

Ramping Up Supplier Capacity in Volatile Times

Still stinging from the recession, many suppliers remain averse to risk. How can manufacturers get suppliers to add capacity to help meet demand? By reducing the risks and sharing the rewards.



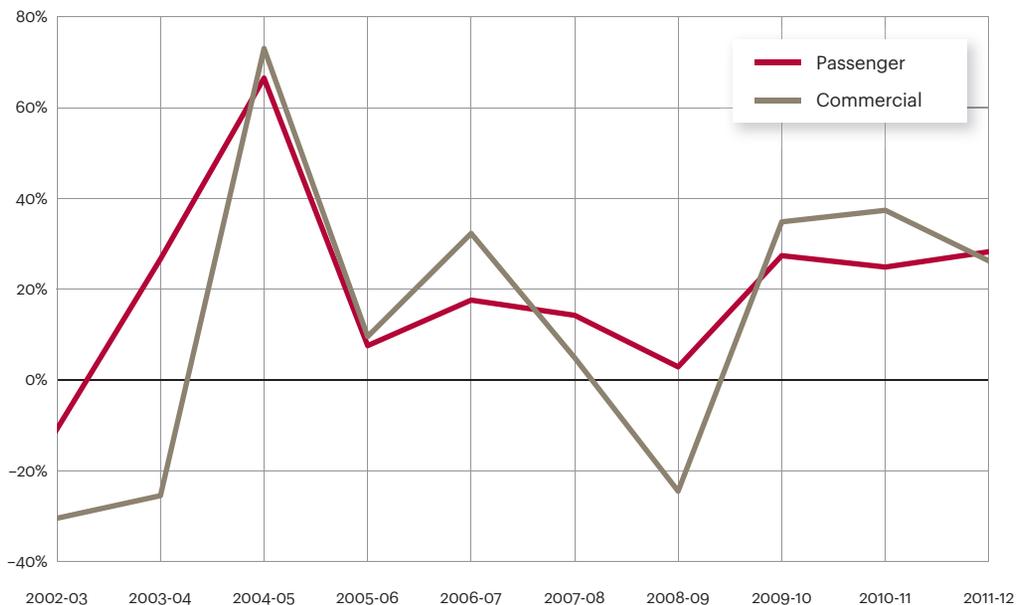
The late 1990s and early 2000s were a time of unbridled optimism for most industries across the globe. As demand grew, original equipment manufacturers (OEMs) and suppliers invested in capacity ahead of demand to stay competitive. Ambitious growth plans and easy access to capital fueled heavy over-investment across the supply chains of most industries.

The global recession changed all of that, as pessimism reigned. The steep fall in demand across sectors forced manufacturers to cut production and cancel orders for input supplies. Cyclical industries with long investment lead times were hit hardest—primarily because they could not pull out of their large capacity investments (see figure 1). The effects were felt worldwide, with a drastic drop in sales translating to a near-complete cancellation of orders from suppliers. Facing idle capacity and unable to repay loans, many suppliers went bankrupt, reduced their workforce, or downsized production facilities. As thousands of smaller suppliers went out of business, major manufacturers streamlined their vendors, focusing on retaining their larger first-tier integrators—those most able to withstand future shocks.

Although the past two years have brought a brief rebound, future prospects remain uncertain. Demand is picking up and the manufacturing sector is recovering from the depths of the crisis, yet many suppliers remain hesitant to add capacity. Component manufacturers have seen significantly slower investment growth than OEMs (see figure 2 on page 3).

These risk-averse suppliers are causing manufacturers to lose sales. General Motors blames a shortage of key parts for lost sales in India while the CEOs of Boeing and Airbus have publicly expressed concern over suppliers' inability to keep up with their growth plans. In the past two years, the lead time for semiconductor supplies has nearly tripled as suppliers decline to add capacity. Cisco's ambitious growth plans have been constrained by the lack of cooperation from dynamic random access memory (DRAM) suppliers that suffered estimated losses of \$13 billion in 2009 and 2010.

Figure 1
The production growth rate of commercial and passenger vehicles in India



Source: SIAM Reports

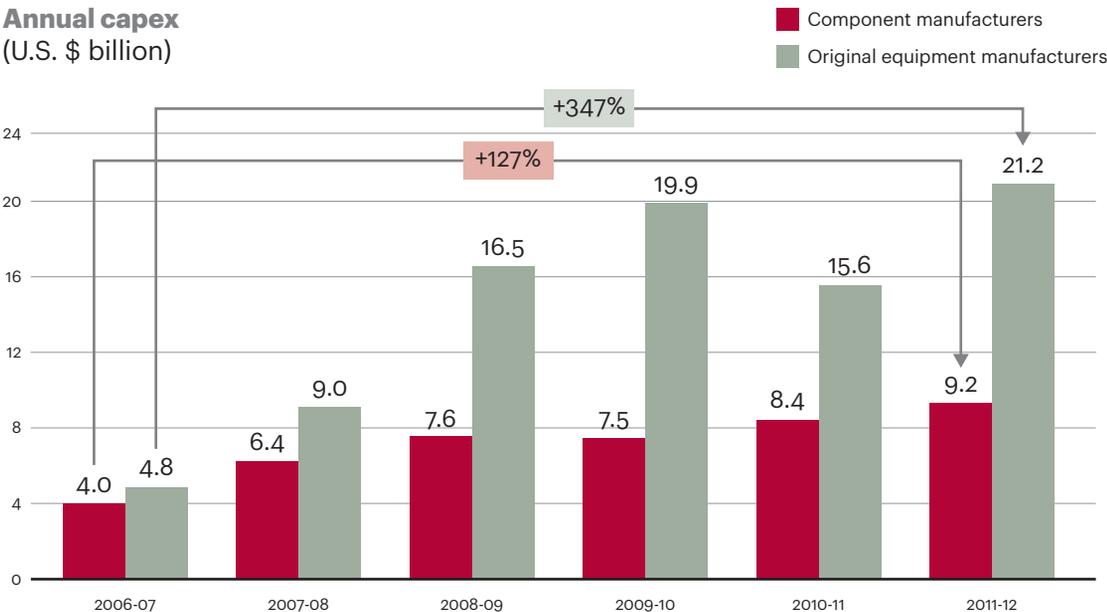
One major reason suppliers are wary of adding capacity is because they bear the majority of the risks—even more so during a recession—while the rewards are skewed toward manufacturers. In the absence of appropriate risk-sharing mechanisms, suppliers have little incentive to add capacity ahead of demand, especially if adding capacity requires large capital expenditures. It is imperative for manufacturers—especially those in cyclical industries—to provide suppliers with incentives to add capacity. The question is: how?

Sharing the Rewards, Reducing the Risks

Every manufacturer wants to minimize the risk of too much or too little capacity. With markets bouncing back, the best way to manage risks is to share them with suppliers. There are four main steps for ensuring adequate capacity addition:

- **Create a strong demand forecast.** Adopt comprehensive, analytical, data-oriented, and scenario-based forecasting tools to develop best estimates of demand forecasts.
- **Collaborate and communicate.** Work together with suppliers to provide transparent forecasts and capacity usage numbers and create an understanding of how much capacity is needed from all major suppliers.
- **Agree on a capacity addition plan.** Reach joint agreements with suppliers on how to address capacity gaps.
- **Create risk-sharing contracts.** Reduce the disparity in risks and rewards by devising a capacity addition strategy with appropriate risk-sharing contracts.

Figure 2
Automakers are investing more in capacity than their suppliers



Notes: The totals are the capital investments for the top 94 listed auto-component suppliers in India (by revenue) and the top 22 Indian original equipment manufacturers (by revenue), including five truck manufacturers, four tractor companies, two passenger vehicle makers, and 11 two- and three-wheeler manufacturers. Data for 2011-12 are estimates.

Source: ISI Emerging Markets Database

Demand forecasting

The first step in encouraging suppliers to add capacity is providing a strong demand forecast. Repeatedly inaccurate demand forecasts create volatility and fluctuations that filter down the chain to suppliers. If manufacturers consistently “mis-forecast” demand, suppliers will, over time, naturally plan for the inaccuracy and underinvest in capacity.

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We suggest five steps in the demand forecast process: identify demand drivers, conduct correlation analysis, use “first-cut” demand estimates, triangulate findings with external sources, and use scenario-based modeling (see figure 3). The important elements of a demand-forecasting process are the frequency of forecasts and the time horizon, both of which depend on the nature of the industry (cyclical or stable) and the operating model of the company (lean or build-to-stock).

Most manufacturers forecast demand using “first-cut” estimates based on managers’ judgments and historical market trends. Best practices, however, indicate that there is far more accuracy in the use of sophisticated, real-time, enterprise-level IT forecasting systems. For example, automakers Ford and Maruti (India) use short forecast horizons with frequent tracking and recalibration. They triangulate their demand estimates through multiple reviews of their own production forecasts, suppliers’ independent forecasts, and dealers’ leading indicators on customer demand.

Figure 3
Demand forecasting process



Source: A.T. Kearney analysis

Improving forecast accuracy requires an exhaustive understanding of underlying demand volatility. This is accomplished using scenario analysis to identify all possible situations, determining the probability of a scenario occurring based on discussions with sales teams and economic planners, figuring out sales forecasts for each scenario, and, as mentioned earlier, triangulating forecasts from production, suppliers, and dealers.

For each scenario, the costs of lost sales and carrying excess inventory are determined. These costs together help calculate the optimal level of production, which is then mapped across all component categories and suppliers to understand where capacity should be added. Given that it is difficult to predict all possible scenarios, a mechanism for adding supplier capacity should be devised even as the pinpoint accuracy of the demand forecast is questionable.

Collaboration and communication

Complementing demand forecasting and scenario planning with collaboration and transparent communication provides suppliers with a clear view of forecasts and offers manufacturers a clear view of suppliers' capacity utilization. Companies with best-in-class demand management practices consistently share with suppliers information critical to capacity addition.

Many manufacturers put faith in their suppliers without adequate due diligence, only to realize later that the supplier cannot support the manufacturer's growth plans.

Manufacturers often use a daily system that orders parts with suppliers according to the lead time for delivery. Such systems minimize ad-hoc orders (alleviating the problem of loose cannons) and give suppliers a clearer view of demand forecasts. Ford, for example, has online supplier portals that allow its vendors to get real-time insight into production schedules.

The more accurate and transparent the forecasts, the more trust and cooperation from suppliers, especially in terms of timely capacity increases.

Capacity addition plan

Armed with a shared understanding of predicted demand and capacity gaps, both the manufacturer and supplier agree on a capacity addition plan. At this stage, it is also important for the manufacturer to assess the fundamental viability of its suppliers. Many manufacturers put faith in their suppliers without adequate due diligence, only to realize later that the supplier does not have the strategic aspirations, business model, or financial strength to support the manufacturer's growth plans.

There are five options for adding capacity, depending on the capacity gap to address: (1) reallocate existing capacity, (2) add shifts or stagger breaks, (3) improve productivity and eliminate bottlenecks, (4) add production lines, and (5) set up new facilities, or "greenfield"

expansion (see figure 4). Cost is always a factor in the timing and ease of these options. We recommend specifying capacity and lead-time requirements in a formal agreement with the supplier. If existing suppliers are unable to increase available capacity, there are other options such as new supplier development, backward integration in the supply chain, or leasing capacity.

Risk-sharing contracts

Every supplier needs a good reason—the proper incentives—to add capacity. Determining what those incentives are requires segmenting suppliers along two dimensions: the willingness to add capacity and the complexity of doing so.

The willingness of a supplier to add capacity depends on how unique to the manufacturer the additional capacity will be, and the relative bargaining power between manufacturer and supplier. This bargaining power is gauged by the nature of the manufacturer-supplier relationship and by how critical the component is to both parties’ businesses.

The complexity of adding capacity is determined both by the incremental capital expenditure required of the supplier, and the lead time needed to create the additional capacity.

Incentives and the Supplier Segmentation Matrix

We use a Supplier Segmentation Matrix to determine the appropriate incentives for each supplier, incorporating adequate risk-sharing mechanisms to ensure suppliers’ cooperation in capacity additions (see figure 5 on page 8). Incentives are especially important for suppliers reluctant to add incremental capacity; however, the need for incentives is lower if there is strategic alignment between the supplier and manufacturer.

Figure 4
Options for adding capacity with the existing supply base

Options for capacity addition	Reallocate existing capacity	Add an extra shift or stagger breaks	Improve productivity and eliminate bottlenecks	Add production lines	Set up new facility or “greenfield” expansion
Capacity gap*	0%-10%	5%-25%	5%-25%	25%-50%	>50%
Lead time to production	0-2 months	1-3 months	3-6 months	6-12 months	6-18 months
Capex involved					

*The percentages denote the gap between total capacity required and existing capacity.
 Source: Primary interviews with component manufacturers

Suppliers can fall into any one of four categories on the Matrix:

- 1. Willing to add capacity, and it is not a very complex undertaking.** Suppliers in this category are willing to add capacity, so they usually require minimal incentives and formal contracts to do so. While they may voluntarily make more capacity available to the manufacturer, they may also require incentives, such as joint productivity improvement exercises or simple pull contracts. Both parties agree on a unit price, and the supplier decides how much capacity to invest in. The supplier then shoulders the added capacity and inventory risk alone.
- 2. Willing to add capacity, but there's a lot of complexity associated with it.** Suppliers in this category are willing to invest in capacity but might be unable to do so either because of the capital outlay required or the long lead time that will delay returns on the investment. These suppliers may need the manufacturer to co-invest in the capacity or acquire an equity stake in the supplier to reduce the strain on cash flows. Many manufacturers choose this approach when the cost of adding capacity is high.

QF contracts are useful in industries such as high tech, which use rolling forecasts with frequent recalibration.

- 3. Reluctant to add capacity, but it is a fairly easy undertaking.** Suppliers in this category are less willing to invest in capacity, but the relative ease of increasing capacity makes it possible for the manufacturer to facilitate this investment by the following means:
 - Conduct joint productivity improvement exercises
 - Increase prices (marginally) for incremental capacity additions, either via subsidies for each unit of capacity added, or fixed subsidies for pre-determined levels of capacity
 - Engage in revenue-sharing agreements that limit investment risk and give suppliers a revenue upside when demand is strong
 - Develop contracts that help manufacturers purchase supplier capacity up front at a pre-determined price, followed by incremental payouts for unanticipated increases
- 4. Loath to add capacity, and it is a highly complex undertaking.** Suppliers in this category are the least inclined to add capacity for the manufacturer, necessitating considerable effort to facilitate the investment. Here, the manufacturer can co-invest in capacity, which reduces the supplier's required capital outlay and ensures equitable risk sharing in case demand falls, or use pull-based contracts, such as quantity flexibility (QF) contracts and backup agreements, which assure purchases from the supplier irrespective of demand, thus transferring the risk to the manufacturer.

Sign on the Dotted Line

Contracts developed with suppliers can be informal, such as price or price-quantity commitments, or formal, involving range-bound commitments, penalties for non-purchased quantities, and revenue-sharing agreements. The following are the three most common types of manufacturer-supplier contracts:

1. QF contracts. In QF contracts, the capacity required is specified within a band around an initial estimated quantity (Q). The supplier agrees to supply up to $Q^*(1 + X\%)$ and the manufacturer agrees to procure no fewer than $Q^*(1 - Y\%)$. This mitigates the effects of lost sales for the manufacturer and overcapacity for the supplier. In these contracts, the X and Y factors that determine order flexibility are critical and can be estimated through scenario-based planning by the manufacturer. This contract is useful in industries such as high tech, which use rolling forecasts with frequent recalibration.

The success of such contracts depends on frequent and timely communication with the supplier regarding pivotal rolling estimate points and variability levels. When manufacturers have the upper hand in these relationships, they tend to specify the upper cap but not a lower cap. This type of contract can also be successfully used to offer incentives by specifying a lower cap to suppliers with low willingness to add capacity.

Figure 5
Supplier Segmentation Matrix



Note: OEM is original equipment manufacturer.
Source: A.T. Kearney analysis

The main advantage of this contract is that it is binding, which lends credibility to the manufacturer's request for capacity addition. But it is generally not useful in cases where either the manufacturer has a reputation for renegeing on the downside penalty or where the demand is too uncertain for both parties to agree on initial quantities.

2. Backup agreements. The manufacturer typically places an order for an estimated quantity and a backup quantity. If demand exceeds initial estimates, purchases the backup quantity. If demand falls short of estimates, rather than purchasing the backup quantity, the manufacturer pays a penalty to compensate the supplier.

These contracts are typically used in retail but may also be used to provide downside risk protection to suppliers in other industries. The advantage of this contract is that it penalizes the manufacturer for inaccurate demand forecasts; the downside is that manufacturers are often tempted to renege on the contract unless it is legally binding.

3. Revenue sharing. Revenue-sharing agreements provide suppliers incentives to add capacity, as they stand to gain if demand increases. Manufacturers pay a lower unit cost for the parts purchased in return for a share of revenues given to the supplier. These contracts do not provide adequate downside risk protection to suppliers when actual demand is lower than projected. Additionally, suppliers with insufficient financial resources are often unable to grant initial concessions below the unit cost. These agreements became popular in the U.S. video retail sector where rental companies such as Blockbuster and Rentrak used them to increase product availability during peak demand.

Revenue-sharing agreements are also common in aircraft manufacturing because order placement lead time is long and cash-strapped manufacturers want to push the risk of uncertain demand to suppliers. Boeing and Airbus regularly use these contracts with component suppliers.

Working with Suppliers

It is imperative for manufacturers to work closely with suppliers when increasing capacity. Comprehensive demand forecasting, transparent communication, and equitable sharing of risks and rewards will help smooth the process of adding supply capacity and encourage profitable short- and long-term relationships between manufacturers and suppliers.

Authors



Manish Mathur, partner, Gurgaon
manish.mathur@atkearney.com



Mayank Bansal, principal, Gurgaon
mayank.bansal@atkearney.com



Shiv Shivaraman, partner, Mumbai

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