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Increase the Optimal Amount of Fraud?**

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## **Pandora's Box: Does Electronic Commerce Increase the Optimal Amount of Fraud?**

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### **Abstract**

Close business relationships are important in the food industry. However, the introduction of electronic commerce has emerged as a fundamental challenge to these relationships. In particular, retailers who start procuring private label food products in electronic auctions risk the termination of the relationships with their suppliers thus losing the value derived from these relationships. Instead, they move their focal interest towards single, unrelated transactions. The authors argue that this development increases the optimal amount of fraud in electronic commerce. In this context, they analyze the occurrence of opportunism.

**Keywords:** *Relationships, information asymmetry, auctions, opportunism, economics of information*

### **1 The Occurrence of Opportunism in Electronic Markets**

With the advent of the Internet, researchers and practitioners alike had great expectations and praised the Internet for nearly unlimited purposes. For many business applications, the Internet seemed to be 'all-gifted', just like the all-gifted Pandora, the first woman on earth in Greek Mythology. But, early appraisals changed. Pandora opened the box with all misfortunes of mankind. Similarly, the Internet revealed its drawbacks. For example, Internet marketplaces may promote fraud in comparison to traditional business networks, since long-term relationships, personal commitment and trust between partners are less perceivable. This paper is therefore going to examine the factors influencing the occurrence of opportunistic behavior in retailers' online reverse auctions to source private label (PL) food products. We derive explanations from the New Institutional Economics framework.

The next section illustrates aims and consequences of using online reverse auctions to carry out transactions between retailers and PL food product suppliers. In Section 3, we describe the information asymmetry in those transactions from an Information Economics' point of view. We suspect growing information asymmetries when relationships are transferred to electronic marketplaces. In Section 4, we extend the analytical approach by combining Information Economics with Nooteboom's (1996) opportunism model. Thereafter, we apply this model to

online reverse auctions and identify different factors influencing the occurrence of fraud. Finally, we deduce implications for management practice.

## 2 Business Auctions for the Procurement of Private Label Food Products

More than six years ago, worldwide retail companies started founding joint b-to-b-market-places such as Global Net Xchange (GNX) and Worldwide Retail Exchange (WWRE). In 2000 those retailers started contracting their suppliers by using reverse auctions on the Internet. In addition to the design of an auction, e. g., the form, price acceptance, pricing design, lot design, and auction duration (Daly/Nath 2005; Jap 2002), researchers have discussed several opportunities and threats of business auctions on the Internet. An extensive analysis of articles published from 2000 to 2005 in *Lebensmittel Zeitung*, Germany's leading food-retailing journal, revealed four important effects of online reverse auctions for retailers. **(1) Global sourcing:** Retail companies intend to find new suppliers for food products and non-food items via the Internet. However, this involves uncertainty as the new suppliers and their products need to be assessed. Some retailers ask for samples in order to invite only those suppliers to a closed auction whose samples meet the retailer's quality expectations. Other retailers ask suppliers to bid for a tender first. Only after the auction is completed they start auditing those suppliers with the best bids. These suppliers need to meet the quality expectation, otherwise they are not contracted. **(2) Procurement processes:** Auctions make procurement processes more efficient by saving time for negotiations thus speeding up the whole process. Reductions of up to 80% in process runtime and 60-70% in process costs have been reported. However, at the same time legal uncertainty is mentioned. It is difficult to compensate this uncertainty with trust between the involved parties (similar to Jap 2002). Moreover, suppliers and responsible buying agents in retail companies alike complain about deteriorated relationships. Furthermore, a lack of data and process quality occurs although trainings for auction participants are offered. **(3) Market transparency:** Markets become more transparent for retailers because they are able to easily address more suppliers as well as to survey and record the suppliers' bidding behavior. However, the retailers still need to know the market very well prior to the auction (similar to Jap 2002). **(4) Price Reductions:** Due to increased market transparency, competition has intensified which results in the decline of product prices. Especially the first auctions taking place in a specific product group have resulted in significant price reductions. Reductions between 3 and 35% have been reported. To realize such reductions retailers need to possess a comprehensive knowledge of the respective market. First, they need to carefully select the products and to provide detailed product specifications. Second, orders must be of high value. In order to achieve such values, retail companies across Europe pool their demand for PL products to conduct only one single auction (Collaborative Sourcing). Third, competition should be intensive and spare capacities should be available in the supply base (similar to Jap 2002).

As a consequence, auctions for sourcing PL food and non-food products have become very popular. The fast growing PL food business particularly focuses on price and cost reductions in order to cope with the price differentials. For example, differentials amount to 18% for refrigerated food and 42% for pet food compared with manufactured brands. Today, PL products account for approximately 17% of the global market share in value, with an even higher amount of 23% in Europe. The leading food related product category is refrigerated food,

where already 32% of all sales are PL sales, followed by frozen food (25%), and pet food (21%). The relevance of PL products continued to grow in 2005 and market insider reveal that the trend will further strengthen in upcoming years (AC Nielsen 2005).

Turning our attention from retailers to suppliers, similar opportunities and threats of auctions have to be considered: **(1) Global sourcing:** Incumbent suppliers that have been in a close business relationship with a retailer realize new competitors in the market. For out-suppliers, i. e. suppliers that have not been in a relationship with this retailer before, global sourcing offers the opportunity to address new retailers. In an auction the price is the most important decision criterion so that out-suppliers do not have to fear any disadvantages in bidding for the contract. **(2) Procurement processes:** Suppliers also profit from efficiency gains in selling processes. But apart from this, they face various kinds of uncertainty. Deteriorated relationships lead to a lack of trust. First, for suppliers the retailers' procurement processes are not transparent although some retail companies explicitly guarantee that all suppliers receive the same information before and during the auction. Second, suppliers report of changing specifications. Retail companies change conditions after a supplier has already won the auction so that the supplier's calculation based on the first specification becomes obsolete. Third, suppliers are afraid of fake bids that only aim to further decrease prices. **(3) Market transparency:** While incumbent suppliers might lose transactions, out-suppliers have the chance to win a bid if only the price is decisive. **(4) Price reductions:** The price is the most important decision criterion. Hence, for suppliers it is almost impossible to compete with superior quality of their products.

In the following sections we focus on online auctions in which the identity of the bidders is not disclosed. We use a New Institutional Economics point of view to identify factors influencing the likelihood of opportunism in electronic marketplaces in comparison to traditional transactions.

### 3 Buyer-Seller Information Asymmetry from an Information Economics Perspective

Based on Stigler's (1961) idea of 'search costs', Nelson (1970) and Darby/Karni (1973) suggested the distinction between search, experience, and credence qualities of goods. Despite the popularity of this concept in economic theory and management practice, there remains confusion on how to distinguish between those qualities. The distinction can be based on the points in time, when a consumer *can* judge the quality of a product. In accordance with the original approach of Nelson, the distinction can also be based on the points in time, when a consumer *is really judging* the quality (Welling 2006). Although being able to judge the quality of a good, a consumer may abstain from doing so due to high inspection costs. Based on widely used information economic models in literature, we refer to *Nelson-Situations* (Nelson 1970), if the qualities *can* be observed by inspection during the search process prior to purchase. In contrast, we refer to *Akerlof-Situations* (Akerlof 1970), if inspection is only possible after purchase. Finally, we call those cases *Arrow-Situations* (Arrow 1963) in which goods can neither be inspected before nor at any time after the purchase. Depending on a cost-benefit analysis in different buying situations, economic agents will – if possible – try to either inspect these factual qualities before the purchase, or delay the inspection to a point in time after the purchase, or will never inspect the qualities at all. In other words: Depending on the situation, *factual* search

and/or experience qualities which *can be judged* may become *calculus* experience and/or credence qualities *by the actor's deliberate choice*. Accordingly, these situations will lead to different information problems: In Nelson-Situations, a potential customer can verify the supplier's information on a good's qualities before making the decision. Opportunistic behavior like the presentation of false or misleading information can be discovered since the qualities can be observed prior to purchase. Therefore, suppliers cannot expect to gain an advantage by providing false information. Since in Akerlof-Situations qualities cannot be discovered until the product is purchased or used after purchase, a potential customer cannot verify information on those qualities of a certain product prior to purchase. This information disadvantage of potential customers in comparison to the better-informed suppliers is called 'information asymmetry'. In these cases, customers have to be aware of opportunistic supplier behavior like the provision of misleading information or the delivery of poor product quality. But due to the information asymmetry it is difficult to reveal fraudulent behavior. Thus, according to the economic analysis of Darby/Karni (1973), *the optimal amount of fraud* increases with a rising degree of information asymmetry.

On the Internet a huge amount of information is available. Nevertheless, fraudulent transactions are frequently reported. The way of presenting information and products on the Internet gives reasons for this observation. On the Internet, a product is described by information, while this information is separated from the product itself. Although this does not change the characteristics of a product itself, the process of verification of the product qualities becomes more difficult or even impossible. A higher information asymmetry is the result leading to a higher optimal amount of fraud. This is due to two factors: (1) The opportunity to inspect the qualities has been changed as the presentation of products on the Internet is limited to audio-visual illustrations. Thus, other senses cannot be addressed and verifications of product qualities through 'smelling', 'feeling', and 'tasting' are infeasible. Even visual characteristics like the size and color of a product are more difficult or even impossible to evaluate. Regarding those product characteristics, the situation has been transformed into an Akerlof-Situation. In this respect former (factual) search qualities turn into (factual) experience or even into (factual) credence qualities (Graefe 2003; Welling 2006). Even if agents aim at evaluating those qualities they are factually not able to do so. (2) The inspection costs increase when procuring via the Internet. Even if consumers are actually able to inspect goods or production facilities, the inspection costs will probably be higher. For example, travel costs have to be taken into account in the case of global sourcing, making it economically senseless to judge the qualities prior to purchase. Even if information on the product qualities is available on the Internet, the customers are often unable to verify this information. Therefore, we can expect to find goods with a high share of factual and calculus experience qualities on the Internet. Suppliers, especially those with inferior products, will therefore try to take advantage of those two effects and strive for profits, for instance, by presenting false information.

## 4 Fraudulent Transactions in Retailer-Supplier Relationships – Playing Pandora?

### 4.1 Preconditions for Fraudulent Transactions

Darbi/Karni's analysis on the optimal amount of fraud is solely based on different levels of information asymmetry. Nevertheless, they fit with a wider but closely related research context: In the New Institutional Economics framework, researchers have discussed the determinants of opportunistic behavior in transactions in general. The following section is largely based on a model by Nooteboom (1996). However, some adjustments concerning the allocation of certain sub-factors to the three identified main variables 'incentive for opportunism', 'opportunities for opportunism', and 'propensity towards opportunism' affecting the level of a supplier S's fraud against his/her retailer R have been made.

**'Incentive for opportunism'** – the first determinant in Nooteboom's model – has a positive influence on the level of opportunistic behavior. It reflects the monetary net benefit the supplier S might realize through opportunistic behavior (Nooteboom 1996; Böhme 1999). It can be subdivided into the benefits of an act of opportunism and its costs. Overall, this incentive is especially influenced by the degree of information asymmetry between the transaction partners. Taking into account the benefits of opportunism, the incentive is positively influenced by the value from the fraudulent transaction for S, but also by R's dependence on S. This level of dependence is a result of R's switching costs due to his/her specific investments (Williamson 1985; Böhme 1999). Besides, R's dependence is also affected by the future value of S relative to the next best alternative supplier (Nooteboom 1996; Nooteboom et al. 1997; Böhme 1999). As counterbalancing factors the costs of fraud have to be considered exerting a negative effect on S's incentive for opportunism. Therefore, we have to take the supplier's own level of dependence into account as well. This, in turn, is influenced by S's stake in specific assets or his/her switching costs, respectively and R's future value to S which might be lost if R due to fraudulent behavior by S breaks up the relationship or cuts back in business. This is one potential forming of the reputation effect where the shadow of the future with respect to the *existing relationship* becomes relevant for S's current decision to behave opportunistically. Here, reputation is seen as private information, being effective only in the dyadic relation (Shapiro 1983a). Another part of this reputation effect pertains to future sales with *other (possibly new) retailers* who might back down from dealings with S due to his/her bad reputation which is assumed to be public information (Klein/Leffler 1981; Shapiro 1983b). Taken together, these 'private ordering' (Williamson 1985) compensating factors might be interpreted as hostages, pledges or guarantees in the hands of R that he/she might use as ex post sanctions to opportunistic conduct by S (Williamson 1983). In addition, there might also be formal, legally enforceable forms of monetary sanctions, such as contractual penalties or damages. This 'legal ordering' also has a negative effect on S's incentive for fraud. It depends on the level of detail of the contract, the size of the potential sanction, the sudden occurrence of novel, unforeseen and hence not (yet) contractually covered techniques for opportunistic behavior as well as possible changes of the formal institutional framework governing the relationship. But in order for the threat of private and legal sanctions to pose restrictions on S's opportunism, fraudulent conduct has to be detected (Nooteboom et al. 1997). Thus, the existing methods of controlling

and monitoring *S* to reduce information asymmetries plus *R*'s actual usage of these methods for monitoring his/her supplier also have an influence on *S*'s incentive for opportunism.

**'Opportunities for opportunism'** is the second antecedent of opportunistic behavior. It refers to the feasibility of an opportunistic act to be conducted by *S*. This includes the supplier's abilities to even discover existing monetarily profitable options for cheating as well as his/her competencies to utilize these opportunities (Nooteboom 1996). A factor positively influencing a person's competence to behave opportunistically might be his/her level of entrepreneurial alertness as discussed by Kirzner (1978). The determinants discussed so far present traditional Transaction Cost Economics description of the human nature as generally being opportunism prone. It holds that opportunism will emerge to the fullest possible extent as long as it yields a profit and one is not prevented from doing so. This negative view of economic agents was object of various forms of critique (e. g. Ghoshal/Moran 1996). According to Granovetter (1985), exchange relations are typically embedded in a surrounding social context which serves as an adjustment factor for opportunism. However, "a rejection of the TCE view as a whole ... runs the risk of throwing away the baby with the bathwater" (Nooteboom 1996). Although not ubiquitous, opportunism is nonetheless an observable fact in a lot of real exchange relations.

To account for these circumstances, Nooteboom explicitly includes the actor's **'propensity towards opportunism'** as the third main determinant of opportunistic behavior (Nooteboom 1996; see also Ghoshal/Moran 1996; Böhme 1999). This factor extends the Transaction Cost Economics point of view with aspects from sociology. It refers to the supplier's proclivity to actually employ known available and monetarily profitable opportunities for fraud. This inclination is itself affected by several other factors: First of all, the level of trust, which has been built up between the parties during the relationship, has a negative impact on the supplier's propensity towards fraud. Trust can be the result of either bonds of friendship and/or sympathy between retailer and supplier due to, e. g., personal forms of communication (leading to a low degree of social distance between *R* and *S*, Böhme 1999) or of jointly developed norms and institutions (Nooteboom et al. 1997). To the extent that a high degree of trust between the parties prevails, the resulting low propensity towards opportunism may exercise a regulative effect for *S* so that ultimately a feasible chance for fraud is rejected despite of its monetary net benefit. However, next to trust, *S*'s inclination towards fraud is also positively affected by the pressure from competition *S* faces (Nooteboom 1996; Böhme 1999). As long as the industry *S* is part of is characterized by high rates of growth and a low pressure from competition it might not be necessary for *S* to exploit every existing opportunity for monetary profit. Yet, this might change as competitive pressure rises thus leading to severe consequences for *S* of even the termination of business if he/she passes up such a chance for fraud. In these cases, the negative influence of built-up trust on the supplier's propensity towards opportunism might be over-compensated by a positive effect from competitive pressure to actually employ known profitable chances for fraud.

To sum up, with this model focusing on 'hard' as well as on 'soft' influences, Nooteboom presents a fairly comprehensive attempt to list factors affecting the risk of fraud in business transactions. Subsequently we are going to use this model to compare the likelihood of fraud in

traditional procurement relations with the procurement processes in electronic marketplaces, thereby focusing on the procurement of PL food products.

#### 4.2 *Procurement of Private Label Food Products on Electronic Marketplaces: Incentive, Opportunities, and Propensity for Fraud Transactions*

Nowadays, retailers increasingly purchase PL food products in online reverse auctions which results in significant changes in the relationships between retailers and suppliers. Although potential benefits are widely appreciated, this form of procurement also opens a big, but unknown box containing potential disadvantages as, for example, suppliers' opportunistic behavior. However, the illumination of the factors influencing the outcome of 'evil' is the first step towards seeing and using 'hope' on the bottom of the box.

Analyzing the supplier's **incentive for opportunism** in online reverse auctions in comparison to the traditional transaction situation, we find that certain characteristics change the supplier's benefits and costs of opportunistic behavior. Especially the degree of information asymmetry is higher. As described in section 3, this is partly a result of the different opportunities for a retailer to judge the qualities of the product prior to purchase. Procurement on electronic marketplaces is characterized as an Akerlof- instead of the former Nelson-Situation. However, even if the situation might still be termed Nelson-Situation as inspection is still possible, inspection costs due to global sourcing and completely different technological setups may become so high that the retailer abstains from it. Yet, the net effect on the supplier's incentive for fraud cannot be determined without ambiguity since the effects on the benefits and costs might compensate for one another. On the one hand, a rising *net value of fraud* increases the benefits of opportunism since the transaction costs to agree on a contract are lower on the Internet. On the other hand, using electronic marketplaces abates the *retailer's dependency* on the supplier due to lower *switching costs* as well as *S's lower future value* for R since suppliers become interchangeable. With respect to the costs of fraud, being interchangeable also raises the supplier's incentive for opportunism since not only S's future value for R, but also R's *future value* for S diminishes. Knowing about one's own replaceability leads to a shorter planning perspective thus reducing the amount of future transactions that are considered. In other words, the supplier's reputation as a piece of private information between the partners does not have as large an impact on the stabilization of the relationship because of a shorter shadow of the future. Moreover, considering the technical possibilities on the Internet, the reputation effects for possible transactions with other retailers are lower as well. This is due to the fact that a negative reputation will hamper S's fraudulent behavior only, if this bad reputation as a consequence of detected opportunism becomes public information. Yet, on the Internet suppliers might change their identity more easily after having conducted fraud. In further transactions with the same or with alternative retailers, S might therefore not be identified as the opportunistic agent in the market. In addition, the shorter planning range could also influence S's *switching costs* affecting his/her *dependency* negatively. Just like R, S will not dedicate specific investments to a certain partner, if there is no guarantee for sustained transactions. Hence, S faces lower switching costs respectively a higher incentive for fraud. Changes with respect to *legal ordering* and its effect on the incentive for opportunism by S as a result of conducting transactions on the Internet have to be considered as well. On the one hand, due to the



greater information asymmetry that accompanies transactions on electronic marketplaces, contracts cannot be as detailed as for traditional transactions. Therefore, not incorporating all possible manifestations of fraud, the consequences of opportunistic behavior for S will be lower resulting in a higher incentive. This effect is reinforced by the legal uncertainty of Internet transactions which is reported even for dealings between domestic partners. Besides, since suppliers might come from abroad, it is unclear which national laws will be applied which discloses possibilities not to be punished for fraud. Another effect concerning S's incentive for opportunism might be deducted taking the *methods of controlling and monitoring* into account. Since those methods might constantly be developed and improved by the retailer, especially new suppliers cannot evaluate which methods will be applied. This uncertainty can result in a lower incentive for opportunism. Yet, on the Internet the supplier has a higher possibility of hiding former fraud transactions. Due to these possibilities of changing one's virtual identity, a history of opportunistic conduct is more difficult to detect than outside the electronic world.

In contrast to S's incentive for opportunism being affected in either ways by procuring via electronic marketplaces, the alterations of his/her **propensity towards opportunism** are clear-cut: Due to the different exchange situation, the propensity rises leading in turn to a higher possibility of fraud by S: First, its price-based nature increases the *intensity of competition*. Besides, the supplier's perception of his/her competitive surroundings is sharpened compared to the traditional relationship being usually based on long-term considerations. Therefore, S's perceived pressure from competition to exploit any existing and monetary profitable opportunity for opportunism is higher. Second, the *social distance* between the transaction partners on the Internet is increased as due to impersonal forms of communication bonds of friendship and sympathy in an auction are hardly built up. This again leads to a higher propensity towards fraud. Finally, whereas in traditional transactions the involved actors get to know the values of the respective partner and both parties perhaps build up own *shared values* during the relationship, in the relatively more anonymous electronic marketplace there is less knowledge about these values. Consequently, trust will be lower in the electronic environment accounting for the straightforward effect with respect to the supplier's inclination towards fraud.

Finally, there are some changes reflecting the **supplier's opportunities for opportunism** as well. In this case, S's increased possibilities of discovering profitable opportunities for fraud may have the highest impact on the actual level of opportunism in electronic marketplaces. This is due to the novelty of this method to conduct transactions, thus leading to a larger room for applying alertness compared to traditional relationships. In other words: As alertness is the factor breeding innovations, the talent to find profitable options for fraud can be applied more successfully in circumstances that are new. In the final section, based on the determinants of opportunistic behavior some measures to reduce the amount of fraud in Internet transactions are discussed.

## 5. Management Implications and Concluding Remarks

Whereas many researchers claim that auctions lower procurement prices and harm long-term relationships at the same time (Jap 2002), Daly and Nath (2005) discuss measures to make auctions more relationship-friendly. They suggest subsidies for investments in a long-term rela-

tionship, price negotiations after an auction, and payments to the losing bidders. Furthermore, auction platforms might be used to improve collaboration processes. Yet, once the relationship between suppliers and retailers becomes closer and more valuable, the achievable reductions in selling prices on the Internet tend to decline. It depends on the retailer's purpose whether this is acceptable. If retailers contract their suppliers on the Internet in order to improve the procurement processes and enhance the collaboration with their suppliers, the described measures seem sufficient. However, if a retailer follows the strategy to become the price leader in a respective market, the purchasing prices are the only decision criterion in the procurement process. Yet, this strategy entails the risk of opening Pandora's Box. This is why we look for measures that are able to reduce opportunistic behavior in single transactions instead of implementing a win-win relationship on the Internet. But it will become obvious that these measures are limited. First of all, auction platforms operate as trusted third parties aiming at preempting fraud transactions. They try to prevent participants from publishing fake bids and monitor that the winner of an auction really receives the respective contract. Despite, suppliers often assume that retailers use online auctions in opportunistic ways (Jap 2002). Second, in order to prevent identity changes and to ensure that a supplier is able to match the required product quality, some retailers certify their suppliers in advance. In certain auctions only those suppliers already certified can participate. Such certifications will lower the optimal amount of fraud but also increase transaction costs. Third, the legal uncertainty increases the degree of opportunism. Therefore, retailers should specify the conditions of an auction as detailed as possible. They should also avoid changing conditions during or even after an auction to gain reputation for being a fair transaction partner. Finally, retailers using auction mechanism for their procurement should implement methods for controlling their buying processes and should make these transparent to the suppliers in order to nip fraud in the bud.

If retail companies contract suppliers via auctions on the Internet focusing only on reductions of product prices, this is likely to open Pandora's Box. Due to the described circumstances suppliers will act selfishly and opportunistic behavior will occur. Measures against such conduct are limited. In contrast, if retail companies contract suppliers via electronic markets in order to improve collaboration and if the results are in favor of both parties curtailing the occurrence of fraud transactions on electronic marketplaces becomes much easier.

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