Research paper

Wood pallet suppliers' reaction to online reverse auctions

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Abstract
Purpose – The purpose of this paper is to quantitatively assess wood pallet suppliers' reaction to online reverse auctions and its impact on their business policies and practices.
Design/methodology/approach – Survey method was used to determine how pallet suppliers react to online reverse auctions.
Findings – Determines that pallet suppliers do not realize the benefits claimed 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. The qualitative benefits identified for suppliers by third-party online reverse auction service providers are overstated or false.
Research limitations/implications – The present work can be extended to other commodity categories to identify similarities and differences in how suppliers react to online reverse auctions, understand the domain of successful and unsuccessful application of the online reverse auction tool, and provide further insight into the evolution of buyer-seller relationships, including embedded organizational routines such as power-based bargaining.
Practical implications – Findings mirror the results found in a previous study that examined aerospace parts suppliers' reaction to online reverse auctions, and indicates that market makers have consistently overstated the benefits of online reverse auctions to both sellers and buyers, and the use of this tool will typically result in unfavorable outcomes for both buyers and sellers.
Originality/value – This paper will be of interest to buyers, sellers, and market makers, as it identifies important problems with online reverse auctions, and suggests questions that buyers should ask market makers to ensure better sourcing decisions.

Keywords Electronic commerce, Auctions, Pallets, Purchasing

Paper type Research paper

Introduction

Online reverse auctions, also called "e-reverse auctions" or "downward price auctions," have in recent years become a common method to source production and non-production goods and services by *Fortune* 2,000 companies. Among the commodities sourced are new and recycled wood pallets (SIC code 2448; NAICS 321920) used to transport and store materials. Pallets range in unit price from US$4 to US$20 depending upon durability (e.g. single use vs. heavy duty reusable) and other requirements. Over 700 million new and repaired or recycled wood pallets are produced annually in the USA and Canada, with an aggregate annual sales volume of US$5-6 billion (Deomano, 2003).

The principal purchasers of pallets are manufacturers of consumer and durable goods, with the majority of total annual purchases made by large corporations. Since the pallet supply base is large and fragmented, corporate buyers can easily source pallet manufacturing and related services using the online reverse auction process. The use of online reverse auctions for sourcing pallets to achieve lower prices began in earnest in 1999, facilitated by third party "market makers" such as FreeMarkets Inc. (*Pallet Enterprise*, 1999; Brindley, 2000; Richards, 2000; FreeMarkets, 2003).

The online reverse auction process, including careful scrutiny of the benefits and shortcomings for buyers and sellers, has been described previously (Emiliani, 2000; Emiliani and Stec, 2001, 2002a, b, 2004; Beall *et al.*, 2003). Importantly, the "gross" savings identified at the conclusion of the online reverse auction is often just a fraction of what is actually achievable upon post-auction implementation (Emiliani and Stec, 2002a). The net savings – the savings achieved after implementation, incorporating both "direct" and "indirect" losses – is an average of at least 50 percent less when measured across a broad market basket of product and service commodity categories (The Center for Lean Business Management, 2004). 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 or buying organizations (Tully, 2000; FreeMarkets, 2001; Judge, 2001).

In addition, online reverse auctions are widely perceived by incumbent suppliers as a divisive purchasing tool designed principally to drive down unit prices with no real intention of

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Supply Chain Management: An International Journal
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switching sources (Emiliani, 2000; Kobe, 2001; Tulder and Mol, 2002; Emiliani and Stec, 2002b; B2BRC, 2003; MHEDA, 2003), and without adequate consideration given to other important measures of service performance or production capability (Brindley, 2000; Bartholomew, 2001, 2002; Beall *et al.*, 2003) or total costs (Emiliani and Stec, 2001, 2002a, 2004). Recent studies have shown that online reverse auctions can damage a buyer's long-term performance by creating distrust among its incumbent suppliers (Jap, 2001, B2BRC, 2003; Beall *et al.*, 2003; Emiliani and Stec, 2004). Widespread perceptions among sellers that online reverse auctions are unfair and have been misused by buyers and market makers has resulted in the creation of a voluntary guidelines for conduct in the US auto industry (OESA, 2002), the European aluminum foil industry (European Aluminum Foil Association, 2002), the European flexible packaging industry (Flexible Packaging Europe, 2002), and European carton makers (European Carton Makers Association, 2003), as well as recommendations regarding the correct use of online reverse auctions (Goetting, 2002; Smeltzer and Carr, 2002, 2003; Beall *et al.*, 2003; Sawhney, 2003).

Corporate buyers unfamiliar with wooden pallets may assume they are non-technical items and that the many sources of supply – inclusive of design capabilities, materials used (softwoods and hardwoods, fasteners, etc.), manufacturing methods, and pre- and post-sale services – are largely interchangeable. However, pallets are load-bearing structures that are engineered to meet specific requirements, and are therefore better characterized as a "customized commodity" rather than a pure commodity (Brindley, 2000). Mechanical failure of wooden pallets can result in damage to valuable goods, delays in material movement, injuries, customer returns, legal claims, additional transactions, and ultimately higher costs for both buyers and sellers.

While it may be convenient to think that pallets are simple non-technical items, easily procured, the reality is different. Pallets are important functional products that must be damage tolerant and meet performance expectations of the people that use them throughout their specified design life (NWPCA, 2003). In addition, there are requirements and services related to effective pallet supply that buyers value yet are likely unaware of (Brindley, 2000; Richards, 2000). In other words, technical specifications and other requirements contained in the so-called "total cost" request for quote (RFQ) may not actually represent the cost of reliable service and supply (Richards, 2000; Brindley, 2002a).

Importantly, purchasing agents are usually measured on their ability to achieve lower unit prices and not the lowest total cost (Emiliani and Stec 2001, 2002a, 2004; Brindley, 2002a). Online reverse auction service providers know that most large corporations measure purchasing effectiveness using the "purchase price variance" (PPV) or "purchase order variance" (POV), i.e. standard or budgeted price minus actual price paid. The online reverse tool caters to this common metric, despite the "total cost" characterization portrayed by market makers (Emiliani and Stec, 2001, 2002a, 2004). As a result, buyers and market makers claim substantial price savings despite the fact they usually incur additional costs assignable to budget categories unrelated to purchase price – and therefore invisible in PPV calculations (Emiliani and Stec, 2002a, 2004).

The use of online reverse auctions by buyers have clearly been of great concern to pallet suppliers because of margin erosion among successful incumbent bidders and potential loss of sales volume to other "qualified" suppliers (Richards, 2000; Brindley, 2000, 2002a, b, 2003; LeBlanc, 2002). Pallet suppliers typically generate 3-5 percent pre-tax profits, with some having margins of 10 percent, while the cost of goods average nearly 85 percent (Brindley, 2000). Many pallet suppliers participated in online reverse auctions in the beginning with the hope of winning large contacts to offset lower margins (Brindley, 2000; Richards, 2000). However, pallet suppliers later reported that unqualified bidders were allowed to participate in online reverse auctions, and specifically cited the lack of verification by the buyer or market maker of the bidders' capability to deliver pallets to the requirements specified in the RFQ (Brindley, 2000). Some pallet suppliers allege that due diligence was purposefully not performed by the buyer or market maker in order to increase the number of bidders and thus drive down prices (Brindley, 2000).

In addition, pallet brokers have been allowed to participate in the reverse auctions, despite having no pallet production capability or manufacturing source identified at the time bids were placed (Brindley, 2000, 2002b, 2003). It was only after the reverse auction that brokers would seek pallet producers to fulfill orders, usually at prices below manufacturing cost. Brokers that won the work but were unable to source the work walked away from the contact – a benefit not available to manufacturers due to the market maker's bidding terms and conditions (Brindley, 2000). As a result of these reported shortcomings, online reverse auctions have been characterized as an unfair bidding process used by large corporations as a substitute for poor purchasing and supply management practices (Brindley, 2002a; Emiliani and Stec, 2002a, b). Over time, wooden pallet suppliers learned the issues related to online reverse auctions and have either refused to participate or are more selective in what they bid on (Brindley, 2002b).

The quantitative impact of online reverse auctions on wood pallet suppliers' specific business policies, practices, relationships with sellers, and the purported benefits to pallet suppliers has not been previously reported. This paper contributes to the literature by examining these aspects, which should be of interest to buyers and sellers, academics, and those who invest in market makers because it may foretell the sustainability of online reverse auctions within the buying company or in certain commodity categories.

Research method

A 20-question survey was used to determine how pallet suppliers react to online reverse auctions, including changes to strategy and operating practices and the impact on relationships with their customers (Table I). The same survey instrument was used in a previous study to determine aerospace parts suppliers' reaction to online reverse auctions (Emiliani and Stec, 2004).

The authors solicited the editor of *Pallet Enterprise* magazine to support this study on a pro bono basis because they have access to pallet suppliers across the USA and Canada through subscription databases and participation by pallet suppliers on its online message board (*Pallet Enterprise*, 2003). Calls for responses to the survey were made through three channels:

Table I Summary of online reverse auction survey findings

Survey question	Median response value 1-5 scale (scale description)	Capsule result/analysis
1. Has your business strategy changed as a result of online reverse auctions?	1 (no change in strategy)	Will no longer participate in ORAs ($n = 4$)
2. Has your company's participation in online reverse auctions resulted in changes to your operating practices?	1 (no change in operating practices)	Won't perform an "extras" for customers that use ORAs ($n = 1$)
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; capabilities have been eroded ($n = 5$); capabilities have improved ($n = 1$)
4. What has been the effect of online reverse auctions with regards to your long-term competitiveness?	3 (no change in competitiveness)	Most suppliers reported either a reduction or no change in long-term competitiveness. Deterioration of long-term competitiveness due to lower margins ($n = 3$); price-only buying ($n = 2$); prices bid below cost ($n = 1$)
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 no increase in overhead burden. Increase in overhead burden due to lost sales volume and people and time working on RFQ and bidding
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 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?	3 (sometimes)	ORAs compel most suppliers to retaliate with respect to pricing when the opportunity arises with their customers. 17 suppliers reported a score of 4 or more
11. List a few key benefits of online reverse auctions for suppliers	–	20 suppliers said there were no benefits.
12. List a few key drawbacks of online reverse auctions for suppliers	–	Poor data quality, unqualified suppliers, price-only bidding, unilateral terns and conditions
13. How could the online reverse auction process be improved to deliver greater benefits to suppliers?	–	ORAs can't be improved ($n = 16$); poor data quality and unqualified suppliers
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 ($n = 9$); average amount of work returned = 78 percent
15. When was the first and last time you participated in an online reverse auction? Give month and year	–	First 6/98; last 6/03; average duration = 21 months
16. About how many online reverse auctions events (not individual lots) have you participated in?	2 (11 to 25)	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)	77 percent of suppliers won no new customers
18. How much has your sales increased as a result of online reverse auctions?	1 (0 to 5 percent)	90 percent of 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)	93 percent of suppliers reported no access to new markets
20. Total number of full-time employees?	1 (10 to 50)	All suppliers responding to the survey can be classified as small businesses

editorial columns and notices in *Pallet Enterprise* magazine, editorial columns and notices in the newsletter *Pallet Profile Weekly*, and notices placed on the *Pallet Enterprise* online message board. Surveys were obtained from US and Canadian pallet suppliers producing new and recycled wooden pallets.

It should be noted that the editorial position of *Pallet Enterprise* magazine and the newsletter *Pallet Profile Weekly* with regards to reverse auctions has been critical based upon feedback the editors and writers received from the pallet supplier community at large, as well as the editorial team's own analysis of the merits of using online reverse auctions to

Supply Chain Management: An International Journal
Volume 10 · Number 4 · 2005 · 278–288

facilitate pallet sourcing – both independent of this study. However, these channels are not believed to have resulted in responses biased against reverse auctions because surveys conducted by independent third-parties in other commodity categories have yielded similar findings (B2BRC, 2003; Beall *et al.*, 2003; Stoddard, 2003a; Emiliani and Stec, 2004).

A total of 30 usable surveys were received in the first quarter of 2003, constituting about 5 percent of the US and Canadian pallet suppliers that have participated in one or more online reverse auctions since June 1998. This sample size yielded results that are consistent with a much larger supplier survey (B2BRC, 2003), as well as surveys of smaller numbers of suppliers (Beall *et al.*, 2003; Stoddard, 2003a; Emiliani and Stec, 2004).

The authors' interest in the use of online reverse auctions for sourcing pallets is to extend prior work to other commodity categories and identify similarities and differences in how suppliers react to online reverse auctions, as well as understand the domain of successful or unsuccessful application of the online reverse auction tool. The results presented here contribute to the literature by providing further insight into the evolution of buyer-seller relationships, embedded organizational routines favoring power-based bargaining (Womack *et al.*, 1990; Nishiguchi, 1994; Emiliani, 2003; Emiliani and Stec, 2004), 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.

Results

Survey participant responses were measured on a 1-5 Likert scale. Some questions were asked that required respondents to provide written details. In these cases, the non-repeating responses are grouped under various categories. Question-by-question analyses of the survey results are presented in the Appendix, while a summary of the findings is shown in Table I.

Finally, the following unsolicited comments were received from pallet suppliers. They illustrate the depth of their dissatisfaction with online reverse auctions and the customers that use them:

> I, and many others in this industry, are losing significant business to the "price-only" mentality of online auctions. Our certified quality and world class customer service is no longer [as] important as it was not too long ago.

> I tell my [customers] that if they want to find the absolute worst supplier in the pallet industry, they will do it with the reverse auction. He will be the low bidder.

> Reverse auction [service] providers have NO product knowledge [emphasis original]. Why would you pay for a service to purchase a product for you when they know nothing about it? … The providers claim to qualify suppliers, but they do not. The current supplier is often subject to lower bids from competitors who have no intention or ability to perform the actual work. They simply want to drive the price down. What a poor way of doing business. Greed, Greed, Greed.

> What kind of relationship can one company have [with] another when your customer simply whore's your product, service, and company commitment to the lowest bidder?

Comparison to previous results

The findings presented in this paper compare favorably to a previous study examining aerospace parts suppliers' reaction to online reverse auctions using the same survey instrument (Emiliani and Stec, 2004). Overall, the results are very consistent for questions 1-10 and 16-20. Findings for questions 11-15 are also consistent and discussed in greater detail to compare results:

- *Question 11.* Of aerospace parts suppliers, 39 percent (compared to 66 percent of pallet suppliers) found there were no benefits associated with online reverse auctions. The benefits identified by aerospace parts or pallet suppliers were not specific to online reverse auctions; i.e. they could be achieved using traditional strategic sourcing processes. These results further support the view that market makers have failed to establish a meaningful value proposition for most suppliers.
- *Question 12.* Both pallet and aerospace parts suppliers found the drawbacks of online reverse auctions to be more numerous than the benefits. This indicates that online reverse auctions possess severe structural problems – deficiencies that will negatively impact both buyers and sellers. Online reverse auctions do not effectively address important intangible aspects of buyer-seller relationships (both business and personal).
- *Question 13.* Of aerospace parts suppliers, 43 percent said that online reverse auctions cannot be improved or don't know how they can be improved, but also identified a wider range of potential improvement opportunities than did pallet suppliers. The authors are aware of one change made by market makers in response to supplier suggestions: to reduce the quantity of part numbers (i.e. line items) in a lot.
- *Question 14.* Aerospace parts suppliers said an average of 19.5 percent of the work returned to them. That pallet suppliers had a much greater amount of work returned to them (average of 78 percent) compared to aerospace parts suppliers – who make much more difficult products – is surprising. However, it may be that pallet buyers belatedly value local sources of supply to better meet demanding service requirements and reduce shipping costs. In contrast, aerospace parts supply has globalized in recent years, even for bulky parts, principally to take advantage of lower labor costs in developing countries which partially offset higher shipping costs (Emiliani, 2004).
- *Question 15.* Aerospace parts suppliers participated in online reverse auctions for an average duration of 23.2 months and a standard deviation of 15 months (compared to an average duration of 21 months and a standard deviation of 16 months for pallet suppliers). These findings indicate the useful life span for conducting online reverse auctions in a given commodity category is about two years, and represents the average time it takes for both buyers and sellers to learn the benefits and limitations of this new purchasing tool. Of aerospace parts, 35 percent suppliers were engaged in online reverse auctions at the time the survey was conducted compared to 23 percent of pallet suppliers. Pallet suppliers appear to become less interested over time in participating in online reverse auctions than aerospace parts suppliers. This could be due to a more intense focus on the shortcomings of online reverse auctions among pallet suppliers, and less interest in being subjected to power-based bargaining routines used by their customers.

Discussion

The purported benefits of online reverse auctions for suppliers as described by the market makers are shown in

Supply Chain Management: An International Journal
Volume 10 · Number 4 · 2005 · 278–288

Table II (Emiliani and Stec, 2004). Note that they express the benefits qualitatively, not quantitatively. Thus, suppliers must take it on faith that there are benefits they can actually realize by participating in online reverse auctions. Since the market makers do not distinguish to whom the benefits are available – i.e. incumbent or new suppliers – the benefits are presumably available to any "qualified" supplier.

Items a through f were directly addressed in this study: questions 5, 7, 9, 17, 18, and 19, respectively. Most pallet suppliers surveyed indicated that they failed to realize these key benefits. No mention was made of items j through q as being beneficial to suppliers. Indeed, much has been written in recent years advising suppliers of the perils of online reverse auctions (Dougherty, 2002; IHA, 2002; Terry, 2002; Glimm, 2003; Morris, 2003; Salimando, 2003; Stoddard, 2003a, b; Altman, 2003), rather than illuminating its purported benefits.

The picture that has clearly emerged from the authors' extensive work, and that of others who have closely scrutinized online reverse auctions, is that the market makers have consistently overstated the benefits for both sellers and buyers. Indeed, if a buyer normally achieves 2 percent annual cost reduction through traditional negotiation processes, but suddenly, through online reverse auctions, identifies savings of 15-30 percent or more, then is that not too good to be true? In most cases it is. In addition, the return on investment has been reported to be ten times and as high as 20 times in just four to six months (FreeMarkets, 2001, 2002; Reason, 2001), despite the inability to accurately capture total costs or calculate net savings inclusive of both direct and indirect losses.

The evidence suggests that thousands of senior managers in many of the world's largest corporations, some with MBA's from the best business schools, have been misled. As this study illustrates, the common result is poor sourcing decisions, higher costs, and less cooperative supplier relationships – the opposite of what senior management hoped to achieve. How could this happen? The answers, we believe, are centered around nine main points:

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

Source: Emiliani and Stec (2004)

(1) Tremendous pressure for cost reduction due to global competition, particularly from low wage countries.
(2) Pressure from large investors to quickly increase shareholder value (Emiliani, 2003).
(3) Widespread existence of the "confirming-evidence trap" among senior managers (Hammond *et al.*, 1998), in which information that supports a viewpoint or critical need is accepted, while that which contradicts it is quickly rejected.
(4) Strong desire among senior managers to use technology-based tools that can help them achieve what appear to be "quick hits."
(5) Finance and accounting systems that do not capture total costs.
(6) Common use of the purchase price variance metric, which can be easily give the appearance of large savings.
(7) A pervasive view among CEOs, Presidents, and CFOs that the purchasing function is non-technical and simple to understand, cost savings are easy to achieve, suppliers are interchangeable (presumably the market makers as well), and differences between commodities are minimal or unimportant.
(8) Online reverse auctions support embedded power-based bargaining routines that have long-existed between most buyers and sellers (Emiliani, 2004).
(9) Senior managers do not know what questions to ask to determine if online reverse auctions are as effective as market makers and other buyers claim them to be.

In other words, online reverse auction service providers have successfully exploited extant competitive pressures and several key weaknesses in current management thinking and practice.

Given these findings, as well as those found in previous studies (Emiliani and Stec, 2001, 2002a, b, 2004), we suggest that senior managers of buying organizations ask market makers 11 key questions before they start using online reverse auctions. Sellers can use these same questions to help educate buyers considering the use of online reverse auctions:

(1) The relevant figure to discuss is the net savings, not gross savings. Ask the market makers: "What is the net savings for this commodity category, inclusive of both direct and indirect losses, achieved by other buyers that you have worked with?" The market makers have the data based on direct losses; insist that they share it. However, the data will have to be discounted by 25-75 percent or more to account for indirect losses.
(2) Do contract terms and conditions (T's&C's) help both buyer and seller understand the root cause of cost problems and encourage the buyer and supplier to collaborate to solve cost problems? Ask the market makers: "How do the T's&C's help us and our suppliers improve financial and non-financial performance?" Don't be convinced by the one or two isolated success stories.
(3) Does the market maker accurately portray the significant time and effort required by the buyer to secure the savings? Ask the market makers: "What is the average amount of time it has taken other customers of yours to secure the net savings for this commodity?"

Supply Chain Management: An International Journal
Volume 10 · Number 4 · 2005 · 278–288

Can better results be achieved as fast or faster through collaborative cost reduction activities?

(4) Does the market maker suggest new, typically small suppliers to participate in the reverse auction? In most cases, new small suppliers will not actually be able to satisfy the buyer's requirements compared to current suppliers, and may be included in the reverse auction simply to drive down the price and give the appearance of a large gross savings opportunity. Ask the market makers: "How frequently does a new small supplier win the work for this commodity and perform acceptably?" Senior managers can contact other users of reverse auctions to better understand this issue.

(5) Look at your corporate ethics policy regarding supplier relationships. Ask yourself and the market maker: "Do online reverse auctions violate our ethics policy?" If the ethics policy contains specific references to fairness or fair competition, building long-term relationships, trust, respect, or conducting business free of deception or coercion, then using online reverse auctions likely violates your code of ethics (Emiliani and Stec, 2002b).

(6) Online reverse auctions often result in opportunistic behavior among suppliers; principally retaliatory pricing. Ask the market makers: "How prevalent is retaliatory pricing in this commodity?" and "Show me the data that supports your claim that reverse auctions improve relationships between buyers and sellers." Again, don't be convinced by the one or two isolated success stories.

(7) Regarding benefits for suppliers, ask the market makers: "What are the quantitative benefits to suppliers for participating in online reverse auctions?"

(8) Ask the market makers: "Exactly how do online reverse auctions reduce our total costs?" Ask this while keeping in mind the other ten questions, especially questions 1, 3, 4, 6, 7, 9, 11.

(9) Ask the market makers: "What percent of the work is eventually sourced back to the original supplier?" If they don't know, then be prepared to incur additional costs associated with sourcing the work back to incumbent suppliers.

(10) Ask the market makers: "If reverse auctions are so good, then how come you don't want reverse auctions applied to the services you offer?" and "You're a supplier, and you want long-term relationships with your customers – isn't that inconsistent?" (FreeMarkets, 2002).

(11) Finally, ask the market makers: "How do online reverse auctions improve our organization's overall competitive capabilities? Does it help engineering, operations, purchasing, marketing, finance, etc., learn how to avoid high costs from the start?"

Asking these and appropriate follow-up questions may reveal that online reverse auctions offer no substantive benefits for either buyers or sellers for most commodities. The price reductions that buyers seek, as well as improved quality and service, are often better achieved using disciplined sourcing and collaborative cost reduction processes that result in bilateral continuous improvement (Womack *et al.*, 1990; Monden, 1995; Nishiguchi, 1994; Bounds, 1996; Bounds *et al.*, 1996; Cooper and Slagmulder, 1999; Fujimoto, 1999; Dyer and Nobeoka, 2000). Most suppliers are valuable resources that can help buyers improve their competitiveness, rather than interchangeable adversaries to perpetually bargain with – and potentially reduce the long-term competitiveness of both parties (Chin, 2002; Emiliani, 2004).

Summary

This paper examined how wood pallet suppliers reacted to the use of online reverse auctions by their customers. Findings are reported for suppliers that have participated in online bidding, and include:

- suppliers surveyed realized few benefits, if any, from participating in online reverse auctions;
- 60 percent of suppliers 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;
- suppliers viewed online reverse auctions as a divisive purchasing tool that damages relationships with long-time customers;
- most suppliers drop out of the bidding process after one or two years; and
- most suppliers consider online reverse auctions to be an unethical business practice.

These results closely parallel that found in a previous study further reinforce earlier findings that show online reverse auctions have numerous serious shortcomings for both buyers and sellers (Emiliani and Stec, 2001, 2002a, b, 2004; B2BRC, 2003). This, as well as previous studies (B2BRC, 2003; Beall *et al.*, 2003; Stoddard, 2003a; Emiliani and Stec, 2004), suggest the findings are broadly applicable to pallet suppliers that participate in reverse auctions, and that similar results will be realized by suppliers of other technically specified goods and services. However, it is possible that more successful outcomes may exist between specific pairs of buyers and sellers for certain commodities such as bulk materials or non-technical services that can be easily specified and where switching costs are negligible.

The results also indicate that market makers have consistently overstated the benefits of online reverse auctions to both sellers and buyers. This is attributed to several factors including competitive pressures and important weaknesses in current management thinking and practice among buyers. A total of 11 questions are presented which buyers should ask to determine if online reverse auctions are as effective as market makers and other buyers claim them to be. The same questions can be used by sellers to help educate buyers considering the use of online reverse auctions In addition, senior managers should consider alternate approaches to cost reduction known to result in valuable intra- and interorganizational capability building, are more responsive to short- and long-term competitive pressures, and help build relationships.

Future research will continue to focus on extending the present work to other 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. This will provide further insight into the evolution of buyer-seller relationships, embedded organizational routines promoting power-based bargaining, and the overall utility of online reverse auctions.

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Appendix. Question-by-question analyses of the survey results

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). Suppliers mainly answered this question consistently with a "no change on strategy" response. However, those that did indicate a change in strategy ($n = 4$) noted that the change made was to not participate in reverse auctions, or avoid the "standard pallet" market segment in reverse auction activity is greatest. A few suppliers ($n = 3$) also mentioned their discomfort with a "price- only" auction. They believe that quality and service also play an important role in the value they provide to their customers.

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). The survey results show there has been no change in operating practices resulting from online reverse auctions. One supplier ($n = 1$) described a specific change in operating practice as being that they will no longer perform any "extras" for their customers who use online reverse auctions.

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). Most suppliers reported no change in production capabilities as a result of online reverse auctions. Those that noted either an erosion ($n = 5$) or improvement ($n = 1$) in capabilities did not specify which capabilities were affected.

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). Most suppliers reported either a reduction or no change in long-term competitiveness as a result of their participation in online reverse auctions. A few suppliers provided information on how their long-term competitiveness has deteriorated including: lower margins ($n = 3$); price-only buying with no consideration of quality or service by customer ($n = 2$); prices bid below costs ($n = 1$).

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). Most suppliers reported no increase in overhead burden. However, those indicating an increase in overhead burden ($n = 8$) said it was due to business volume lost to other competitors via online reverse auctions ($n = 1$) and an increase in overhead expenses associated with staff of people and time required to work on the RFQ and bidding process ($n = 4$). They specifically noted that incomplete or inaccurate RFQs and

Supply Chain Management: An International Journal
Volume 10 · Number 4 · 2005 · 278–288

specifications from customers consumed large amounts of time.

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). Most suppliers reported a decrease in gross margin. Reasons specifically noted included business lost to competitors and higher operating expenses.

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). Most suppliers reported less cooperative relationships with their customers as a result of online reverse auctions. Comments included: personal relationships have deteriorated in favor of the Internet; reverse auction mandates driven by corporate headquarters strain local plant-supplier relationships; customers ignore the value-added services of pallet suppliers and now treat pallets as a "commodity." Note that the costs associated with less cooperative relationships are not accounted for in so-called "total cost" RFQ's.

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). Of 30, 26 suppliers (87 percent) reported a score of 3 or less. Four suppliers replied with a value of 5 indicating this is an ethical business practice, but noted that the process of how customers used the tool is unethical. 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). Of 30, 29 suppliers (97 percent) reported a score of 1. One supplier gave this question a score of 3, noting that the bidding atmosphere reflected a "game" rather than a serious business bidding activity. 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). A total of 18 suppliers (60 percent) reported a score of 3 or more; nine suppliers (30 percent) reported a score of 4 or more; and eight suppliers (27 percent) reported a score of 5. A total of 12 suppliers (40 percent) reported a score of 1. This indicates the use of online reverse 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 suppliers are not accounted for in so-called "total cost" RFQ's.

Question 11. List a few key benefits of online reverse auctions for suppliers
The responses are clustered into two groups (see Figure A1). A total of 20 suppliers (66 percent) said there were no benefits associated with online reverse auctions. Four suppliers noted benefits related to "markets or customers." The remainder made the following comments:

- "Lowers costs without the corporate red tape needed to lower quality standards."
- "You learn how little competitors value what they provide their customers."
- "You find out which customers are willing to stab you in the back for a nickel."
- "You get to see how much the lots go for. It makes you laugh."
- "Current vendor has knowledge of correct specifications."
- "An opportunity to learn what a potential customers is using to bid on AFTER the low bidder doesn't deliver" (emphasis original).

Question 12. List a few key drawbacks of online reverse auctions for suppliers
The drawbacks of online reverse auctions for suppliers were much more numerous than the benefits. The majority of the responses to this question centered on "RFQ," "intangibles," and "process management" aspects (see Figure A2). The responses again highlight the fact that there is no rational framework for determining costs, setting prices or profits, and that buyers continue to use power-based bargaining to lower suppliers' prices (Emiliani and Stec, 2004). The responses grouped under "RFQ," "intangibles," and "process management" reflect concerns regarding data quality, poor communication, bidders capabilities, and that the use of reverse auctions is promoting adversarial relationships between the buyer and supplier. These responses indicate buyers are not considering total costs, despite the market maker's characterization of RFQ's as "total cost."

Question 13. How could the online reverse auction process be improved to deliver greater benefits to suppliers?
A total of 16 respondents (53 percent) said the online reverse auction process can not be improved or don't 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 "RFQ" and "process management" indicates the principal issues are data integrity and the elimination of unqualified suppliers (see Figure A3). The following comments were made regarding how online reverse auctions could be improved to benefit suppliers:

Figure A1

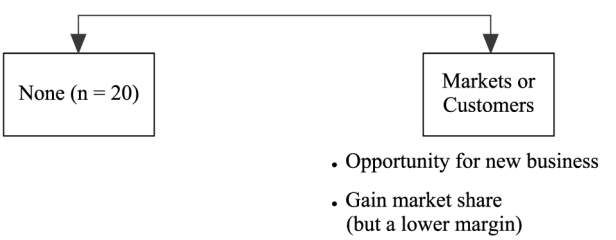


Figure A2

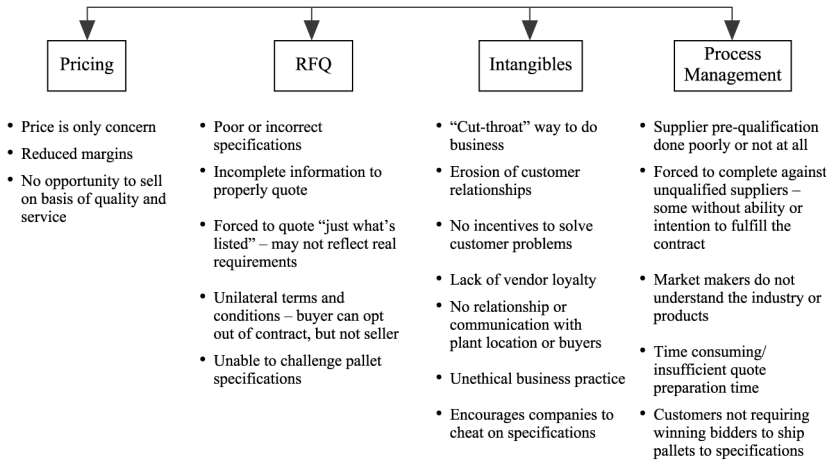
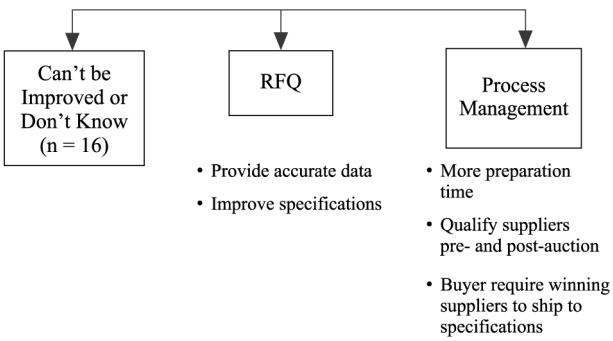


Figure A3



- "Eliminate them." or "Use the traditional bidding process" ($n = 5$).
- "Buyers … are not interested in making [online reverse auctions] beneficial to the supplier."
- "Let each bidder visit the [customer's] plant and review ALL pallets and how they are used" (emphasis original) ($n = 3$).
- "Weed out the brokers that don't understand pallet design."

Question 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 ($n = 9$).
- Percent of work returned ($n = 8$): high = 100 percent; low = 30 percent; average = 78 percent.

Nine supplies said that work had not returned to them. The suppliers that responded "yes" cited an average of 78 percent 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 unaware that such outcomes will be encountered. It 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. Note that the costs associated with sourcing work back to the original supplier are not accounted for in so-called "total cost" RFQ's.

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

- First: June 1998; Last: April 2003 ($n = 25$).
- Average duration of participation: 21 months ($n = 25$). Standard deviation: 16 months.
- Participating in online reverse auctions in 2003 ($n = 7$).

This data shows that most pallet 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 supplier participation indicates the life cycle of the online reverse auction process for wood pallets is relatively short. The coefficient of variation (standard deviation ÷ mean = 0.76) indicates that the process has low variability and is tightly distributed around the mean of 21 months. Within that time period, suppliers learn the issues surrounding online reverse auctions and gain insight into its 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 suppliers surveyed and so they drop out of the process. Only 23 percent of the suppliers responding were engaged in online reverse auctions at the time the survey was conducted. One supplier said: "We are declining to participate in online auctions unless forced to by an existing customer." (italics added).

This statement supports previous findings where incumbent suppliers are usually coerced by buyers into participating, likely in violation of company ethics policies (Emiliani and Stec, 2002b; B2BRC, 2003; MHEDA, 2003).

Question 16. About how many online reverse auction events (not individual lots) have you participated in? (Scale: 1 = 1-10; 2 = 11-25; 3 = 26-50; 4 = 51−75; 5 = over 75). This data shows that level of participation or auction activity is low, or that suppliers are very selective with regards to the extent of their participation. This finding indicates that most 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). This data shows that suppliers win few new customers as a result of their participation in online reverse auctions. A total of 23 of 30 suppliers (77 percent) 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 percent; 2 = 6-10 percent; 3 = 11-15 percent; 4 = 16-20 percent; 5 = over 20 percent). Most suppliers reported that their sales did not increase. Three suppliers (10 percent) reported a 1-5 percent 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). Most suppliers (93 percent) reported no access to new markets as a result of their participation in online reverse auctions. Two suppliers (7 percent) said they gained access to one new market.

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