

## Editorial

## Marketing and Designing Transaction Games

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Past research reveals an extraordinary number and variety of transaction games, often with different rules. For example, buy and sell offers can be take-it-or-leave-it, irrevocable, of limited duration, negotiable, contingent on events, et cetera. The possible sets of rules seem endless.

Past (often, very insightful) research has focused on optimization, given particular rules of the game. This focus often overlooks why players choose to play the game. Indeed, assuming that an exchange will occur makes the marketing function (e.g., facilitating exchanges) inconsequential. Unlike inescapable market games between rival firms, buyers and sellers often choose whether to play transaction games. Hence, game design (i.e., setting the rules of the game) becomes vital, because the design determines both the likelihood of desirable outcomes (e.g., the best transaction price) and whether (or how many) players will choose to play.

We need more research revealing the desirability of various rule sets for different target groups and revealing rules that enhance the benefits to all players. For example, a particular auction game might provide sellers with liquidity (i.e., faster transactions) while providing buyers with unique items at bargain prices. We should also explore the interaction of rules and player benefits (e.g., liquidity, anonymity, likelihood of a transaction, etc.).

*Key words:* transaction games; game theory; auctions; rules of the game; game design; player benefits

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**Transaction Games**

The literature reveals an extraordinary number of transaction games—both theoretical (see McAfee and McMillan 1996 for lessons for marketing) and observed (see Aumann and Maschler 1985 for ancient validation of modern solutions). In each transaction game, at least one buyer and at least one seller play a game, with possibly infinite outcomes, given all possible supergame mixed strategies (Fudenberg and Maskin 1986). For instance, a seller (e.g., a retailer or a service provider) might offer the buyer (e.g., a shopper or a client) a take-it-or-leave-it transaction price (i.e., an ultimatum) for a prespecified product or service.

There are numerous articles that meticulously specify how strategic sellers play particular games, including the relative division of profits (see, e.g., Bolton and Zwick 1995 and Bolton and Ockenfels 2000).

Some articles, with more normative objectives, purport to advise strategic sellers regarding the best strategy for playing particular games. Some recent articles examine the impact of strategic choice on the formation of institutions such as Internet shopping agents (Iyer and Pazgal 2003).

Of course, there are myriad forms of transaction games (McAfee and McMillan 1996). Some appear hypothetical and are found only in theoretical explorations. Some involve intuitive outcomes and some do not (Goeree and Holt 2001). Some transaction games are more recognizable and are often associated with illustrious and more ancient institutions or markets. For example, the buyer might offer a complex take-or-leave-it transaction (e.g., a common feature of many real estate transactions). The buyer and seller might mutually negotiate the terms of a transaction (which is, e.g., common for many high-priced durable and industrial goods transactions). Sometimes, bold sellers impose bidding rules that the buyers must follow. Some games require monitoring, and others do not (see, e.g., Grossman and Hart 1986). Sometimes, buyers (e.g., of labor) design incentive contracts that sellers must accept—provided the contract renders the seller a minimum expected financial reward. Sometimes, the buyer designs an auction format that requires buyers to make irrevocable offers of unlimited duration with a small probability of success.

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Recent research has investigated many other types of transaction games, including fixed/flexible time limits, special auctions (Chakravarti et al. 2002), reverse auctions, bilateral bargaining, reward frequency programs, lotteries, contingent contracts (Biyalogorsky and Gerstner 2004), bundled deals, contests, extended time contracts, advance selling contracts (Shugan and Xie 2004), strategic negotiation (Desai and Purohit 2004), deferred rebates, informative selling (Godes 2003), and so on. The literature considers private information held by the players (see, e.g., Glosten and Milgrom 1985), establishing reputations (see, e.g., Fudenberg and Levine 1989), the fairness of the outcome (see, e.g., Rabin 1993 and Zwick and Chen 1999), learning over time (see, e.g., Ostrom et al. 1994), and so on.

For each transaction game, rigorous and intricate research articles meticulously explore the nuances and permutations of different strategies permitted by the exogenous rules of the game. These articles often have extraordinarily insightful implications about the likely outcomes and the potential advantages of various strategies. Some research provides strategies for optimizing one side's position.

## Game Theory and Marketing

To study transaction games, many marketing articles employ or advance game-theoretic techniques. These techniques are mathematical models of conflict and cooperation between intelligent and rational decision makers (Myerson 1991). Game theory is probably the most after used tool in marketing science; in fact it may be the modal tool. There are games between firms (Ofek and Sarvary 2003). There are games in channel relationships (see, e.g., Shaffer and Zettelmeyer 2004, Tyagi 2005). There are games between firms and consumers (see, e.g., Kuksov 2004). There are games between firms and employees (see, e.g., Mishra and Prasad 2004). There are implicit games between buyers (e.g., Amaldoss and Jain 2005). Indeed, the stream of articles using game theory continues to grow from its early beginnings (Alderson 1937, Howard 1955, Baligh and Richartz 1967, Guth 1980). The results are sometimes trivial, only providing one of many explanations for past observations; however, the results are often also extraordinarily revealing. They can provide detailed explanations for how particular markets work or how players should react to perturbations in the rules of the game.

However, there are at least two fundamentally different types of games. Some games are inescapable, because withdrawal is prohibitively costly (e.g., firm-firm games in the same market). Other games, in particular transaction games, involve a true choice of whether or not to play the game. For example, bidders

can choose whether or not to participate in auctions. Franchisees can choose whether or not to enter into incentive contracts. Customers can choose whether or not to join loyalty programs. Salespeople can choose whether or not to accept incentive contracts, not only considering expected monetary outcomes but also the required (potentially onerous) effort and nonmonetary costs of accepting the contract. Here, game design (i.e., setting the rules of the game) becomes important, both because the design determines the likelihood of desirable outcomes (e.g., getting the best transaction price) and whether (or how many) players will choose to play the game.

Unfortunately, many recent game-theoretic applications in marketing tend to emphasize an adversarial relationship between rivals, rather than a trading relationship seeking mutual benefits. More limiting is the strong assumption that a transaction will occur (sometimes, subject to a minimum payoff). This focus often overlooks why players choose to play the game. Indeed, assuming that exchanges will occur makes the marketing function (e.g., facilitating exchanges) inconsequential.

Many applications, for example, focus on the insidious extraction of consumer surplus (the difference between the consumer valuation and the price paid), rather than on the more common marketing perspective of boosting customer valuations at the minimum cost to the firm. Although an adversarial framing of the transaction game can provide an insightful approach for some research objectives, it can narrow the focus of transaction games to extracting (for example) the buyer's surplus, thus making this research sterile of marketing strategy. This approach tends to relegate the marketing function (with the goal of facilitating transactions) to the background and, in many cases, entirely dismisses the marketing function as irrelevant.

Still more limiting is the sometimes blind exogenous acceptance of the rules of the game. The rules of the game are often, *ipso facto*, forged in stone.

## The Rules of the Game and the Marketing Function

Historically, at least three separate sources often have dictated the rules of the game. First, some rules are meant to mimic real-world stylized representations of transactions in observed extant markets as perceived by the researchers. For example, rules might mimic sales mechanics occurring in Internet retailing, Internet bidding, the airline industry, the automobile industry, industrial bidding, and so on. Secondly, some rules are meant to simplify the often onerous mathematics and allow analytical tractability. Thirdly, some rules are meant to resolve possible

ambiguity, allowing unique solutions or predictions. Hopefully, the resulting rules should extend research beyond fascinating puzzles, illustrative applications of problem-solving aplomb, and accomplishment. Research should extend beyond the, perhaps intriguing and certainly gratifying, mechanical task of pure optimization. Research should also consider which rules will encourage all parties to play the resulting game (i.e., facilitate transactions). Research should consider which rules of the game would enhance the mutual benefit of the parties involved.

So let us step back and consider the fundamental reasons why particular rules persist and why those rules encourage all parties to choose to play transaction games. It is here the marketing function is found. The rules should facilitate mutually beneficial transactions (i.e., a primary role of the marketing function). In fact, we might suspect that most profitable transactions create value for all players. As Jeuland and Shugan (1983) state when discussing the transaction price  $t(D)$  between a reseller and a manufacturer: “We want to emphasize that the manufacturer does not impose  $t(D)$  on the retailer. The [final transaction] is a result of bilateral negotiations between the parties . . . Each party participates.” Gould (1980) emphasizes that “trading occurs because both parties to the trade realize gains from the transaction.” In fact, Gould (1980) notes: “In a fundamental sense there are neither buyers nor sellers, simply traders. Each trader is simultaneously a buyer and a seller.”

To a large extent, the marketing function determines the rules of the game. In the same spirit as the more theoretical pursuit of classic mechanism design (McAfee 1993), the marketing function within organizations create rules for seasonal promotions, contests, rebates, reward programs, website transactions, service contracts, contingent rewards, sales incentives, and so on. Indeed, a critical marketing function is coaxing every party to play the game in the first place. After all, a forward-looking player might fail to participate in a game that is expected to yield few benefits. In other words, we might step back from the game and try to design games that encourage participation.

We should start by remembering that rewards or payoffs have many components beyond the transaction price. Focusing on the transaction price can limit the analysis to adversarial strategies. Indeed, all players can win transaction games. For example, one player might seek liquidity (i.e., a fast transaction) over a slightly better price. Another player might seek lower transaction costs (e.g., less complex terms, less time investment) over a slightly better price.

A critical long-term strategic goal of the marketing function is the creation of buyer surplus, often by better matching seller organizational capabilities with

buyer wants. Marketing research tries to target customers who would get the greatest surplus from a transaction favorable to the seller. The critical step in that task is discovering the appropriate rules of the game that best attract buyers.

Obviously, one could imagine transaction games that would overwhelmingly favor one party. Sometimes, one party might have the power to dictate a particular type of transaction game format. However, if one expects future competition, one might still adopt rules that allow sufficient buyer surplus to discourage new entry or infringement by current competitors. Moreover, adopting less favorable rules might provide still other advantages, such as attracting more players, accelerating transactions, and lowering the costs of the transaction itself.

### **Will Buyers and Sellers Agree to Play?**

In the vast majority of transaction games, all parties decide which transaction games they will play. As both buyers and sellers must agree on a transaction price, for example, they must also both agree on the rules of the transaction game, either through direct input or through refusal to play.

For example, travelers can purchase airline tickets in auction markets, name-your-own price markets (Fay 2004), opaque-product markets, or fixed-price markets. Airlines can sell in one or more of these markets. Salespeople can agree to an employer’s incentive contract or can decide that, despite the expected reward, alternative employer contracts are more appealing (in terms of required effort, stability over time, the distribution of payoffs, tenure, and so on) despite smaller financial rewards. Rules can encourage or discourage transactions. For example, rules creating risks (e.g., overbooking and non-refundable transactions), increasing transaction costs (e.g., complex menus, variable waiting time for the transaction), linking transactions (e.g., loyalty reward programs), and allowing flexibility (e.g., substitutions) might be inspired by operational benefits and costs unrelated to the transaction price, but these rules might influence buyer willingness to play the game. Some rules for loyalty reward programs might increase expenditures for those who join the programs and play the game, but those rules could discourage many customers from joining the program.

Developing the rules of the game might be analogous to new product development. As technology improves, a wider set of opportunities becomes available (Shugan 2004). The objective becomes more efficiently meeting the wants of all of the game’s participants through advances in knowledge, technology, and creativity. We aspire to improve game design to benefit all players (Shugan 2003).

A marketing perspective can help us design the transaction game. We should match the benefits associated with particular rules with the benefits desired by each party. A marketing perspective considers the myriad benefits that the selling format provides (e.g., whether the transaction is certain, the extent that buyers must engage in search (Zwick et al. 2003), who reveals what information, who obtains what information, the uncertainty regarding the outcome, the commitment requirements of each party, the impact on future reputations, the impact on future transactions, whether anonymity is possible, the ease at which rules are broken, the perceived fairness of the outcome, etc.).

### An Example—Auction Games

As an example, consider auction transaction games (see, e.g., Klemperer 1999). An enormous literature evinces the innumerable variations of those games, including some empirical tests of theory (Laffont 1997). Certainly, the advancement of technology (particularly Internet technology) and websites such as eBay has helped spawn the enormous recent interest in consumer (see, e.g., Pinker et al. 2003) and industrial (see, e.g., Kauffman and Popkowski Leszczyc 2005) auction games.

In many auctions, sellers ask buyers to commit to bids while buyers retain the unilateral power to accept or reject individual seller bids, depending on the values of other bids. With these rules, it might appear that *ex officio* sellers obtain the best possible transaction price or, at least, the highest revenue from multiple transactions (e.g., as with Dutch auctions).

Now consider why strategic buyers would participate in such unfriendly games. It seems that strategic buyers would prefer more friendly sellers who commit to low prices, bestowing buyers with the power to accept or reject offers based on other opportunities (at least making price search easier). Perhaps, sellers have unique and valued items that allow powerful sellers to dictate all of the transaction terms—i.e., impotent buyers absolutely require a transaction, and trapped unlucky buyers are willing to expend ample resources to win the auction game because buyers have no other buying opportunities or all other opportunities yield less desirable outcomes.

There are certainly auctions that yield the best possible price, given a rare market of trapped potential bidders who have only access to the auction, are able to participate, and acquiesce to the sellers' rules. However, in other situations, unfriendly auctions might dramatically decrease the number of participating bidders (Campbell and Levin 2006).

We might wonder, then, why some buyers apparently like auction games. The reason might be that

auction games often fail to produce the highest possible transaction prices, but instead, provide buyers with bargain prices while providing sellers with other benefits beyond high prices. Indeed, the primary seller benefit might be unrelated to obtaining the highest possible revenue. As basic marketing textbooks espouse, transactions occur because they yield benefits to all parties. Similarly, the auction format could provide benefits to all parties unrelated to the transaction price.

One might hypothesize that sellers might obtain higher transaction prices by setting a high fixed price, advertising widely, and patiently waiting. If demand varies across time for almost any reason (buyers entering and exiting the market, diffusion of information about the item, variation in other opportunities for the buyer), then the patient seller might dramatically increase the transaction price by announcing a high price and waiting until a very high-valuation buyer appears.

Strategic sellers might also dramatically increase the size of the market by disclosing acceptable prices, rather than by forcing buyers to enter into potentially vexing auctions and expending considerable effort bidding with a high likelihood of buying nothing or obtaining little surplus. Remember that buyers incur many disadvantages in auction games beyond capitulating to sellers' rules. The buyers must, for example, spend time bidding, research the transaction (e.g., inspect the item), forego the benefits of repeated transactions with the same sellers (e.g., desirable long-term incentives), accept lower probabilities of a successful purchase (e.g., as compared to buying retail), pay the fixed costs associated with entering auctions, and sometimes fail because of undisclosed reserve prices. Hence, auctions might provide consequences contrary to those anticipated by the auctions literature because far fewer buyers participate when rules are unfavorable to the buyer. Auctions might provide sellers with far less than the maximum transaction prices.

Rather than providing higher transaction prices, many auctions might provide strategic sellers with other benefits. For example, sellers might gain greater liquidity and accelerated (more immediate) sales. Sellers might benefit from lower transaction costs including, but not limited to, minimizing selling efforts, decreasing the expenses associated with finding buyers, lowering the expenses associated with certifying the quality of their products, avoiding inventory costs, minimizing shipping costs, avoiding risks associated with warranties, remaining anonymous, not jeopardizing external reputations, and so on. Sellers might save resources otherwise spent on determining demand (e.g., doing market research) and

other efforts associated with pricing decisions. Auctions might require less advertising than selling single items at fixed prices for an extended time because auctions spread advertising costs across many sellers, which creates economies of scale for information dissemination. Also, auctions might reach much larger markets that include unconventional buyers seeking unique items.

Beyond enjoying lower transaction prices, auction buyers might anticipate unusual bargains. In fact, auction games might be the only practical format for selling items with liquidity problems. Buyers might enjoy lower search costs because lower auction prices makes incremental search less attractive. Buyers might also want to collect price and demand information for future transactions. Auction games (as well as other transaction games) might also be a form of entertainment for buyers.

Finally, some transaction games might have objectives well beyond selling particular items. Sellers' might profit from fixed fees collected before the transaction. Sellers might benefit from establishing market prices for accounting functions (e.g., tax deductions). Sellers might benefit from collecting information (perhaps about other competitive products) and testing the market for planning future new products, setting future prices, identifying target customers, or merely doing standard market research (e.g., on valuations) for future decisions. Hence, multidimensional benefits create the need for different rules and can allow positive sum auction games to achieve those benefits.

In sum, setting the rules for transaction games requires explicit consideration of the benefits that each player seeks. Facilitating transactions requires an understanding of these benefits.

## Conclusions

By viewing the design of transaction games as providing a myriad of possible benefits beyond the transaction price, transaction game design begins to resemble more traditional marketing functions focusing on trader benefits and facilitating the trade (i.e., making all parties willing to participate). When the marketing function is properly executed, costly functions are transferred to the party that has the lowest cost of performing those functions, and rewards are transferred to the party that most values those rewards. When designing games, the critical task should be enumerating and weighing these costs and benefits for each player. Different transaction games might transfer costs and benefits to different players.

For example, some transaction games might provide sellers with a more immediate sale (albeit at lower prices than other games). Some transaction games might provide sellers with less need for advertising but a greater need to specify the condition

of the product being sold. Some transaction games might require more extensive warranties than others might.

Classic marketing tells us that the marketing function develops a marketing strategy that uncovers target segments and the benefits most desired by those segments. It matches those benefits with the distinctive competencies of individual sellers.

The transaction game is no different. The design strategy might target buyers who will shop to pay less or those who will not. The design strategy might target buyers who are willing to incur inspection costs or buyers who want to rely on the seller to certify quality. The design strategy might target buyers whose valuations are known by the firm, or it might target buyers whose valuations are unknown to the firm. The design strategy might target buyers who are willing to risk no transaction for a lower price or target buyers who are willing to pay more for a virtually certain transaction. The design strategy might target the buyer who is willing to assume a greater risk for a lower price. The design strategy might target buyers who will forego the opportunity of getting a better match (i.e., higher utility product) in the future for an immediate purchase. The strategy can target those who will expend effort for small incremental rewards or those who will not. Indeed, future research should analyze the buyer and seller benefits associated with different forms of transaction games.

Future research should directly consider who is likely to play particular transaction games. Perhaps future research should directly consider whether sellers consider buyer benefits in their own payoff matrix. Perhaps future research should expand the payoff space to include nonmonetary outcomes. Perhaps future research should concentrate a bit more on efficiency and who in the transaction is most equipped to bear the costs and who would most value the expected benefits. A few costs and benefits to consider include:

- the transaction price
- the speed of the transaction and the costs of delay
- the probability that a transaction will occur and the cost of failure
- the risks each party bears
- the transaction cost and effort for each party
- who makes the first offer and whether there is a leader advantage or disadvantage
- who reveals what information
- whether revealing information impacts future transactions
- whether anonymity is possible and desirable
- who bears inventory carrying cost
- what knowledge each party requires to participate

- who bears which costs for gathering information
- whether the trade is unique
- which party has more information about the market
- the total number of desired transactions
- each party's ability and desire to negotiate or not negotiate
- the need to foresee future opportunities
- the number of participants
- the reputation required to play and the impact on future reputation from playing
- the ability to break the rules

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