Dealing with the Paradox of Embeddedness: The Role of Contracts and Trust in Facilitating Movement Out of Committed Relationships

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When there are constantly new, valuable opportunities to transact with alternative partners—a situation we refer to as exchange value uncertainty—long-term or committed transactions among the same individuals are discouraged. However, when opportunism creates exchange hazards, which escalate in nonrecurring transactions, individuals will be reluctant to take full advantage of the gains from switching to more valuable partners, thereby leading to “overembedded” exchanges. Instead of embracing new, valuable exchanges with strangers whose propensity to cooperate is uncertain, individuals may prefer to preserve recurring ties with familiar actors. Two mechanisms may encourage movement out of committed relationships in those conditions. First, formal contracts should serve as a safeguard to market participants, in the sense that they limit potential losses due to opportunistic behavior. Second, trust in general others (as opposed to trust in familiar people) reduces participants’ perception of hazards in market exchanges, and hence promotes transactions among strangers. By increasing the propensity to initiate new exchanges, general trust also diminishes the role of contracts in causing movement out of committed relationships. In this paper, we present experimental evidence largely consistent with this theory of the interplay between formal and informal mechanisms in the determination of social mobility.

Key words: networks; embeddedness; contracts; trust

Economists have long touted the virtues of markets in governing exchange. Markets optimally match sellers possessing heterogeneous product offerings with buyers possessing heterogeneous valuations of those offerings (e.g., Friedman 1962, Hayek 1945). Markets permit broad search, but ultimately pair sellers to those buyers who place the highest value on the products offered. Organizational theorists also highlight the virtues of broad search as a mechanism for learning and technological advance (e.g., Denrell 2003, Hansen 1999, Levinthal and March 1993), which is particularly critical in environments where sellers or buyers are constantly innovating. In these environments, there is tremendous uncertainty about the optimality of any given buyer-seller pair. For instance, technological ruptures may render incumbent suppliers unable to match the innovation or production efficiencies possessed by alternative suppliers in the industry (Afuah 2000). Consequently, in settings where seller offerings and buyer valuations are constantly shifting, thereby rendering the value of future transactions with a specific actor uncertain, the broad search and mobility provided by markets become particularly critical in guaranteeing an optimal match among exchange parties as new opportunities emerge.

However, effective exchange typically involves much more than guaranteeing an optimal match of buyers and sellers and then facilitating an arm’s-length transfer of a good or service. Exchange often requires complex, protracted relationships between exchange parties. In establishing the terms of that relationship or in fulfilling those terms, abundant opportunities may arise for one party to opportunistically exploit the other. The hazards arising from such opportunistic behavior, which have been widely recognized by both new institutional economists (North 1990, Williamson 1985) and social exchange scholars (Kollock 1994, Yamagishi et al. 1998), create a particular form of uncertainty due to the possibility of deceptive behavior in social interactions. This behavioral or social uncertainty causes buyers and sellers to consider alternative forms of governance, including the integration of buyer and seller pairs through hierarchical organization (Klein et al. 1978).

Social scientists across a wide range of literature have discussed the virtues of long-term, committed relationships as a solution to opportunism in exchange that...
avoids costly hierarchy. Scholars argue that long-term, committed relationships create a history of exchange that promotes social attachments, social norms, and familiarity-based trust (Granovetter 1985, Gulati 1995, Macneil 1978, Ring and Van de Ven 1994). In addition, game theorists suggest that committed relationships establish an expectation of repeated exchange, which discourages opportunistic behavior whenever expected payoffs from continued exchange surpass short-term gains from defection (Abreu 1988, Axelrod 1984, Taylor 1987). These two factors, an expectation of future exchange and a history of past exchange resulting from complex social interactions, jointly contribute to the stability of cooperation as individuals become less willing to engage in actions harmful to other parties. Consequently, exchanges embedded in close, committed social relations are likely to curtail the propensity to act opportunistic and, hence, resolve the inherent uncertainty associated with harmful behavior in market interactions (Cook and Emerson 1978, Granovetter 1985, Kollock 1994).

Unfortunately, many exchange settings are plagued with both forms of uncertainty, discussed above: the possibility that the value of transacting with a particular actor will shift in the future—which we refer to as exchange value uncertainty—and hazards of opportunism—which, following Yamagishi et al. (1998), we term social uncertainty. In such settings, committed relationships or relationships embedded in close social connections “at times facilitate and at times derail exchange,” creating what Uzzi defines as the “paradox of embeddedness” (Uzzi 1997, p. 35). When the value of particular exchange partners is shifting dramatically over time, these committed relationships, while resolving social uncertainty, constrain the firm from shifting to new, more optimal exchange partners (Blau 1964). The mobility of markets, by contrast, allows individuals to pursue valuable opportunities as they emerge, but undermines cooperation in conditions of social uncertainty. Frequent switching not only diminishes exchange partners’ expectations regarding the longevity of exchange, but also precludes the evolution of relationship-specific norms often found in socially embedded exchanges. Thus, in their study of interactions between investment banks and corporate customers, Eccles and Crane (1988, p. 55) note that actors often “want the advantages of [long-term] relationships and the advantages of a more transactional [arm’s-length] orientation” (emphasis in the original). Customers, for instance, tend to want both customized service, which requires long-term collaboration, and mobility to freely exploit arbitrage opportunities, which implies less frequent deals with the same bank. Therefore, in many circumstances those managing organizations face a clear dilemma in deciding how to structure exchange optimally.

Scholars have evaluated networks of specialized actors as a partial solution to this dilemma. Such networks provide entire communities of socially connected exchange partners that nonetheless preserve their autonomy (e.g., Jones et al. 1997, Piore and Sabel 1984). Within these networks, reputation and social ties resolve social uncertainty, whereas network breadth provides access to a wide set of specialized actors outside closed circles (e.g., Burt 1992, 2005), thereby addressing exchange value uncertainty. Nonetheless, social networks may be plagued with the risk of “overembeddedness” (Uzzi 1997). Instead of embracing new, valuable exchanges with strangers whose propensity to cooperate is uncertain, individuals may prefer to preserve recurring ties with familiar actors (Portes and Sensenberger 1993). This problem is aggravated when there is great uncertainty about optimal exchange pairings over time; in this case, embedded networks impose dysfunctional constraints on optimal matching, leading to “feuding, choking off novel information from other parties of the industry, and welfare-like support of weak network members” (Jones et al. 1997, p. 925). Thus, although the virtues of flexible exchanges have long been discussed and, indeed, constitute the bedrock of neoclassical market theory, and although the virtues of committed, socially embedded relationships have been persuasively articulated, scholars have not adequately or extensively examined conditions that make market actors more willing to move into new, valuable opportunities instead of confining exchanges to a group of recurring partners.

We address this void in the literature by analyzing alternative mechanisms that enable movement out of committed relationships in settings where both social and exchange value uncertainty are present. Specifically, we explore the role of formal contracts and trust, as well as their interplay, in easing movement out of committed relationships when exchange value uncertainty encourages such a move. We argue that contracts curtail the initial exposure that individuals face in initiating new exchanges, thereby promoting new ties (Johnson et al. 2002). We also argue that individuals may be propelled to move out of committed relationships and into new exchanges by an inherent propensity to trust. Thus, Yamagishi and Yamagishi (1994) posit that general trust or a “belief in the benevolence of human nature in general” (p. 139) is an individual trait that “helps people move out of committed relations” (p. 160). General trust increases mobility because it reduces the perceived likelihood that new partners will act opportunistically. In addition, we evaluate the interaction between contracts and trust as mechanisms to ease movement out of existing relationships. Namely, individuals exhibiting high general trust (as opposed to trust in familiar people) may be more willing to transact with new partners and less inclined to adopt formal
contracts. Following Kollock (1994), we use experimental evidence—a repeated buyer-seller market where both social and exchange value uncertainty are present—to test our theory. By evaluating the role of contracts and general trust, and their interaction, as a way to promote exit from enduring relationships and “overembedded” networks, our study contributes to the understanding of the dynamics of social exchange and the organizational mechanisms that can increase exchange performance.

The paper is structured as follows. In the second section, we present our theory in detail. In the third section, we discuss our experimental procedure. We next present and discuss the results. A conclusion section follows.

Theory

Social Uncertainty and Commitment

Economic exchange confronts a variety of exchange hazards or uncertainties caused by opportunistic behavior. Some reference this general class of exchange hazards as social uncertainty or “the risk of being exploited in social interactions” (Yamagishi et al. 1998, p. 170). Thus, sellers may misrepresent information about the quality of their products prior to the buyer’s purchase—a manifestation of an exchange hazard that economists reference as adverse selection (Akerlof 1970). Sellers may also exert low effort after buyers agree to acquire their services, which is a problem of moral hazard (Paully 1968). Transaction cost economics (Klein et al. 1978, Williamson 1985), in addition, highlights the possibility of “hold up” when one party consummates investments that are specific to the other party, thus creating the possibility for the latter to bargain for higher rents in the exchange. These types of opportunistic behavior create potential expropriation losses in market exchanges and thus require organizational effort to support cooperative relations. Organizational economists have emphasized the role of incentives, contracts, and hierarchical integration to overcome these exchange hazards (e.g., Milgrom and Roberts 1992, Williamson 1985). Other scholars, however, have stressed the role of informal mechanisms based on social patterns of interaction among individuals.

The creation of committed relationships—repeated, long-term exchanges among the same actors—allows for a host of informal mechanisms that support cooperation under social uncertainty. At the most basic level, committed relationships have a longer expected horizon of repeated exchange. To use Axelrod’s (1984) term, commitment increases the “shadow of the future.” Expanding the horizon of future interaction allows for the establishment of informal retaliation strategies, i.e., an individual can refuse to transact in the future with exchange parties who have defected in the past. If the long-term payoff from cooperation is sufficiently high—more precisely, if the payoff surpasses any short-term gain from opportunistic behavior—then cooperation can be sustained even among self-interested individuals (Abreu 1988, Klein and Leffler 1981, Taylor 1987, Telser 1980). Other authors, however, suggest that this is only a partial assessment of the role of commitment. By transacting repeatedly, partners become familiar with one another and develop social attachments and norms (Bercovitz et al. 2006, Gulati 1995, Ring and Van de Ven 1994). This history of interaction constitutes the basis of socially embedded exchanges (Granovetter 1985, Uzzi 1997) and relational patterns of governance (Macneil 1978), characterized by mutual interests and collaborative orientation.

High Exchange Value Uncertainty and Mobility

In many settings, however, market participants are concerned with more than social uncertainty. They may be more concerned with finding the optimal exchange partner rather than perfecting exchange with the current one. We define exchange value uncertainty as a situation in which there is uncertainty about the value of future exchanges with a certain actor, whether or not there is a propensity to act opportunistically (e.g., Kranton and Minehart 2000). This type of uncertainty may occur even if the value of a current exchange is completely known, as long as an actor is not certain about how this value will shift in future periods. For instance, potential suppliers are constantly updating their skills and capabilities, resulting in constant change in their value as exchange partners. Consequently, buyers cannot know with certainty whether a particular supplier will be able to keep up with radical innovations introduced by alternative firms and thereby match the low-cost or high-quality bids that alternative suppliers may offer (Afuah 2000, Kranton and Minehart 2000, Robertson and Gatignon 1998, Rowley et al. 2000). Also, buyers may not know with certainty whether sellers can adjust production capacities when faced with variations in the downstream demand (Eccles 1981, Jones et al. 1997). Notice that the factors that cause social and exchange value uncertainty differ. Although social uncertainty results from the intentions of exchange partners, including the possibility of opportunism, exchange value uncertainty derives from technical or demand factors that induce variation in the value of exchanging with particular partners.

Exchange value uncertainty discourages the development of committed relationships. New, more valuable exchange opportunities with alternative partners are likely to continually emerge over time. If exchange values are stable over time, individuals can simply identify optimal exchange partners and then develop and maintain committed relationships with them. However, when exchange value uncertainty is high, the value gap between a current and an alternative relationship (Cook and Emerson 1978, Thibaut and Kelley 1959, Yamagishi
et al. 1998) may at times be quite large. Increasing performance under these circumstances often encourages constant coupling and decoupling of actors in broader markets to provide adaptation to changing circumstances (Jones et al. 1997). In sum, exchange value uncertainty simply requires social mobility, so that buyers or sellers can flexibly access more attractive exchange opportunities beyond existing, close ties. This leads to:

HYPOTHESIS 1. An increase in exchange value uncertainty enhances the likelihood that an actor will switch to a new exchange partner in a given period.

Mobility vs. Commitment
Movement out of committed relationships comes at a cost, however. The accompanying reduction in commitment to a particular exchange partner may hinder the exchange partners’ willingness to cooperate in the face of social uncertainty, i.e., in settings where gains from opportunistic behavior are present. Individuals who switch partners with great frequency destroy their reputations for cooperating and cause existing or future partners to reduce their estimates of the expected duration of an exchange (Podolny and Page 1998, Singh and Mitchell 1996). Sellers who transact with a buyer who has discontinued prior supply arrangements or has not committed to steady procurement schedules should not expect long-term supply relationships with that buyer (Srinivasan and Brush 2007). For example, Helper (1991) documents that U.S. automakers created a “legacy of mistrust” with their suppliers through ongoing solicitation of competing bids and a general propensity to switch exchange partners. Moreover, market participants who switch exchange partners frequently fail to build close relationships that socially attach buyers to sellers through evolving, relationship-specific norms. Consequently:

HYPOTHESIS 2. In settings characterized by social uncertainty, actors who frequently switch exchange partners will elicit less cooperation from their partners than actors who maintain long-term, committed relationships.

The combination of these two hypotheses highlights the dilemma that market participants face under conditions of both social and exchange value uncertainty. Thus, although we treat these types of uncertainty as analytically distinguishable, we are particularly interested in their interaction. Without social uncertainty, exchange value uncertainty would not be the problem it otherwise is; markets would trivially promote optimal buyer-seller matching. For instance, in markets where the quality of products is easily assessed prior to purchase, switching partners is inconsequential in terms of cooperation because buyers can easily check whether or not the new suppliers have low-quality products. If, on the other hand, opportunism is present but exchange values do not change much, then actors could easily resolve social uncertainty by establishing committed, enduring relationships. A critical dilemma emerges when social uncertainty and exchange value uncertainty occur jointly. In this case, although commitment curbs opportunism, commitment also curtails exchange with alternative actors. As Blau (1964, p. 161) put it, “the immobility resulting from firm attachments precludes the adjustments in the social structure required for exchange transactions to yield fair returns to all parties.”

Some have proposed that this dilemma can be solved with participation in broad social networks comprised of autonomous, specialized actors embedded in complex social relations (Jones et al. 1997, Piore and Sabel 1984). Within these networks, actors can couple and decouple in response to changing conditions and yet still preserve some degree of cooperation. Therefore, even closed groups may thrive if some members create and preserve external contacts bringing new ideas or exchange opportunities (Burt 2005). When social uncertainty is pervasive, however, networks tend toward “overembeddedness” (Uzzi 1997). To understand why, notice that the value of exchanging with new partners beyond established circles is only realized if new exchange partners behave cooperatively. However, the mere act of switching to new partners may signal a lack of commitment that undermines the newly formed ties. Moreover, turning to new partners destroys cooperative norms built in existing relationships. Consequently, actors may forgo valuable exchange opportunities outside established social circles, thereby limiting exchange performance. This outcome becomes particularly troublesome when exchange value uncertainty escalates. Therefore, although scholars have argued that social networks potentially balance mobility and commitment as compared to markets and hierarchies, they have failed to systematically assess how to avoid “overembeddedness” within networks as actors refrain from moving out of committed relationships.

We explore in the remainder of this paper resolutions to this dilemma. In particular, we explore the capacity of trust and contracts to simultaneously address both social uncertainty and exchange value uncertainty.

The Role of Contract Enforcement
Contract enforcement is a formal mechanism that promotes exchange among strangers. Ironically, by lowering the potential hazards in a new exchange, contracts ease movement out of existing committed relationships. As is widely discussed, contracts may increase the expected benefits from an exchange, including a new one, by diminishing the gains that market participants attain from defecting (Baker et al. 1994, Klein 1996, Lazzarini et al. 2004, Poppo and Zenger 2002). Contracts may also act as a safeguard against possible exchange losses that
the other party may face in conditions of social uncertainty, providing in essence a form of insurance as they venture into new exchanges. Thus, contracts may not only have a direct effect of sanctioning defection from the point of view of sellers, but also reduce the potential losses faced by buyers if sellers defect. For instance, a contract may create penalties for late delivery that represents an incentive for sellers to perform and/or provide buyers with some form of warranty that enables them to eventually receive their product or be reimbursed in case of defection. Although in practice contracts will typically have both of these functions, we focus on the latter. Consequently, even when the exchange is subject to hazards, contracts may facilitate greater mobility because individuals will perceive lower downside risk in newly formed exchanges and thus be more likely to engage in transactions with strangers (Johnson et al. 2002), even for short durations. Therefore:

**Hypothesis 3.** In settings characterized by social uncertainty, market participants will be more willing to initiate exchanges with new partners in response to exchange value uncertainty when contract enforcement is available.

Movement out of committed relationships is, of course, most consequential when exchange value uncertainty is high. Without contracts, individuals may perceive large potential losses from pursuing new exchange partners. By contrast, when exchange values are relatively stable, contracts offer more limited value because exchange performance is enhanced by individuals simply maintaining the same partners. Furthermore, there are possible inefficiencies associated with the use of contracts. The most obvious cause stems from the costs of using the legal system (Chen 2000, Lazzarini et al. 2004). Other authors propose a more implicit cost of contracting, based on the idea that formal controls may damage the quality of relationships. Contractual clauses may signal distrust and reduce individuals’ willingness to cooperate (Macaulay 1963, Sitkin and Roth 1993). The explicit controls attached to contracts may crowd out or substitute for the intrinsic motivation embodied in a committed relationship (Deci and Ryan 1985, Fehr and Gächter 2000, Frey 1997, Taylor 1987). As originally advanced by Strickland (1958), agents may become less motivated to act cooperatively if they perceive the existence of external controls that are actually designated to suppress defection (Lubell and Scholz 2001, Malhotra and Murnighan 2002, Tenbrunsel and Messick 1999).

To enhance exchange performance, contracts must provide benefits that surpass these potential costs of contracting. Thus, individuals will apply contracts in a contingent, discriminating way: They should do so to a larger extent in conditions involving high exchange value uncertainty, where a desire to transact with new, valuable partners will escalate potential losses due to social uncertainty. When exchange value uncertainty is low, there is little value in accessing alternative partners. Individuals will be able to economize on the cost of contracting by simply developing committed exchanges as a solution to social uncertainty. In other words:

**Hypothesis 4.** An increase in exchange value uncertainty will make actors more willing to use contracts to initiate exchanges with new partners when social uncertainty is present.

The Role of Trust

Trust is an informal mechanism of governance that may also perform an important role in facilitating movement out of committed relationships. Trust, however, has many definitions. Following Yamagishi and Yamagishi (1994), we distinguish between two types of trust: general trust and knowledge-based trust. General trust refers to the expectation that people in general will not act opportunistically even when they have the opportunity to do so. Trust by this definition is independent of contractual provisions or controls in an exchange; it is a personal trait that influences commitment decisions in the sense that it affects an individual’s assessment of the benevolence of other actors (Yamagishi and Yamagishi 1994). Individuals who exhibit high general trust will likely perceive lower hazards in exchanges with strangers. This perception will have two effects. First, individuals will be more willing to move out of committed relationships in response to high exchange value uncertainty. Second, because they place higher confidence on the benevolence of their new partners, individuals with high general trust will be less affected by the presence or absence of contract enforcement even under conditions of social uncertainty. High general trust will therefore substitute for the need of contracts, and vice versa. This substitution is consistent with Granovetter (1985, p. 489), who contends that formal institutions “do not produce trust but instead are a functional substitute for it.” In the same vein, Putnam (1993) also observes that societies with a high degree of trust do not need strong legal enforcement. This logic leads to the following:

**Hypothesis 5.** Market participants with high general trust will be more willing to initiate exchange with new partners in response to exchange value uncertainty than market participants with low general trust.

**Hypothesis 6.** Market participants with high general trust will be less likely to adopt formal contracts to control social uncertainty than market participants with low general trust.

Knowledge-based trust, by contrast, refers to the expectation that familiar people—i.e., people with whom an individual has interacted in the past—will not act opportunistically (Shapiro et al. 1992). Knowledge-based
trust is trust that emerges from experience with a particular exchange partner. Individuals exhibiting this kind of trust do not necessarily exhibit greater confidence in the benevolence of actors, but rather confidence in the reliability of the exchange partners with whom they have experience. These individuals thus feel more comfortable exchanging in closed groups comprising actors with whom they have had previous contact (Huff and Kelley 2003). For this reason, these individuals may be particularly unlikely to transact with strangers unless strong contractual safeguards are in place. Knowledge-based trust is therefore likely to show effects that are opposite from those shown by general trust. Namely, subjects with high knowledge-based trust should be less inclined to move out of their ongoing relationships, and they should make higher use of formal contracts. This may appear to be counterintuitive, given that trust is commonly seen as an alternative to external controls. However, notice that we are examining contexts involving social mobility. To facilitate movement into new exchanges, trust must necessarily be impersonal—as both formal contracts and general trust indeed are. Trust based on histories or experiences of interaction is personal, thereby requiring more impersonal means of governance such as contracts whenever exchange involves new partners. Thus:

**Hypothesis 7.** Market participants with high knowledge-based trust will be less willing to initiate exchanges with new partners in response to exchange value uncertainty than market participants with low knowledge-based trust.

**Hypothesis 8.** Market participants with high knowledge-based trust will be more likely to adopt formal contracts to control social uncertainty than market participants with low knowledge-based trust.

Figure 1 summarizes the hypothesized relationships of our theory.

**Figure 1** Summary of Hypothesized Relationships

Experimental Design and Procedures

**Design**

There have been a number of experiments on market exchange between buyers and sellers with differing marginal values and cost parameters; these typically incorporate no contractual problems and little opportunity for deceit (for a survey, see, Holt 1995). There have also been a number of experiments on social uncertainty (e.g., Kollock 1994, Yamagishi et al. 1998) that incorporate no variation over time in the value of exchanging with different partners. The conclusions from these two experimental literatures, respectively, are that neoclassical markets work well when there is heterogeneity in buyer values and seller costs, and that committed relationships work well when there is a potential for opportunism. To the best of our knowledge, however, there have been no experiments evaluating the benefits of mobility when social uncertainty is present. It is only within this more complex setting that subjects find it worthwhile both to create, and depart from, enduring relationships.

In this sense, we implement an experimental environment where buyers and sellers have repeated opportunities to transact during several rounds. The product being exchanged has two quality levels, high and low. Similar to Kollock (1994), this creates a situation of social uncertainty because sellers may act opportunistically and deliver low-quality products to buyers after purchase. We vary exchange value uncertainty so that we can assess the mobility-based benefits of contracts and generalized trust in the face of potential opportunism. More specifically, we employ a $2 \times 2$ factorial design whereby we manipulate the level of exchange value uncertainty and the presence of contract enforcement. Although we do not manipulate the level of general and knowledge-based trust in our experimental groups, we do measure trust and assess how these two personal traits affect commitment decisions and exchange performance. Each treatment cell involves two experimental groups, where each group corresponds to a market with six buyers and seven sellers; in total, we have 104 subjects. There are more sellers than buyers in each group to induce some competition among sellers and hence create conditions for the dissolution of existing ties (Baker et al. 1998), which is the primary interest of our study.

**Subjects**

Our subjects are 104 students at a private American Midwestern university, both undergraduate (88.4%) and graduate students (11.6%). They were recruited by the staff of the experimental laboratory of the school through public announcements, and were not told about the purposes of the study. Sixty-seven percent of the subjects are male, and the average age is of 20.6 years, ranging from 18 to 34 years. Subjects were randomly assigned
to these groups, as well as to the role of buyer or seller. At the end of each session, subjects received a show-up fee of $5, plus a variable compensation depending on their performance in the experiment, all paid in cash. The average total compensation was around $25 for a two-hour session.

Procedure

In our experiment, transactions are mediated by a software system linking buyers’ and sellers’ computer terminals in a network. Buyers and sellers stay in the same room, seated in cubicles with a computer terminal. They are not informed, however, who is playing the role of buyer or seller. Before the experiment begins, instructors read the experimental instructions and verify subjects’ understanding of the procedures through a quiz involving four comprehension questions. Responses are individually checked and corrected to guarantee that all subjects understand the sequence of decisions and how payoffs are computed. Instructors then demonstrate the software and conduct a practice session where each subject plays against himself or herself (i.e., as both buyer and seller). Subjects are next privately informed of the role they will play in the experiment and are assigned an anonymous identity code. Finally, instructors announce that the experiment will last at least 15 rounds, but that after the 15th round, there is a 50% chance that the whole experiment will end.

The performance of subjects was computed based on “experimental points.” In our setting, low quality always costs zero to sellers, and yields zero to buyers. High quality yields 100 experimental points to buyers, and costs a variable number of experimental points to sellers, to be explained below. Buyers pay a certain price, in experimental points, to receive a unit of the product. In every round, the sequence of events is as follows:

First Stage: Sellers Submit Price Offers. After privately visualizing their costs in each round, sellers begin by offering prices to supply a high-quality product to as many buyers as they want. Thus, sellers can offer different prices to all buyers on the market, to a single buyer, or to a subset of buyers. If sellers do not want to submit price offers, they exit and wait until the next round. Sellers can choose any price level they want for each buyer, as long as it is an integer between 1 and 100 (for instance, they are able to keep prices at a certain level even if costs increase in a certain period).

Second Stage: Buyers Choose Sellers. Buyers then observe the prices chosen by sellers. A buyer \( i \) thus receives a vector of price offers, \( p_{ij} \), from all suppliers \( j \) who have submitted offers to that buyer. Buyers do not see the vector of offers to other buyers on the market. With this information, a buyer then requests the product from only one seller who has submitted a price offer. However, a seller may sell the product to more than one buyer if he or she receives more than one request. If buyers do not want to buy the product, then they exit and wait until the next round. However, if buyers accept the price offer, then they pay for the product beforehand. Thus, they cannot refuse to pay if sellers deliver low-quality products.

Third Stage: Sellers Choose the Quality Level of the Product. Sellers are next informed about the buyers who accepted their offers, and then decide the quality level of the product to be delivered. Note that sellers may send products to more than one buyer, and may choose different quality levels for each buyer.

In each stage, subjects have at most two minutes to complete their decision. After the third round is completed, buyers are then notified about the choice of their sellers. Because buyers pay for the product beforehand, sellers can simply receive the payment and deliver low quality, which is associated with zero production cost. However, given that the market is repeated, cooperation—i.e., delivery of high quality—may emerge if the same buyers and sellers transact, to some extent, continuously. In every round, sellers can submit new price offers, buyers can choose different sellers, and sellers can vary the chosen quality to each buyer. The full outcome of each round, including seller behavior, is communicated only to the buyers and sellers who effectively transact with one another. However, all subjects are informed about the underlying structure of past “connections” in the market. Namely, they know who transacted with whom in every period—based on anonymous identity codes—and therefore observe the revealed commitment levels chosen by buyers. Thus, market-level reputation mechanisms are feasible, but the information upon which to derive these reputations is noisy. Buyers only have precise behavioral data for sellers with whom they have transacted and only for those periods in which the exchanges with them occurred. We do not fully reveal information about past behavior on the market as a whole because our objective is to examine conditions that make individuals more willing to transact with new actors despite the advantages of preserving enduring ties; otherwise, neoclassical markets would trivially emerge. Moreover, the availability of complete information about social behavior in broad markets is unrealistic for most settings (Williamson 1996, pp. 153–158) unless proper information-disseminating institutions exist (Milgrom et al. 1990).

Manipulating Exchange Value Uncertainty

In our experimental setting, exchange value uncertainty is operationalized as the extent to which the costs that each seller will face to deliver high quality to each buyer vary from period to period. Whereas the cost to deliver low quality is constant (zero), costs to deliver high-quality products are randomly drawn in an independent...
manner across sellers, buyers with whom sellers may transact, and periods. Such costs are private information: Neither buyers nor sellers are informed about the exact costs of other sellers. Both buyers and sellers, however, are informed that seller costs can vary from period to period. In the treatment involving high exchange value uncertainty, costs are drawn from a discrete uniform distribution involving integers between 0 and 100. To facilitate understanding, denote $c_{ij}$ as the cost that a seller $j$ incurs to deliver high quality to buyer $i$. In our market, which has six buyers and seven sellers, costs $c_{ij}$ are the entries of a $6 \times 7$ cost matrix that varies across periods. Thus, suppose that in a certain period random draws are such that the cost matrix becomes

$$
\begin{bmatrix}
89 & 55 & 92 & 56 & 3 & 21 & 40 \\
29 & 38 & 83 & 31 & 37 & 61 & 52 \\
25 & 53 & 24 & 2 & 87 & 3 & 19 \\
98 & 82 & 44 & 11 & 64 & 4 & 83 \\
40 & 86 & 63 & 23 & 41 & 25 & 83 \\
95 & 18 & 28 & 68 & 3 & 91 & 0
\end{bmatrix}
$$

The matrix shows, for instance, that seller 2 (second column) incurs a cost of 82 points to supply a high-quality product to buyer 4 (fourth row), and a cost of 18 points to supply a high-quality product to buyer 6 (sixth row). Also, to deliver high quality to buyer 3, seller 5 incurs 87 points, whereas seller 4 incurs 2 points. This example serves to illustrate the tension in the experiment when exchange value uncertainty is high. If prices are aligned with costs, buyer 3 could possibly earn a significant number of experimental points by transacting with seller 4 instead of, say, seller 5. However, if buyer 3 has successfully transacted with seller 5 before—possibly because this seller used to have low costs—and has never transacted with seller 4, then buyer 3 may be reluctant to transact with the latter, fearing that a low-quality product will be delivered. Also, buyer 3 may refuse to sever a long-term relationship with seller 5 to avoid undermining this seller’s willingness to cooperate in the future. Recall that a low-quality product has zero value to buyers, and hence they necessarily lose experimental points if sellers do not deliver high quality.

In the low exchange value uncertainty condition, by contrast, costs have a substantially lower dispersion: they are randomly drawn from a discrete uniform distribution between 45 and 55. Note that the expected cost that sellers will face from period to period is equal to the treatment with high exchange value uncertainty (50 points)—only the dispersion of costs changes. Because costs do not vary much in the treatment involving low exchange value uncertainty, there should be no large gap between what buyers could receive with an alternative seller and what they receive with their ongoing partners.

### Manipulating Contract Enforcement

In the treatment where contract enforcement is possible, buyers also choose whether to offer a contract simultaneously with their acceptance of a particular seller offer (i.e., in the second stage). Thus, sellers are informed not only about the acceptance of their offers, but also about the existence of a contract in their exchange with buyers. In the other treatment, contract enforcement is neither allowed nor mentioned to participants. The contract automatically forces sellers to deliver high quality whenever they choose low quality. Thus, this is a type of contract referred to in the legal literature as specific performance, where “breaching parties [are] ordered by the state to perform their part of the bargain” (Rosett 1994, p. 344).

In our experiment, the contract is enforced with 50% probability. If a contract is offered and the seller chooses low quality afterwards, then the buyer ends up receiving the high-quality product for the accepted price in 50% of the cases. In the other instances, buyers end up receiving low quality and are not reimbursed. It is easy to check that, in a one-shot exchange, sellers can always get more experimental points by choosing low quality even when a contract is in place. If the contract is enforced, they will at worst incur the costs to deliver high quality, which yields a payoff equal to what they would get had they cooperated in the first place. However, if the contract is not enforced, which occurs with 50% probability, they may earn a substantial amount of points because the cost to deliver low quality is zero. This feature serves to minimize the role of contracts as incentive devices in our experimental setting, and highlights their role as safeguards to buyers, which constitutes our main interest. Given that the contract is enforced with 50% probability, if sellers choose low quality, then buyers can always expect to receive more points when a contract is in place than when they do not have this safeguard, even though there is still a chance that high quality will not be enforced.

The use of contracts costs buyers five experimental points in every round. The choice of contract cost was arbitrary. Our goal was to induce a direct cost of contracting to avoid an indiscriminate use of this mechanism, while attempting to set the cost at a reasonably low level to make its use somewhat attractive (the experimental treatments involving no availability of contracts can be thought of as a condition where contract costs are prohibitively high). Sellers do not incur any extra cost when they exchange under a contract. Because the contract holds for a single period only, buyers are free to change their use of contract enforcement across experimental rounds.

Our experimental setting is, admittedly, complex. Participants must make several choices beyond the key decision of buying from an incumbent seller or switching to a new one. Thus, sellers must offer prices and buyers...
must decide whether to select when those formal mechanisms are available. Although we could have implemented a simpler setting in which prices were defined by the experimenters and contracts were always offered in the corresponding treatment, we chose our more complex design for two main reasons. First, following Kollock (1994), we wanted to closely simulate the institutional setting of markets where prices autonomously influence exchange. Second, expanding subjects’ choice set allows us to examine a range of interesting effects. For instance, we can examine whether buyers’ voluntary choice of contract has an impact on sellers’ propensity to cooperate. The drawback of our design, however, is that several choices are to some extent uncontrolled. To address this limitation, we perform several checks to verify whether our manipulations elicit the expected behaviors (e.g., when exchange value uncertainty is high, there should be larger differences across seller prices). We also examine whether unobserved factors (given the lack of control of some choices) may spuriously affect our results.

Measuring Trust

To measure buyers’ general and knowledge-based trust, we employ a questionnaire using the items reported by Yamagishi and Yamagishi (1994) in their final measures of those constructs. The questionnaire is administered at the end of each experimental session and measures buyers’ agreement with particular statements using a seven-point Likert scale. Table 1 shows the items used in the questionnaire, and their factor loadings (using promax rotation) in a two-factor model estimated through maximum likelihood. A likelihood-ratio test reveals that the two-factor model significantly outperforms the model with no factor ($\chi^2 = 209.56, p < 0.01$), thus suggesting that items are indeed measuring two different constructs. Because the general trust items 4 and 5 do not display a clear pattern of loading, we drop them from the final measures. Thus, the final measure of general trust is the sum of the scores for items 1, 2, 3 (reverse scored), and 6 (Cronbach alpha = 0.822), whereas the final measure of knowledge-based trust is the sum of the scores for all corresponding items, where item 2 is reverse scored (Cronbach alpha = 0.851). To facilitate comparison, we standardize these final measures.

To be sure, the experimental treatments may influence responses in the postexperimental questionnaire, thereby causing spurious inference. Thus, Malhotra and Murnighan (2002) discuss how contracts may negatively affect attributions of partners’ trustworthiness. Although the measures of trust used here are not tailored to particular market participants, the outcome of experimental sessions may influence buyers’ generic trusting attitudes. To verify this possibility, we also administer preexperimental questionnaires for half the buyers, randomly selected within each treatment cell (in order to control for pretest sensitization). Regressions with postexperimental measures of general and knowledge-based trust as dependent variables, against preexperimental measures of each construct and treatment variables as independent variables, reveal no significant effect of treatments in changing the trust scores (results not reported here).6

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Items Used to Measure General and Knowledge-Based Trust (Based on Yamagishi and Yamagishi 1994) and Their Factor Loadings in a Two-Factor Model (Promax Rotation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td>Factor 1</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>General trust</td>
<td></td>
</tr>
<tr>
<td>1. Most people are trustful of others.</td>
<td>0.647</td>
</tr>
<tr>
<td>2. Most people are trustworthy.</td>
<td>0.931</td>
</tr>
<tr>
<td>3. Most people are basically dishonest.*</td>
<td>−0.653</td>
</tr>
<tr>
<td>4. I am trustful.</td>
<td>0.428</td>
</tr>
<tr>
<td>5. Most people will respond in kind when they are trusted by others.</td>
<td>0.328</td>
</tr>
<tr>
<td>6. Most people are basically good and kind.</td>
<td>0.810</td>
</tr>
<tr>
<td>Knowledge-based trust</td>
<td></td>
</tr>
<tr>
<td>1. Whatever work I have to perform, I feel more secure when I work with someone I know well than with someone I don’t know.</td>
<td>−0.084</td>
</tr>
<tr>
<td>2. I trust a person I don’t know more than one I know well.*</td>
<td>0.095</td>
</tr>
<tr>
<td>3. The people I trust are those with whom I have had long-lasting relationships.</td>
<td>−0.053</td>
</tr>
<tr>
<td>4. Generally, a person with whom you have had a longer relationship is likely to help you when you need it.</td>
<td>0.010</td>
</tr>
</tbody>
</table>

Notes: Log likelihood = −16.903. $\chi^2$ (two factors vs. no factor) = 209.56 ($p < 0.001$). Loadings in italics correspond to items used in the final measures. *Reverse-scored item.

Results and Discussion

Manipulation Checks

We check the effectiveness of our manipulations in two ways. First, we include in the quiz administered right after the experimental instructions some questions to assess the subjects’ understanding of experimental parameters and variables affecting payoffs—including costs, prices, levels of quality, and (if applicable) contractual provisions. We check the responses and make sure that all participants understand the correct answers. Second, we include in the postexperimental questionnaire some items to measure subjects’ perception of the manipulated variables. Using a seven-point Likert scale, buyers and sellers indicate their agreement with the statements “It is likely that sellers’ costs varied a lot from period to period,” and “My costs to deliver a high quality good to each buyer varied a lot from period to period,” respectively. Scores are significantly larger in the manipulation involving high exchange value uncertainty ($p < 0.01$). In the case of contract enforcement,
the items for buyers and sellers are respectively “I had no way to protect myself, even partially, from possible losses associated with a low quality good,” and “If I wanted, I could always earn a lot of points by choosing low quality” (all items are reverse-scored).

Confirming the effect of the manipulation, buyers’ agreement to the questionnaire item is lower in the treatment where contract enforcement is available, although with moderate significance ($p < 0.10$). In the case of sellers, however, the difference is insignificant. We believe that this was due to the generic nature of our manipulation item for sellers, which did not include any explicit reference to contracts. However, as explained before, the preexperimental quiz for subjects assigned to the contract treatment included questions to assess their understanding of how payoffs could vary depending on costs, prices, and the possibility of contractual enforcement. All subjects were required to answer the quiz, and responses were individually checked and corrected in case of error or misunderstanding. Moreover, the software used in the experiment had a clear user interface where sellers could see whether buyers offered contracts or not. Therefore, we are confident that all sellers were aware of the contract manipulation, despite the failure of our manipulation item to detect between-group differences.

**Buyers’ Willingness to Switch Their Sellers**

To strictly test our hypotheses related to movement out of committed relationships, we need to observe the history of ongoing buyer-seller pairs and, in particular, buyers’ decisions to keep or switch to alternative sellers. Thus, we adopt a discrete-time event history procedure (Allison 1984) by observing, in each experimental round, whether a given buyer accepted an offer from the incumbent seller (i.e., the seller with whom the buyer transacted in the previous period) or switched to another seller. The decision to switch is equivalent to movement out of an ongoing exchange. In this sense, our dependent variable is coded 1 if the buyer accepted an offer from a seller other than the incumbent, and 0 otherwise. We omit instances where the buyer has not accepted any offer. Because the data have a panel structure with a binary dependent variable, we employ the random-effects probit model proposed by Butler and Moffit (1982), where the time-invariant error term is centered on each buyer. Thus, our estimation procedure controls for interdependencies among decisions by each buyer across all experimental rounds.

We first estimate a baseline model including relationship-specific variables commonly discussed in the literature (other than those outlined by our hypotheses), as well as buyer-specific controls. *Past Defection* is coded 1 if the incumbent seller delivered low quality to the buyer in the previous period, and 0 otherwise. Because buyers are likely to retaliate for past defection with the termination of an ongoing relationship (e.g., Axelrod 1984, Macaulay 1963), we expect the coefficient of this variable to be positive. *Relationship Length* is the number of previous rounds in which the buyer has transacted with the incumbent seller on a continuous basis, up to the current period. The familiarity and evolving norms in long-term relationships suggest a negative coefficient for this variable. As buyers accumulate experience with an incumbent seller, they should be less inclined to switch (Gulati 1995, Ring and Van de Ven 1994, Seabright et al. 1992). Although the exact round when the experiment will terminate is unknown, buyers were informed that it would last at least 15 rounds, and that thereafter the experiment would end with 50% probability. When they reach this 15th period, buyers should be less willing to switch to another seller because this seller will perceive a short horizon of future exchange and, therefore, should be more inclined to preserve the ongoing tie. Thus, we also include in the baseline model a dummy variable *Endgame*, which is coded 1 if the period is above or equal to the 15th round, and 0 otherwise. Finally, we add some buyer-specific personal characteristics that serve as control variables: *Male* (coded 1 if the subject is male and 0 otherwise), *Age* (in years), *Graduate* (coded 1 if the subject is a graduate student), *Business/Economics Major* (coded 1 if the subject falls into this category), and *Experience* (equal to 1 if the subject has participated in previous experiments at the lab where our study was run).

Model (1) in Table 2 presents estimates of the baseline model including relationship- and buyer-specific controls only. As expected, buyers are less willing to transact with a seller who has defected in the previous period ($p < 0.01$). Also, as an ongoing relationship with an incumbent seller progresses, buyer propensity to switch to another seller diminishes ($p < 0.01$). Among the buyer-specific controls, only *Male* is significant, although marginally so ($p < 0.10$). *Endgame* is also insignificant, thus showing that buyers do not change their switching behavior as the experiment approaches its end.

Model (2) adds variables whose effects are predicted by Hypotheses 1 and 3. Namely, we include the variable *Price Difference*, which corresponds to the difference between the price offered by the incumbent seller and the minimum price offered to the same buyer by any other seller in a particular period. The lower bound of *Price Difference* is zero, which occurs when the incumbent seller is offering the lowest price on the market in a particular round. Because the dispersion of seller costs is substantially higher in the treatment involving high exchange value uncertainty, *Price Difference* is, on average, significantly higher in that treatment than in the case where exchange value uncertainty is low ($p < 0.01$). Thus, *Price Difference* essentially captures the hypothesized effect of exchange value uncertainty on buyers’
inclination to move out ongoing relationships. Namely, Hypothesis 1 suggests that an escalation of Price Difference will increase the likelihood that the buyer will switch to another seller, in pursuit of an exchange with higher value (i.e., lower price). The data strongly support this hypothesis ($p < 0.01$).

As for the effect of contract enforcement, we employ the variable Contract, which is coded 1 when contracts are available and 0 otherwise. Hypothesis 3 suggests a positive interaction between this variable and Price Difference: In the presence of contractual safeguards, buyers should be more willing to move out of an ongoing exchange and into an exchange with higher value. Without contracts, some buyers may stick with their incumbent sellers even if there are other sellers offering lower prices, fearing that those other sellers might act opportunistically. To test this hypothesis, we therefore add the interaction Price Difference $\times$ Contract. The main variables are centered prior to the computation of their interaction to avoid problems of multicollinearity—a procedure that is used throughout the paper. $^9$ We also add the main effect of Contract to promote a robust test of the interaction term. As shown by regression (2) in Table 2, the coefficient of Price Difference $\times$ Contract is positive and highly significant ($p < 0.01$), whereas the coefficient of Contract is insignificant. This lends support to Hypothesis 3: Contracts enhance buyers’ willingness to sever existing exchanges and initiate new ones, but only when exchange value uncertainty creates a large value gap between current and alternative exchange relationships. Otherwise, contracts have no significant effect on the propensity to switch.

Models (3) to (5) include the trust-related variables to test Hypotheses 5 and 7. General Trust and Knowledge-based Trust are the measures of trust described in the previous section, whereas Price Difference $\times$ General Trust and Price Difference $\times$ Knowledge-based Trust are interaction terms used to assess how trust affects buyers’ propensity to move out of an ongoing exchange in favor of partners with higher exchange value. Model (3) includes variables related to general trust only, where, as before, we include their main effects to provide a robust test involving their interactions. Supporting Hypothesis 5, the significantly positive coefficient of Price Difference $\times$ General Trust ($p < 0.05$) indicates that individuals with higher levels of general trust are more willing to switch to another seller offering a substantially lower price than that of the incumbent. The main effect of General Trust is insignificant, suggesting that general trust affects individuals’ willingness to move into exchanges with higher value, rather than their overall propensity to switch partners. Model (4) includes variables related to knowledge-based trust, which are found to be insignificant. This result refutes Hypothesis 7: A propensity to trust familiar people does not make individuals more reluctant to switch partners. Finally, model (5) includes both general and knowledge-based trust variables. The interaction term Price Difference $\times$ General Trust remains significant in this expanded model.
(p < 0.05), whereas the other trust-related variables remain insignificant.

Together, these results confirm our expectation that an increase in the gains to exchange with alternative partners, caused by an escalation of exchange value uncertainty, discourages frequent transactions among the same individuals. However, because we examine a setting involving social uncertainty, some individuals are likely to refrain from moving out of committed circles unless some form of safeguard is in place. Thus, contract enforcement has a greater effect in reducing commitment when buyers are more frequently exposed to alternative sellers offering prices substantially lower than those offered by the incumbent—a situation that is much more common in our treatment involving high exchange value uncertainty. By contrast, when exchange value uncertainty is low, the benefit of contract enforcement is minimal. This is because committed relationships, which emerge as a response to social uncertainty, are not strongly penalized: There is little value in severing ongoing relationships to transact with new actors. We also find that, similar to contract enforcement, individuals’ propensity to trust general others increases their willingness to switch to high-value partners. Thus, general trust is particularly helpful when exchange value uncertainty is high. However, we fail to lend support for the hypothesis that individuals who tend to trust familiar others will be more reluctant to sever their ongoing relationships in favor of partners with higher value.

**Buyers’ Choice of Contracts**

Hypotheses 4, 6, and 8 focus on factors that might induce buyers to choose contracts when this mechanism is available. Namely, Hypothesis 4 focuses on the effect of exchange value uncertainty, and Hypotheses 6 and 8 present predictions on the effect of general and knowledge-based trust, respectively. To assess the determinants of contract choice, we employ as a dependent variable a dichotomous measure coded 1 if the buyer offered a contract to the seller from whom he or she accepted a price offer, and 0 otherwise. Obviously, this variable is only applicable for treatments where buyers were given the contract option.

We again begin with a baseline model including relationship- and buyer-specific variables only, which serve as controls. Past Defection codes the number of accumulated previous defections by the seller with whom the buyer is transacting in a given period (i.e., instances where the seller delivered low quality). Previous evidence of defection should make buyers more willing to employ contracts in new transactions with the seller. Past Transactions is the number of previous rounds in which the buyer has transacted with the seller, up to the current period. This variable intends to capture the effect of familiarity and norms in recurring exchanges (Gulati 1995). Thus, buyers can drop their contracts as the relationship unfolds. We also add the variable Endgame, which is coded 1 if the period is above or equal to the 15th round, and 0 otherwise. As the experiment approaches its end and the incentives for sellers to preserve their reputation diminish, buyers should be more willing to use contractual safeguards. As in the previous analysis, we include the buyer-specific controls Male, Age, Graduate, Business/Economics Major, and Experience.

Estimates from this baseline model are included in the column (1) of Table 3. We keep using a random-effects probit model with buyer-specific error terms to

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Variables Affecting the Choice of Contracts by Buyers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>High uncertainty</td>
<td>2.037** (1.120)</td>
</tr>
<tr>
<td>General trust</td>
<td>-0.760* (0.340)</td>
</tr>
<tr>
<td>Knowledge-based trust</td>
<td>1.212** (0.418)</td>
</tr>
<tr>
<td>Past defection</td>
<td>0.689† (0.374)</td>
</tr>
<tr>
<td>Past transactions</td>
<td>-0.341** (0.064)</td>
</tr>
<tr>
<td>Endgame</td>
<td>0.168 (0.470)</td>
</tr>
<tr>
<td>Male</td>
<td>0.206 (0.526)</td>
</tr>
<tr>
<td>Age</td>
<td>0.621† (0.193)</td>
</tr>
<tr>
<td>Graduate</td>
<td>-8.682** (2.584)</td>
</tr>
<tr>
<td>Business/Economics major</td>
<td>1.802† (0.704)</td>
</tr>
<tr>
<td>Experience</td>
<td>-1.500** (0.557)</td>
</tr>
<tr>
<td>Constant</td>
<td>-9.231** (3.351)</td>
</tr>
<tr>
<td>N</td>
<td>336</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-70.76</td>
</tr>
<tr>
<td>χ²</td>
<td>43.17**</td>
</tr>
</tbody>
</table>

Notes: Estimates of random-effects probit model centered on each buyer. Standard errors in parentheses. Dependent variable is computed for the treatment where contract enforcement is available, and corresponds to a dichotomous measure coded 1 if the buyer offered contract to the seller from whom he or she accepted a price offer, and 0 otherwise. †p < 0.10; *p < 0.05; **p < 0.01 (one-tailed tests for hypothesized effects).
control for interdependencies across decisions by each buyer. The coefficient of Past Defection indicates that previous instances where the seller delivered low quality make the buyer more willing to employ contracts in transactions with that seller, although the effect is only marginally significant ($p < 0.10$). As expected, an increase in Past Transactions reduces buyers’ use of contracts; they do appear to drop contracts as they accumulate experience with a particular seller ($p < 0.01$). However, the use of contracts is unaffected by Endgame. As for the buyer-specific variables, there is evidence that older subjects and business/economics majors are significantly more likely to use contracts ($p < 0.01$ and $p < 0.05$, respectively), whereas graduate students and subjects with experience in the lab where the study was run are less likely to use contracts ($p < 0.01$). Except for Business/Economics Major, the effects of these other buyer-specific characteristics remain significant in the subsequent model specifications. Male is always insignificant: Male subjects are not more inclined to offer contracts than their female counterparts.

Model (2) in Table 3 adds the variables High Uncertainty—coded 1 if the subject in the treatment with high exchange value uncertainty and 0 otherwise—and General Trust to test Hypotheses 4 and 6, respectively. Confirming Hypothesis 4, buyers adopt contracts to a larger extent when exchange value uncertainty is high than when it is low ($p < 0.01$). Thus, buyers are using contracts selectively. When exchange value uncertainty is low, cooperation can be easily sustained through committed relationships, and hence the costs of contracting can be avoided. In contrast, when exchange value uncertainty is high, buyers must intermittently sever ongoing relationships to reduce prices—a potential gain that can compensate for the costs of employing contracts as safeguarding devices. The significantly negative coefficient of General Trust, in turn, shows that individuals who place higher trust in general others are less inclined to use contracts ($p < 0.01$). This result lends support to Hypothesis 6: General trust reduces the need for contractual safeguards to promote social mobility.

Model (3) substitutes Knowledge-based Trust for the other trust variable. Supporting Hypothesis 8, individuals with higher knowledge-based trust are significantly more likely to use contracts in market exchanges ($p < 0.01$). Whereas individuals with high levels of general trust tend to perceive the benevolence of others (including strangers) in a more positive way, individuals with high knowledge-based trust will tend to put more emphasis on familiar people. Thus, on average, they should be more inclined to use contracts to initiate their exchanges or to move into alternative relationships. When added together in the regression (model (4)), both General Trust and Knowledge-based Trust remain significant and with opposing signs, as before.

These results show that buyers not only use contracts in a discriminating manner (i.e., only when they need to move out of committed relationships in conditions of high exchange value uncertainty); they also differ in their intrinsic propensity to use contracts as a function of the level and nature of their trust. Aligned with our expectations, our data indicate that general trust substitutes for contracts under conditions of exchange value uncertainty, whereas knowledge-based trust shows a complementary effect. Individuals with higher knowledge-based trust place higher value in exchanges with familiar people and, hence, contractual safeguards have a role in boosting their movement into new exchanges. In contrast, subjects with high general trust are more confident in the outcome of infrequent transactions, thereby reducing their need for contracts in forming ties.

**Sellers’ Propensity to Cooperate**

To complete our empirical analysis, we must also show that, in our setting, buyers’ decisions to switch sellers in pursuit of higher exchange value does in fact require a trade-off. In choosing to switch, do buyers elicit lower cooperation from sellers? As Hypothesis 2 predicts, buyers’ commitment choices should affect sellers’ propensity to act cooperatively, i.e., deliver high quality. Namely, a reduction in commitment signals sellers that repetition of the exchange with a particular buyer is less likely, which damages the shadow of the future (Axelrod 1984), and hence makes sellers less willing to preserve their reputation by not defecting. Also, a reduction in commitment inhibits the development of relationship-specific norms because exchanges between the same individuals become less frequent. To test this hypothesis, we must now examine seller choices (high or low quality) as a function of the level of commitment expressed by buyers who accepted the offers of each seller in each period.

We begin with a baseline model including other variables, commonly discussed in the literature (besides buyers’ commitment), which may affect sellers’ propensity to cooperate. Rent is equal to the price received by the seller minus his or her production costs to deliver high quality. We should expect a positive effect of this variable on cooperation for two reasons. First, sellers motivated by reciprocity norms may respond positively to a “generous” price that yields them satisfactory profits even considering that they incur additional costs to deliver high quality (Akerlof 1982, Fehr et al. 1997). Second, sellers may perceive that the buyer who accepted a sufficiently high price will be willing to sacrifice short-term gains to increase the future pay-off stream that sellers will likely receive in a long-term exchange. Because sellers will likely lose these future gains if their defection precipitates severing the
exchange tie, they may instead find it in their self-interest to keep cooperating (Klein and Leffler 1981, Telser 1980). To accommodate nonlinear effects associated with Rent (e.g., Charness et al. 2004, Lazzarini et al. 2004), we also add its squared term in our regressions, which is computed after centering the main variable to avoid multicollinearity.

Contract Offered, in turn, is a dummy variable coded 1 if the buyer chooses to use a contract to transact with the observed seller in each period, and 0 otherwise. Thus, differently from Contract—which is a treatment variable—Contract Offered is both time varying and buyer specific. There are competing hypotheses on the effect of this variable. On the one hand, the contract may limit the short-term gains that sellers may attain by defecting, which favors cooperation (Baker et al. 1994, Klein 1996). Because contractual incentives were weak in our experiment by design, we do not expect to find support for this hypothesis (see, however, Lazzarini et al. 2004). On the other hand, the contract may signal distrust and undermine sellers’ intrinsic motivation to cooperate (e.g., Fehr and Gächter 2000, Malhotra and Murnighan 2002). As discussed before, this may be an implicit cost of contracting, besides the more direct cost related to the use of the legal system (in our case, represented by experimental points that buyers needed to pay to adopt contracts).

Model (1) in Table 4 presents regression results including the above variables as well as the other control variables used in the previous analyses: Endgame—given that sellers should more likely defect when there is a high likelihood that the experiment will end—and the same subject-specific controls previously used for buyers. This model is estimated using a random-effects probit model centering on each seller, where the dependent variable is coded 1 if the seller delivers high quality to the buyer who accepted his or her offer in a given period, and 0 if the seller delivers low quality. Thus, as before, our procedure controls for interdependencies among decisions by each seller across experimental rounds. Only observations where both the buyer and the seller have not exited (i.e., when they have agreed on a certain price) are used in the regressions. Consistent with our expectations, the significant coefficient of Rent indicates that sellers respond positively to increases in the price paid for their products ($p < 0.01$), although its squared term is insignificant. Contract Offered, in turn, is significantly negative: If the buyer offers a contract, one should expect a reduction, rather than an increase, in the likelihood of cooperation ($p < 0.01$). This preliminary result supports the argument that the use of contracts either suggests distrust or reduces sellers’ intrinsic motivation to respond cooperatively (although see our further analysis below). As for the control variables, the coefficient Endgame confirms that sellers are significantly less cooperative close to the end of the experiment, whereas all seller-specific controls are insignificant.

Model (2) includes all the variables described before plus a commitment-related, relationship-specific variable devised to test Hypothesis 2. For a particular seller, we first compute the overall number of transactions that were performed in previous periods by each buyer who

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment</td>
<td>0.842**</td>
<td>0.808**</td>
<td>1.034**</td>
<td>1.041*</td>
</tr>
<tr>
<td>Rent</td>
<td>0.062**</td>
<td>0.058**</td>
<td>0.048**</td>
<td>0.099**</td>
</tr>
<tr>
<td>Rent2</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Contract offered</td>
<td>−0.665**</td>
<td>−0.515**</td>
<td>−0.173</td>
<td>0.848</td>
</tr>
<tr>
<td>Past defection</td>
<td>−0.414**</td>
<td>−0.414**</td>
<td>−0.412</td>
<td>−0.412</td>
</tr>
<tr>
<td>Endgame</td>
<td>−1.226**</td>
<td>−1.275**</td>
<td>−0.353</td>
<td>−2.276**</td>
</tr>
<tr>
<td>Male</td>
<td>−0.411</td>
<td>−0.453</td>
<td>0.005</td>
<td>0.165</td>
</tr>
<tr>
<td>Age</td>
<td>0.075</td>
<td>0.046</td>
<td>0.014</td>
<td>0.044</td>
</tr>
<tr>
<td>Graduate</td>
<td>−1.031</td>
<td>−0.764</td>
<td>−0.412</td>
<td>0.417</td>
</tr>
<tr>
<td>Business/Economics major</td>
<td>−0.337</td>
<td>−0.312</td>
<td>−0.016</td>
<td>0.180</td>
</tr>
<tr>
<td>Experience</td>
<td>0.183</td>
<td>0.120</td>
<td>0.238</td>
<td>0.176</td>
</tr>
<tr>
<td>Constant</td>
<td>−0.713</td>
<td>−0.183</td>
<td>0.495</td>
<td>0.882</td>
</tr>
<tr>
<td>$N$</td>
<td>709</td>
<td>661</td>
<td>661</td>
<td>524</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>−249.46</td>
<td>−229.51</td>
<td>−190.33</td>
<td>−131.56</td>
</tr>
<tr>
<td>$\chi^2$ (Wald)</td>
<td>108.71**</td>
<td>102.86**</td>
<td>169.61**</td>
<td>143.96**</td>
</tr>
</tbody>
</table>

Notes. Models (1) to (3): estimates of random-effects probit model centered on each seller. Model (4): estimates of fixed-effects (“conditional”) logit model centered on each seller. Standard errors in parentheses. Dependent variable is a dichotomous measure coded 1 if the seller delivers high quality to the buyer who accepted his or her offer in a given period, and 0 otherwise. Events where either the buyer or the seller have exited (i.e., have not agreed on a certain price) are excluded from the sample. $p < 0.10$; $p < 0.05$; $p < 0.01$ (one-tailed tests for hypothesized effects).
accepted the seller’s offer in a given period. The variable **Commitment** is then calculated as the proportion of that buyer’s transactions that were made with that particular seller up to the current period. It ranges from 0 (the buyer has never transacted with that particular seller) to 1 (the buyer has only transacted with that seller), whereas intermediate values indicate that the buyer and the seller exchanged intermittently. Consistent with Hypothesis 2, **Commitment** is positively related to the likelihood that the seller will deliver high quality \( (p < 0.01) \). This result confirms that buyers’ reputation of building and preserving a long-term relationship with a particular seller is a critical determinant of cooperation. With the inclusion of **Commitment**, inference about the other variables remains qualitatively similar, except for the fact that the squared term of **Rent** becomes significant and reveals a nonlinear relationship between prices and likelihood of cooperation.10

The negative coefficient of **Contract Offered** is intriguing because it suggests an implicit cost of using contracts. Or, as discussed before, it may simply be a spurious result given that we manipulate only the availability instead of the actual choice of contracts by buyers. For instance, buyers may employ contracts only for sellers who for some reason they perceive to be less cooperative. Failing to control for this effect may induce a biased relationship between contracts and cooperation. As discussed before in the analysis of contract choice, buyers do use contracts more frequently when dealing with sellers who have defected in the past. We thus perform two additional regressions. First, departing from the same model described above, we add the variable **Past Defection**, which is the number of instances where the seller defected in previous transactions with the current buyer. As shown in Model (3), this variable is highly significant \( (p < 0.01) \) and, aligned with our expectations, completely eliminates the significance of **Contract Offered**. Model (4) performs an additional robustness check by using a fixed-effect approach to control for general, omitted seller-specific characteristics that may affect their propensity to cooperate and bias the relationship between contracts and cooperation. Because there is no satisfactory fixed-effects estimation approach for the probit model, we employ the fixed-effects (“conditional”) logit model suggested by Chamberlain (1980). The sample size in the fixed-effects model is reduced due to certain sellers exhibiting lack of variability in their responses, which are then completely eliminated with the fixed-effects specification. **Contract Offered** is, again, found to be insignificant. In this new model, inference about the other variables does not change qualitatively, except for the fact that the squared term of **Rent** becomes, again, insignificant.

Therefore, although a reduction in commitment allows buyers to constantly initiate valuable exchanges, the reduction does undermine cooperation in relationships with new sellers or with previous ones whose supply relations have been severed in the past. Is a reduction in commitment, then, beneficial or detrimental? Developing a highly committed relationship augments the likelihood that the seller will cooperate, but increases the average price paid because buyers will refrain from interacting with more valuable partners. The last effect should be particularly pronounced when exchange value uncertainty is high, because, intermittently, there will be a large gap between the price buyers are attaining in their ongoing exchanges and the price that they could possibly attain by switching to alternative partners. Thus, some reduction in commitment may be necessary to increase exchange value, as long as this gain surpasses possible losses due to lower cooperation by sellers. As observed in the analysis of partner-switching decisions, buyers do reduce their commitment to ongoing relationships in response to exchange value uncertainty. Formal contracts ease movement out of committed relationships precisely because they reduce the potential losses that buyers expect to suffer as a consequence of lower seller cooperation.

**Analysis of Exchange Performance**

We now proceed with an exploratory, post hoc analysis of exchange performance as a function of the conditions implemented in our study. To be sure, analyses of performance depend on the particular parameters chosen in the experiment. It is not our goal, however, to test any particular claim; rather, we would like to observe the outcome of our experimental exchanges in light of the previously discussed results.

With this caveat in mind, we adopt a simple approach to measuring exchange performance by summing up, in each period, the experimental points earned by all buyers and sellers on the market. The advantage of this approach is that it treats prices as simple monetary transfers (which are canceled out with the sum of buyers’ and sellers’ points) and focuses on how the market as a whole matches buyers and sellers who are able to provide the lowest possible costs to each buyer.11 Consider, for instance, the matrix exemplified in the third section. Given the structure of costs, it would be desirable that buyers 1, 2, 3, 4, 5, and 6 transact with sellers 5, 1, 4, 6, 4, and 7, respectively, in that particular period. Those sellers have the lowest possible production cost to each buyer on the market.

Figure 2 shows how our measure of exchange performance varies across treatments. Each observation is the total number of points attained by buyers and seller per period. Contract enforcement apparently increases exchange performance to a greater degree when exchange value uncertainty is high; when exchange value uncertainty is low, contract enforcement actually appears to decrease performance. An ANOVA test reveals that there is a significant main effect of exchange
value uncertainty and a significant interaction between exchange value uncertainty and contract enforcement ($p < 0.01$); the main effect of the latter is insignificant.

The positive main effect of exchange value uncertainty is due to the fact that buyers self-select sellers, even though the average cost in the treatments with low and high exchange value uncertainty is the same. Thus, if buyers randomly select sellers or stick with sellers with whom they transacted at the outset, then the cost draws for those sellers who effectively transact with buyers should gravitate around the mean value of 50 experimental points. However, given that buyers endogenously choose their sellers, they are likely to pick sellers with relatively lower prices—and, hence, lower costs. Considering that the minimum possible cost is substantially lower in the treatment involving high exchange value uncertainty, it follows that buyers’ self-selection of sellers can drive average costs down, which contributes to an increase in exchange performance.

The interaction between exchange value uncertainty and contract enforcement, in turn, supports the idea that contract enforcement makes buyers more willing to venture into exchanges with new partners. Contracts in settings of high exchange value uncertainty ease movement into exchanges with valuable sellers, who are not necessarily sellers with whom buyers have transacted in the past. By contrast, in the treatment involving low exchange value uncertainty, the benefits of reducing commitment are minimal and do not outweigh the costs associated with contract enforcement. Thus, the results suggest that contracts are only conditionally useful in supporting optimal exchange. Contracts are particularly important in settings where there is substantial uncertainty around optimal exchange partners. Because new exchanges imply lower commitment and hence lower cooperation, contracts will be important mechanisms in these settings to mitigate the exchange hazards faced in initiating new exchanges. By contrast, when there is minimal value in shifting exchange partners, committed relationships should satisfactorily support cooperation and economize on the costs of formal contracting. We stress, however, that this result depends on the parameters of our experiment—in particular, the nature of contract enforcement and its associated costs. For instance, if contracts are excessively costly or if the likelihood of effective enforcement is very low, then contracts will not be useful in any condition.

**Conclusions**

Several authors have stressed the virtues of long-term, committed exchanges in several contexts—buyer-supplier relations (Dyer and Singh 1998, Helper 1991), strategic alliance networks (Gulati 1995), local communities (Ellickson 1991), and so forth. When social uncertainty is high (that is, when exchanges are subject to the hazards of opportunism), committed relationships provide both expectations of future and a history of past exchanges necessary for cooperation. However, despite the fact that cooperation is prevalent in those contexts, the expansion of markets and the specialization of activities are likely to bring valuable exchange opportunities outside committed, socially embedded circles. Thus, North (1990) posits that economic growth has been invariably associated with an enlargement of markets, which implies that specific individuals may transact less frequently. Whenever markets expand and individuals specialize, innovations and new trade opportunities tend to constantly emerge outside committed circles, which makes the value of existing long-term ties relative to alternative ties uncertain (a situation that we refer to as exchange value uncertainty). However, to pursue those valuable opportunities, individuals must overcome the hazards of opportunism that tend to escalate when social mobility increases, given that individuals will prefer to exchange in a more nonrecurring manner. Without proper mechanisms to facilitate transactions with new partners, exchange networks may become dysfunctionally “overembedded.” We explore in this paper alternative mechanisms that can support social mobility: contractual safeguards and trust, as well as their interplay.

We hypothesize and find experimental evidence confirming that contractual safeguards increase individuals’ willingness to switch to new partners with higher value. Thus, our results do not support the idea that committed relationships can effectively substitute for legal enforcement in the support of exchanges (Ellickson 1991, Granovetter 1985, Kollock 1994, Macaulay 1963, Taylor 1987). Contracts allow individuals to move more confidently out of committed relationships and initiate new, more valuable exchanges that emerge when exchange value uncertainty is high. Consistent with this idea, there is widespread historical evidence that formal enforcement mechanisms have been instrumental in supporting cooperation when economic expansion reduces the
extent to which individuals transact repeatedly (Greif 1997). Thus, Zucker (1986) discusses how the industrial development in the United States was associated with an increase in social mobility, leading to the emergence of formal safeguarding institutions such as legislation and regulatory bureaus. De Soto (2002) also highlights the importance of formal mechanisms to break dysfunctional exchanges restricted to closed social groups in emerging economies. More recently, the expansion of markets resulting from new information technologies such as the Internet have raised questions about how to safely support infrequent exchanges among strangers. New certification mechanisms, warranties, and secure payment procedures have emerged in several e-commerce sites.

We also examine the role of trust as a personal trait that influences commitment choices (Yamagishi et al. 1998, Yamagishi and Yamagishi 1994) and the perceived benefits of contract enforcement. We find that subjects with higher general trust—that is, trust in general others, including strangers—are more willing to switch partners in pursuit of lower prices. Subjects with high general trust are also less inclined to adopt formal contracting, possibly because they place higher confidence in the benevolence of others and, hence, are less sensitive to the insurance-based benefits of contracts. Although we find that knowledge-based trust—trust in familiar people—has no significant effect on the decision to sever ongoing exchanges, we do find that subjects with higher knowledge-based trust are more inclined to adopt contracts. Because individuals with higher knowledge-based trust place higher value in exchanges with familiar partners, they are apparently more sensitive to the existence of formal safeguards to develop new exchanges or discontinue ongoing ties.

Our results confirm not only that trust is an important determinant of social structure, but also that there is value in pursuing more precise definitions of that construct by characterizing the type of people on which trust is based. Thus, to be an effective substitute for legal enforcement—which is an impersonal mechanism of governance—trust should also be, perhaps paradoxically, impersonal. Confidence that is simply based on past relationships may be detrimental because they lock people into closed circles and lock them out of valuable external opportunities. This differentiation can be very helpful in studies attempting to examine the effect of culture or other institutional factors on the performance of exchanges or even economies (Glaeser et al. 2000, Huff and Kelley 2003).

Admittedly, our study is limited in several ways. Although our experimental setting was designed to maximize the tension between commitment and mobility to provide a powerful test of our hypotheses, it certainly lacks some features observed in real exchanges. For instance, the values that two parties attain in an exchange may not change substantially from time to time as in our experiment; values may remain somehow correlated for some time. In other words, exchange value uncertainty may induce punctuated changes in markets, which may in turn promote movement out of committed relationships in a more intermittent manner than in our setting (e.g., Lazzarini and Zenger 2002). In addition, our experiment lacks some reputational effects that may appear in some market settings. For instance, we do not reveal information about the past behavior of sellers in transactions with other buyers. This design choice is appropriate to the objectives of our study because we wanted to create a setting where social uncertainty was high (e.g., Kollock 1994). Future studies could introduce an additional treatment where information about past behavior is disseminated to the market as a whole—which would be analogous to formal third parties collecting and providing traders with historical information about market participants (Greif et al. 1994, Milgrom et al. 1990).

Another general limitation related to the issue of how trust is treated in the experiment. As explained earlier, trust is not a manipulated variable in our experimental setting. Although we do find some significant results involving trust, our study may lack sufficient heterogeneity to assess the effect of this variable on commitment decisions and use of contracts. Different results may be obtained in cross-national studies with higher variance in trust and where individuals with different levels of trust are grouped into particular treatment cells (e.g., Yamagishi et al. 1998). Finally, trust here is treated—both conceptually and empirically—as an exogenous factor. The reason is that we are considering trust as a personal, subject-specific trait that may influence social mobility. However, perceptions of trust may change as a result of both experiences in social interactions and the legal structure of a society (Zak and Knack 2001). Understanding the dynamic relationships between contracts, trust, and social structure is certainly a fertile area for future research.

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Endnotes
1To our knowledge, the analysis of the interplay between formal contracts and trust in the context of easing social mobility when opportunism is present has not been explored in detail. Previous work has studied the role of these alternative mechanisms either in isolation (e.g., Johnson et al. 2002, Yamagishi et al. 1998) or examined their effects on cooperation rather
than mobility in exchange (e.g., Blumberg 2001, Lazzarini et al. 2004, Malhotra and Murnighan 2002).

Previous studies have examined the effect of social uncertainty on commitment decisions. Thus, in a buyer-seller experimental setting, Kollock (1994) finds that subjects develop long-term, committed relations especially when sellers can act opportunistically by delivering low-quality products after purchase. By contrast, when product quality is not a matter of concern, commitment is lower. Yamagishi et al. (1998) obtain similar findings in a different experimental setting. In a field study of investment banking, Podolny (1994) finds that in conditions of social uncertainty (which he terms “market” uncertainty) firms tend to choose actors with whom they have transacted in the past. Such commitment enhances cooperation in the exchange.

To make our discussion more interesting and realistic, we focus on incomplete contracts—i.e., contracts that are only able to enforce certain easy-to-meter exchange dimensions or that have some probability that the deal will not be enforced due to cognitive inability to anticipate future contingencies or limitations by the courts (Tirole 1999). In a related study, Brown et al. (2002) empirically examine the effect of complete contracts on cooperation and find that those contracts tend to yield fewer recurring exchanges. An interesting aspect to be analyzed in future experimental work is how subjects may endogenously change the completeness of the contract; for instance, they can engage in a more thorough description of the tasks to be performed (e.g., Argyres et al. 2007).

Note that our definition of trust does not follow a “calculative” logic (Hardin 2001, Williamson 1993)—trust here is independent of exchange controls or incentives that may induce even self-interested individuals to cooperate. Also, trust here is conceptualized as a personal trait rather than an evolving relationship-specific attitude. That is, trust is based on exogenous, individual propensities to judge people in a certain way. In contrast, Malhotra and Murnighan (2002) analyze how trust toward particular partners endogenously evolves as a result of past behavior in experimental exchanges.

Experimental instructions and the quiz are available upon request.

The database with these measures and the overall decisions in the experiment is available from the authors upon request.

There is evidence that previous training in economics (which is also the case for business students) affects subjects’ behavior in social dilemmas (Frank 1988).

This control is warranted because subjects may learn from experience how to deal with experimental markets.

In assessing interactions, a common advice is to subtract the mean from each of the interacting variables. Correlations between the interactions and the main variables are reduced because covariance decreases. For a discussion, see Aiken and West (1991, pp. 32–33).

It may be the case that, when exchange value uncertainty is high, sellers understand that it is “normative” to switch partners. Or, put another way, they may be more sensitive to a reduction in commitment when uncertainty is low, inferring that the buyer has switched for “just a penny.” This discussion suggests a negative interaction between commitment and the treatment involving low exchange value uncertainty. However, when included in the model, the interaction is insignificant (results not reported here).

In economics jargon, this criterion measures efficiency in the exchange system using a utilitarian approach. One possible criticism of this criterion is that subjects may derive benefits other than the monetary compensation based on experimental points. For instance, subjects may feel that committed exchanges are more “comfortable” despite the existence of more profitable options elsewhere. To assess this effect, we asked subjects to indicate their agreement to the following item using a seven-point Likert scale: “I am satisfied with my outcomes in the experiment.” This item was included in the postexperimental questionnaire and answered before subjects were informed about their monetary compensation. Responses to this item are positively correlated with the number of experimental points attained in the experiment: Correlation coefficients are 0.50 for buyers and 0.62 for sellers ($p < 0.01$).

References


