

## Research paper

# Aerospace parts suppliers' reaction to online reverse auctions

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### Keywords

Business-to-business marketing, Electronic commerce, Aerospace industry, Auctions, Purchasing techniques, Suppliers

### Abstract

Presents the results of a survey conducted among aerospace part and sub-assembly suppliers to quantitatively assess their reaction to online reverse auctions and its impact on their business policies and practices. Findings are compared to the qualitative benefits identified for suppliers by third party online reverse auction service providers. Determines that incumbent suppliers do not realize the benefits suggested by online reverse auction service providers. Identifies new sources of costs which accrue to buyers and are not accounted for in so-called "total cost" request for quotes, including retaliatory pricing practices, less cooperative relationships, and sourcing work back to the original supplier. Concludes that both buyers and sellers participating in online reverse auctions will likely encounter unfavorable outcomes, thus questioning the effectiveness of this new purchasing tool as a means of reducing the unit price of buyer-designed engineered components.

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## Introduction

Business-to-business online reverse auctions, also known as downward price auctions, have gained popularity among *Fortune* 2000 companies as a tool to reduce the unit price of purchased materials used in the production of durable goods (Richards, 2000; Tully, 2000; Anderson and Frohlich, 2001; Judge, 2001). The general process, as well as its purported strengths and key weaknesses, have been described previously (Emiliani, 2000; Emiliani and Stec, 2001, 2002a, b; Tulder and Mol, 2002). The companies that provide online reverse auction services are also known as "market makers".

The market makers assist the buyer in creating detailed request for quote (RFQ) packages that categorize parts into logical groupings, by part or process families, to facilitate price estimating and online bidding. Market makers often refer to the RFQs they help create as "total cost" RFQs, thus indicating to both buyers and sellers that the RFQs represent an accurate depiction of all the costs associated with doing business. The process culminates in real-time, dynamic, open bidding conducted over the Internet between tens of suppliers versus the traditional static three-quote closed bidding process. The dynamic bidding process typically results in significantly lower unit prices than the buyer has previously paid, usually between 10-30 per cent.

Leading providers of online reverse auction services include Ariba, CommerceOne, Covisint, eBreviate, FreeMarkets, Moai Technologies, Orbis Online, Procuri, and PurchasePro. Aerospace industry-specific market makers include Cordiem and Exostar. Most companies characterize themselves as neutral third parties that facilitate the matching of buyers and sellers. In actual practice, however, this may not be the case because the price that the buyer pays for the online reverse auction services often includes incentive compensation based on the level of savings achieved. Importantly, the incentive compensation is usually based upon the gross savings, or maximum theoretically achievable savings identified at the close of bidding. This motivates market makers to recommend to the



buyer that it invite several "qualified" low-cost sources of supply to bid in order to drive down the price. Alternative low-cost sources of supply are usually identified by the market maker, based upon the supplier's performance in previous online reverse auctions conducted with other customers for similar commodity categories.

It is worth briefly noting that prior work (Emiliani and Stec, 2002a) has reported the losses that are incurred in post-auction implementation activities to secure the identified savings. The net savings is an average of at least 50 per cent less when measured across a broad market basket of product and service commodity categories (CLBM, 2002). Thus, the amount of savings that buyers can actually achieve is, in most cases, much less than that portrayed by online reverse auction service providers.

Online reverse auctions are widely perceived by incumbent suppliers as a divisive purchasing tool designed principally to drive down unit prices (Tulder and Mol, 2002), without adequate consideration given to other important measures of performance or production capability (Richards, 2000; Bartholomew, 2001, 2002). A recent study (Jap, 2001) concluded that online reverse auctions damage a buyer's long-term performance by creating distrust among its incumbent suppliers. One such source of distrust arises when buyers use online reverse auction to test the market with no real intention of switching sources, but instead to drive down the unit prices of incumbent suppliers. Attempts to mitigate distrust between buyers and suppliers has resulted in the creation of a voluntary online reverse auction "code of ethics" in the US auto industry (Kisiel, 2002a, b, c; OESA, 2002), a "good trading practice" guideline in the European aluminum foil industry (EAFA, 2002), and recommendations on the correct use of online reverse auctions (Goetting, 2002).

The online reverse auction process is clearly of great concern to incumbent suppliers because they stand to lose work to other suppliers engaged in online bidding (Tulder and Mol, 2002). The quantitative impact of online reverse auctions on suppliers' specific business policies, practices, relationships with

sellers, and the purported benefits to suppliers has not been previously reported. This paper examines these aspects in a segment of the aerospace supplier community. The results should be of interest to buyers and sellers, as well as those who invest in the market makers, because it may foretell the sustainability of the online reverse auction process within the buying company or in certain commodity categories.

## Research method

A 20-question survey was constructed to determine how suppliers react to online reverse auctions, including changes to strategy and operating practices and the impact on relationships with their customers. The questions were based on unpublished research conducted by the authors in the summer of 2001. A dozen aerospace suppliers were visited and asked several questions pertaining to their general experiences with online reverse auctions, including the specific data asked for by buyers and the market makers before, during, and after an online reverse auction. The interviews indicated there were important discrepancies between the purported benefits and outcomes promulgated by buyers and market makers, and those experienced by suppliers participating in online reverse auctions. The identified discrepancies provided the basis for the current research.

The survey was sent via e-mail to senior managers, typically president or vice president, of 43 aerospace part and sub-assembly suppliers located in the eastern USA and whose core competency is principally machining components from various types of metals, including bar stock, castings, and forgings. On average, the level of complexity of the engineered parts made by these suppliers can be characterized as medium to high. These companies supply the majority of their products directly to large, multi-billion dollar Tier 1 original equipment aerospace product manufacturers based in the USA. Data collection for the survey began at the start of September 2002 and was completed three weeks later.

There were two e-mail addresses which were no longer valid, and four suppliers indicated

that they had never been asked to participate in online reverse auctions. The reasons cited were:

- The supplier's parts are proprietary designs, and thus can not be easily sourced elsewhere.
- The type of parts the supplier produces has not yet been subjected to online reverse auctions.

Of the remaining 37 suppliers, 23 responses to the survey were received resulting in a response rate of 62 per cent. All of the suppliers surveyed were USA-based Tier 2 incumbent suppliers that have had decades-long business relationships with their USA-based Tier 1 customers, from which they generate 25-75 per cent of annual sales. The suppliers responding to the survey are principally make-to-print sources of supply, which means the Tier 1 customer owns the part design. This greatly facilitates the customer's ability to source work using the online reverse auction process.

## Results and analysis

Survey participant responses were measured on a one-to-five Likert scale. The format for presenting the results is: the question, the scale for the response, a "box-and-whisker plot", explanation of the data plot, and then a brief analysis of the finding. The box-and-whisker plots show the minimum response (far left) and maximum response (far right), as well as the first quartile (left side of box), second quartile (median; vertical line in box), and third quartile (right side of box). Some questions were asked that required respondents to provide written details. In these cases, the non-repeating responses are grouped under various categories. A summary of the findings is presented in Table I.

### Question 1. Has your business strategy changed as a result of online reverse auctions?

Scale: 1 = no change in strategy; 3 = minor change in strategy; 5 = major change in strategy (Figure 1).

#### Results

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of three. The

interquartile range (Q3-Q1) is 3.5 indicating the middle 50 per cent of data were significantly varied between values of 1 and 4.5. The minimum value and first quartile are the same at a value of 1.

#### Analysis

Suppliers interpreted this question many different ways and in some cases characterized what most people would perceive to be a minor change in strategy as a major change in strategy. For example, the use of online reverse auctions by customers propelled some suppliers to find new customers that do not use online reverse auctions ( $n = 4$ ), have greater caution regarding participation in online reverse auctions or increased selectivity on items they bid on ( $n = 3$ ), recognition that work awarded through traditional sourcing practices would be short term ( $n = 2$ ), or that new technology equipment was needed ( $n = 1$ ). A more substantive change in strategy was an increased awareness of the need to improve productivity using lean production practices ( $n = 2$ ). One supplier noted that their major shift in strategy was to aggressively win new work through the online reverse auctions process. The strategy was to "go low on pricing" to increase production volume and thus improve overhead absorption. That supplier is now out of business. While there were many factors that contributed to the supplier's demise, the ongoing deterioration in gross margin due to contractually defined year-over-year price reductions could be directly attributed to winning new work through the online reverse auction process – despite ongoing efforts to improve productivity using lean production practices and the benefits associated with producing families of parts using similar processes.

### Question 2. Has your company's participation in online reverse auctions resulted in changes to your operating practices?

Scale: 1 = no change in operating practices; 3 = minor change in operating practices; 5 = major change in operating practices (Figure 2).

#### Results

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 1. The interquartile

Table I Summary of online reverse auction survey findings

Survey question	Median response value (scale description)	Capsule result/analysis
1. Has your business strategy changed as a result of online reverse auctions?	3 (minor change in strategy)	Seek new customers not using ORAs ( $n=4$ ); exhibit greater caution participating in ORAs or increased bid selectivity ( $n=3$ ); adopt lean production practices ( $n=2$ )
2. Has your company's participation in online reverse auctions resulted in changes to your operating practices?	1 (no change in operating practices)	Greater awareness of costs or greater emphasis on cost reduction ( $n=2$ ); adopt lean production practices to improve productivity ( $n=2$ )
3. What has been the effect of online reverse auctions with regards to your production capabilities?	3 (no change in capabilities)	Most suppliers reported no change in production capabilities; adopt lean production practices ( $n=2$ ); obtain new and different types of work ( $n=1$ ); diversify customer base ( $n=1$ )
4. What has been the effect of online reverse auctions with regards to your long-term competitiveness?	2 (reduction or no change in competitiveness)	Most suppliers reported either a reduction or no change in long-term competitiveness; deterioration of long-term competitiveness ( $n=3$ ); improved long-term competitiveness by adopting lean production practices to become more flexible and responsive ( $n=2$ )
5. What has been the effect of online reverse auctions on your company's overhead burden?	3 (no change in overhead burden)	Most suppliers reported an increase in overhead burden
6. What has been the effect of online reverse auctions on your company's gross margins?	1 (decrease in gross margin)	Most suppliers reported a decrease in gross margin
7. What has been the effect of online reverse auctions with regards to relationships with your customers?	1 (less cooperation)	Most suppliers reported less cooperative relationships with their customers
8. Do you feel that online reverse auctions are an ethical business practice?	1 (no)	Most suppliers judged ORAs as an unethical business practice
9. Do you feel that online reverse auctions create a "level playing field"?	1 (no)	Most suppliers judged ORAs as being ineffective at leveling the playing field
10. As a result of your experience with customers using online reverse auctions, do you actively seek opportunities to charge them higher prices?	4 (sometimes to all the time)	ORAs compel most suppliers to retaliate with respect to pricing when the opportunity arises with their customers
11. List a few key benefits of online reverse auctions for suppliers	–	39 per cent of suppliers said there were no benefits
12. List a few key drawbacks of online reverse auctions for suppliers	–	Pricing, RFQ, intangibles, process management
13. How could the online reverse auction process be improved to deliver greater benefits to suppliers?	–	Can not be improved ( $n=10$ ); pricing, contracts, bidders, process management
14. Has work that you lost as a result of online reverse auctions come back to you? If "yes", what percent of the total lost has returned?	–	Yes ( $n=14$ ); average amount of work returned = 19.5 per cent
15. When was the first and last time you participated in an online reverse auction? Give month and year	–	First 11/97, Last 9/02; average duration = 23.2 months
16. About how many online reverse auctions events (not individual lots) have you participated in?	1 (one to ten)	The level of participation in ORAs is low or suppliers are selective regarding the extent of their participation
17. How many new customers have you won as a result of online reverse auctions?	1 (zero to two)	Half of the incumbent suppliers won no new customers
18. How much has your sales increased as a result of online reverse auctions?	1 (0 to 5 per cent)	Most suppliers reported no increase in sales
19. How many new markets have you gained access to as a result of online reverse auctions?	1 (zero to one)	Most suppliers reported little or no access to new markets
20. Total number of full-time employees?	2 (51 to 100)	All suppliers responding to the survey can be classified as small businesses

Figure 1

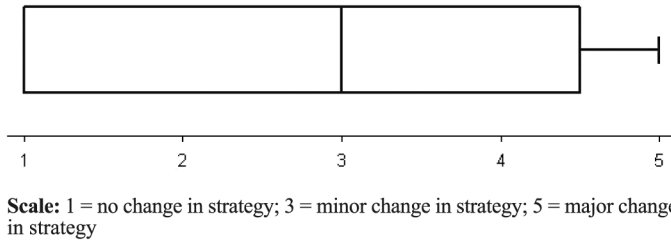


Figure 3

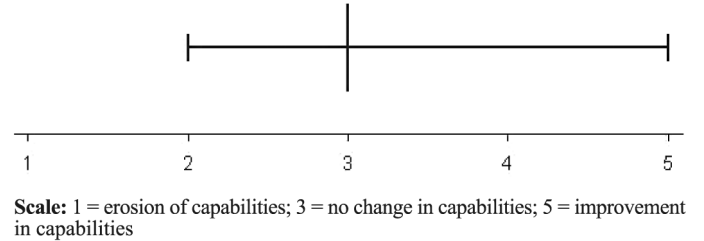
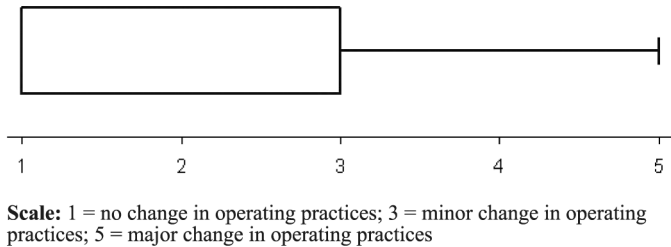


Figure 2



range (Q3-Q1) is 2 indicating the middle 50 per cent of data were fairly consistent between values of 1 and 3. The minimum value, first quartile, and median are the same at a value of 1.

*Analysis*

A few suppliers described the specific changes in operating practices, including: increased awareness of costs and greater emphasis on cost reduction ( $n = 2$ ), improving productivity through the adoption of lean production practices ( $n = 2$ ), and outsourcing simple machining operations ( $n = 1$ ).

**Question 3. What has been the effect of online reverse auctions with regards to your production capabilities?**

Scale: 1 = erosion of capabilities; 3 = no change in capabilities; 5 = improvement in capabilities (Figure 3).

*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 3. The interquartile range (Q3-Q1) is 0 indicating the middle 50 per cent of responses were consistent at a value of 3. The first quartile, median, and third quartile are the same at a value of 3.

*Analysis*

Most suppliers reported no change in production capabilities as a result of online reverse auctions. A few suppliers provided additional information regarding changes to their production capabilities including: adopting lean production practices ( $n = 2$ ), obtaining new and different types of work ( $n = 1$ ), diversifying the customer base ( $n = 1$ ), and investing in new equipment ( $n = 1$ ).

**Question 4. What has been the effect of online reverse auctions with regards to your long-term competitiveness?**

Scale: 1 = reduction of competitiveness; 3 = no change in competitiveness; 5 = improvement in competitiveness (Figure 4).

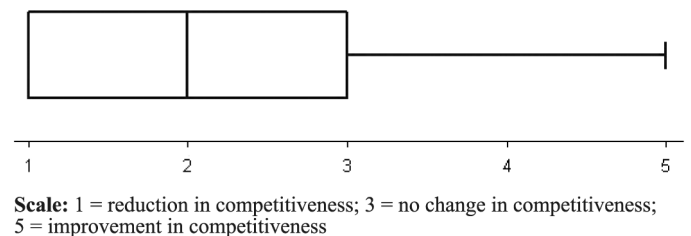
*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 2. The interquartile range (Q3-Q1) is 2 indicating the middle 50 per cent of data were fairly consistent between values of 1 and 3. The minimum value and first quartile are the same at a value of 1.

*Analysis*

Most suppliers reported either a reduction or no change in long-term competitiveness as a result of their participation in online reverse auctions.

Figure 4



A few suppliers provided information on how their long-term competitiveness has deteriorated including less money to spend on improvement activities, technology, or equipment ( $n = 3$ ). A few others noted how their long-term competitiveness has improved by adopting lean production practices to become more flexible and responsive ( $n = 2$ ) and through better market intelligence relative to pricing ( $n = 1$ ).

**Question 5. What has been the effect of online reverse auctions on your company's overhead burden?**

Scale: 1 = increase in overhead burden; 3 = no change in overhead burden; 5 = reduction in overhead burden (Figure 5).

*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 3. The interquartile range (Q3-Q1) is 2 indicating the middle 50 per cent of data were fairly consistent between values of 1 and 3. The minimum value and first quartile are the same at a value of 1. The median and third quartile are the same at a value of 3.

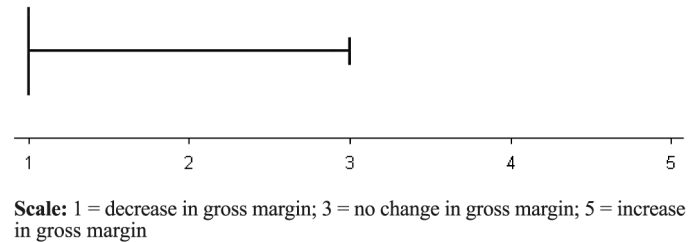
*Analysis*

Most suppliers reported an increase in overhead burden due to the work lost to other suppliers. Suppliers reported an increase in overhead expenses associated with the team of people required to work on the RFQ and bidding process ( $n = 3$ ), and an increase in engineering and clerical personnel as well as higher tooling costs ( $n = 3$ ).

**Question 6. What has been the effect of online reverse auctions on your company's gross margins?**

Scale: 1 = decrease in gross margin; 3 = no change in gross margin; 5 = increase in gross margin (Figure 6).

**Figure 6**



*Results*

The box-and-whisker plot displays a narrow range of overall responses to this question with a median response value of 1. The interquartile range (Q3-Q1) is 0 indicating the middle 50 per cent of data were consistent at a value of 1. The minimum value, first quartile, median, and third quartile are all a value of 1.

*Analysis.* Most suppliers reported a decrease in gross margin as a result of the work that was lost to other suppliers.

**Question 7. What has been the effect of online reverse auctions with regards to relationships with your customers?**

Scale: 1 = less cooperation; 3 = no change in level of cooperation; 5 = more cooperation (Figure 7).

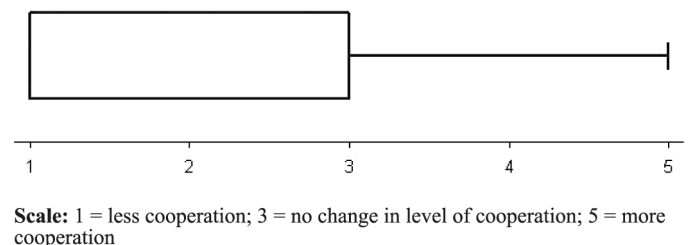
*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 1. The interquartile range (Q3-Q1) is 2 indicating the middle 50 per cent of data were fairly consistent between values of 1 and 3. The minimum value, first quartile, and median all have a value of 1.

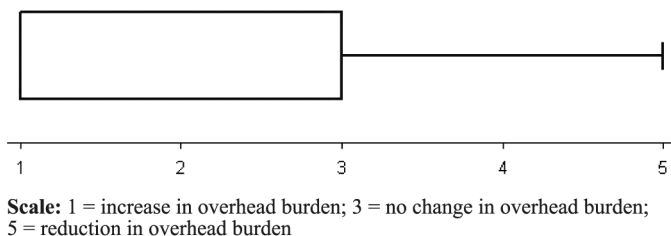
*Analysis*

Most suppliers reported less cooperative relationships with their customers as a result of

**Figure 7**



**Figure 5**



online reverse auctions. The one supplier that reported "more cooperation" is the supplier mentioned previously that is no longer in business. Note that the costs associated with less cooperative relationships are not accounted for in so-called "total cost" RFQs.

**Question 8. Do you feel that online reverse auctions are an ethical business practice?**

Scale: 1 = no; 3 = don't know or neutral; 5 = yes (Figure 8).

*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 1. The interquartile range (Q3-Q1) is 0 indicating the middle 50 per cent of data were consistent at a value of 1. The minimum value, first quartile, median, and third quartile have the same value of 1.

*Analysis*

A total of 21 of 23 suppliers (91 per cent) reported a score of 3 or less. One supplier gave this question a score of 4, while another gave a score of 5. Most suppliers judged this new purchasing tool as an unethical business practice.

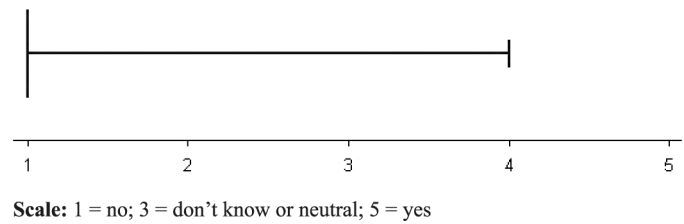
**Question 9. Do you feel that online reverse auctions create a "level playing field"?**

Scale: 1 = no; 3 = don't know or neutral; 5 = yes (Figure 9).

*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 1. The interquartile range (Q3-Q1) is 0 indicating the middle 50 per cent of data were consistent at a value of 1. The minimum value, first quartile, median, and third quartile all have values of 1.

Figure 9



*Analysis*

A total of 21 of 23 suppliers (91 per cent) reported a score of 1. One supplier gave this question a score of 3, while another gave a score of 4. Most suppliers judged this new purchasing tool as being ineffective at leveling the playing field.

**Question 10. As a result of your experience with customers using online reverse auctions, do you actively seek opportunities to charge them higher prices?**

Scale: 1 = not at all; 3 = sometimes; 5 = all the time (Figure 10).

*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 4. The interquartile range (Q3-Q1) is 3 indicating the middle 50 per cent of data were significantly varied between values of 2 and 5. The third quartile and maximum value are the same at a value of 5.

*Analysis*

A total of 17 suppliers (74 per cent) reported a score of 3 or more; 12 suppliers (52 per cent) reported a score of 4 or more; and five suppliers (22 per cent) reported a score of 5. A total of six suppliers (26 per cent) reported a score of 1. This indicates that the use of online reverse

Figure 8

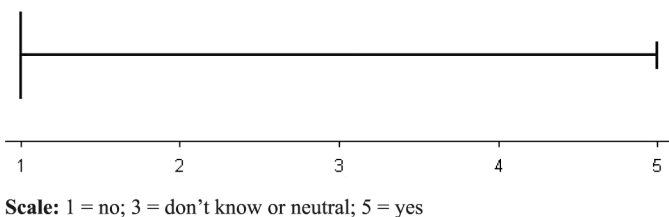
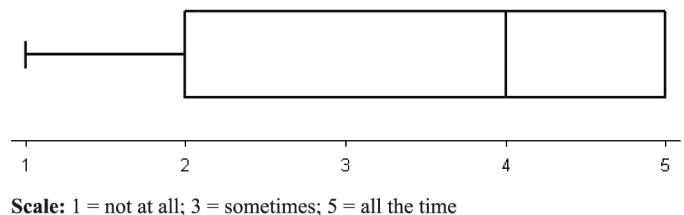


Figure 10



auctions compels most suppliers to retaliate with respect to pricing when the opportunity arises with their customers that use online reverse auctions (i.e. spot buys, expedited orders, etc.). Note that the costs associated with opportunistic behavior by incumbent suppliers are not accounted for in so-called “total cost” RFQs.

**Question 11. List a few key benefits of online reverse auctions for suppliers**

See Figure 11.

*Analysis*

The responses are clustered into three groups. A total of nine suppliers said there were no benefits associated with online reverse auctions. This is supported by the responses under “markets or customers” where suppliers said they look for customers that are not using reverse auctions. The benefits listed under “contracts” are not specific to online reverse auctions; i.e. the reported benefits could be achieved under traditional strategic sourcing processes without using online reverse auctions.

**Question 12. List a few key drawbacks of online reverse auctions for suppliers?**

See Figure 12.

*Analysis*

The drawbacks of online reverse auctions for suppliers were more numerous than the benefits. The majority of the responses to this question centered on “pricing” and “intangible” aspects. The long-term effect of the pricing drawbacks is a reduction in the profitability and capability of suppliers. The responses also highlighted the fact that there is no rational framework for determining costs,

setting prices or profits, and that buyers continue to exert their leverage to lower suppliers' prices. The responses grouped under “intangibles” reflect the concern that buyers are not considering the total cost in the RFQ or the bids received, and that the use of reverse auctions is promoting adversarial relationships between the buyer and supplier.

**Question 13. How could the online reverse auction process be improved to deliver greater benefits to suppliers?**

See Figure 13.

*Analysis*

Responses for improving the online reverse auction process were varied as indicated by the five groupings. The majority of respondents ( $n = 10$ ) said that the online reverse auction process can not be improved or do not know how it can be improved, indicating that buyers should re-evaluate the use of this purchasing tool and its long-term effect on suppliers rather than trying to improve the process. The responses grouped under “pricing” and “bidders” are inconsistent. This suggests that suppliers are coping with this process differently and that many may still be unaware of the key drivers for maximizing savings in online reverse auctions – namely, attractive bid volumes and the inclusion of new suppliers in the bidding process.

**Question 14. Has work that you lost as a result of online reverse auctions come back to you? If “yes”, what percentage of the total lost has returned?**

- Yes ( $n = 14$ ).
- Percentage of work returned ( $n = 10$ ): high = 50 per cent; low = 5 per cent; average = 19.5 per cent.

Figure 11

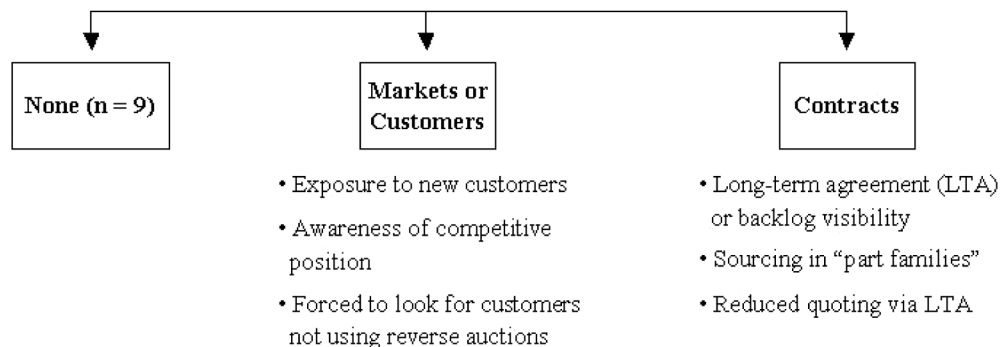


Figure 12

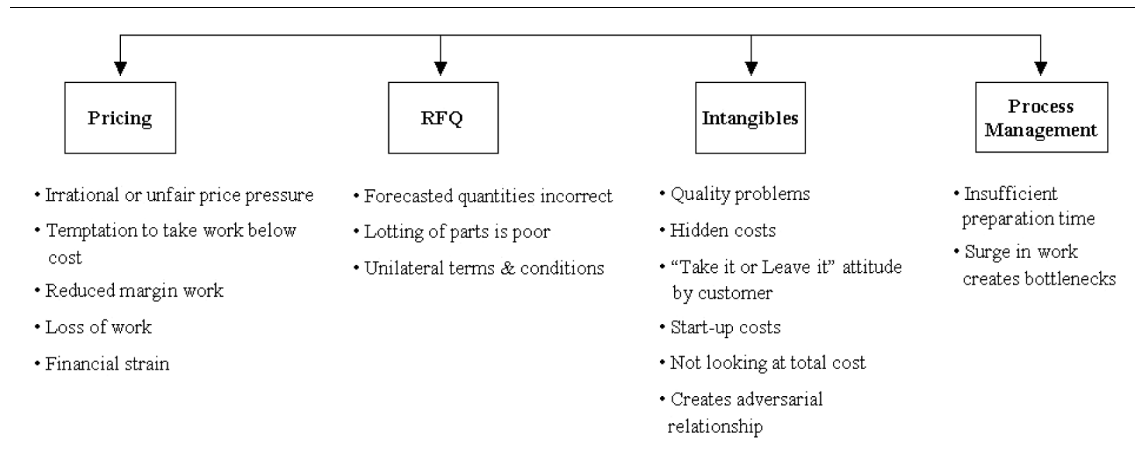
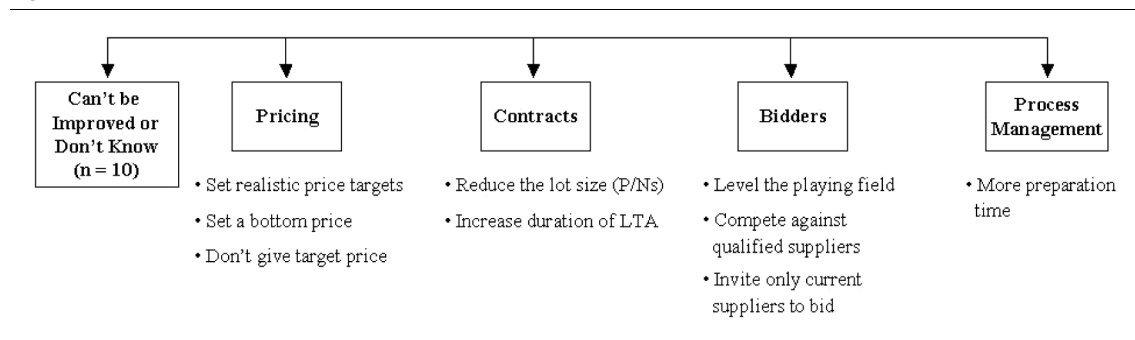


Figure 13



### Analysis

A total of 43 per cent of the suppliers responding said an average of 19.5 per cent of the work returned to them later on, presumably due to non-performance by the new source of supply. This is an important finding because buyers entering into online reverse auction service agreements are likely to be unaware that such outcomes are highly probable for engineered parts.

It also indicates that some suppliers are not as interchangeable as the buyer might believe them to be, and that some suppliers may have more power than they or their customers realize. The power that make-to-print sources of supply have will rest in their capabilities, which can range from relationships with their own suppliers to manufacturing processes to specialized equipment or tooling, and associated tacit knowledge. Note that the costs associated with sourcing work back to the original supplier are not accounted for in so-called "total cost" RFQs.

### Question 15. When was the first and last time you participated in an online reverse auction? Give month and year

- First: November 1997; last: September 2002 ( $n = 18$ ).
- Average duration of participation: 23.2 months ( $n = 16$ ). Standard deviation: 15 months.
- Participating in online reverse auctions in 2002:  $n = 8$ .

### Analysis

These data show that most aerospace parts suppliers participate at some level for periods of up to two years in duration, and then drop out of the process. The average duration of incumbent supplier participation indicates the life cycle of the online reverse auction process for the aerospace machined parts commodity category is relatively short. The coefficient of variation (standard deviation  $\div$  mean = 0.65) indicates that the process has low variability and is tightly distributed around the mean of 23 months. Within that time period, suppliers

learn the issues surrounding online reverse auctions and gain insight into their potential benefits. If the benefits are tangible, then it should result in sustained commitment among suppliers to participate in the online reverse auction process. However, the results indicate that the benefits (presented in the "Discussion" section) are not realized by most of the incumbent suppliers surveyed and so they drop out of the process. Only 35 per cent of the suppliers responding were engaged in online reverse auctions at the time the survey was conducted.

**Question 16. About how many online reverse auctions events (not individual lots) have you participated in?**

Scale: 1 = 1-10; 2 = 11-25; 3 = 26-50; 4 = 51-75; 5 = over 75 (see Figure 14).

*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 1. The interquartile range (Q3-Q1) is 1 indicating the middle 50 per cent of data were fairly consistent at values between 1 and 2. The minimum value, first quartile, and median are the same at a value of 1.

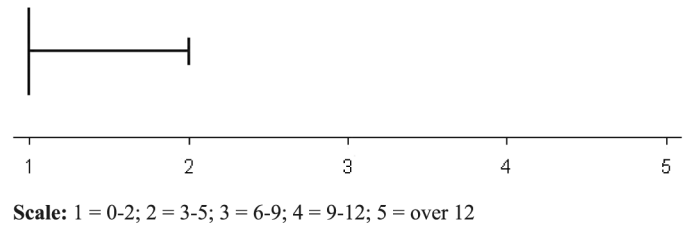
*Analysis*

These data show that level of participation is low or that suppliers are very selective with regards to the extent of their participation. This finding indicates that most incumbent suppliers approach online reverse auctions cautiously and do not view them as a desirable opportunity.

**Question 17. How many new customers have you won as a result of online reverse auctions?**

Scale: 1 = 0-2; 2 = 3-5; 3 = 6-9; 4 = 9-12; 5 = over 12 (see Figure 15).

**Figure 15**



*Results*

The box-and-whisker plot displays a small range of overall responses to this question with a median response value of 1. The interquartile range (Q3-Q1) is 0 indicating the middle 50 per cent of data were consistent at a value of 1. The minimum value, first quartile, median, and third quartile all have values of 1.

*Analysis*

These data show that incumbent suppliers win few new customers as a result of their participation in online reverse auctions. A total of 12 suppliers (52 per cent) said they won no new customers.

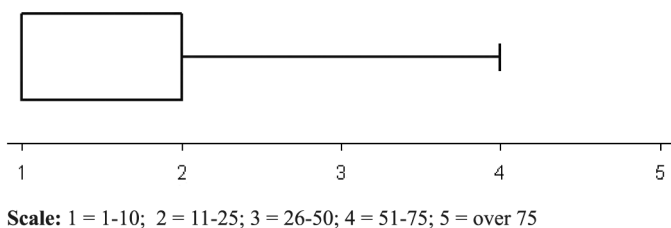
**Question 18. How much has your sales increased as a result of online reverse auctions?**

Scale: 1 = 0-5 per cent; 2 = 6-10 per cent; 3 = 11-15 per cent; 4 = 16-20 per cent; 5 = over 20 per cent (see Figure 16).

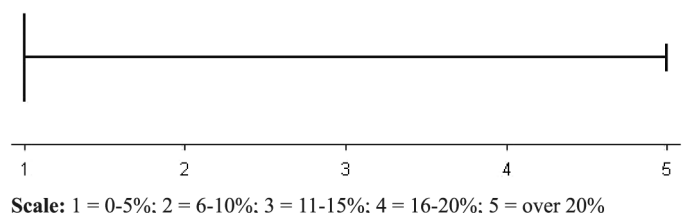
*Results*

The box-and-whisker plot displays a wide range of overall responses to this question with a median response value of 1. The interquartile range (Q3-Q1) is 0 indicating the middle 50 per cent of data all were consistent at a value of 1. The minimum value, first quartile, median, and third quartile all have values of 1.

**Figure 14**



**Figure 16**



*Analysis*

Most suppliers reported that their sales did not increase. A total of two suppliers reported financial losses, while two suppliers reported 20 per cent or more increase in sales.

**Question 19. How many new markets have you gained access to as a result of online reverse auctions?**

Scale: 1 = 0-1; 2 = 2; 3 = 3; 4 = 4; 5 = 5 or more (see Figure 17).

*Results*

The box-and-whisker plot displays a very small range of overall responses with a median response value of 1. The interquartile range (Q3-Q1) is 0 indicating the middle 50 per cent of data all were consistent at a value of 1. The minimum value, first quartile, median, and third quartile all have values of 1.

*Analysis*

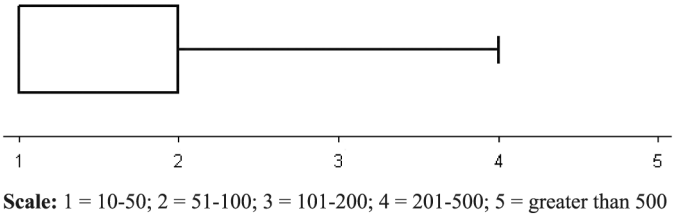
Most suppliers reported little or no access to new markets as a result of their participation in online reverse auctions. A total of 12 suppliers (52 per cent) said they have not gained access to any new markets.

**Question 20. Total number of full-time employees?**

Scale: 1 = 10-50; 2 = 51-100; 3 = 101-200; 4 = 201-500; 5 = greater than 500 (see Figure 18).

*Results.* The box-and-whisker plot displays a large range of responses with a median response value of 2. The interquartile range (Q3-Q1) is 1 indicating the middle 50 per cent of data all were fairly consistent at values between 1 and 2. The minimum value and first quartile are at a value of 1. The median and third quartile are the same at a value of 2.

**Figure 18**

*Analysis*

All of the suppliers responding to the survey can be classified as small businesses, most with less than 100 employees.

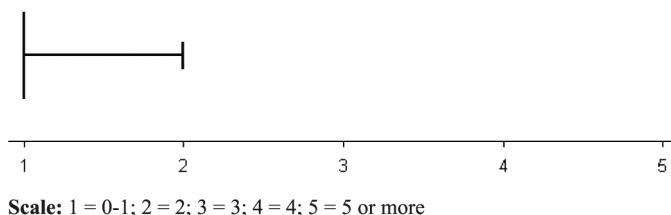
## Discussion

The purported benefits of online reverse auctions for suppliers as described by the market makers (Ariba, 2002; CommerceOne, 2002; Cordiem, 2002; Covisint, 2002; eBreviate, 2002; Exostar, 2002; FreeMarkets, 2002; Moai, 2002; Orbis, 2002; Procuri, 2002; PurchasePro, 2002) are presented in Table II. They make no distinction between these benefits as they relate to incumbent suppliers or lower cost sources of supply that may win new work. Thus, the benefits are apparently equally available to incumbent suppliers and all other qualified suppliers located in the USA or in low wage countries such as Eastern Europe or China.

Importantly, none of the online reverse auction service providers cited previously quantify the benefits that suppliers can expect to achieve in numerical terms. Suppliers must therefore take it on faith that there are benefits they can actually realize. Items (a) through (f) were directly addressed in this study – i.e. Questions 5, 7, 9, 17, 18, and 19, respectively. In general, the suppliers surveyed indicated that they failed to realize these key benefits.

Several suppliers noted that the online reverse auction process does not address total costs (item (g)) as claimed by the market makers. Some suppliers noted benefits associated with improved market intelligence relative to pricing (item (h)) and the creation of long-term agreements (item (i)) for incumbent suppliers that won the work. No mention was made of items (j) through (q) as being beneficial to the suppliers.

**Figure 17**



**Table II** Purported benefits for suppliers

Item	Benefits
(a)	Reduce operating, selling or customer acquisition costs
(b)	Improve buyer-seller relationships
(c)	Compete on a level playing field
(d)	Access to new customers
(e)	Increase sales
(f)	Access to new markets
(g)	Focus on total cost
(h)	Improved market intelligence (relative to pricing)
(i)	Long-term (e.g. two-to-three-year) contracts
(j)	Reduce the complexity of the bid process
(k)	Reduce the bid cycle time
(l)	Process efficiencies
(m)	Improve customer service/customer satisfaction
(n)	Save time
(o)	Fewer geographic boundaries
(p)	Share critical information
(q)	Improved supplier communication

### The principal findings of this study

- The incumbent suppliers surveyed realized few benefits, if any, from participating in online reverse auctions. The claims made by the market makers regarding the benefits to suppliers are at best inaccurate and at worst false. Importantly, previous work has shown that the claims made by market makers with respect to the benefits (i.e. savings) that buyers can expect to realize are greatly exaggerated (CLBM, 2002; Emiliani and Stec, 2002a). This indicates that online reverse auctions are more hype than substance, and that buyers using this new tool will likely encounter unfavorable outcomes when applying the online reverse auction tool to buyer-designed and specified engineered components.
- Over 70 per cent of incumbent suppliers responding to the survey actively seek opportunities to charge their customer higher prices as a direct result of their participation in online reverse auctions when the opportunity to do so arises. This provides concrete evidence that the natural reaction among incumbent suppliers is to retaliate with respect to pricing. The buyer is viewed as behaving in an opportunistic manner, which creates self-similar behavior among incumbent suppliers. Importantly, the market makers claim that the online

reverse auction process accurately portrays the “total cost” of acquisition of purchased goods. However, the reality is that it does not account for retaliatory pricing practices, less cooperative relationships, and sourcing work back to the original supplier, all of which appear to be common outcomes that will surely increase total costs – the very opposite of that which is so much desired by buyers.

- The incumbent suppliers surveyed view online reverse auctions as a divisive purchasing tool that damages relationships with long-time customers. This finding is of no consequence for those buyers who believe that relationships with suppliers, whose products typically comprise over 70 per cent of the cost of goods sold, are not important. Negating the importance of having strong collaborative relationships between buyers and sellers, while recently fashionable, will ultimately result in the destruction of value sought by end-use customers (Womack and Jones, 1996).
- Incumbent suppliers that drop out of the bidding process after one or two years reduce the available pool of qualified suppliers, thus making it more difficult to source engineered parts using the online reverse auction process. It will also be more difficult to secure the level of gross savings that was achieved when the online reverse auction process was first applied to the commodity under consideration (CLBM, 2002). If the number of suppliers that drop out of the process is high enough over time, then leverage will eventually return to the sellers and the online reverse auction process will no longer be useful to buyers (Tulder and Mol, 2002). However, suppliers could diminish the buyer's leverage more quickly if many of them refused to participate when the opportunity first arises, or if they dropped out after the first auction event. The implication for market makers is that they risk running out of high gross savings commodity categories, which historically have been the principal sales and marketing feature used to acquire corporate customers. In the future, market makers may be forced to focus on commodity categories that offer lower gross

- savings potential, likely resulting in fewer customers, diminished sales revenue, or both.
- Some suppliers (about 9 per cent) recognize the great threat that online reverse auctions pose and respond with dedicated efforts to improve productivity and overall competitiveness by adopting lean production practices (Ohno, 1988). So there can be a “silver lining” that benefits both the seller and buyer. Ultimately, however, the buyer has to acknowledge that the cost of purchased good is largely determined by their own design practices and specification requirements, which are often determined without supplier input. In other words, buyers create their own problems and later attempt to transfer them, unjustly, to suppliers. Removing cost from engineered products requires close collaboration between buyers and sellers in design and in production (Nishiguchi, 1994; Monden, 1995; Bounds, 1996; Bounds *et al.*, 1996; Cooper and Slagmulder, 1999; Fujimoto, 1999).
  - A few suppliers responded to online reverse auctions with efforts to improve productivity by adopting lean production practices.

Importantly, the gains in productivity achieved by suppliers using lean production practices are not generally used to better position the supplier for future participation in online reverse auctions. Instead, improved productivity is used as a selling point to prospective customers that do not use online reverse auctions.

Published reports in both academic journals and the business press, as well as conversations between the authors and managers in industry responsible for other commodity categories, suggest that similar results will be found among incumbent suppliers from other industries that produce buyer-designed and specified goods and services in other commodity categories. Thus, the general trends illustrated in this paper are judged to be broadly applicable. However, it is possible that more successful outcomes may exist between specific pairs of buyers and incumbent sellers for certain commodities such as bulk materials or non-technical services that can be very easily specified.

These results, as well as previous studies (Emiliani and Stec, 2001, 2002a, b), show that online reverse auctions offer much less savings to buyers than the market makers claim, while the value proposition for incumbent suppliers is largely non-existent and likely dubious even for new sources of supply who have to contend with the “winner’s curse” (Tulder and Mol, 2002). Buyers could achieve similar results (i.e. net savings) more easily and much less expensively by sending letters to suppliers demanding 5 per cent or 10 per cent price cuts or risk losing their business (Kobe, 2001). While we do not recommend this approach either, it simply is used to illustrate the point that online reverse auctions are not an authentic improvement in purchasing practice – at least for certain commodities.

So what should senior managers do to reduce the cost of purchased materials? Alternative solutions based upon collaborative problem solving, rather than power-based bargaining, and leading to long-term organizational capability building and improved

## Summary

This paper examined how aerospace part and sub-component suppliers specializing in producing engineered machined parts and sub-assemblies react to online reverse auctions. The results show that online reverse auctions have numerous serious shortcomings as far as incumbent suppliers are concerned. Key findings include:

- The incumbent suppliers surveyed realized few benefits, if any, from participating in online reverse auctions.
- Over 70 per cent of incumbent suppliers responding to the survey actively seek opportunities to charge their customer higher prices as a direct result of their participation in online reverse auctions when the opportunity to do so arises.
- The incumbent suppliers surveyed view online reverse auctions as a divisive purchasing tool that damages relationships with long-time customers.
- Most incumbent suppliers drop out of the bidding process after one or two years.

competitiveness have been presented in previous studies (Womack *et al.*, 1990; Nishiguchi, 1994; Monden, 1995; Bounds, 1996; Cooper and Slagmulder, 1999; Fujimoto, 1999) and commented upon in relation to online reverse auctions (Emiliani and Stec, 2002a, b).

Future research will focus on extending the present work to other buyer-designed or specified commodity categories, with the intent to identify similarities and differences in how suppliers react to online reverse auctions and understand the domain of successful and unsuccessful application of the online reverse auction tool. Such results will provide further insight into the evolution of buyer-seller relationships, embedded organizational routines promoting power-based bargaining, the overall utility of online reverse auctions, and the long-term viability of the market makers' business model with respect to acquiring new customers, customer retention, and financial performance.

## References

- Anderson, J. and Frohlich, M. (2001), "Free markets and online auctions", *Business and Strategy Review*, Vol. 12 No. 2, pp. 59-68.
- Ariba (2002), Ariba Inc. Web site, available at: [www.ariba.com/suppliers/suppliers\\_overview.cfm](http://www.ariba.com/suppliers/suppliers_overview.cfm) (accessed 12 September).
- Bartholomew, D. (2001), "E-Business commentary – starving suppliers is not the answer", *IndustryWeek*, 1 November.
- Bartholomew, D. (2002), "The big squeeze", *IndustryWeek*, 1 April.
- Bounds, G. (1996), "Toyota supplier development", in Bounds, G. (Ed.), *Cases in Quality*, R.D. Irwin, Chicago, IL, pp. 3-25.
- Bounds, G., Shaw, A. and Gillard, J. (1996), "Partnering the Honda Way", in Bounds, G. (Ed.), *Cases in Quality*, R.D. Irwin, Chicago, IL, pp. 26-56.
- CLBM (2002), "Online reverse auctions: be careful!", available at: [www.theclbm.com/research.html](http://www.theclbm.com/research.html); and [www.theclbm.com/ora/ora\\_slides.pdf](http://www.theclbm.com/ora/ora_slides.pdf) (accessed 12 September).
- CommerceOne (2002), CommerceOne Inc. Web site, available at: [www.commerceone.com/solutions/products/source\\_benefits.html](http://www.commerceone.com/solutions/products/source_benefits.html); and [www.commerceone.com/download/collateral/cmrc\\_source\\_brochure.pdf](http://www.commerceone.com/download/collateral/cmrc_source_brochure.pdf) (accessed 13 September).
- Cooper, R. and Slagmulder, R. (1999), *Supply Chain Development for the Lean Enterprise*, Productivity, Portland, OR.
- Cordiem (2002), Cordiem LLC Web site, available at: [www.cordiem.com/](http://www.cordiem.com/); and [www.cordiem.com/index.cfm?u\\_page=A7D805BE7DF0468493E485265C51B C38&part=E26521E14CEB433A97BA11CF7FB83A4F](http://www.cordiem.com/index.cfm?u_page=A7D805BE7DF0468493E485265C51B C38&part=E26521E14CEB433A97BA11CF7FB83A4F) (accessed 13 November).
- Covisint (2002), available at: [www.covisint.com/solutions/proc/auctions3.html](http://www.covisint.com/solutions/proc/auctions3.html); and [www.covisint.com/downloads/print/auctions.pdf](http://www.covisint.com/downloads/print/auctions.pdf) (accessed 12 September).
- European Aluminum Foil Association (EAFA) (2002), "Good trading practices in electronic bidding processes: reverse auctions", EAFA, available at: [www.alufoil.org/pdf/eCommerce.pdf](http://www.alufoil.org/pdf/eCommerce.pdf) (accessed April).
- eBreviate (2002), available at: [www.ebreviate.com/products/internet-negotiations.html](http://www.ebreviate.com/products/internet-negotiations.html); and [www.ebreviate.com/products/downward.html](http://www.ebreviate.com/products/downward.html) (accessed 12 September).
- Emiliani, M. (2000), "Business-to-business online auctions: key issues for purchasing process improvement", *Supply Chain Management*, Vol. 5 No. 4, pp. 176-86.
- Emiliani, M. and Stec, D. (2001), "Online reverse auction purchasing contracts", *Supply Chain Management*, Vol. 6 No. 3, pp. 101-5.
- Emiliani, M. and Stec, D. (2002a), "Realizing savings from online reverse auctions", *Supply Chain Management*, Vol. 7 No. 1, pp. 12-23.
- Emiliani, M. and Stec, D. (2002b), "Squaring online reverse auctions with the Caux Round Table 'Principles for Business'", *Supply Chain Management*, Vol. 7 No. 2, pp. 92-100.
- Exostar (2002), Auctioneer 4.0 Product Sheet, available at: [www.exostar.com/solutions.asp](http://www.exostar.com/solutions.asp); and [www.exostar.com/auctions.asp](http://www.exostar.com/auctions.asp) (accessed 13 November).
- FreeMarkets (2002), available at: [www.freemarkets.com/en/benefits/default.asp](http://www.freemarkets.com/en/benefits/default.asp); [www.freemarkets.com/en/benefits/supplying/default.asp](http://www.freemarkets.com/en/benefits/supplying/default.asp); and [www.freemarkets.com/en/benefits/case\\_studies/machined\\_comp.asp](http://www.freemarkets.com/en/benefits/case_studies/machined_comp.asp) (accessed 12 September).
- Fujimoto, T. (1999), *The Evolution of a Manufacturing System at Toyota*, Oxford University Press, New York, NY, pp. 129-72.
- Goetting, E. (2002), "When to use an auction", *Line56 Magazine*, 4 September.
- Jap, S. (2001), "The impact of online, reverse auctions on buyer-supplier relationships", working paper, Goizueta Business School, Emory University, Atlanta, GA, July.
- Judge, P. (2001), "How I saved \$100m on the Web", *Fast Company*, No. 43, pp. 174-81.
- Kisiel, R. (2002a), "Supplier group seeks conduct code for auctions", *Automotive News*, 11 March.
- Kisiel, R. (2002b), "Information technology: supplier group forms reverse-auction rules", *Automotive News*, 13 May.
- Kisiel, R. (2002c), "Traverse city: guidelines for reverse auctions finished", *Automotive News*, 5 August.
- Kobe, G. (2001), "Supplier squeeze", *Automotive Industries*, March.
- Moai (2002), available at: [www.moai.com/partners/benefits.asp](http://www.moai.com/partners/benefits.asp); and [www.moai.com/solutions/solutions\\_faq.asp](http://www.moai.com/solutions/solutions_faq.asp) (accessed 12 September).
- Monden, Y. (1995), *Target Costing and Kaizen Costing*, Productivity Press, Portland, OR.

- Nishiguchi, T. (1994), *Strategic Industrial Sourcing*, Oxford University Press, New York, NY.
- OESA (2002), "Reverse auction code of ethics: OESA call to action", *Automotive OE Supplier News*, Vol. 5 No. 3, pp. 1, 3, available at: [www.oesa.org/pdf/march2002.pdf](http://www.oesa.org/pdf/march2002.pdf)
- Ohno, T. (1988), *Toyota Production System*, Productivity Press, Portland, OR.
- Orbis (2002), available at: [www.orbisonline.com/faq.asp](http://www.orbisonline.com/faq.asp) (accessed 13 November).
- Procuri (2002), available at: [www.procuri.com/right/supplier.htm](http://www.procuri.com/right/supplier.htm); and [www.procuri.com/right/benefits.htm](http://www.procuri.com/right/benefits.htm) (accessed 12 September).
- PurchasePro (2002), available at: [www.purchasepro.com/docs/suppliers/supplier\\_overview.jsp](http://www.purchasepro.com/docs/suppliers/supplier_overview.jsp); [www.purchasepro.com/docs/suppliers/supplierfaq.jsp](http://www.purchasepro.com/docs/suppliers/supplierfaq.jsp); and [www.purchasepro.com/docs/suppliers/suppliersuccessstories.jsp](http://www.purchasepro.com/docs/suppliers/suppliersuccessstories.jsp) (accessed 12 September).
- Richards, B. (2000), "Dear supplier: this is going to hurt you more than it hurts me . . .", *Ecompany Now*, Vol. 1 No. 1, pp. 136-42.
- Tulder, R. and Mol, M. (2002), "Reverse auctions or auctions reversed: first experiments by Philips", *European Management Journal*, Vol. 20 No. 5, pp. 447-56.
- Tully, S. (2000), "Going, going, gone! The B2B tool that really is changing the world", *Fortune*, Vol. 141 No. 6, 20 March, pp. 132-45.
- Womack, J. and Jones, D. (1996), *Lean Thinking*, Simon & Schuster, New York, NY.
- Womack, J., Jones, D. and Roos, D. (1990), *The Machine that Changed the World*, Rawson Associates, New York, NY, pp. 139-68.