understand its current costs and that could be blindsided by sudden events that render their sourcing strategy—whether offshore or onshore—both dysfunctional to operations and damaging to the bottom line.

Risk and Reshoring Resources:

Zurich Supply Chain Risk Resources and Assessment Tools
www.zurichna.com/zna/corporatebusiness/supplychain.htm

Zurich Global Risk Simulator <http://hpd.zurichna.com/RiskSimulator/>

Reshoring Initiative www.reshorenw.org
Total Cost Estimator and other reshoring resources

¹ "The Real Cost of Outsourcing," Business Week, June 18, 2007
http://www.businessweek.com/magazine/content/07_25/b4039001.htm

² "Made In The U.S. Again," Boston Consulting Group,
<http://www.bcg.com/media/PressReleaseDetails.aspx?id=tcn:12-75973>

³ Federal Reserve Board, The Beige Book, April 13, 2011
<http://www.federalreserve.gov/fomc/beigebook/2011/20110413/FullReport.htm>

⁴ "Manufacturing's Secret Shift: Gaining Competitive Advantage by Getting Closer To The Customer,"
Accenture, 2010

⁵ "Does Offshoring Still Make Sense?" Supply Chain Management Review, January / February 2009

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