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The China Syndrome

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Booz & Company

from **strategy+business** issue 38, Spring 2005

reprint number 05102

The China Syndrome

A five-dimension analytical model for deciding when (and when not) to purchase from the East.

by Mitchell Quint and Dermot Shorten

For one U.S. automotive supplier a few years ago, it seemed that purchasing components from China was the right thing to do — and quickly. Manufacturers in virtually every industry were setting up shop in China; to read about it in the business press, every venture paid off. The industrial manufacturer, though, discovered to its dismay that success in China is not a sure thing. Enticed by attractive price quotes, the manufacturer failed to make completely sure that its Chinese partners could live up to its technical and logistical requirements. When the Chinese suppliers struggled to meet production schedules, the manufacturer was forced to use expensive air-freight. Quality issues also surfaced; the suppliers lacked the skills to maintain process control and implement engineering changes. The combination of problems eroded the expected cost savings. Ultimately, the automotive supplier reduced its Chinese procurement effort.

With Western companies rushing to China to fill gaps or strengthen links across their supply chains,

one particular part of their operations — procurement — deserves special scrutiny. If approached with a rigorous evaluation of product characteristics, Chinese component purchasing can be the right answer for optimal management of the supply chain. When not well planned and carefully analyzed, sourcing in China can be the source of woe.

Gold Rush

The China “gold rush” grew out of a dilemma. In recent years, when companies examined their P&Ls, most found that purchased material was the largest line item — typically 40 to 70 percent of the total cost of goods. In the face of relentless market pressure to keep prices down, procurement often became a prime target for cost reductions. But that well, for many companies, has begun to run dry. Thus, businesses are increasingly looking to nondomestic sources to meet cost reduction demands.

Asia, especially China, is the most apparent solution. It has the cheapest labor, a pro-business environment, a productive work force, and strong government support for keeping domestic manufacturing



operations as inexpensive as possible — a direct path to easy cost cutting.

The supply chain's headlong tilt toward China can be seen in the percentage share of supplier contracts awarded in the past six years. In 1998, at one U.S. auto manufacturer, U.S. and Canadian companies garnered 62 percent of all quotes and supplier contracts, and Asian (primarily Chinese) outfits only 4 percent. By 2002, the two regions were just about equal, with each enjoying about 30 percent of supplier contracts awarded.

This trend is not even near its peak yet. By 2008, auto and industrial products companies will more than double their percentage of spending on components and materials in low-cost countries (LCCs), according to a recent Booz Allen Hamilton survey of purchasing executives. Moreover, apparel companies, which currently spend 50 percent of their procurement dollars in LCCs, say that within four years, these countries will provide virtually all of their material and supply needs. (See Exhibit 1.) And for most companies, over half of the spending targeted for LCCs will be earmarked for China.

The Chinese experience can turn sour, though, when procurement managers fail to systematically assess the fit between the requirements for purchased components and the realities of the China-based supply chain. They can inadvertently increase their cost of operations and put revenue at risk — thereby compromising their profitability. Some commodities that are sourced in China, it turns out, can more wisely be procured from another low-cost region, or even from domestic sources.

Each of five critical dimensions

must be examined for every prospective purchase of components and materials in order for a company to determine whether purchasing from China is the best decision. These dimensions include, naturally, manufacturing cost, but they add in transportation efficiency, lead time and scheduling stability, product design, and technical capabilities.

Using this analysis, we have found, for example, that production tooling (such as injection-molded plastics and stamping dies, which are labor-intensive to manufacture and which have long product lead times) is perfect for Chinese procurement initiatives. By contrast, minimal labor requirements make China a bad bet for auto interior plastics and stamping, for example. Frequent product changes similarly rule the country out as a first choice for customized telecommunications equipment. Manufacturers in these industries would do better to consider low-labor-cost regions closer to home (such as Mexico for the U.S., or Eastern Europe for Western Europe), where they can realize a portion of the labor savings while maintaining tighter control on the supply chain.

Five Dimensions

The five-dimension analytical model readily leads procurement executives to a set of significant matters they need to consider when making sourcing decisions.

1. Manufacturing Cost. China can provide Western parts and materials buyers significant benefits in overhead and raw material costs. Total overhead rates in China vary significantly by supplier, but can be less than half of Western levels.

Chinese labor rates also are extremely attractive relative to those

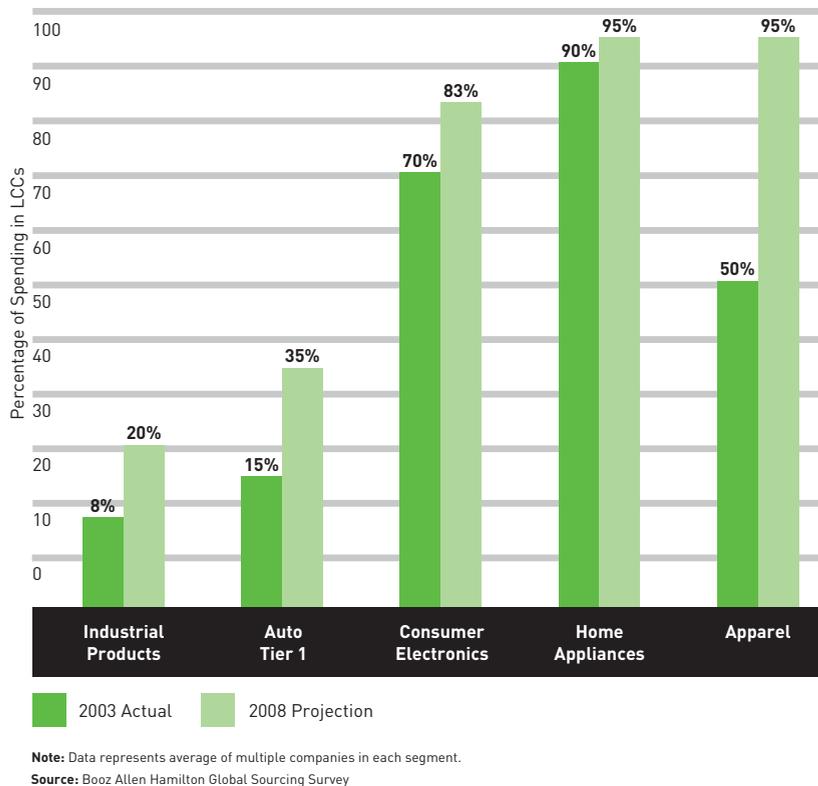
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This article is adapted from *The Missing Link: Designing Supply Chains for Growth, Profitability, and Resilience*, edited by Jeffrey Rothfeder with an introduction by Tim Laseter and Keith Oliver (strategy+business Books, 2005).

Exhibit 1: Low-Cost Country Sourcing Levels



of other countries. Including hourly wage rates and benefits, Chinese wages are about 10 percent of salaries in the U.S. and Western Europe and 50 percent of the average wage in Mexico. There is still a large supply of low-cost labor throughout the country, and manufacturers in major cities (Shanghai, for example) are supported by government efforts to keep wages low by bringing additional workers to urban areas.

Nevertheless, as more and more companies purchase supplies from China, there has been wage inflation in some large cities. As a result, labor-intensive supplier relationships, such as some automotive OEM programs, are moving inland, where wages remain lower. Honda, for example, is establishing its manufacturing center, automotive assembly, and supporting compo-

nent operations in Dongfeng, in central China. Moving inland, though, makes shipment scheduling more difficult and often more costly, because of poor roads and the lack of developed logistics infrastructures.

These trends show how executives should evaluate manufacturing cost when making procurement decisions:

- *The total labor content (direct and indirect) of a product is the primary driver for China procurement savings.* For a product with a large labor component (i.e., 25 percent or more of the product cost structure), low Chinese wages represent a meaningful benefit. In these cases, the labor savings — applied labor hours multiplied by the difference in the labor rate — can be significant. But for some products, such as shoot-and-ship injection-molded plastics, for which one operator

manages several high-speed machines, the labor requirements are too low for China sourcing to be the best option.

- *Real overhead savings can be realized in China.* Local labor rates are embedded in the price of many of the goods and services that are critical components of overhead costs. And many suppliers use local machinery, which can also cost as little as half the price of imported equipment.

- *Savings on raw materials in China are possible when these materials are locally sourced from competitive suppliers.* Electronic components and some lower-end steel grades are areas where local competition can lead to raw-material savings. However, when Chinese suppliers have to import materials — such as high-quality steel alloys — there can be a significant cost penalty in a procurement agreement.

- *To gain the highest potential returns from a Chinese procurement effort, the amount of labor should be maximized.* It often pays to think beyond the purchase of the part, and to include machining and assembly activities in the sourcing contract. For example, when an automotive company attempted to purchase raw aluminum castings from China, the Chinese supplier offered savings of only 1 percent over the bid of a U.S. supplier. By redoing the bid to include finished machining of the parts, the incremental labor, handling, and overhead, the automotive company realized a 15 percent total cost savings from the same supplier.

2. Transportation Efficiency. Procurement from China naturally increases transportation cost over more local sourcing arrangements. In China, a product must go from

the factory to the port, onto a ship, and then to the U.S. or another major market, where it is unloaded and trucked to its destination. The cost of ocean transport alone from China to the U.S. is \$2,500 to \$3,000 per container. For a \$12 casting, the total incremental transportation cost is \$1.10, compared with \$0.30 for a typical Mexican supplier shipping to the U.S.

Financial assessment of China sourcing should be made on the total landed cost of a product, which includes the manufacturing cost differential as well as the full logistics cost — hence two major considerations when assessing transportation costs:

- *Measure the ratio of transport cost to total product cost.* Since ocean transportation costs are essentially a fixed cost per volume shipped, economics favor China when smaller, higher-value items are involved. For instance, thousands of small electric motors can be packed in one container, spreading the fixed costs

pound. Only products with very high packing density and high value per unit (for example, printed circuit boards) can support the costs associated with airfreight.

3. Lead Time and Scheduling Stability. Ocean freight adds four to six weeks to the delivery time from China to Western markets. The risk of this extended supply chain to the core business needs to be incorporated into any assessment of whether China is the right place from which to procure. The time delay generated by the longer supply chain significantly increases the chances of both stock-outs in the near term, and excess and obsolete inventory in the long term. So procurement executives must carefully weigh several factors to ensure that their lead times and scheduling remain stable:

- *Because Chinese providers typically include large volumes of a product in each shipment, buyers face inventory and defect risk.* Purchasing in large volumes means more of the

wiring panels required labor-intensive assembly. However, this benefit was canceled out because the manufacturer's customers often demanded a high degree of late-stage product customization and expected a rapid lead time. The manufacturer was able to charge more for these customized products and, thus, pay the slightly higher wages in Mexico and Eastern Europe for a quicker turnaround on components delivered to U.S. and Western Europe operations.

4. Product Design. Engineering changes can introduce instability even into mature supply chains. Because the items most frequently sourced are components made up of other components, when an old version of a product becomes obsolete, a change can create a cascade of incompatibility. What's more, manufacturing operations require time to digest new products and processes; subpar quality frequently corrupts operations during a transition period.

The long lead time and large order quantities required to do business cheaply in China exacerbate both these problems, because the arrival of old-version components can continue for weeks after an engineering change. And it can require an equally long time to take corrective action on lower-quality parts — thus, the central product-design considerations when sourcing from China:

- *Products with one or more design changes per quarter may not be suitable for Chinese procurement.* Frequent design changes mean the supply chain could end up with a continuous run of obsolete inventory and on a learning curve that resembles a merry-go-round. Products that are stable for at least a

Products with one or more design changes per quarter may not be suitable for Chinese procurement.

over numerous units. Conversely, plastics and stamping assemblies for auto interiors require protective packaging that results in low packing density and fewer parts to share the burden.

- *If airfreight is required — for instance, to meet lead time requirements shorter than ocean freight allows — the savings generated by lower-wage-rate manufacturing in China are usually eliminated.* Airfreight costs about \$1.51 per pound; ocean transport, \$0.06 per

buyer's dollars are tied up in massive inventory investments, a source of inventory carrying costs and, potentially, obsolescence. Moreover, if manufactured defects are spread throughout a shipment, that could mean thousands of useless components.

- *For some product categories, ocean freight lead time can make a Chinese procurement effort unwise.* For instance, a manufacturer of telecom infrastructure seemed to be a perfect fit for China because its

model year, such as automotive components, may fit better in a Chinese procurement strategy, since they essentially involve a successful one-time launch rather than continual incremental changes.

- *China is probably not a good option when a high degree of skill is required to implement design changes.* Chinese supply chains are challenged by the language gap, a lack of local technical capability for implementing changes correctly, and the complexities of suppliers' processes for managing launches of new products.

skilled domestic factories will probably yield a better total cost return than procuring the total product. Technology-driven processes often need significant oversight if process control is to be maintained. That frequently can be achieved only in sophisticated plants in developed countries. When factory processes get out of skew in China, yields decrease and the resulting scrap (as well as logistics costs) can quickly overshadow the savings generated by lower wage rates.

- *The evolving sophistication of Chinese suppliers means careful buyers*

better understand their geographic sourcing options — which products are candidates for being sourced from low-cost countries and which should be purchased from more developed markets. If a low-cost country is appropriate, assessment of lead times can help establish which commodities can be sourced from remote low-cost countries (such as China or India) and which need to be purchased more locally — from Mexico, say, or Eastern Europe.

China remains one of the world's most desirable sourcing opportunities. Its wage advantages are not likely to end anytime soon, and its skills as a supplier and manufacturer will only grow stronger. But as is the case with any other procurement effort, obvious costs, such as labor, are not the only factors to take into account. When the other, subtler criteria in our model are considered, China may still be a lucrative gold mine for some companies. Others, though, should be careful: The ore could be a fool's blend. +

Reprint No. 05102

Chinese suppliers are becoming more sophisticated. A savvy purchaser can gain advantage by exploring cost *and* capability.

5. Technical Capabilities.

China is not currently a viable option for highly specialized manufactured products made with custom equipment, such as application-specific copper-wrapped coils or high-speed connector assemblies. The processes used to manufacture such products often require specific technical knowledge of product engineering or equipment design that generally is not available among suppliers in new procurement markets such as China.

By contrast, almost all suppliers can handle commoditized processes such as stamping, casting, and manual electronics assembly. Companies buying from Chinese sources must weigh two issues relating to the supplier's capabilities:

- *Sourcing subcomponents in China and maintaining technology-intensive activities in more highly*

can gain some important, albeit temporary, advantages. Although products made with the least complicated, most mature technologies are the best choices to source from China, the nation's suppliers continue to develop increasingly sophisticated skills. As a result, more companies are sourcing process-sensitive products, such as rubber and machined parts, from China. That can be a good decision when other critical procurement dimensions, such as lead time, engineering changes, and labor and transportation costs, favor China. It also can give a purchaser a boost over competitors who haven't figured out where to go to combine China's cost advantage with its emerging capabilities.

By analyzing the five critical dimensions for each unique procurement initiative, companies can

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is published by Booz & Company Inc.
To subscribe, visit www.strategy-business.com
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Originally published as “The China Syndrome” by
Mitchell Quint and Dermot Shorten.

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