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Supply Chain Management

## Shock absorbers

By Rob Atkinson and Jonathan Wright

Flexible and fine-tuned to react rapidly to oil price surges, raw material shortages and other disruptive changes, dynamic supply chain management frees companies from rigid assumptions of the past, enabling them to achieve high performance in an era of heightened uncertainty.

It may seem like ancient history today, but not so long ago, most companies could base their supply chain assumptions on a number of apparently immutable givens. Cheap fuel, for example, allowed companies to engage in aggressive global sourcing in their search for cheap labor. Reflecting the best in lean thinking and prudent working capital management, managers kept inventories low by shipping materials in small batches via fast, fuel-thirsty means of transport, while distribution models emphasized fewer facilities and longer distances.

The explosive onset of oil-price volatility has demonstrated just how quickly conventional assumptions about supply chain management can be overturned. And in this particular case, with wages rising in China and other key emerging markets, labor cost savings have been less able to offset fuel-price increases, creating classic strategic tipping points for many businesses and product ranges. The persistent threat of these kinds of disruptions has undermined traditional supply strategies, forcing companies to pursue dynamic sourcing approaches and new supply chain management practices.<sup>1</sup>

Supply chain management for a high-performance business is characterized by the ability to identify and analyze all of a product's acquisition and lifecycle costs.

Whether the disruption involves cartwheeling oil costs, changing market priorities or access to needed talent, to play this new game successfully and help their companies achieve high performance in a period of heightened uncertainty, supply chain managers must address five core issues, which we explore here from the perspective of high fuel prices.

**Network strategy.** Supply chain modelers traditionally consolidate warehouses and manufacturing plants to gain scale and reduce inventory, a concept known as “risk pooling.” With high fuel prices, companies might instead decide to locate more facilities closer to customers. Electronics giant Sharp Corporation, for example, shifted a higher share of its flat-screen-TV production from Asia to Mexico to be closer to markets in the Americas.

The arrival of more expensive energy and less predictable labor costs makes boosting supply network flexibility, at the analysis as well as the execution stages, an agenda topper. Flexible analysis means identifying trigger points, such as fuel-price increases, that indicate a need for strategic shifts. Flexible execution is the ability to launch the right network changes quickly and cost effectively.

Companies have a number of options for improving both capabilities. They can work more closely with third parties to reduce their reliance on distribution assets such as warehouses and enhance their ability to rapidly scale or relocate inventory. Or they can position plants and warehouses closer to the markets they serve. Another option involves designing regional networks, which provide attractive benefits for companies that make or buy in a few far-shore locations that supply many countries.

**Sourcing and procurement.** High and erratic fuel prices fundamentally change most calculations of the total cost of shipping a product from its origin to its final destination (known as “net landed cost”), placing a premium on expertise in this area. Without this expertise, managers cannot effectively launch the wide variety of sourcing and procurement changes needed to keep up with the market. Accenture’s experience shows that supply chain management for a high-performance business is characterized by comprehensiveness—the ability to identify and analyze all of a product’s acquisition and lifecycle costs.

A net landed cost analysis will typically confirm that high fuel prices affect virtually every purchase companies make. The core issue pits the savings associated with low-cost-country sourcing against the rising expense of moving purchased goods from those places.

Recent analysis by Accenture, MIT and ILOG<sup>2</sup> reveals that in the United States, a \$10-a-barrel increase in crude oil prices raises the cost of diesel fuel by 24 cents a gallon, which ultimately generates a four-cent-per-mile increase in transportation rates. In Europe, the same shift generates an even bigger hike: seven to nine cents per mile, depending on the country. As transportation costs increase, positioning manufacturing and sourcing activities close to markets becomes more attractive.

**Planning and forecasting.** In the face of market disruptions like volatile fuel prices, overall planning and forecasting goals will likely remain focused on achieving maximum accuracy. But many planning and forecasting considerations will

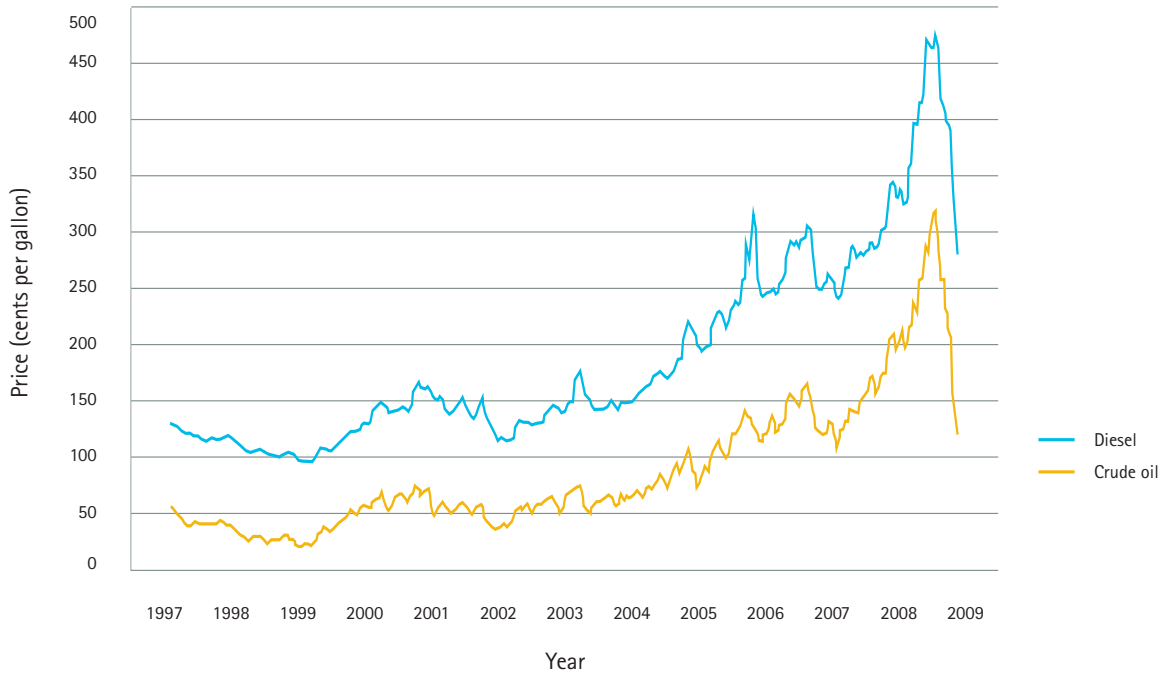
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<sup>2</sup> For details, see Robert Gosier, David Simchi-Levi, Jonathan Wright and Brooks A. Bentz, “Past the Tipping Point,” Accenture 2008.

# Fuel for thought

Fuel-price volatility is only the most dramatic recent example of the kind of disruption that can upend conventional assumptions about supply chain management.

## US diesel and crude oil prices over time



Source: Simchi-Levi, et al., "The Impact of Oil Price"

## Typical fuel surcharge methodology (US)

Change in per-barrel oil price	Relative change in diesel price (per gallon)	Standard fuel surcharge adjustment (cost per mile)	Cost impact on 500-mile shipment
\$10	\$.24	\$.04	\$20

## Analysis of fuel impact on transportation costs since 2006

Date	Oil price (per barrel)	Relative change in price (per gallon)	Standard fuel surcharge adjustment (cost per mile)	Cost impact on 500-mile shipment
2006	\$66	NA	NA	NA
2007	72	\$.15	\$.02	\$10
2008 (July)	137	1.55	.25	125
2008 (Nov)	52	(.33)	(.06)	(28)
Projected	75-200	.22 to 3.22	.04 to .53	(\$18) to 265

Source: ILOG; MIT; Energy Information Association; Accenture analysis

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change dramatically because of the need to rethink sourcing, procurement, transportation, warehousing and network design organizations.

In environments where high fuel prices and increased volatility encourage moving more stock closer to customers, companies that improve forecast accuracy can achieve significant advantages. Moreover, planners and forecasters must remain alert to the impact of fuel-related shifts on the behavior of consumers, who might choose, for instance, to make fewer shopping trips but buy much more per trip.

Depending on the business model, the planning and forecasting department's highest priority might be eliminating small rush orders by introducing agile processes that anticipate last-minute changes and thus help to minimize transport costs. In addition, vendor management inventory models can provide suppliers with even greater opportunities to reduce shipping costs by controlling the flow of goods to customers. Spare parts and service operations provide particularly rich targets, given their propensity for small, last-minute shipments.

**Transportation.** Companies need transportation models that emphasize better utilization—fewer, higher-quantity shipments over shorter distances, and fewer “empty” miles. In industries where transportation represents a high percentage of the cost of goods sold, companies will focus on this goal; but most shippers, distributors and retailers should consider it too.

Strategies include abandoning fuel-intensive transport options, such as road and air, and embracing slower but more economical choices, such as rail and water. Companies wedded to road and air must push for more factory-direct shipments, larger

inventory minimums or wider delivery windows that allow shippers to hold freight until a truck is full.

Firms will probably replace expensive private fleets with contract carriers and third-party logistics services providers that keep costs down by, for example, running full trucks and amortizing technology investments over a larger asset base. Improvements in sourcing and buying will become an elevated priority, anchored by a standardized methodology that ensures companywide approaches to calculating total landed cost.

Managers can also replace long-term contracts with more effective short-term solutions. Kimberly-Clark's European operation, for example, has developed exceptional spot-buying capabilities and books transport on a day-to-day basis. The company issues proposal requests almost continuously through a “transport desk,” and accepts bids from carriers prepared to offer a low price for a fixed route or journey that is taken on a regular basis.

**Distribution.** Every aspect of a distribution operation comes into play when fuel prices rise. But the impact will differ from one company to another.

Amazon.com, for example, cannot ship in bulk to a customer who orders one book, so each shipment must absorb the full fuel-price increase. Many companies in similar situations are rethinking their storage and inbound supply strategies to reduce shipment quantities and limit materials-handling expenses. Conversely, a company like discount retailer Costco Wholesale Corp. may be able to spread cost increases over larger quantities, redo its distribution strategy by changing inbound and materials management practices, and package or palletize fewer, yet larger, outbound shipments.

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## Philips Healthcare: Simplicity, transparency, agility

Massachusetts-based Philips Healthcare—a unit of the Dutch electronics giant Royal Philips—felt the impact of supply chain disruptions in an especially challenging context. During a massive post-merger integration, managers discovered vulnerabilities in the company's service parts supply chain.

The healthcare market changed significantly in the past decade, when Philips was expanding its global healthcare organization. In addition to demanding leading-edge medical imaging and other products, hospitals—the company's primary customers—began to seek compelling and differentiated service offerings.

To compete successfully with global giants GE, Toshiba and Siemens, Philips Healthcare had to offer higher levels of cost-effective service and increased machine uptime guarantees, which required excellent service parts availability. The company realized that this created not only challenges for the spare parts supply chain but opportunities as well. Reliable parts availability resonates strongly with Philips Healthcare customers because of the critical importance of product uptime: If a necessary repair part fails to arrive on time, lives could be at risk.

Take, for example, the National Health Service in the United Kingdom. In a policy shift, the NHS, a major Philips client, now allows patients to choose which hospital will provide treatment for them. It also increasingly outsources procedures to the private sector, creating competition and putting even more emphasis on machine uptime—an issue compounded by the general lack of sufficient imaging machine capacity in UK hospitals. Service parts supply chain performance and machine availability were absolutely critical to Philips Healthcare's competitiveness.

This situation compelled Stefan Kuhn, the Philips vice president responsible for service parts supply, to drive end-to-end improvements across the acquired healthcare businesses. The company's spare parts fill rates lagged industry benchmarks, and Philips had drifted into a "one-size-fits-all" approach to service delivery that failed to distinguish between easily replaced equipment and critical MRI scanners that often had no backups.

Philips's service parts supply chain, with its unpredictable supply-and-demand profile, is particularly complex. It moves roughly 40,000 parts through the system at any given time and handles a million customer orders per year from 12 major locations on three continents.

The company needed an agile, more flexible network. Perhaps the most important move—surely the boldest—Philips made occurred early on when it replaced its 12 pre-merger-integration logistics companies in about 40 locations with a single, global lead logistics provider: UPS.

UPS provides global warehousing, inventory management, transportation and related services, giving service parts supply a third-party network with the flexibility Philips needed as it shifted to a shared services model. UPS enabled the company to cost-effectively maintain its inventory either centrally or in closer proximity to customers, which helped managers to address cost issues such as rising fuel prices.

Given the number of acquisitions Philips had made, managers next needed to establish a single IT solution and a standard way of working across different divisions and geographies.

Kuhn's team established a standard, organization-wide SAP configuration that enabled the concept of *fluid inventory*: Instead of tracking single transactions across business units and regions, managers gained global visibility of all inventories. This provided the flexibility to shift inventories seamlessly across borders to meet customer demand.

The guiding principle behind the IT system's design mandated that sophistication always take a backseat to absolute standardization. Furthermore, managers based their standardized and newly simplified order fulfillment process on customer feedback indicating that speed was less important than order accuracy, which enables hospitals to better meet their patients' expectations.

At the same time, the team made it significantly easier for Philips Healthcare's 7,000 field engineers to return defective parts. Quicker returns enable faster repairs—which, in turn, gets more usable inventory to the field faster.

Kuhn's team streamlined the process, introducing preprinted return labels and developing robust root-cause analyses to eliminate defective parts and boost customer satisfaction. This activity linked directly to the major challenge service parts supply faced regarding remanufactured parts.

The operation has a circular supply chain in the sense that it returns 40 percent of distributed parts by volume (70 percent to 80 percent by value) for refurbishment and resale. The team took steps to speed up this process to improve the organization's working capital situation and push high-value parts back into service faster. Service parts supply also rationalized its repair operations, outsourcing key elements to ensure service reliability.

Bottom line: The project so far has delivered cost reductions of about 20 percent. More important, perhaps, Philips Healthcare has boosted its service parts supply fill rate to highly competitive levels, has significantly reduced inventory as a percentage of sales and has increased customer satisfaction.

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Companies should reconsider the quantity, scope, design and layout of their distribution centers to offset fuel costs with higher inventories and

improved operational capabilities. In South Africa, Unilever is consolidating its food, home and personal-care supply chains to generate flexibility and cost savings by sharing transport and warehouse operations.

In the midst of market turmoil and economic uncertainty, companies seeking high performance will replace the rigid, conventional assumptions that have guided their supply chain decisions with dynamic, flexible thinking. Fine-tuned to react rapidly to oil price surges, competitive shifts and other disruptions, the dynamic supply chain effectively unshackles companies from the past, enabling them to maintain their balance in the face of whatever tipping points the future may bring.

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