

Nearshoring

Category Sourcing Guide

- ❖ **China's recent five year plan provides insight into changing costs and priorities.** Government policy outlining increased wages, tighter environmental controls and encouragement of specific industries will affect costs and many products traditionally sourced most cost effectively from China.
- ❖ **Chinese labor prices have increased 15% at the beginning of 2012 and are likely to increase another 15% mid-year.** The planned wage increases in China are shifting footprint further inland as well as to competing countries.
- ❖ **Unpredictable raw material policy.** China has a history of manipulating strategic raw materials to encourage domestic industries through export quotas and VAT rebate policy.
- ❖ **Environmental considerations affect Chinese Industry.** China's 12th five year plan calls for environmental controls and limits permits for some highly toxic manufacturing processes while taxing others.

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Cost and Capital Partners is a management consulting firm that works with companies to improve cost and capital efficiency. Our client base includes Fortune 1000 companies from the industrial, automotive, electronics, hospitality, process, consumer goods, transportation and white goods industries. We work with clients to improve results and enhance visibility for strategy development. Supplier engagement is a core focus ranging from direct supplier negotiations to market and financial viability assessments. In addition to working with clients to execute sourcing initiatives, we also deliver sourcing training that enables organizations to increase their level of professionalism in supplier engagement.

The Cost and Capital Partners approach to category strategy development is a data focused review of the cost drivers affecting each category. This review is based on recent hands-on sourcing project work in China and Mexico. Much of the recent work and analysis is contained in this report.

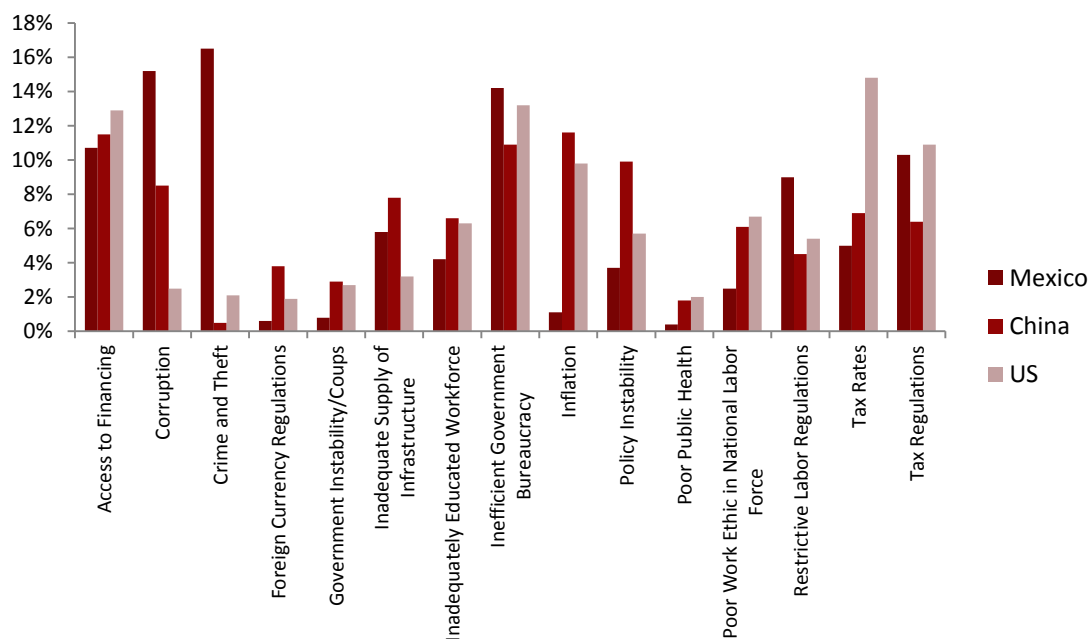
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Introduction

Many companies moved manufacturing operations and the supply chain footprint to China during the last decade, to take advantage of a seemingly limitless pool of available and inexpensive labor. New Chinese suppliers often supplemented or completely replaced existing operations in North America and Europe. Many of the cost categories that made China attractive are losing their advantage, including raw materials, labor, tax incentives, logistics, currency and inventory costs. Purchasing executives are taking a closer look at the total cost of ownership of their supply chain footprints. Some regions in eastern China which were once 50% or more competitive than Mexico are now becoming on par if not more expensive. Factors such as unpredictable changes in Chinese VAT refunds can add as much as 17% to the cost of a product or component. Recent tax changes are largely aimed at encouraging higher value exports, constraining raw material exports, and limiting toxic manufacturing processes. Such non-market driven forces will continue to change the landscape of Chinese competitiveness, especially for basic manufacturing.

As identified by Figure 1, in addition to global macroeconomic factors, each country carries its own risks and concerns for sourcing organizations. A recent survey of business executives by the World Economic Forum identified the key inhibitors to doing business in various nations. As seen below, the main concern in Mexico and China is crime and inflation respectively. Meanwhile, the chief concern in the US is tax rates. This ranking is just one example of the various factors that can impact companies before, during and after sourcing decisions are made.

Figure 1: Most Problematic Factors for Doing Business



Source: World Economic Forum, From a list of 15 factors, respondents were asked to select the five most problematic for doing business in their country and to rank them between 1 (most problematic) and 5. The bars in the figure show the responses weighted according to their rankings.

Over the past several years key cost drivers in China have increased significantly. This is especially true for labor rates which have increased at a CAGR of 36% over the past 2 years. The trend of shifting production from China to Mexico and also to the United States is often referred to as “Nearshoring.” The decision to near-shore is category specific and should be based on the cost structure, incentives, exposure and overall risk management.

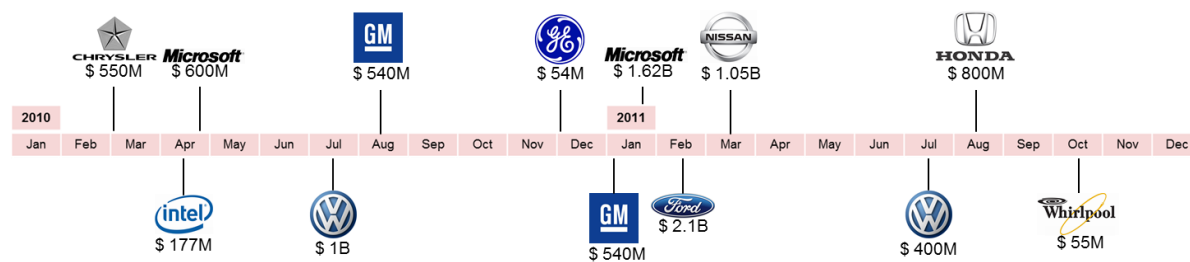
Cost Impact

As outlined in Figure 2, labor costs in Mexico are still significantly higher than in China, but that gap continues to narrow and, depending on the category, wage rates only account for between 10 to 20 percent of a product’s total cost. With the closing wage gap, lower shipping, inventory, utility costs, favorable currency developments and the tax stability from the North American Free Trade Agreement (NAFTA), Mexico becomes a viable alternative to China. Recent industry developments and investments by companies such as Chrysler, General Motors, GE, Intel, Whirlpool and (Figure 3) underline the continued competitiveness and importance of Mexico for manufacturing.

Figure 2: Cost Driver Summary

	Mexico	China
Raw Materials	Resin – PE Resin – PP Metal Alloys	Rare Earths Resin – ABS Electronic Components
Full Labor Cost (Jan 2012)	\$ 5.93/hr	\$ 1.40/hr
Energy	\$ 0.09/kWh	\$ 0.15/kWh
Currency Development to USD (Jan 2011 – Jan 2012)	- 12.1%	+ 3.8%
Shipping Cost	Low	High
Lead Times	2- 7 days	~ 40 days
Taxes and Duties	0% in NAFTA	0 - 17%

Figure 3: Recent Major Investments in Mexico

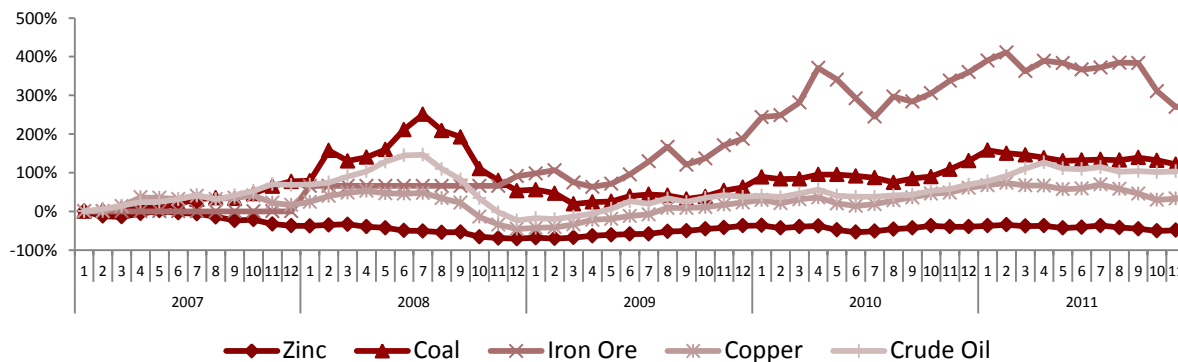


Value in USD; Source: C&C Research

Raw Materials

Key material inputs can have either a price advantage or distinct price disadvantage in China. Some raw materials that are in limited supply and are strategic for key industries tend to be manipulated in China. Access to these strategic inputs is often limited through quotas, heavy export duties, minimum export price systems or additional requirements and procedures for exporters. These restrictions can create serious disadvantages for foreign producers by artificially increasing China’s export prices and driving up world prices. At the same time, such restrictions lower China’s domestic prices for the raw materials due to significant increases in domestic supply. This gives China’s domestic downstream industries a significant competitive advantage and puts pressure on foreign producers to move their operations and technologies to China.

Figure 4: Price Developments of selected Raw Materials since 2007

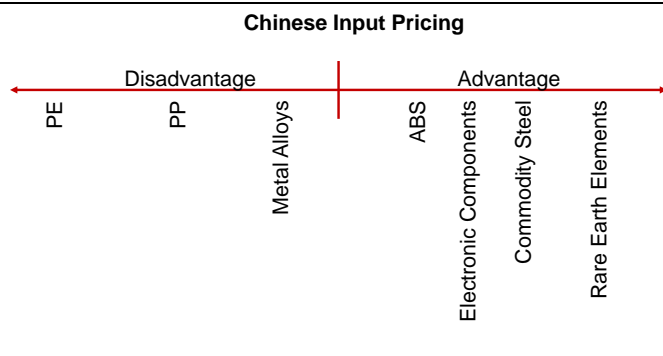


Source: International Monetary Fund

The existing industrial footprint is a major factor of underlying supply and demand. For resins, ABS plastic is derived from Butadiene, a key byproduct of synthetic rubber. Since the supply of tires is concentrated in China and Korea, the supply of Butadiene and the ABS product is heavily concentrated in Asia. ABS is a plastic often used in electronics and the majority of the demand is also located in Asia. Separately, the supply of Polyethylene and Polypropylene is derived from natural gas refining. The cost of natural gas in North America is up to 70% less than in Asia and Europe. This is due to hydraulic fracking techniques to extract natural gas from shale in the United States giving North America a distinct advantage in both cost and supply of the Polyethylene stream and subsequent byproducts: Polypropylene, PVC, HDPE and Polystyrene. Figure 5 shows the relative advantage or disadvantage of common inputs with distinct regional pricing advantage.

In recent times, the EU, U.S., and Mexico brought the case of raw material manipulation to the WTO (Canada joined the panel in January 2010). A dispute settlement case was initiated in June 2009 and a WTO Panel established in December 2009. China claimed that its system of export duties and quotas on raw materials (e.g. bauxite, coke, fluorspar, magnesium, manganese, silicon carbide, silicon metal, yellow phosphorus and zinc), used in the production of steel, electronics and medicines, served to protect its environment and scarce resources. In its final decision on January 30, 2012, the WTO ruled in favor of the plaintiffs, declaring that China broke WTO rules with its export quotas and duties. The WTO said China had failed to give good reason for its protectionist measures and called its environmental protection reasons unjustified. It is important to note however that rare earth metals were not covered by this ruling.

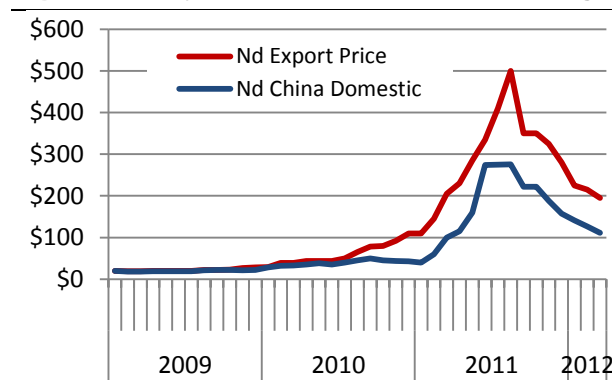
Figure 5: Chinese Input Pricing Advantage



Source: Cost & Capital Research

Rare earth metals are used in a range of goods such as hybrid cars, mobile phones, solar power, windmills and transmissions. China produces about 95% of the world's rare earth minerals and introduced export quotas in early 2009. Since then, China has cut these quotas multiple times. This has led to an explosion of prices for rare earth metals such as neodymium which is used for magnets in electronics (Figure 6). These quotas also led to a price advantage for Chinese consumers of rare earths compared to foreign consumers. Governments around the world are trying to develop other sources of supply – but that will take years. As a result, companies that are large users of rare earths in the U.S., Europe and Japan have been moving operations to China to avoid the export quotas and taxes. Although prices for rare earth metals fell since peaking in August 2011, they are still many times more expensive than before the export restrictions.

Figure 6: Neodymium China and Export Price (\$/kg)



Source: Asian Metal

Raw materials in Mexico have no tax or export restrictions within NAFTA. In general, they follow the same pattern as prices in the US

Labor

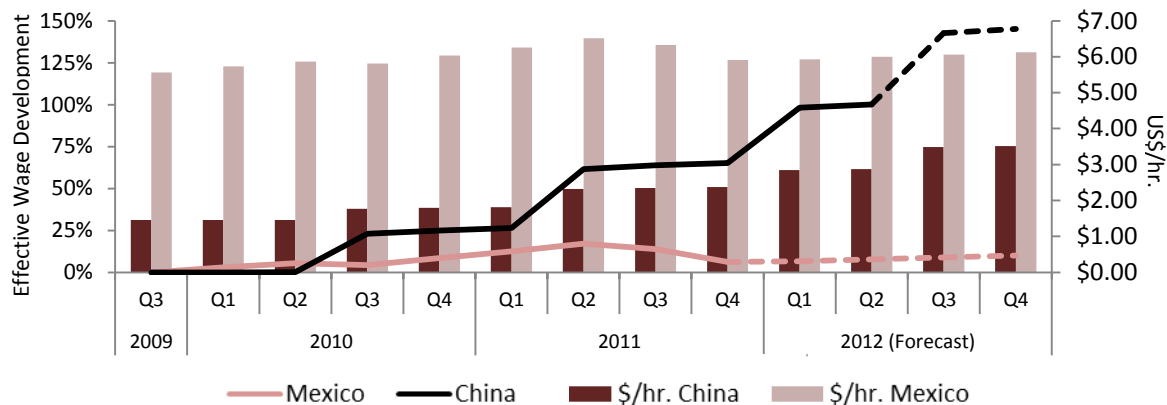
For years, China has been the go-to market for cheap labor. Beijing has relied on low wages to win the title as world's largest exporter and surpassed Mexico and Canada as the largest exporter to the US in 2009. That led to higher living standards for some Chinese workers but also to an increasing income disparity accompanied by a growing number of strikes in various factories. The growing wealth within the society also contributes to an increasing number of young adults with college degrees who are either reluctant or unwilling to work in the country's manufacturing industry. That combined with China's one-child policy began a decline of the number of young workers entering the workforce. To address the supply-and-demand imbalance, and avoid further labor unrest, China's government raised the minimum wage in most of its regions sharply (15 – 20 percent per year). This also helps boost domestic consumption and reduces reliance on exports to expand the economy. In China's 12th Five-Year-Plan, the government targets a minimum wage increase of 13% annually, or 63% over five years, whereas industry expects an increase of 80% within five years.

Another goal of China is to shift their export to more innovative higher end and higher profit goods and services to compete with global economic leaders. The government hopes, that the manufacturers will not be able to earn enough money selling lower-end items to cover increased wages, which will encourage them to produce higher-end products to cover the additional costs and still make a similar profit margin. As a consequence, the cheapest labor jobs are headed out of China. Some Chinese manufacturers such as Foxconn are trying to expand their operations to inland areas near Chengdu, Wuhan, An Hui, and Zhengzhou, where wages are still low. However, such moves are not without some risks and may drive higher logistics complexity and costs. Capacity could also become an issue if China's domestic market continues to grow, as output from inland factories is largely consumed by in-country demand.

In contrast stands Mexico. In the period, where China's effective labor cost almost doubled, Mexico's increased by a moderate 6.6 percent as shown in Figure 7. Although labor costs in Mexico are still significantly higher than in China, the gap continues to narrow each year.

From a demographic perspective, the number of Mexicans 15 years and older that have completed at least the ninth grade jumped to 54 percent in 2005 from 36 percent in 1990 and 9 percent in 1970, according to the Mexican government. On top of that, Mexico does not have to deal with strikes in export factories, as there have been no reports in 2011.

Figure 7: Effective Wage Development Index and Labor Cost per hour: Manufacturing

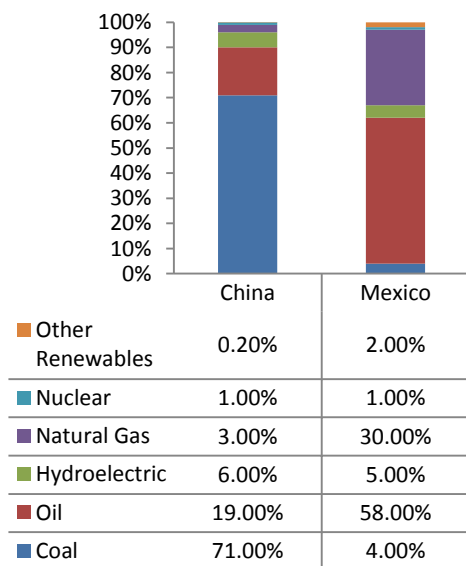


China: Guangdong Region, Mexico General Manufacturing
 Source: BLS, INEGI, GlobalPost, Oanda.com, Cost & Capital Research

Energy

In 2009, coal made up 71 percent of China's total primary energy consumption with an estimated 3.5 billion short tons of coal used (over 46 percent of the world total). From 2002 on, importing coal became competitive with domestic production and in 2009 China became a net importer of coal signing a 6 billion USD loan-for-coal agreement with Russia for 15-20 million tons of coal for 25 years. China's goal is to increase energy generated from renewable sources to 15 percent of the total output by 2020. China also sees nuclear power as a clean and efficient source of electricity generation and has made investments so that the capacity is forecasted to increase from 10.8 GW to over 70 GW, from 2% to 4% of predicted energy production. Although

Figure 8: Energy Sources (2008)



Source: Energy Information Administration (EIA): International Energy Statistics.

the Fukushima accident in March 2011 lead to a suspension of government approvals for new nuclear plants until safety reviews were performed on current plants and those under construction, industry analysts do not see this affecting China's investments in new reactors.

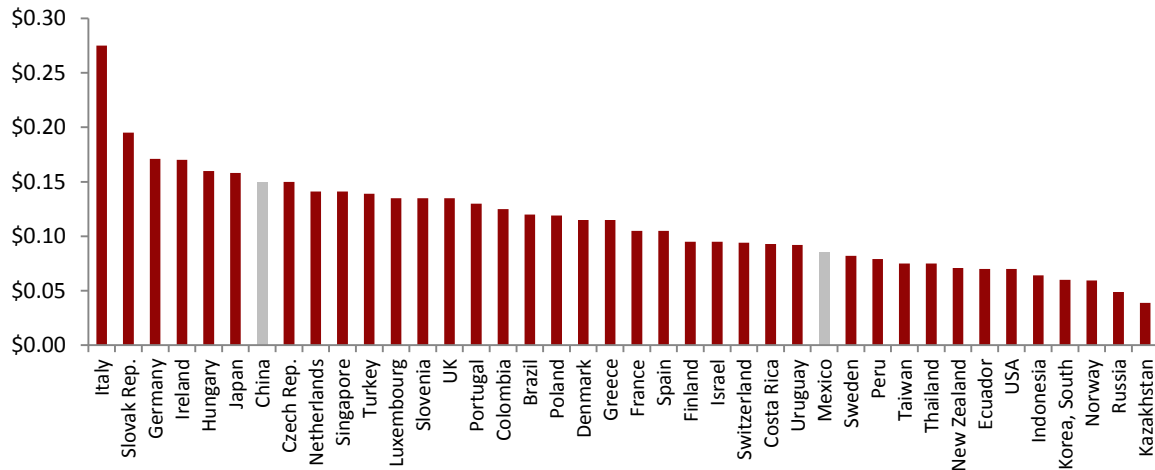
In China, electricity prices (wholesale and retail) are determined and capped by the National Development and Reform Commission (NDRC). In 2009, the NDRC made small changes to its pricing system and allowed electricity producers and wholesale end-users such as industrial consumers to negotiate with each other directly. China announced electricity price increases of about 5 percent twice during 2011. The NDRC's intention is to help Chinese power plants as they struggle with rising coal prices and capped power tariffs causing them to become unprofitable in 2010.

China's energy costs are rising due to strong demand and price increases for the fuels, coal and oil, that China uses to generate power. In contrast to China, as seen in figure 8, Mexico's energy consumption consisted mostly of oil (58 percent), followed by natural gas (30 percent).

Mexico has large reserves of natural gas. However, its consumption has outgrown production causing the country to become a net importer of natural gas. The growing replacement of oil with natural gas will likely depend upon higher imports from either the United States or via liquefied natural gas (LNG).

In Mexico, the electricity sector is federally owned, with the Federal Electricity Commission (CFE) in charge. The CFE is the only grid operator but tariffs are approved by the Ministry of Finance and Public Credit (SHCP). In the past, average electricity prices have been held below cost with the aim of maintaining macroeconomic and social stability. Recent discoveries of large untapped natural gas reserves as well as investments in renewable energy have helped keep Mexico’s electricity prices relatively stable. Electricity is currently cheaper in Mexico than China (Figure 9) and will most likely remain so in the near future.

Figure 9: Electricity Cost by Country (\$/kWh)

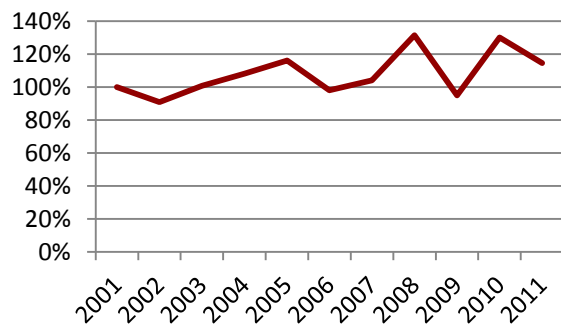


Source: IEA: Energy Prices & Taxes; Eurostat; Europe’s Energy Portal. Prices are in USD and include taxes.

Shipping

When China initially became a global player in the global manufacturing system, shipping lead times of up to 40 days were outweighed by low oil prices and cheap labor. The benefits of offshoring to China far exceeded the additional transport costs and delays. However, soaring oil prices and an increasing desire for lean inventories have made China less attractive.

Figure 10: Container Forty Foot Equivalent (FFE) Price Trend 2001 - 2011



Source: Maersk Annual reports 2001-2011.

As the container shipping industry is market driven, supply and demand for containers drives volatility. This uncertainty of a major cost item causes suppliers to build an additional risk premium into component pricing overseas.

Due to its proximity to the US and ease of land border crossing, shipping costs from Mexico are only slightly higher than within the US and typically require 2-7 days. Due to difficulties in predicting demand, manufacturers who have their production in China are often forced to store manufactured products in warehouses for longer periods. Additionally, last minute or emergency supply costs are much higher in China, due to air cargo charges and premium shipping rates.

The close proximity to the US market and the membership of NAFTA gives Mexico an additional advantage over China. Another advantage of the close proximity is the ability to ship in pallet or box quantities allowing a better flexibility orders whereas shipments from China generally ship in container load quantities.

Currency

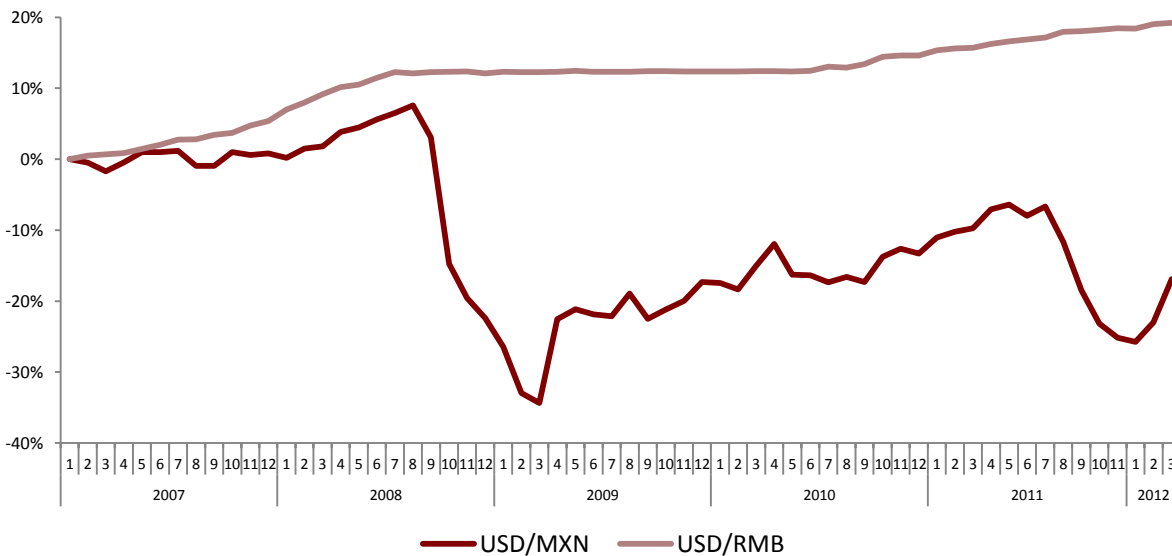
For many years, it was China’s policy, to artificially limit or halt the appreciation of its currency, the renminbi (RMB), against the U.S. dollar and other currencies. This has been a recurring issue in many congressional debates and meetings. The main point of critique is the intention of China’s policy to make its exports significantly cheaper by undervaluing the RMB against the U.S. dollar.

In July 2005, the Chinese government announced that the RMB’s exchange rate would become “adjustable, based on market supply and demand”. So from July 2005 to July 2008, China’s central bank allowed the RMB to appreciate against the dollar by about 21%. However, the global economic crisis brought this to a halt. China tried to minimize the effects of the crisis on Chinese industries by halting appreciation of the RMB from July 2008 to June 2010 (Figure 11). In June 2010, China’s central bank announced that it would resume appreciation of the RMB. Since then, the RMB/USD exchange has risen slowly, but steadily. Many American officials have criticized this pace as being too slow, especially given China’s strong economic growth over the past few years, and its rising level of foreign exchange reserves, which hit \$3.2 trillion as of June 2011. But, the RMB appreciation has been steady to the point that many can forecast a 3% per year appreciation relative to the USD for the next few years.

The Mexican Peso is allowed to fluctuate according to the foreign exchange market. The Peso took a big hit during the economic crisis beginning in September 2008. After a slow but steady recovery, a renewed wave of market stress weakened the Mexican peso again. However, with foreign exchange reserves close to US\$140 billion, together with ample sources of local finance, Mexico is relatively well positioned to weather global financial shocks.

According to Scotiabank, the Mexican peso will stay at an average exchange rate of around 13.50 Mexican pesos to the US dollar during 2012, and RMB is expected to appreciate further. These developments will further narrow the competitive gap between China and Mexico. Chinese RMB appreciation will be steady for the next few years. This stability allows organizations to plan for currency effects in the supply chain. Although the devaluation of the Mexican Peso provides opportunities for many organizations, the volatility of the Mexican Peso to the USD still poses risks.

Figure 11: Currency Developments since January 2007 (Exchange Rate to USD)

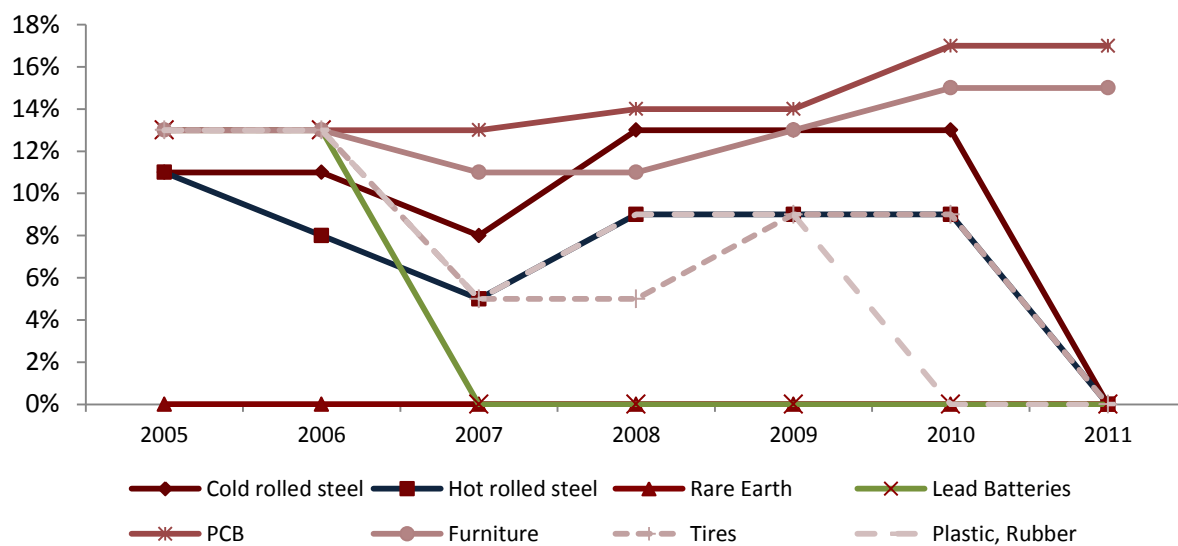


Source: www.oanda.com.

Government Intervention

Mexico, Canada and the US created NAFTA in 1994. Ever since that agreement has been in place, the concept of *Maquiladoras* has exploded. A *Maquiladora* is a factory that can import materials and equipment duty- and tariff-free for assembly or manufacturing and then export the assembled or manufactured product. VAT is only applied to on products remaining in Mexico or services or materials purchased in Mexico and used for production, making production under the *Maquiladoras*' umbrella very attractive for US companies. In contrast, China uses a Value Added Tax (VAT) rebate system to steer its economy. VAT is generally applied to all products produced in China, regardless of whether or not the product remains in the country. In 1985, China implemented a VAT rebate policy, ranging from 5 to 17 percent, to promote certain exports. Since then, China has changed its VAT rebate multiple times to boost certain industries or to put industries at a disadvantage (Figure 12). The VAT rebate system is a good indicator of China's desire to move up the production value chain. The most recent changes in the rebate structure affected high polluting industries and favored more sophisticated industries. Such VAT changes have made the usage of Chinese steel for a product to export more expensive than to import, process and export steel bought on the world market.

Figure 12: China's VAT Rebate by Commodity Category



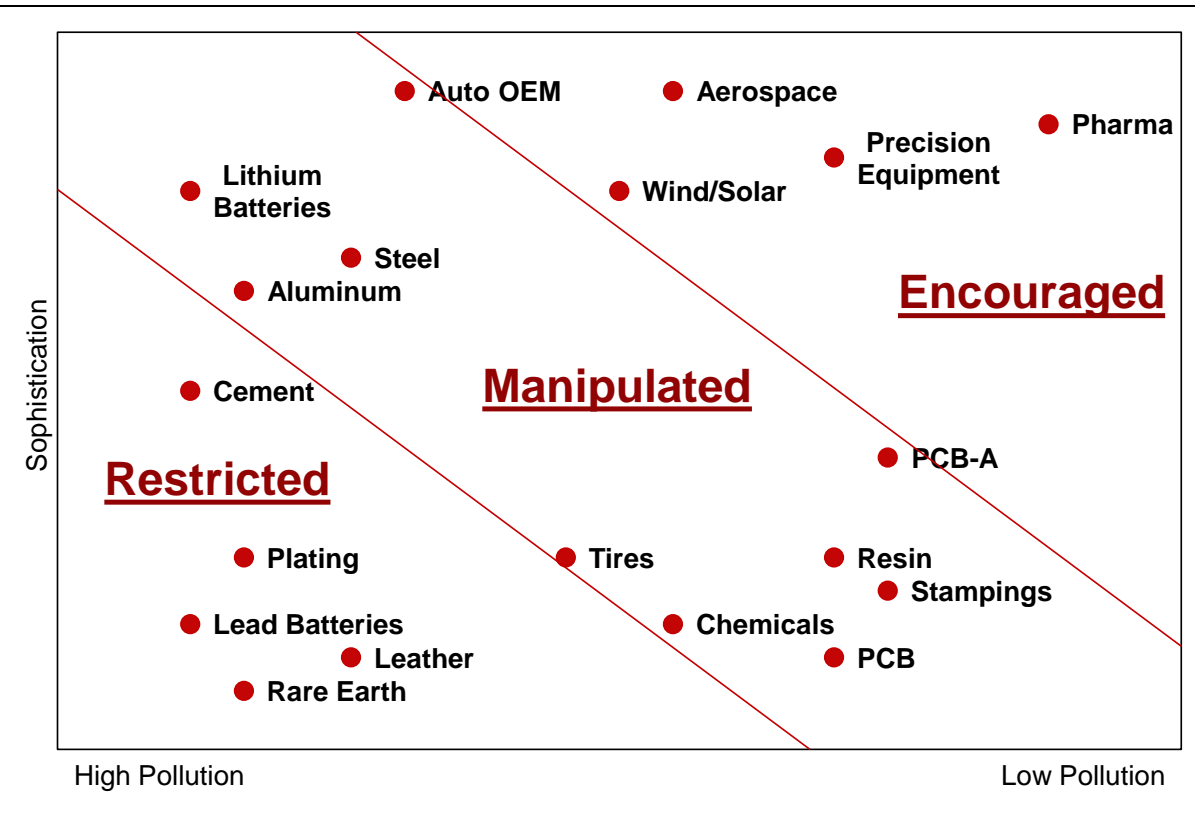
Source: C&C Research, GlobalPost, China's 12th Five Year Plan.

When the Government lowered rebates for the VAT, many buyers were faced with price increases from suppliers to make up the difference. One challenge with a volatile tax policy is that price increases are common and re-pricing when rebates are raised is often difficult to manage. Some VAT rebate trends can be identified through reading the Chinese five year plan as well as by assessing historical treatment of industries. In general, the Chinese five year plan encourages more sophisticated product and less purely manual processing.

Part of the risk of many products coming from China is the risk of manipulation. As stated in the Chinese five year plan, the goal is to export more value added product and improve the state of the environment. In order to accomplish this goal, China uses a directed industrial policy to encourage the long-term goals for many products. Low value-add and toxic products are often discouraged from export with low VAT rebates. Higher value add and low polluting products are often encouraged with full rebates as well as subsidies making these products very competitive in the global marketplace. The challenge is for products that fall in between.

These products are often difficult to plan for as the Chinese policy changes based on balancing conflicting economic and environmental goals. As seen in Figure 13. Long term category strategy development is most challenging for the “Manipulated” categories since it is difficult to plan for the changes in policy that will affect the competitiveness of sourcing from China.

Figure 13: Chinese Industrial Support by Category



Source: C&C Research, GlobalPost, China's 12th Five Year Plan.

Environment

China has historically been known for lax environmental regulations. That caused companies to move their most environmentally problematic productions steps, such as smelting, plating and chemical processing to China. To combat environmental problems as well as media reports, the Chinese government recently decided to limit environmentally problematic production steps. Following that directive, China set goals to phase out certain energy-intensive and polluting industries. Local governments were not allowed to issue permits. In May 2011, the Ministry of Industry and Information Technology revealed a plan to eliminate a total of 1.813 million tons of outdated aluminum, copper, lead and zinc smelting capacity by the end of this year. Since then, these goals have increased by over 13 percent to 2.0431 million tons. More than 100 plants were asked to phase out outdated capacity in 2011. However, China will still remain the world leader in production and consumption of aluminum, lead and zinc and largest consumer of copper. Production of the four metals will continue to rise due to previously issued licenses.

Nevertheless, the recent focus of China's 12th Five Year Plan on environmental issues and regulations will most likely reduce the amount of environmentally hazardous manufacturing processes and drive up their respective costs.

Mexico has more strict environmental laws compared to China or other developing countries. Since Mexico signed NAFTA, it has worked closely with the U.S. to improve environmental standards. Despite being more lax and less enforced than in the U.S., environmental laws alone do not provide an incentive to move production from China to Mexico.

Stamped Part Analysis

Procurement Managers must constantly evaluate suppliers and their respective cost drivers. In this example, we will review two stamped components' cost development from January 2008 to January 2012. As previously mentioned, key cost drivers such as materials, labor, freight, and VAT have changed significantly over the past few years.

Figure 14: China vs. Mexico Cost Comparison

As seen in Figure 14, other cost drivers including plant overhead, SG&A, profit, and basic equipment costs vary less by region and are likely to be tied to the component's total cost. These changes have reduced, and in some cases eliminated the competitive advantage China has over Mexico.

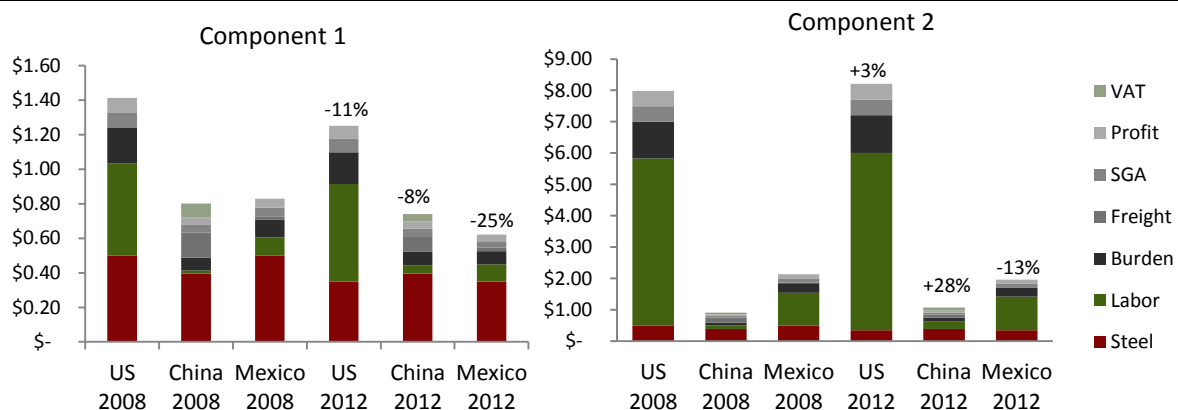
The first sample component is a basic stamped part. This part weighs one pound, requires minimal labor and is easy to ship. As can be seen in Figure 15, during 2008, China was the lowest cost region with a 2% and 42% landed price advantage over Mexico and the US respectively. However, by 2012, this advantage has disappeared. This is largely due to the fact that steel prices in China are relatively the same when comparing January 2008 to January 2012, however prices in the US and Mexico have fallen. Other drivers such as labor costs, the declining peso and increasing RMB have made Mexico more competitive. Managers must be vigilant if they rely on raw material arbitrage in China as VAT and freight can rapidly deteriorate this benefit.

Cost Element	Regional Variability	Mexico Jan 2008 vs. 2012 % Change	China Jan 2008 vs. 2012 % Change
Material			
HR Steel	Medium	-30%	0%
Labor	High	-5%	158%
Manufacturing Cost			
SG&A	Low	-25%	-3%
Profit	Low	-25%	-3%
Shipping	High	0%	-38%
Duties	High	0%	-47%

Source: C&C Analysis

The second component is a stamped part that requires post-processing and is thus more labor intensive. However, when compared to the first component, roughly the same weight and basic shipping dimensions exist. In this case, even though the Chinese price has risen by 28% since 2008, it is still well below the landed price values in the US and Mexico. This is due to the fact that fully burdened basic manufacturing wages in Guangdong are still only ~\$2.84 per hour compared with ~\$5.93 in northern Mexico.

Figure 15: Price Developments of selected Stamped Parts, January 2008 vs. January 2012



Source: Cost & Capital Analysis

Conclusion

The age of simply sourcing from China to achieve savings is rapidly coming to an end. Numerous factors including raw materials, labor, energy, currency, taxes, regulations and shipping can greatly impact the total cost of a product. These cost drivers have evolved rapidly over the past decade and will continue to do so in the future. For this reason, it is vital for sourcing professionals to continuously monitor the competitiveness of their supply chains.

The ideal supplier footprint is a constantly changing target. Sourcing decisions today can experience inflation based on what is already projected and planned for as increases in labor, utilities, currency and shipping. Some factors are unpredictable, but many of the ways that China telegraphs strategy enables a thorough analysis with the expected cost pressures for each category. Leading supply chain organizations need to assess not just the current, but the future state of costs for each category. Making the best decision for the lifetime of a contract can minimize the amount of supplier changes and price increases in the future.

Sourcing decisions seem to always be second-guessed. When inflation, natural disasters or labor shortages halt the supply of product, the supply chain decisions are critiqued and the question is brought up as to why the team did not anticipate these events. With sourcing from China, much of the future is prescribed. Organizations that do not take into account the trends and historical data will be open to such criticism.

A detailed cost analysis, value chain review and risk identification is a straightforward way to evaluate an organization's supplier footprint and support strategic planning. Once conducted, such cost analyses can establish a clear baseline to be closely tracked and monitored over the coming years.