

Outsourcing Production *without*

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Outsourcing carries great risks—especially when the balance of power tilts to the provider of outsourced services. By giving up control to another party, companies leave themselves open to the possibility of opportunistic behavior and abuse. In the face of this risk, supply chain managers need to think like investigators and examine all outsourcing decisions based on means, motive, and opportunity.

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In September 2003, a California jury agreed with a breach-of-contract claim of nearly \$1 billion against Flextronics, the world's largest electronics manufacturing services provider. The lawsuit had been brought by Beckman Coulter, a seller of test equipment to medical labs and drug companies. Beckman alleged that Flextronics had failed to comply with a contract to produce circuit boards for a Beckman blood analyzer, pressured Beckman for additional payments, and refused to relinquish crucial materials unless Beckman also bought unrelated parts.

Beckman ultimately recovered more than its actual damages and legal expenses—the two companies later agreed on a \$23-million settlement rather than continue a potentially protracted and uncertain appeal process. But the outsourcing failure jeopardized the company's future, and the litigation was a major distraction for more than two years. Regardless of whether the events actually occurred as claimed, this episode underscores the compelling need for companies to tread carefully when outsourcing production—or any other function, for that matter.

To be sure, there are benefits to outsourcing. Outsourcing can allow companies to replicate an existing function at lower cost or with incremental quality improvement. Occasionally an outside party may offer the quickest or even the only path to new capabilities. But with outsourcing, there is no guarantee of a happy ending. In fact, for many types of outsourcing, there is a growing body of examples in which the outcome has been a disappointment.¹

For example, outsourcing can sacrifice critical capabilities. Communication between internal and outsourced functions can be difficult. The client company becomes not only vulnerable to the service provider's underperformance but also to the provider "holding hostage" certain assets that are critical to the client's business (as allegedly happened to Beckman Coulter). A provider could also use the client's knowledge to benefit the client's competitors or even to become a competitor itself. The recent spate of corporate scandals should also provide a sobering warning of the risks

of ill-considered outsourcing. In a highly outsourced economy, companies must rethink corporate governance even beyond the purview of the Sarbanes-Oxley Act. Only by doing so can they safeguard the promise of production outsourcing.

When outsourcing takes activities offshore, the risk factors are only intensified. Complications can arise from any cultural or language barriers, differences in legal codes and

duction" includes activities such as procurement, manufacturing/assembly, test, repair, logistics, and returns.) However, our research suggests that a company faces substantial risks when outsourcing production on a large scale, especially in the "turnkey" approach that consolidates extensive responsibility and control with a single service provider. This practice threatens to tilt the balance of power towards service providers while complicating their customers' ability to moni-

LOSING CONTROL

enforcement practices (especially regarding the protection of intellectual property), or misalignment in attitudes about environmental and human rights issues. Geographic distance further complicates the monitoring needed to assure that a service provider's actions are true to its customer's intentions.

In spite of these risks, more and more companies are outsourcing production. (For the sake of this discussion, "pro-

tor the outsourced processes in enough detail. Further, the very act of outsourcing puts new and difficult responsibilities on the shoulders of a company's procurement function, which is charged with selecting and monitoring the service providers.

The intent of this article is not to propose a foolproof universal formula for resolving the insource-vs-outsourcing conun-



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drum. Instead, we will address how to oversee the service provider. We will focus on an important aspect of production—procurement—in which substantial outsourcing is under way and describe concrete business controls to mitigate the risks. It is our hope that our prescriptions will help some manufacturers make better decisions about the risks and rewards of outsourcing production.

The Language of Criminal Justice

Some outsourcing risks are primarily due to the complexity, fragmented decision making, and broken information flows that can result when tasks and responsibilities are decentralized. Such challenges call for investments in process redesign and information technologies. However, these approaches alone are not adequate for the risks incurred by deliberate actions by the service provider—actions that are by no means

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in the client's best interests. We believe that the outsourcing debate has not been willing to confront this contentious issue head-on and so this article will focus on providing a framework to understand and manage this class of events.

The language we will use to describe this framework is borrowed from the field of criminal justice. Let us make one thing clear right away: Our use of such terms in no way suggests that we view outsourcing service providers as deliberate or persistent malefactors. We are not interested in labeling actors on either side as criminals or inferring that their actions as illegal *per se*. However, it is a fact that all business relationships are based on some form of contract, and all contracts have gray areas or points on which the agreement is “silent.” In such matters, no party can be faulted for an interpretation that is somewhat self-serving. Whether dealing with internal employees or external partners, it is always shaky business practice to subject one's agents to conditions of ambiguity and temptation.

Criminal investigations probe for a confluence of *means*, *motive*, and *opportunity*. Logically speaking, a criminal act is impossible if the suspect has neither means nor opportunity. Motive is not as absolute a requirement, but its presence always displays the reddest of flags to investigators. In the context of production outsourcing, a company that outsources automatically creates *means* by ceding some measure of decision control to the service provider. The magnitude of the means is a function of the type of task outsourced and the degree of autonomy granted. For instance, hiring a service provider to directly perform a narrow and standardized

activity gives little means. The means is much greater when, for instance, the service provider is allowed to select and pay for materials, suppliers, and possibly subcontractors.

Motive begins with the presumption that independent economic entities should be expected to serve their own interests first. The agendas for the client company and the provider may not be completely conflicting, but it is naïve to presume that they will be perfectly aligned. Outsourcing creates this divergence, as a group of internal employees with a common stake in their employer's success is supplanted by an external enterprise that has its own investors to satisfy in the short and long run. In this context, the motive is usually financial, so the motive's magnitude is a function of the amount of money at stake, either directly or indirectly.

Of course, not all acts detrimental to the client are intentional. Honest mistakes, such as clerical errors in billing, do occur occasionally. However, the notion of motive also helps illuminate any reluctance of service providers to make costs transparent, to self-police, or to make good on any errors beyond those caught by the client.

Outsourcing converts an internal function to a service procured from an outside firm. The *opportunity* for detrimental acts arises from the inevitable imperfections in the client's ability to dictate and monitor the actions of the service provider (which is exacerbated by any geographic or cultural separation). Such responsibilities usually fall to the client's procurement function, which in most companies has historically been oriented towards the purchase of materials rather than services. Purchasing services requires a sometimes profound shift in practices and general mindset. Unfortunately, many buyers are ill-equipped to handle this shift gracefully.²

Purchasing services is much more complex than purchasing materials. Expectations for purchased materials typically can be established with some degree of concreteness and detail, through engineering specifications, standards, and physical tests. The concreteness and detail also give a buyer some ability to estimate costs. In contrast, services tend to have many attributes that are difficult to specify in measurable terms, often leading to imprecise service-level agreements (SLAs) and statements of work. Pricing can be complex and vague, with contingencies buried in the contract language. This is, in part, because the labor content (and its supporting business services) is relatively higher. Whereas materials can be substituted (especially if they are commodities), people never can be. Consider a service provider's assurance, “We'll put our best people on this project.” What does “best” mean, and how can this be verified? With service providers, there is no simple analogy to the safeguards found in materials procurement, such as inventory inspection or three-way match (receipt of goods matched to order quantity matched to payment, confirming that the buyer received what was ordered and was charged only for what was

received). Companies may be tempted to capitulate to the opaque nature of some services and use blanket purchase orders and allow summary billing invoices. But these actions only further obscure relevant cost drivers. All these factors complicate the initial sourcing and ongoing monitoring of procured services and magnify the opportunity for outcomes that do not match expectations.

Of course, many processes conducted in-house also suffer from some version of these challenges, but at least they play out under the jurisdiction of the company's own checks and balances. The challenge is only exacerbated by the fact that many companies equate outsourcing with reductions in resource and staff requirements and fail to recognize that investments in business controls must actually increase because the means, motive, and opportunity for detrimental acts has increased.

The Double Danger in Outsourcing Procurement

Let's now focus on one aspect of production that is substantially affected by outsourcing: the purchasing of parts and materials. Many issues arise whenever any independent party acts as a buying agent for an original equipment manufacturer (OEM). (From here on, we will refer to the provider of the manufacturing services as a contract manufacturer, or CM, and the product brand owner as an OEM.³)

There is a valid business case to be made for outsourcing procurement to a contract manufacturer. For example, tight coordination of manufacturing and materials decisions can prevent myopic actions such as choosing a cheaper component without considering a corresponding increase in assembly cost. Turnkey engagement of a CM ostensibly achieves this kind of integration with the least overhead while retaining the benefits of outsourcing manufacturing.

CMs certainly have financial incentives to lobby for taking over the OEM's direct procurement; they typically earn a markup over the cost of materials. In addition, because some financial analysts base certain metrics on revenue, the ability to count materials flowthrough as revenue can elevate a CM's public stature. The sums at stake can be significant. Consider that in the electronics sector, materials costs can represent up to 80 percent of a CM's or OEM's revenue.

At the same time, competition has pressured the margins that CMs can earn for contract manufacturing, and they cannot currently rely on end-market expansion to drive growth. So it should come as no surprise that some CMs are utilizing manufacturing almost as a loss-leader to drive business to the profit center that procurement has become. This by itself is not a problem. Any party that provides a valuable service is

entitled to fair compensation. The open question is when does such an arrangement have the potential to produce substantive, unintended consequences for the OEM.

The strategic potential of the procurement function derives from a simple premise: The livelihood of any seller depends on making the buyer happy. A buyer who understands this will pursue preferential treatment in the form of attractive prices (either straightforwardly, or indirectly through rebates and other subsidies), short leadtimes, liberal return privileges, forgiveness of occasional contract noncompliance, assurance of supply in times of scarcity, ability to influence technology roadmaps, technical support, and so forth. From this perspective, the ultimate goal of procurement can be described concisely as the *creation and preservation of preferential treatment*.⁴

This means that control of the buying decision is an asset with the potential of substantial value. Thus, something more profound than a markup on materials is changing hands when procurement is outsourced. Such outsourcing inserts an intermediary between the grantor and the rightful recipient of the dividends on that asset. Will the intermediary be a fair and worthy steward of this asset? This brings us back to the issues of means, motive, and opportunity.

Means, Motive, And Opportunity in Turnkey Outsourcing

Obviously, procurement activities can be implemented in many ways—from turnkey, in which the CM negotiates with and buys from the supplier, to in-house, where the OEM controls those roles. For the purposes of this discussion, we will focus on turnkey outsourcing, returning later to summarize risks and mitigation approaches for each of several other purchasing modes.

As noted earlier, any type of outsourcing automatically creates some form of means. Turnkey outsourcing obviously takes this to an extreme. All companies have a duty to put their own long-term shareholder value first, which can be accomplished by acquiring new customers or increasing margins. A CM can serve both objectives by aggregating the outsourced spend of multiple OEM customers; this can lower overhead and increase the enthusiasm of suppliers for providing preferential treatment. Such a move, in principle, can benefit the OEMs in aggregate (although some might gain at the expense of others). But it provides a blanket *motive* for any CM initiative that hijacks the preferential treatment or otherwise results in buying decisions that advance mostly the CM's goals. Motive is amplified whenever the CM has less risk from a negative outcome than does the OEM—for example, brand damage from association with any quality problems or exploitative labor practices.

And what of *opportunity*? It can be created by the inherent difficulty of specifying and monitoring procurement actions.



For certain classes of activities, sustaining these oversight capabilities would require such an intimate level of involvement that the OEM might have been better off not outsourcing in the first place.

To highlight the points where a CM's means, motive, and opportunity converge most forcefully, it is useful to break out procurement activities along two dimensions, as shown in the matrix in Exhibit 1. One dimension classifies procurement activities by what is being moved or exchanged—or as *physical* (movement of goods), *informational* (communication of knowledge and intentions), or *financial* (payments, collections, and investments). The other classifies activities by the type of action—*planning* (determining future requirements), *execution* (completing current actions), and *management* (maintaining and enhancing capabilities). The row and column headers suggest the OEM's procurement priorities while the cells describe the requisite activities.

EXHIBIT 1

Procurement Activities for Potential Outsourcing

	Physical: Efficient and effective movement of goods and materials	Informational: Timely, clear, and secure communication of instructions, reports, and data	Financial: Improved cash-to-cash performance and compliance with legal and regulatory requirements
Planning: Robust determination of future requirements	1. Determine the capacity and materials needed to support manufacturing	2. Collaborate on demand forecasts and potential supply constraints	3. Select suppliers and negotiate terms and conditions
Execution: Reliable and responsive completion of current actions	4. Receive goods, assess quality, track inventory, and pick and stage parts for manufacturing	5. Place purchase orders and execute order changes such as quantity or timing adjustments	6. Pay suppliers, receive rebates or reimbursements, and maintain transaction records
Management: Resolution of issues and continuous improvement of performance	7. Appropriately rebalance inventory across locations and utilize expedited shipment modes from suppliers	8. Identify deviations from plan and request contingent and corrective actions	9. Monitor costs and asset utilization and invest to strengthen supply base

The cells hint at different levels of vulnerability. In each, it is simple to deduce the CM's means and opportunity. Here is a review of each scenario in turn.

1. Planning—Physical

If a CM is given the authority to determine the capacity and materials required (means), it can guide the “who” and “how much” outcomes to its own advantage (opportunity). Even if parts must be selected from a shortlist of OEM-approved suppliers with prenegotiated contracts, CMs will exhibit their own priorities when making trade-offs among factors such as assurance of supply, responsiveness, quality, and technical performance. For example, the possibility of long-term repair contracts can present a temptation to favor less reliable components. CM decisions also may be colored by financial side agreements between the CM and a supplier in the form of rebates or “ordering fees.” Sometimes these arrangements are more subtle. We have learned of situations where a CM directs the spend of one OEM towards a particular supplier

in exchange for attractive terms when purchasing on behalf of a different OEM.

2. Planning—Informational

If the CM provides consumption forecasts directly to suppliers (means), the poor quality or questionable intent of its forecasts can be hidden by the inevitable “forecast errors” (opportunity). Whenever forecasts do not entail absolute requirements to purchase, the buyer has an incentive to provide inflated forecasts. This strategy pursues assurance of supply at someone else's cost. OEMs are certainly no angels when managing procurement themselves; this tactic can erode trust and create supply chain inefficiencies by corrupting the quality of information flow. The risk added by outsourcing is increased whenever the CM is less vested in the relationship with a particular supplier than the OEM.

3. Planning—Financial

If the CM is given the freedom to choose suppliers and negotiate contracts (means), it controls the preferential treatment from suppliers and can make self-serving or myopic decisions about supplier selection and engagement (opportunity). The lack of direct OEM involvement in supplier qualification and contract negotiation might lead to unexpected brand damage should the supplier turn out to be, for instance, an environmental or human-rights villain. The situation need not be so extreme: One high-tech OEM found that its CM had surreptitiously replaced a critical plastic

component with a cheaper alternative and retained the material cost differential. The inferior part failed several years later, punishing the OEM with brand damage and millions of dollars in service costs. Other OEMs have rudely discovered that their CMs used patent-violating components, requiring extensive rework and scrap.

4. Execution—Physical

If the CM receives goods and tracks inventory (means), it gains physical possession of materials and can divert them to unintended uses (opportunity). For example, when mission-critical parts go on allocation, OEMs use their resources, efforts, and relationships to obtain the scarce materials. Once inside a CM's plants, however, the CM may use such parts to produce the products of other OEMs, potentially currying favors and obtaining higher margins.

5. Execution—Informational

If the CM determines the orders to be placed with suppliers

(means), it can place actual orders that differ from the OEM's guidelines (opportunity). For example, OEMs typically qualify multiple suppliers and then instruct CMs to split the total purchase volume among the suppliers according to some fixed allocation. This provides a diversification hedge against supply risk and maintains goodwill across a broad supply base while preserving some healthy competition across suppliers. However, CMs might have more self-interested concerns. We have discovered situations where a CM purchased nearly the entire volume from the cheapest vendor (perhaps negotiating an additional private price break or rebate) but charged the OEM the higher, weighted-average price implied by the "recommended allocation." One OEM discovered this only when it tried to get parts during a short market. The supplier sniffed, "What do you mean that you bought 50 percent of your volume from me last year? You didn't buy anything!"

6. Execution—Financial

If the CM controls cash flows to and from suppliers (means), it can obscure visibility into individual transactions or charges and also negotiate similar supplier pricing for itself (opportunity). For example, a CM might improve its cash-to-cash cycle by paying suppliers much more slowly than it is paid by the OEM. Our research has uncovered delays of more than 100 days, possibly undermining the financial stability of the supply base, jeopardizing the assurance of supply, and ultimately elevating prices to the OEM. We have also seen duplicate invoices, excess overhead charges, and rate and fee calculation errors that accounted for more than 2 percent of total expenditures. Although many of these were unintentional, service providers seem to focus most of their efforts on ensuring that they do not undercharge customers and overpay suppliers and are less concerned about errors in the reverse directions. Finally, awareness of supplier pricing to the OEM gives the CM a bargaining advantage in seeking similar pricing for itself on behalf of other OEMs. This erodes the supplier's willingness to grant the OEM such preferential treatment in the first place. One OEM procurement manager has observed, "The most a CM will pay is the least it knows anyone else is paying."

7. Management—Physical

If the CM supervises the rebalancing of inventory across locations (means), it can optimize its own profit and pass on expediting costs (opportunity). For example, a CM might thwart an OEM's attempt to redeploy scarce parts to another location (potentially that of a different CM), especially if the

CM believes itself to have some legitimate claim on the inventory. That was one of the issues at the heart of the Beckman Coulter lawsuit against Flextronics. The CM may also approve air freight from suppliers simply to provide itself a greater time buffer in meeting OEM orders.

8. Management—Informational

If the CM is relied upon to monitor deviations from plan and evaluate the performance of the upstream supply chain (means), it can manipulate data and hide negligent actions (opportunity). There is an intrinsic incentive conflict when the CM is doing much of the reporting and interpretation of data that also conveys its own performance to the OEM. We have discovered situations where data was provided selectively to shift blame or sugarcoat actual performance.

9. Management—Financial

If the CM is put in charge of monitoring costs and developing suppliers (means), it can retain financial benefits, create charges, and under-invest in support (opportunity). For example, CMs are usually entitled to pass on materials-cost increases and required to share reductions. However, the speed of each action is not always written into the contract, and monitoring is difficult. One OEM discovered that cost

Outsourcing puts new and difficult responsibilities on the shoulders of a firm's procurement function, which is now charged with selecting and monitoring the service providers. But many buyers are ill-equipped to gracefully handle the required shift in practices and general mindset.

increases for some electronic components were being passed along in two days on average, whereas sharing of cost reductions typically took 23 days. Certain costs, such as those associated with emergency engineering changes or excess inventory, are notoriously difficult to quantify. Attempts to assign individual responsibility can trigger finger-pointing and degenerate into "he said, she said."

Applying Prudent Safeguards

Now that OEMs know the vulnerabilities when parts procurement is outsourced along with production, how do they protect themselves? Alerting and educating OEMs about the scope of potential outsourcing hazards is only half the battle. Many actual countermeasures are easier said than done. Because the stakes are so high, wishful thinking is inadequate; successful outsourcing requires investing in people and systems and instituting explicit business controls to control the relationships. Let us articulate some basic principles of risk mitigation, mapping them to a CM's means, motives,

and opportunities. Then using a matrix similar to the one in Exhibit 1, we will frame a series of basic safeguards that OEMs can use in each of the nine procurement scenarios described (See Exhibit 2.)

An OEM can limit *means* by reallocating the decision rights, perhaps even bringing certain activities back in-house and/or distributing duties and responsibilities among multiple parties. Distributed responsibility exposes potential errors to

more sets of eyes and increases the effort required to successfully commit fraud (admittedly at the expense of higher coordination costs and other potential inefficiencies).

Conflicting *motives* call for aligning incentives, or at least making them explicit. The contract should formally attach rewards to desirable behaviors and guarantee fair compensation for bearing risks. For example, if an OEM wants its CM to provide assurance of supply and fast turnaround times, it should be willing to provide up-front payments, upside fees, or minimum quantity commitments. An OEM that instead chooses to be hard-nosed in those areas will likely only motivate the CM to increase other fees to offset lost procurement margins. Or as paraphrased eloquently by one manager, "Pay me now, or pay me later."

Process redesign holds the key to the control of *opportunity*. The redesign should pay careful attention to the rules of engagement, the information systems (to improve mutual visibility and facilitate documentation), and the monitoring procedures (using methods such as audits). Periodic audits can call attention to error or

fraud. An invoice without a receipt may indicate the creation of a fictitious supplier, while a receipt without an invoice could signal that goods have been obtained illegally. Findings from audits can be used to modify policies, procedures, and systems to prevent recurrences. Any increase in visibility and ease of reporting, along with the knowledge that audits will be performed, addresses motive by making it easier to apply incentive-aligning rewards schemes. Audits change the means as well, through sharing responsibility for managing information and financial flows.

There are specific actions that OEMs can take to safeguard procurement outsourcing activities. Exhibit 2 matches the situations referenced in Exhibit 1 and shows samples of the relevant initiatives.

EXHIBIT 2			
How OEMs can Safeguard Procurement Outsourcing			
	Physical	Informational	Financial
Planning	- Make parts preferences clear and explicit - Track and audit purchases by part and supplier	- Monitor and help reduce forecast errors - Communicate forecast ranges and flexibility requirements - Share the cost of inventory liability or shortages with the CM	- Establish codes of conduct for all suppliers and investigate compliance - Maintain "veto" power regarding which parts and suppliers are used - Obtain warranties from CMs protecting against poor quality or patent violations
Execution	- Track and audit part quantities and usages (including "defective" and "scrap") - Request OEM-specific stocking locations	- Make part and supplier preferences clear and explicit - Track and audit transactions by part and supplier - Maintain relationships with suppliers and meet with them periodically	- Employ price-masking mechanisms to prevent disclosure of OEM-specific supplier prices - Refuse to accept summary invoices - Audit transactions for accuracy - Maintain relationships with suppliers and ensure that CMs are making timely payments
Management	- Retain ability to transfer parts to alternative locations, even to those of alternative CMs - Require pre-approval of expediting over a certain limit - Share responsibility of expediting costs to better align incentives	- Jointly collect, manage, and interpret performance data and metrics - Request detailed transactional data, not simply summary reports - Collaboratively decide on root causes and corrective actions - Audit data for discrepancies which could indicate potential errors or manipulation	- Make contract terms explicit, such as the speed of cost increases/reductions and liability for engineering changes and excess inventory - Monitor and audit these contract terms - Appropriately compensate service providers for risk-sharing, quality-of-support, and other desirable behavior

EXHIBIT 3

Comparing Alternative Procurement Models for Key Danger Points

Where OEMs can be Exploited	Turnkey	Turnkey with Audits	Supplier Rebates	Buy-Sell	Consignment	In-House
1. Planning – Physical The CM can guide the "who" and "how much" decisions to its own advantages						
2. Planning – Informational The CM can hide the questionable intent or quality of its forecasts within the "errors" that will inevitably occur						
3. Planning – Financial The CM controls the preferential treatment and can make self-serving supplier selection decisions						
4. Execution – Physical The CM gains physical possession of materials and can divert them toward unintended uses						
5. Execution – Informational The CM can place actual orders that differ from the OEM's guidelines						
6. Execution – Financial The CM can obscure visibility into individual transactions or charges and negotiate similar supplier pricing for itself						
7. Management – Physical The CM can rebalance inventory to optimize its own profit while passing along expediting costs						
8. Management – Informational The CM can manipulate performance data and hide negligent actions						
9. Management – Financial The CM can retain financial benefits, create charges, and under-invest in support						

KEY:  = hazard is fully mitigated  = hazard is partially mitigated  = hazard is not mitigated

Alternative Approaches to Procurement in Outsourced Production

Between turnkey outsourcing, which is exposed to all the hazards described above, and in-house procurement, which forfeits the potential benefits of outsourcing, there are four other procurement models. These models attempt to take some sort of middle ground by coherently integrating the intent of various subsets of the concepts described above.⁵ We have listed all six models below in decreasing order of "means-motive-opportunity" risk. (See also Exhibit 3.)

Turnkey: CM negotiates with and buys directly from supplier.

Turnkey's primary strength is the use of the CM's procurement leverage at the lowest overhead. (Obviously, this is only true where the CM's procurement leverage is more signifi-

cant than the OEM's. For large OEMs and noncommodity parts, this conventional wisdom may not be correct.)

Turnkey with Audits: OEM audits transaction prices and quantities.

This model retains the strengths of the turnkey model with the added benefit that subsequent OEM audits can help to detect errors and deter fraud. The mitigation, however, is only partial because: 1) audits discover only a fraction of the problems, 2) OEMs may not achieve full recovery, and 3) the time value of money is often lost.

Supplier Rebates: Supplier rebates price differentials to OEM.

In this model, the CM buys parts on behalf of the OEM, paying a standard list price. Periodically, the supplier rebates to the OEM the difference between the list price and the OEM's private price. Supplier rebates are used when the OEM believes it can negotiate superior prices and effectively monitor and collect rebates.

Buy-Sell: OEM buys directly from supplier at a private price and sells to CM at a different price.

Buy-sell provides a way to outsource tactical purchasing (once the "buy-sell" transaction is complete, the supplier drop-ships materials to CM), while retaining strategic procurement and masking its preferential prices. This model is most appropriate when an OEM believes its procurement leverage delivers significant competitive advantage. Buy-sell has been practiced by major electronics and automotive OEMs for more than a decade.⁶

Consignment: OEM buys and owns the inventory, which is stored at the CM.

The OEM purchases parts directly from a supplier and retains inventory ownership. After purchase, the supplier drop-ships parts to the CM, which stores them until use. Consignment is often used with parts that are unique, slow-moving, proprietary, and/or scarce. With consignment, the OEM can mask prices and also establish inventory buffers above the CM's standard policies (to ensure sufficient supply).

In-House: OEM buys directly from suppliers, managing storage and transit to CMs.

This approach provides complete control and eliminates

all means-motive-opportunity risks—but at a cost. OEMs must have fully staffed organizations, highly integrated information systems, and geographically distributed locations to plan, execute, and manage the inbound supply chain from suppliers to CMs.

Action Items

An OEM today could conceivably engage a single provider for procurement, assembly, test, repair, logistics, and returns activities. In fact, the provider could probably also offer product design, information technology, and call center services.

However, we believe that OEMs must carefully consider the underlying means-motive-opportunity risks when deciding which activities to outsource and how to manage service providers. If they fail to do so, they risk exposure to an array of opportunistic behaviors and abuses—to the point where the consequences may outweigh the original rationale for outsourcing.

We offer no blanket endorsement of any of the strategies described in this article. The decisions must be based on the relative magnitude and importance of several factors—the nature of the industry, attributes of the procured materials, competitive dynamics at the OEM and CM, and the two firms' relative size and power.

We believe that an OEM's overall procurement strategy should include a portfolio of the approaches we suggest. This brings up two action items. The first is that OEMs must develop a variety of procurement capabilities to enable flexible implementation of those found most appropriate. The second is to create sound decision methodologies for allocating spend across these capabilities.

Given the increased reliance on external parties and the relative immaturity of outsourcing relationships, a structured approach, using the assessment and safeguarding principles that we have described, is more critical than ever.

Author's note: This article is based on research conducted over more than a decade with global companies, many of which are headquartered in Silicon Valley. The ongoing research has included audits of the supply chains of nearly 20 companies representing over \$40 billion in outsourcing spend, and interviews and roundtables with hundreds of senior executives affili-

ated with the Institute for Supply Management, CAPS Research, the Stanford Global Supply Chain Forum, and the Procurement Sciences Institute. In addition, one of the authors, Corey Billington, was vice president of the strategic procurement organization at Hewlett-Packard, responsible for deploying many of the solutions described in this article.



Footnotes

¹See Doig, Stephen J., Ronald C. Ritter, Kurt Speckhals and Daniel Woolson. "Has outsourcing gone too far?" *The McKinsey Quarterly*, 2001, No. 4: pp. 25-37. Barthelemy, Jerome. "The seven deadly sins of outsourcing." *Academy of Management Executive*, 17, 2 (2003): pp. 87-100. Earl, Michael J. "The Risks of Outsourcing IT." *Sloan Management Review*, 37, 3 (1996): pp. 26-32.

²See Allen, Sandy and Ashok Chandrashekar. "Outsourcing Services: The Contract Is Just the Beginning." *Business Horizons*, March-April 2000: pp. 25-34. Durfee, Don. "The Great Inflatable Service Bill." *CFO Magazine*, April 22, 2004.

³For us, the OEM is the owner of a product brand and may use a CM to produce the product. This is the predominant usage of these two terms among the companies encountered throughout our research. However, we acknowledge that, in some circles, OEM actually is used to mean CM. Also, companies like Flextronics and Soletron say that they add services beyond manufacturing and prefer the term electronics manufacturing services (EMS). We avoid this term so as not to restrict attention to electronics.

⁴We would like to thank Joseph Sandor, former director of purchasing at Sara Lee, for first sharing this concept with us.

⁵See Ellram, Lisa and Corey Billington. "Purchasing leverage considerations in the outsourcing decision." *European Journal of Purchasing and Supply Management*, 7, (2001): 15-27. We would also like to thank Professor Charles Holloway of Stanford University and Bill Boller, retired vice president of world wide order fulfillment and manufacturing at Agilent Technologies, for insights regarding the advantages and disadvantages of the alternative procurement approaches.

⁶See "OEMs should outsource, but maintain control of sourcing." *Purchasing*, Dec. 11, 2003). Jorgensen, Barbara. "Back to the future." *Electronic Business*, Dec. 1, 2003. "Motorola to Hide Pricing," *Electronic News*, Nov. 3, 2003. "One step at a time." *Electronic Business*, April 1, 2004. Ellram, Lisa and Corey Billington, "Purchasing leverage considerations in the outsourcing decision," *European Journal of Purchasing and Supply Management*, 7, (2001).

