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Relationship Duration and Returns to Brokerage in the Staffing Sector

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We examine how long-term relationships affect brokers' returns, using project-level pricing data from an information technology staffing firm. We argue that long-term relationships between brokers and their counterparties affect both acquisition of private information and bargaining power, helping brokers to create and capture economic value. The results show that the staffing firm is able to charge a higher price and capture a higher proportion of that price when it has a long-term relationship with the worker. We also show that the staffing firm's ability to generate returns from its relationships is constrained when the brokered parties (worker and client firm) have a long-term relationship with each other. We discuss the implications of these findings for the study of market brokerage and long-term exchange relationships.

Key words: brokerage; triads; long-term relationships; temporary employment
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Specialized market brokers play a central role in structuring the exchange of a wide variety of goods and services (Abolafia 1996, Bielby and Bielby 1999, Sasson 2008). Dating agencies, headhunters, realtors, and even banks all help match actors across the two sides of a market, providing a valuable service for market participants. These acts are not entirely altruistic of course; market brokers generate returns for themselves by capturing some of the value that they create for others (Marsden 1982). Many studies have examined the activities of such brokers, both within the specific market context of matching buyers and sellers (e.g., Finlay and Coverdill 2002, Khurana 2002), and in broader contexts in which brokers connect different social worlds (e.g., Burt 2005, Gould and Fernandez 1989). Network studies have shown that actors occupying positions conducive to brokerage tend to experience higher performance (Podolny and Baron 1997, Stuart and Podolny 1999, Burt 2004). Yet there is still much that we do not know about how brokers generate returns from their activities. For example, there is little research on the determinants of returns for brokers that connect buyers and sellers in market contexts, and studies of when exchange is most profitable to brokers are scarce. Developing a better understanding of how brokers generate returns would shed light on how they create and capture value through their activities and, by extension, the role that they play in making markets.

This paper begins the process of exploring the returns from market brokerage by examining the effects of long-term relationships among brokers, sellers, and buyers. Although there are multiple ways in which brokers can create value (see Burt 2000 for a review), we focus on understanding the returns of market brokers that create value by matching buyers and sellers. We argue that long-term relationships are an important determinant of these brokers' returns. A central function for brokers in many markets is the alleviation of information asymmetries (Marsden 1982); buyers and sellers often have little or no information about each other, and struggle to find a suitable match for themselves. Developing long-term relationships with their counterparties enables brokers to access private information about buyers and sellers, and use that information to create more valuable buyer–seller matches. We also claim that long-term relationships may help brokers retain more of the value they create through these better matches. Investing in a long-term relationship can alter actors' bargaining power, by changing the availability of alternative exchange partners; often, these changes in bargaining power will benefit the broker.

Such effects of long-term relationships have important implications for how we understand market brokerage. Theoretical studies suggest that brokers' returns may easily be competed away, because brokers often add little value beyond connecting counterparties, and are vulnerable to displacement by competing brokers (Ryall and Sorenson 2007; see also Burt 2005, p. 230). Where long-term relationships provide access to private information, however, returns are less likely to be eroded; established brokers can use their relationships to form more valuable matches than competitors. In such circumstances, brokers may be able to sustain and even increase their

returns over time as they build long-term relationships. Thus, relationship duration can be an important source of advantage for brokers in markets with information asymmetry, allowing them to generate returns that are sustained, rather than fleeting.

As well as examining relationships between brokers and their counterparties, we explore how long-term relationships between buyers and sellers affect the brokers' returns. A particular feature of brokered markets is that transactions are inherently triadic: broker, buyer, and seller are all involved together. Previous work has noted brokers' vulnerability to disintermediation, when the brokered parties learn to transact without the broker (see Burt 2000). Even where the institutional context prevents brokers from being completely disintermediated, however, we argue that enduring buyer–seller relationships can reduce the broker's ability to increase prices to the buyer and extract value from the seller. Such buyer–seller relationships, therefore, can represent an important constraint on the broker's ability to generate returns from long-term relationships, but through a very different mechanism from that of traditional disintermediation.

Despite the potential importance of long-term relationships for understanding market brokers, there has been little theoretical or empirical examination of how relationship duration affects brokers' returns (see Burt 2007, p. 143). To the extent that researchers have brought a longitudinal perspective to the study of brokerage, their focus generally is on showing that bridging ties decay more quickly than nonbridges (Burt 2002), and that the effects of such ties on brokers' advantages may therefore be temporary (see also Soda et al. 2004). Other authors use historical case studies to explore how the network around particular brokers evolves (e.g., Padgett and Ansell 1993), but do not explore how the duration of ties affects brokers' performance. Indeed, research on brokerage generally pays little attention to how the nature of the particular relationships that a broker maintains with its counterparties affects the broker's returns. Instead, network-based studies of brokerage tend simply to compare the performance of actors who occupy brokerage positions with that of actors who do not, perhaps because they generally lack the transaction-level detail necessary to understand the effects of specific relationships. An exception is Fernandez-Mateo (2007), who shows that the importance of a relationship with one counterparty affects the price at which the broker exchanges with the second counterparty, but does not theorize about relationship duration or its consequences for the broker's ability to obtain economic benefits. The focus of our paper is precisely on relationship duration as a determinant of brokers' returns.

We test our arguments using longitudinal pricing data from the records of a staffing firm in the information technology (IT) industry. Staffing firms that match workers to client companies for short-term assignments are an important example of brokerage. In the United States, the staffing sector has grown faster than the overall economy over the last 30 years (Cappelli 1999, 2008), and its growth has reshaped many of the fundamental characteristics of employment (e.g., Barley and Kunda 2004). Where once employment relationships involved only dyadic ties between workers and firms, third-party brokers now are increasingly common (Kunda et al. 2002).

We show how long-term relationships affect the ability of these staffing firms to create and capture economic value. The unique nature of our transaction-level data set allows us to provide the first (to our knowledge) detailed longitudinal analysis of a broker's returns. We contribute also to the broader literature on exchange within long-term relationships (e.g., Uzzi and Lancaster 2004) by providing longitudinal evidence on how the terms of trade evolve as relationships develop, and by showing that the returns to long-term relationships need not be shared equally.

Brokerage in the Staffing Sector

The staffing sector is a typical example of a brokered market. It is also one of the most rapidly growing industries in the United States, generating approximately $70 billion in sales in 2008 (American Staffing Association 2009). Staffing firms routinely place workers in client companies for short-term projects. These workers are legally employed by the staffing firm, but take direction from the client and usually perform their work at the client's site. Although some staffing firms occasionally provide training in general skills (Autor 2001), workers acquire few skills that are specific to the staffing firm; instead, the staffing firm's role is restricted to matching clients to workers.

The growth of the staffing industry reflects a broader trend toward more flexible, arm's-length employment relationships (Pfeffer and Baron 1988, Osterman 1999). As companies seek to adjust employment levels to fast changing market demands, they make greater use of short-term workers who can be rapidly hired and fired. Using temporary workers increases firms' flexibility, although it brings other problems. Not only must companies search more frequently for workers in the open market, they are also less certain of these workers' abilities (Autor 2003). Firms traditionally have relied on their internal labor markets to learn about employees over time and figure out where to place them (e.g., Baron and Kreps 1999, p. 172); yet this learning becomes much more difficult if firms are constantly introducing external temporary workers. Resumes and interviews give some information about workers, but generally offer little guidance to how well a worker will perform, because they provide limited information on technical skills levels, and almost none on "soft skills," such as motivation and reliability, which, for employers, are among the most

important attributes (Cappelli 1995). Using brokers to screen workers' quality considerably reduces these problems (see Bull et al. 1987, Yavas 1994).

We examine a particular segment of the staffing sector—high-skill IT contract workers (see also Barley and Kunda 2004, O'Mahony and Bechky 2006, Bidwell and Briscoe 2009). This market is highly competitive; there is frequently intense rivalry among several similar staffing firms to attract clients and contractors within any given local market. IT contractors can also completely bypass staffing firms, carrying out projects directly for clients (Barley and Kunda 2004). Yet long-term relationships are also a feature common to this market. Staffing firms often conduct repeat business with both workers and client firms, allowing the building of long-term relationships on both sides of the market (see Baron 2000). These relationships are supported by common legal practices within the market; if a client wants to continue hiring the same worker, it must usually use the same staffing firm that initially placed the worker. Contracts with client firms and workers often forbid clients from directly employing workers initially supplied by a staffing firm for a certain period of time (unless the client is willing to pay a substantial fee to the staffing firm to hire the worker as a permanent employee).

In this context, brokers generate returns from the difference between the bill rate paid by the client firm and the wage received by the worker. These prices and wages are set in separate negotiations, which usually take place only at the beginning of a project (see Barley and Kunda 2004). The staffing firm charges the client firm an hourly "transaction price" for the worker's services. The staffing firm then negotiates with the worker the hourly pay rate that it will pass on to her. The difference between the transaction price paid by the client and the pay rate received by the worker, often known as "the margin," is retained by the staffing firm as payment for its services. Unlike real estate and some financial markets, there are no institutionalized norms about the size of these margins. Nor do most staffing firms discuss their size with workers.

We examine the role of long-term relationships in shaping brokers' returns by studying a single staffing firm ("the Agency"). The Agency is a large global staffing firm that specializes in temporary placements for highly skilled "creative IT" professionals, such as graphic and Web designers. One reason for choosing to study this firm was the amount of in-depth information it was prepared to share with us. Also, we were able to confirm that its practices were very similar to those of other staffing firms in this sector (as also described by Barley and Kunda 2004). Focusing on a single firm places obvious constraints on the generalizability of our findings. However, fully exploring the effects of relationships on brokers' activities requires transaction-level information on relationships and prices. The need for detailed within-firm data to examine our theoretical mechanisms demands a research strategy that emphasizes depth over breadth.

As part of the study, we conducted 49 interviews with 43 individuals (37 contractors, 4 placement agents from the Agency, and 2 industry experts). We used these interviews to build up a detailed understanding of the institutional context and to learn about the process used by the Agency to match workers to projects in client firms. We use examples from this fieldwork to illustrate some of the theoretical mechanisms that we propose.

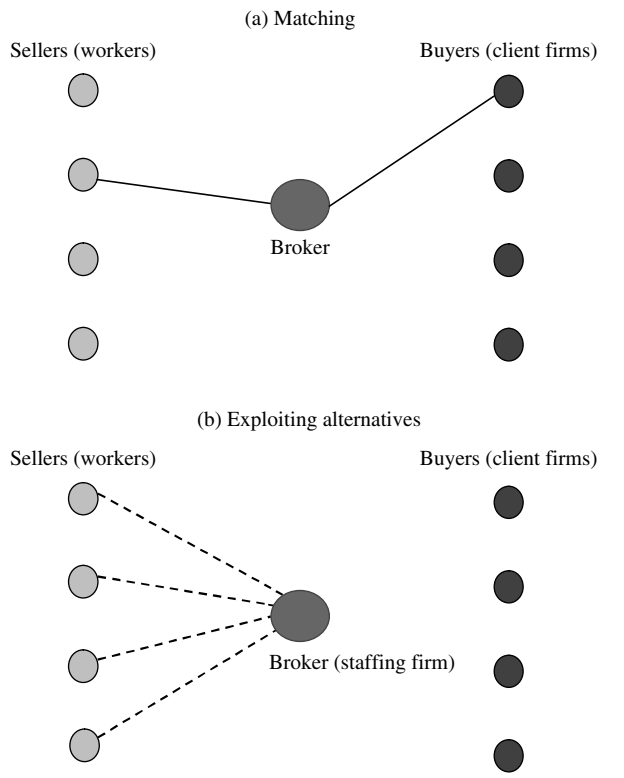
Long-Term Relationships and the Returns from Brokerage

Brokers' returns are determined by their ability to both create value for their counterparties and extract part of that value for themselves (Marsden 1982, Reagans and Zuckerman 2008). Figure 1 offers a schematic representation of the relationships among actors in the context of market brokerage.[1] First (Figure 1(a)), the broker creates value by *matching* buyers and sellers across the two sides of the market (see Marsden 1982, Gould and Fernandez 1989, Simmel 1950). In the staffing sector, the broker brings together workers looking for projects with firms looking for workers, and in the process it generates value for both parties. Second, the broker's position between multiple similar *alters* on one side of the market allows it to *exploit alternatives*, gaining bargaining power over buyers or over sellers (see Ryall and Sorenson 2007, Simmel 1950). Power-dependence theory notes that power is inversely related to the number of available alternatives (Emerson 1962). This paper explores in particular how access to several alternative workers that could be matched with a given client can allow the broker to capture more of the value created through exchange (see Figure 1(b)).

We study how the broker's returns change as its relationships with counterparties evolve, based on how those relationships affect these twin processes of matching and exploiting alternatives. In many mediated markets, it is common for brokers' returns to be set at a proportion of the overall size of the transaction. For example, realtors demand a proportion of a property's sale price, and investment bankers seek a percentage of a given offering. We similarly analyze brokers' returns by studying the factors that raise the transaction price and the factors that raise the proportion of the price that the broker retains (i.e., the margin).

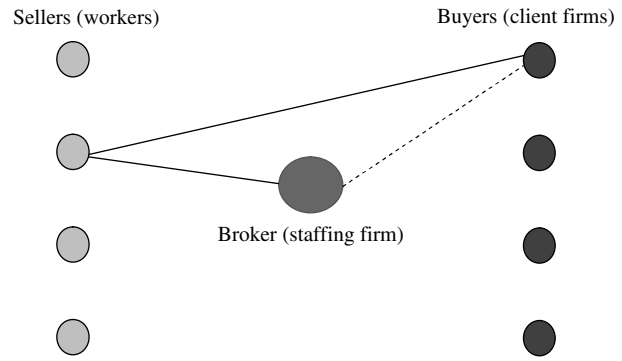
Figure 2 represents the two types of relationships that we study in this paper. We analyze first how the transaction price and the margin retained by the broker change as the seller–broker relationship (worker–staffing firm relationship) evolves. We then explore the effects of long-term buyer–seller relationships (client firm–worker relationships) on these same outcomes. Our theory proposes general mechanisms of value creation and capture

Figure 1 The Two Aspects of Market Brokerage



Notes. (a) The position between the two sides of the market allows the broker to create value by matching otherwise disconnected sellers (workers) and buyers (client firms). (b) The position between multiple sellers (workers) on the same side of the market allows the broker to acquire bargaining power in pursuit of higher returns for a given project.

Figure 2 Two Types of Relationships



Notes. In this paper, we study how long-term seller–broker relationships (worker–staffing firm) and buyer–seller relationships (client–worker) affect the broker's returns by affecting the two processes represented in Figure 1 (matching and exploiting alternatives). We focus our theory on the seller side of the market, but control for the buyer–broker relationship (client–staffing firm) in the empirical analysis.

that should apply to both sides of the market. However, largely for pragmatic reasons, the core of our theoretical and empirical analysis focuses on the seller–broker perspective. From a theoretical point of view, focusing only on one side of the market while holding constant the other side allows us to simplify the exposition of our hypotheses. From an empirical point of view, we are able to test more detailed hypotheses about the effects of seller–broker relationships than those of buyer–broker relationships. We are interested in how the broker's ability to create and capture value from its counterparties is affected by long-term relationships. Holding constant the relative power of the broker and buyer, the transaction price is shaped by the value that the broker creates when matching the seller with a given buyer. In turn, the difference between the transaction price paid by the buyer and the price received by the seller represents how much value the broker captures from the seller. It is much more difficult to disentangle the effects of buyer–broker relationships on the broker's value creation and value capture, because both processes are reflected in a single outcome: the transaction price that the buyer pays. This paper, therefore, does not directly analyze the factors that might affect value creation and capture between broker and buyer. Instead, by introducing buyer–broker relationships as controls in the empirical models, we deliberately keep the buyer's power constant. Toward the end of the paper we provide evidence suggesting that our theory extends to the buyer–broker relationship.

Relationships Between Brokers and Sellers

Market brokers create economic value by bridging information asymmetries between previously disconnected parties (Marsden 1982, Burt 2002). We propose that a broker's ability to perform this function will increase with the duration of its relationship with a seller. Many markets (especially mediated markets) are characterized by high uncertainty about actors' quality. In such contexts, brokers can create better matches between sellers' attributes and buyers' needs when they have access to private information about those parties—information that is not there "for the asking" (Uzzi 1999). As brokers develop long-term relationships with sellers, they should be able to gain better access to this kind of fine-grained knowledge. Uzzi and Lancaster (2003) argue that longer-term "embedded" ties allow actors to learn about each other in ways that would not be possible through arm's-length ties. Other studies show that long-term, frequent interactions improve information transfer (Hansen 1999, Larson 1992).[2] Establishing long-term relationships with sellers, therefore, should allow brokers to create more valuable matches between those sellers' attributes and the needs of specific buyers.

Brokers' access to private information about workers' skills and abilities is especially important in the staffing sector (Autor 2001). In deciding whether to hire a particular temporary worker, a client firm will want to know about the worker's strengths and weaknesses. How productive, creative or accurate are they? Do they work well in teams? Do they fit the organizational culture? These

details cannot be assessed by reading a resume, or even through a brief interview. By repeatedly staffing a given worker, however, placement agents are able to observe performance in various projects. The increased information gleaned over time from repeated transactions allows the staffing firm to better match workers and clients, finding the best fit for a worker's idiosyncratic skills, or placing those workers that it learns to be most able with clients that most value the best quality workers (see also Autor 2001). Such accumulation of private information is similar to the employer learning that occurs in regular employment relationships; where employers use this information to match regular employees to jobs within the organization, though, brokers use it to implement the best matches for workers across multiple different client companies. For example, placement agents in the staffing firm we studied told us:

> [When people have been affiliated to the agency for a longer period of time] it allows us to figure out more about the fit between the job and the person. If a company says, "we need a Web designer," we come up with a list of Web designers, but the better we know the client and the [contractor]—what about their personality? Can they keep up with the pace in this client's environment? Will they fit with the team? Will they fit with this client's clients? The better we know the [contractor] the better the match.
>
> Once I work with a freelancer and know their history, and they know me, I can place them almost blindly, without any problem. I know where they fit.

Longer relationships with sellers therefore allow brokers to form more valuable matches than initially are possible. We propose that the broker is able to translate this improved matching into higher prices charged to the buyers. Where the broker can credibly claim that a seller is of high quality and/or a better match for the buyer's needs, the buyer should be willing to pay more for this service. One of the placement agents explained to us:

> [Workers who have a long-term relationship with the agency] are easier to sell. Because they have a history with us, we can prove to the client what they have done in the past. We have this "problem, action, result." It's almost like a performance evaluation. After each assignment we identify what the problem or requirement of the client was, what actions the contractor took to solve it, and what the results were. . . . For people who stay longer, we have a longer history of these, and we are able to sell them better to the clients . . . to place people better. We can show to a long-term client that this person worked at [Company X], and they had a similar problem as you have, and the contractor did this, and it generated these results. . . . We can charge more for these people (and pay them more too), if we can adequately explain to clients why this person is worth more, because they have more experience with us. We can show them exactly how they will be more valuable.

The broker's ability to raise prices based on long-term relationships with sellers partly reflects the impact of these long-term relationships on competition. When all brokers have short-term relationships with sellers, brokers are effectively interchangeable for the buyer. No broker can charge the buyer more for the services of a given kind of seller than could any other broker. Once a broker is in possession of private information about a seller, though, it is able to differentiate itself. The broker with private information can credibly vouch for the seller in a way that brokers with short-term relationships cannot. Because this private information allows the broker to offer a superior product to the client, it also allows the broker to charge more. The ability of brokers to use long-term relationships to implement more valuable matches and to charge more for them implies that:

Hypothesis 1A (H1A). *The transaction price will increase as the broker develops a longer relationship with the seller* (*i.e., the worker*).

Long-term broker–seller relationships also affect the broker's ability to capture the value that it creates by matching buyers and sellers. Power-dependence theory argues that actors' negotiating power increases the more closely that alternative partners can substitute for their counterparty (Emerson 1962, Cook and Emerson 1978). Long-term relationships between brokers and their counterparties reduce the availability of such comparable alternatives. In an open spot market, actors have large numbers of comparable exchange partners. Yet those short-term relationships do not allow the creation of as much value as long-term relationships, because the actors only have access to public information about each other. Once actors enter long-term relationships with a partner, they can create more value. At the same time, they also become more dependent on each other. To continue to create this extra value, they must continue to transact with one another. Such dependence increases when the time and effort needed to build these relationships means that creating an embedded tie "constrains an actor's ability to invest in other ties" (Uzzi and Lancaster 2003, p. 385).

Although mutual dependence increases for both parties as they enter into long-term relationships, it rarely does so symmetrically. Whether increases in dependence favor one actor or the other hinges on which party sees its alternatives diminish more as it invests in the relationship. In most mediated markets (and certainly in the staffing sector), the balance is likely to tilt toward the broker, who should find it easier than the seller to maintain multiple long-term relationships. After all, if sellers could maintain as many relationships as brokers, it is unclear why they would need a broker at all.

When a worker first joins a staffing firm, for example, many other similar staffing firms in the market offer comparable opportunities. The worker has multiple

alternative exchange partners. Once the worker establishes a long-term relationship with one of these staffing firms, however, that firm becomes less redundant for the worker over time. The worker's skills become better known to the staffing firm it is contracted to, but remain partially unobservable to other staffing firms. Because alternative brokers know less about this worker, they cannot find such high-value placements for her as can the focal staffing firm.

Of course, the same learning process also makes the staffing firm more dependent on the worker. But this increased dependence is not symmetric. Whereas the staffing firm can maintain long-term relationships with multiple different workers, the worker can only maintain long-term relationships with one or very few staffing firms. This difference reflects the nature of their roles: the staffing firm can staff multiple workers simultaneously; workers can only be on assignment with one staffing firm at a time. As a consequence, entering a long-term relationship impacts the worker's set of comparable alternatives much more than the broker's (as we illustrate below). We expect, therefore, that entering long-term relationships will make the worker more dependent on the services of the staffing firm than vice versa. The increased dependence of the worker gives the staffing firm a degree of monopsony power (see Autor 2001 for a similar argument), allowing it to obtain a higher share of the value created in the relationship.

The worker's ability to transact with a new staffing firm does place limits on the focal staffing firm's ability to extract returns. The staffing firm cannot use its bargaining power to offer a worker with whom it has a long-term relationship less than she could obtain in the spot market. Nonetheless, as the broker uses its long-term relationships with workers to obtain a higher transaction price, so asymmetric changes in alternatives for the seller and broker allow the broker to capture a large proportion of those gains. We therefore predict the following:[3]

Hypothesis 1B (H1B). *The proportion of the transaction price* (*percentage margin*) *retained by the broker will increase as the broker develops a longer relationship with the seller* (*i.e., worker*).

Relationships Between Buyers and Sellers

Thus far, we have focused on the effects of long-term ties between sellers and brokers. In some mediated markets, though, sellers also develop long-term relationships with particular buyers, even while transacting through a broker. In the staffing context, for example, staffing firms will often repeatedly place a given worker with the same client. We argue that these long-term relationships between buyers and sellers can limit the broker's ability to benefit from its long-term relationships with sellers. The institutional details of many markets may prevent the kind of full disintermediation predicted by structural holes theory (Burt 1992, 2000). In the staffing industry, for example, clients sign contracts that prohibit them from directly hiring workers that were initially provided through a staffing firm. Yet long-term relationships between buyers and sellers can still reduce the broker's returns, both by limiting the broker's ability to raise the transaction price and by reducing its bargaining power with respect to sellers.

First, we propose that brokers will find it more difficult to raise prices when they continue to match the same buyer and seller. A variety of research on price setting indicates that prices are "sticky" within relationships. Kahneman et al. (1986) argue that the initial terms under which parties trade constitute a "reference transaction" that acts as a precedent in future exchanges. Attempts by one party to deviate from the terms of this reference transaction are perceived as unfair, unless the deviation is clearly required to maintain that party's profits (Okun 1981). For example, survey research finds that attempts by employers to reduce wages in response to a loose labor market are perceived as unfair (Bewley 1999). However, when employers change the reference transaction by transferring employees to different kinds of work, reducing wages is seen as acceptable (Kahneman et al. 1986, p. 730). Ethnographic research similarly finds that actors resist modifying the terms of trade in ongoing relationships, even in the face of changes in supply and demand (Sahlins 1972, Granovetter 2005).

If prices are sticky within relationships, it will be difficult for a broker to raise the price at which a specific buyer and seller transact. Deviations from the reference transaction price are likely to be perceived by the buyer as unfair. Price increases may also be perceived as an attempt to "hold up" buyers, by exploiting switching costs in their relationship with sellers. The client firm cannot tell whether the staffing firm has genuinely learned that the worker performs well and/or is a good match with this particular company. The client may instead believe that the higher price is an attempt to take advantage of its relationship with the worker, particularly if the client and worker have a tendency to continue transacting together (see Kollock 1994). Such perceptions of opportunism would be damaging to the staffing firm's long-term relationships with its clients—relationships that we were told were extremely important to the Agency.

We argue, therefore, that enduring buyer–seller relationships limit the broker's ability to benefit from its long-term relationships with the seller. The broker will be better able to raise the price for a given seller when this seller is matched to a new buyer, allowing the broker to establish a new reference transaction. Specifically,

Hypothesis 2A (H2A). *The transaction price will increase more slowly when the buyer and the seller* (*i.e.,*

worker and client) *have a long-term relationship with each other than when the seller is matched with a new buyer.*

Long-term relationships between buyer and seller also limit the broker's power to capture value from the transaction by reducing its ability to exploit alternatives among workers (Figure 1(b)). When buyer and seller have exchanged repeatedly, they are likely to prefer to continue to trade with one another (Kollock 1994). The seller then becomes less redundant for the broker; other potential sellers are no longer such credible substitutes for matching with this buyer. Similar to the balancing operations described by Emerson (1962), establishing a long-term relationship with the buyer reduces the seller's dependence on the previously more powerful party—the broker. This changes the nature of competition and bargaining, increasing the seller's ability to extract a higher share of the transaction price.

In the staffing market, a staffing firm often has multiple different workers that it could propose in a first transaction with a client. Were a worker to demand too high a pay rate, the staffing firm could offer the job to another worker. Once a worker has a long-term relationship with the client, however, this worker becomes more difficult to substitute. According to placement agents at the Agency, it is very common for clients to demand the services of the same worker repeatedly. When clients request a specific worker, the Agency will try to comply; not doing so risks damaging its relationship with the client, and makes it more likely that the client firm would open up this and future positions to other intermediaries. Striking a deal with a specific worker, therefore, is much more important for staffing follow-on projects than when first staffing the worker to the client. Because the worker becomes less substitutable, this should increase her negotiating power. One worker explained:

> If [a client] hires me back, great . . . but I want more money. And I think that if they like me and if the company likes me, I think if they really want me but they want to pay me through [the Agency] then I think I will ask them to pay me more money to keep me. . . . I think I have a little bit of negotiating power here.

Both power-dependence theory and our fieldwork predict that workers placed with the same client will gain power in their negotiations with the Agency over how to share the transaction price:

Hypothesis 2B (H2B). *The proportion of the transaction price* (*percentage margin*) *retained by the broker will decrease as the seller* (*i.e., worker*) *develops a longer relationship with the buyer* (*i.e., client*).

Research Method

We collected data on the Agency's relationships with workers at one of its largest offices, based in a major U.S. city. This strategy allowed us to hold the nature of the local labor market constant in the analyses. We used the Agency's records to gather data on a specific subset of its workers—those that joined the Agency in 1998 and 1999. We assembled a complete history of every project in which these workers were placed through September 2002, and gathered further information on individual characteristics from their resumes. We have complete data on 250 workers, placed in 1,464 projects across 461 clients. We also collected publicly available information on the clients. Our database includes the prices and margins of every project, which allows us to explore how the broker's returns evolve over time. Most studies that explore the effects of relationships on market transactions rely on average firm-level prices (but see Sorenson and Waguespack 2006). Our project-level data allow us to test the effects of relationships on prices to an unusual level of detail.

Description of Variables

Log Bill Rate. Our measure of the transaction price is the log of the hourly bill rate that the Agency charges the client for each project. The mean bill rate in the sample is \$45 per hour, with a minimum value of \$19.50 and a maximum of \$150.

Percentage Margin. We measure the Agency's margin as the difference between the bill rate and the pay rate, as a proportion of the bill rate. The average value is 0.40. Hence, if the staffing agency charges the client \$45 per hour, the worker receives an average of \$27 per hour. The margins in our data have a minimum value of zero[4] and a maximum of 0.6. This dispersion indicates the absence of strong norms about how margins should be set.

Worker–Agency Relationship Duration. We operationalize the worker–Agency relationship as the total time in months that the worker has previously spent working on projects for the Agency at the start of the current project. Individuals' job histories usually include spells when they were not working for the Agency interlaced with spells when they were. We include only the time spent on projects with the Agency in calculating relationship duration. Our theoretical propositions rest on the broker's acquisition of private information about the worker, which occurs only while the worker is staffed by the Agency. Following their first project, workers in this database were on assignment for the Agency a median of 69% of the time. Our fieldwork suggests that when they are not on assignment with the Agency, individuals are usually working on projects secured elsewhere. Of the 24 contractors we interviewed

who had worked for the Agency, 16 reported that they were affiliated with other staffing firms at the time. They also reported using personal contacts to find jobs. However, there is also some probability that they were not working during these periods. We return to this issue in the analysis below. The *months worked with the Agency* variable is somewhat skewed in this sample, with a mean of 5.9 months and a maximum of 51.9 months. Additional tests (available from the authors), including logging key independent variables, found that this skewness was not a source of bias in the estimates.

Client–Worker Relationship Duration. Our measure of the client–worker relationship is the number of months previously spent on assignment with that specific client. We assume that the worker and the client had no relationship prior to the Agency placing the worker with that client. As we have seen, staffing firms charge substantial margins for placing workers with clients. Where they have preexisting relationships, workers and clients can avoid paying these margins by transacting directly. Indeed, workers often tell placement agents which client firms they have prior relationships with so that the Agency will not seek to place them there. Our measure of the client–worker relationship is also skewed. It has a mean value of 1.44, but 60% of the observations have a value of zero. The maximum value is 36.23. Again, this skewness does not materially affect our results.

There is a substantial correlation (0.52) between the "month worked with agency" and "months worked with me client" measures, although this correlation is not large enough to present serious concerns for the validity of the estimates. To the extent that there are multicollinearity problems, these would produce larger standard errors rather than biased coefficients (Schroeder et al. 1986, p. 72).

Client Controls. We control for a number of client characteristics that could be associated both with higher bill rates/margins and with longer relationships. We coded *client industry* and *firm size* using information from the Agency's database and from external sources such as firm websites and corporate directories. We included 12 industry dummies: *advertising and marketing*; *architecture, engineering, and construction*; *nonprofits, associations, government, and education*; *electronics and computers*; *retail and consumer products*; *accounting and financial services*; *healthcare*; *legal and professional services*; *pharmaceuticals, biotechnology, manufacturing, and research and development (R&D)*; *media and entertainment*; *printing and publishing*; and *telecommunications*. We were unable to code the industries of three clients, representing six observations in our sample, and so we created a "residual" category for these observations. *Client size* is measured as number of employees, and ranges from 1 to 370,000. We use the natural logarithm of *client size* because we expect the effects of increasing *client size* to diminish as firms get larger.

As mentioned above, we control for characteristics of the *client–Agency relationship* that are likely to affect the relative power of the client versus the Agency. First, we include a *preferred client* dummy, for clients that the Agency designated as being among its most valued accounts. These are the clients that are very important to the Agency, and hence those that it is likely to be dependent upon. We also calculated two measures of the *duration of the client–Agency relationship*. We included a measure of *months client–Agency post-1998*, which parallels our measure of the *worker–Agency tie duration*.[5] We calculated the number of months that the Agency had previously staffed any worker in our sample with the focal client. Where the client had engaged multiple workers simultaneously, we summed the length of each of the projects (we reasoned that staffing more workers should lead to increased opportunities for learning about the client). We lack data on assignments carried out by workers outside our sample, which somewhat limits the accuracy of this measure. A particular problem is that we do not have any information on assignments carried out before 1998. However, we do know when a focal client first entered the Agency's database (i.e., when the Agency first staffed a project for this company), even if it was before 1998. We therefore include as an additional control a simple measure of *client–Agency affiliation pre-1998*. This variable counts the number of months that the client was in the Agency's database prior to the beginning of 1998.[6]

Project Controls. We control for two project characteristics that might influence price. First we include dummy variables for *skill requirements*, as classified by the Agency. There are eight categories: *technical*; *Web and multimedia*; *writing*; *secretarial*; *spreadsheets*; *print design and creative*; *print production*; and *presentations*. The Agency takes great care to classify projects into these skill segments accurately, because they help determine bill and pay rates. Second, we control for *project duration*, measured in days. The duration of the median project is 13 days, whereas the mean is 42.5 days.

Career History Controls. We include an indicator of the length of time that the worker has been in the Agency's database, measured in months. This variable allows us to control for workers' acquisition of general human capital over time.

Labor Market Controls. Our time period of analysis (1998–2002) includes a marked rise in demand for the workers we studied. We include a dummy for each month in our sample to fully control for any effects of the external labor market on prices and margins.

Benefits eligibility. A particular concern is whether the pay rate (which we use to calculate margins) captures all the monetary transfers from the Agency to its workers. The Agency offers contractors a benefits package if they work for more than 50 days continuously. Because we do not have data on which workers received benefits and when, we constructed a proxy by creating a dummy variable that takes the value 1 if workers worked continuously for the Agency for 50 days and, therefore, are eligible for benefits. This measure allows us to control for any correlation between relationship duration and provision of benefits.

Worker Characteristics. In some models, we use information on individual characteristics, coded from the Agency's personnel records and from workers' resumes. We obtained the following individual-level data: *gender* (45% of the sample are women); *years of education* (average is 15.83; 75% have at least a bachelor's degree); *college in the field*, to indicate whether the worker's college-level studies were related to computer science, arts, or design (it takes the value 1 for 51% of the sample); *special training in the field* if the individual has specialized certifications in either computer science or graphic design (it takes the value 1 for 30% of the sample); *pre-Agency years of experience* (time elapsed between beginning work and joining the Agency;[7] the average is 6.84 years, with a minimum of 0 and a maximum of 31); and *contractor in last job*, for whether the worker was a contractor or a temporary worker in the last position before joining the Agency (37% of the sample). Table 1 presents summary statistics and correlations.

Data Analysis

We conduct our main analyses using individual fixed effects regressions, which examine the effects of relationship duration on bill rate and margin within each individual's work history. There is likely to be much variation in workers' skills, why they choose contracting, why they use a staffing firm, etc. The worker fixed effects control for all such sources of unobserved heterogeneity. Worker controls are particularly important given the unbalanced structure of the data; individuals' decisions about whether to continue contracting through the Agency may well be correlated with factors that determine bill rates and margins. The process by which workers select into long-term relationships with the Agency may therefore bias cross-sectional estimates of the effects of relationship duration. Applying fixed effects allows us to control for any stable worker characteristics that influence such selection processes. All models were implemented with robust standard errors.

Although we use client fixed effects in a set of additional analyses of client–Agency relationships, we do not adopt such fixed effects in our main models. Theoretically, we propose that better matches may occur in part through moving workers to the most demanding clients once the Agency has learned about their abilities. The use of client fixed effects would remove our ability to identify this mechanism. In addition, the large number of clients (461) leaves us with very limited degrees of freedom when both worker and client fixed effects are included.

Our analyses of the broker's margin also include controls for project bill rates, because it is possible that the broker's percentage margin varies with the transaction price. For example, the broker might retain a higher percentage when margins are low, reflecting the fixed costs incurred in staffing workers. We looked for nonlinear effects of bill rates on margins by regressing the percentage margin on the first, second, third, and fourth orders of bill rate. Plotting the resulting relationship indicated a clear inflection point: above \$40.50, margins were roughly a fixed ratio of bill rates; below \$40.50, margins rose rapidly with bill rates. This appears to reflect the difficulty of paying workers much less than around \$20 per hour; if bill rates fall below \$40, the Agency would find it increasingly difficult to pass on reductions to workers and would be more likely to reduce its margins. We controlled for this bifurcated relationship between bill rates and margins using a two-part spline (Suits et al. 1978) with a knot at the inflection point of 3.7 (log of 40.5). This allows us to model the different relationships between bill rates and margins above and below this point.

Results

Before presenting our regression results, we provide some basic description of the prevalence of long-term relationships in our data, as well as statistics on how bill and pay rates change over time. A core assumption of our theory is that brokers structurally are able to maintain more long-term relationships than are sellers. We use data on relationship durations to validate this assumption. Defining long-term worker–Agency relationships conservatively as those in which a worker has been on assignment with the Agency for more than six months (by which point around 60% of workers in our sample will have left the Agency), we estimate that the broker was involved in long-term relationships with around 45 workers at any given point in time. Further inspection of the data reveals that workers tend to move between projects within one of three broad clusters of skill segments;[8] those 45 long-term workers were spread across the three clusters in roughly equal proportions to the number of projects within each category. As a consequence, the Agency had multiple alternative long-term workers for any given type of project. Yet these same long-term workers did not appear to have a similar number of alternatives. On average, 80% of their time was

Table 1 Summary Statistics and Correlations Main Variables

	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9
1 Ln *bill rate*	3.76	0.353	3.073	5.011	1								
2 Ln *pay rate*	3.238	0.371	2.565	4.605	0.96	1							
3 *Percentage margin*	0.404	0.064	0	0.657	−0.04	−0.31	1						
4 *Months worked agency*	5.969	8.494	0	51.907	0.41	0.42	−0.1	1					
5 *Months worked client*	1.441	3.973	0	36.226	0.12	0.18	−0.25	0.52	1				
6 *Months client-Ag post-98*	9.146	23.322	0	256.147	−0.02	0.06	−0.28	0.21	0.46	1			
7 *Client–Agency pre-1998*	36.736	39.702	0	108.744	−0.26	−0.23	−0.1	−0.16	0.11	0.26	1		
8 *Time in database*	10.93	12.051	0	55.621	0.35	0.35	−0.05	0.72	0.3	0.14	−0.19	1	
9 Ln *client size*	5.992	2.883	0	12.821	−0.06	−0.05	−0.06	0	0.13	0.17	0.4	−0.01	1
10 *Preferred client*	0.134	0.341	0	1	−0.13	−0.13	0.01	−0.04	0.14	0.45	0.31	−0.06	0.31
11 *Project duration*	42.518	81.185	0	1,070	0.08	0.12	−0.15	0.08	0.24	0.32	0.07	0.05	0.11
12 *Gender* (1 = female)	0.452	0.498	0	1	−0.23	−0.21	−0.04	−0.12	0.07	0.14	0.12	−0.01	0.09
13 *Years education*	15.852	1.204	12	18	−0.02	−0.02	0	−0.14	−0.1	0.04	0	−0.03	−0.04
14 *College in field*	0.514	0.5	0	1	0.07	0.05	0.04	−0.04	0	0.03	−0.06	−0.02	0.1
15 *Special training*	0.298	0.457	0	1	0.28	0.29	−0.1	0.19	0.07	0.12	−0.14	0.19	−0.03
16 *Years experience*	6.844	4.734	0	31	0.13	0.17	−0.17	−0.03	0.05	0.12	0.03	−0.02	0.08
17 *Benefits eligibility*	0.141	0.348	0	1	0.09	0.12	−0.11	0.26	0.39	0.2	0.08	0.11	0.06
18 *Contractor last job*	0.37	0.483	0	1	0.22	0.22	−0.04	0.05	0.08	0.07	−0.05	0.01	0.03

	Mean	SD	Min	Max	10	11	12	13	14	15	16	17	18
1 Ln *bill rate*	3.76	0.353	3.073	5.011									
2 Ln *pay rate*	3.238	0.371	2.565	4.605									
3 *Percentage margin*	0.404	0.064	0	0.657									
4 *Months worked agency*	5.969	8.494	0	51.907									
5 *Months worked client*	1.441	3.973	0	36.226									
6 *Months client-Ag post-98*	9.146	23.322	0	256.147									
7 *Client–agency pre-1998*	36.736	39.702	0	108.744									
8 *Time in database*	10.93	12.051	0	55.621									
9 Ln *client size*	5.992	2.883	0	12.821									
10 *Preferred client*	0.134	0.341	0	1	1								
11 *Project duration*	42.518	81.185	0	1070	0.23	1							
12 *Gender* (1 = female)	0.452	0.498	0	1	0.06	0.01	1						
13 *Years education*	15.852	1.204	12	18	0.02	−0.07	0	1					
14 *College in field*	0.514	0.5	0	1	−0.06	−0.01	0.16	−0.02	1				
15 *Special training*	0.298	0.457	0	1	−0.01	0.04	0.06	−0.01	−0.01	1			
16 *Years experience*	6.844	4.734	0	31	−0.04	0.03	0.04	0.12	0.04	0.13	1		
17 *Benefits eligibility*	0.141	0.348	0	1	0.19	0.21	−0.01	−0.1	−0.03	0	−0.06	1	
18 *Contractor last job*	0.37	0.483	0	1	0.01	0.05	−0.01	0.05	0.15	0.01	0.13	0.06	1

Note. Ag, Agency.

spent working for the Agency, precluding the maintenance or development of long-term relationships with other brokers.

We also describe how bill and pay rates changed from project to project. We categorized each project based on whether the bill rate and pay rate were lower, the same, or higher than in the previous project carried out by the worker. We further divided up the projects based on whether they were carried out for the same client as the previous project, or a different client. The results of these analyses are presented in Table 2 and reveal that bill and pay rates are surprisingly volatile from project to project. The market does not appear to establish a clear price for a given worker's services. Instead, bill rates change (upward or downward) 62% of the time from one project to the next. Within this volatility, it is possible to detect a clear trend toward higher bill rates over time. From project to project, bill rates fall 27% of the time but rise 35% of the time ($p < 0.001$). The average bill rate increase of \$9.46 is slightly higher than the average decline of \$9.09, although this difference is not statistically significant. Interestingly, pay rates are similarly volatile. It is well established that wages within firms rarely drop in nominal terms (Baker et al. 1994, Bewley 1999). Yet, in this setting, we find that pay rates fall in almost 20% of new projects. Overall, though, increases in pay are more common than declines ($p < 0.000$).

Most importantly, Table 2 shows significant price stickiness in client–worker relationships. When a worker takes a new job with the same client, the bill rate remains the same 81% of the time. By contrast, when workers change clients the bill rate stays the same on only 15% of occasions.[9]

Table 2 Price Changes for Workers' Consecutive Projects, by Client Status

(a) Bill rate increases and decreases, by client status

	Bill Rate Change			
	Decrease	Same	Increase	Total
Same client	25 5.98%	340 81.34%	53 12.68%	418 100%
Different client	312 38.38%	122 15.01%	379 46.62%	813 100%
Total	337 27.38%	462 37.53%	432 35.09%	1,231 100%

(b) Pay Rate Increases and Decreases, by Client Status

	Pay Rate Change			
	Decrease	Same	Increase	Total
Same client	14 3.35%	326 77.99%	78 18.66%	418 100%
Different client	230 28.29%	242 29.77%	341 41.94%	813 100%
Total	244 19.82%	568 46.14%	419 34.04%	1,231 100%

Notes. A comparison of prices for consecutive projects carried out by the same worker is shown. Same client, project is carried out for the same client as the previous project; Different client, project is carried out for a different client from the one in the previous project. Panel (a) Pearson $\text{chi}^2(2) = 520.09, Pr = 0.000$; Panel (b) Pearson $\text{chi}^2(2) = 269.74, Pr = 0.000$.

Table 3 Individual-Fixed Effects Regressions

	(1)	(2)	(3)
	Ln (*bill rate*)	Ln (*pay rate*)	Percentage Margin
Months worked with agency	0.00805**	0.00467**	0.00140**
	[0.00207]	[0.00179]	[0.00049]
Months worked with client	−0.00522**	−0.0015	−0.00190**
	[0.00185]	[0.00169]	[0.00053]
Months client–Agency post-1998	−0.00152**	−0.00062*	−0.00023**
	[0.00034]	[0.00030]	[0.00007]
Client—Agency affiliation pre-1998	−0.00002	0.00008	−0.00003
	[0.00017]	[0.00015]	[0.00004]
Ln *client size*	0.00251	0.00221	−0.00108
	[0.00216]	[0.00198]	[0.00060]
Preferred client	−0.0121	−0.0510**	0.0250**
	[0.0197]	[0.0165]	[0.0050]
Benefits eligibility	0.00782	0.0222	−0.00819*
	[0.0126]	[0.0119]	[0.00398]
Time in database	0.0110	0.00257	0.0039
	[0.0152]	[0.0139]	[0.00352]
Project duration	0.00004	0.00007	−0.00003
	[0.00007]	[0.00004]	[0.00002]
Ln *bill rate* (spline above 3.7)			0.0286**
			[0.0107]
Ln *bill rate* (spline below 3.7)			0.316**
			[0.017]
Constant	3.872**	3.266**	−0.677**
	[0.219]	[0.201]	[0.0785]
Observations	1,464	1,464	1,464
Number of individuals	250	250	250
R^2 (within)	0.39	0.39	0.50

Notes. These models also include the following controls: *skill segment* (i.e., type of project: *technical*; *Web and multimedia*; *writing*; *secretarial*; *spreadsheets*; *print design and creative*; *print production*; and *presentations*); *industry* dummies (*advertising and marketing*; *architecture, engineering, and construction*; *nonprofits, associations, government, and education*; *electronics and computers*; *retail and consumer products*; *accounting and financial services*; *healthcare*; *legal and professional services*; *pharmaceuticals, biotechnology, manufacturing, and R&D*; *media and entertainment*; *printing and publishing*; and *telecommunications*); *month* dummies. Standard errors are in brackets. All tests are two-tailed.
*Significant at the 5% level; **significant at the 1% level.

Multivariate Analysis

Table 3 presents the results of our main analysis. Model 1 analyzes the determinants of the Agency's bill rate. Consistent with H1A, we find that bill rates increase with the length of the worker–Agency relationship. Specifically, a 12-month relationship with the worker allows the Agency to raise its bill rate by 9.6%, above and beyond any effects of general human capital accumulation by the worker. This represents an increase of \$3.84 per hour for a worker billed out at the median rate of \$40 an hour.

The analysis controls for both the month and the year in which the projects take place, and for the overall amount of time the workers were affiliated with the Agency. Therefore, the results isolate those increases in *bill rates* that are attributable solely to the worker–Agency relationship. The details of the context also ensure that our results are not caused by the accumulation of Agency-specific human capital: workers do not use any specific techniques or methodologies that would make them more productive over time in Agency projects. However, it is possible that the *months worked with Agency* coefficient reflects workers' accumulation of general human capital rather than the Agency's learning. If workers were employed only while they were working for the Agency (and unemployed the rest of the time), then they would accumulate general human capital only when they were on assignment. Our interviews cast serious doubt on this interpretation; most workers had a variety of alternative sources of work such that they were likely working on other projects when not staffed by the Agency. Nonetheless, we thought it useful to probe this alternative interpretation of the worker–Agency relationship effect by generating direct estimates of workers' returns to experience. We used ordinary least-squares regressions to estimate the effects of experience on bill rates, based on workers' pre-Agency experience (see Table A.1 in the appendix). These cross-sectional models include controls for worker characteristics, as described above (*education*, *age*, etc.). We find that pre-Agency experience increases bill rates by a little

over 1% per year; this is around eight times smaller than the effect of time spent working with the Agency. It is possible that some of this difference might reflect the greater value of more recent experience gained while at the Agency. Nonetheless, the stark difference between the value of pre-Agency experience versus time spent working with the Agency suggests that the effects of *worker–Agency relationship duration* are too large to be attributable to workers' accumulation of general human capital. Instead, they appear to reflect the effects of the broker's acquisition of private information.

It is worth noting that the effect of *worker–Agency relationships* on *bill rates* (Model 1, Table 3) is not due to workers being staffed to substantially different types of projects over time, as ensured by our use of skill segment controls. We also conducted analyses that include fixed effects for each person-segment combination, which yielded similar results (available from the authors). These confirm that the Agency is able to create value by better matching of workers over time within a broad class of projects, rather than moving them into substantially different types of projects.

The coefficient for the client–worker relationship (*months worked with client*) variable is negative in Model 1, supporting H2A. Note that the negative effect of this variable does not mean that the bill rate goes down when the worker is placed in the same client (which, as Table 2 shows, rarely happens). Because workers cannot work for a client without at the same time working for the Agency, increases in the client–worker relationship must be accompanied by simultaneous increases in the worker–Agency relationship. Therefore, there is no independent "main effect" of the client–worker relationship on prices. Instead, the negative coefficient on the client–worker relationship implies that the net effect of increasing *both the* client–worker relationship *and the* worker–Agency relationship is less than the net effect of increasing only the worker–Agency relationship. In other words, the bill rate increases more slowly when the worker and the client have a long-term relationship with each other than when the seller is matched with a new buyer (as H2A predicts). Hence, client–worker relationships prevent the Agency from realizing the full benefits of its long-term ties with workers.[10] Interestingly, this finding is the reverse of what a human capital approach might predict. To the extent that workers develop some client-specific skills, their value to the client should increase, and this increased value should allow the broker to raise its prices. However, we find the opposite to be true.

Model 2 shows that the worker's pay rate changes as his relationship with the Agency evolves. Although we do not hypothesize about pay rates in this paper, analyzing them allows us to understand how the Agency's margins evolve (because the margin is the difference between bill and pay rates). We find that workers receive some of the benefits of the increased bill rates: their pay rates rise significantly. But pay rates rise much more slowly than bill rates. Whereas bill rates rise 9.6% over the course of a year's relationship, pay rates only rise by 5.6%. Workers appear to benefit from long-term relationships with the Agency, but not as much as does the Agency. We also find that *months worked with the client* is not significant in the pay rate regression. On the one hand, the Agency may want to pay the worker a higher wage because the worker's relationship with the client makes her less substitutable. On the other hand, prices are less likely to increase when the worker continues to be staffed in the same client. The combination of these two effects on pay rates is indeterminate in theory, and turns out to be effectively zero in practice.

We confirm this result in our analysis of the Agency's percentage margin (Model 3). We find that the margin increases significantly as the Agency's relationship with the worker increases (H1B), whereas it decreases with the duration of the relationship between the worker and the client (H2B). Over the course of a year, the Agency's percentage margin increases by around 1.67. This allows the Agency to capture an additional 67 cents per hour when the worker bills $40 per hour. At the highest value of *worker–Agency relationship duration* in our data, 51.9 months, the Agency would receive 7.3% more of the bill rate than it would for a worker who had just joined the Agency. The magnitude of this effect is somewhat smaller than the difference between the *bill* and *pay rate* coefficients in Models 1 and 2 would suggest. This is because worker–Agency relationships have two effects on the Agency's percentage margin. The first is the direct effect of the relationship on the Agency's bargaining power (H1B). The second is an indirect effect: worker–Agency relationships have a positive effect on bill rates, and higher bill rates allow the Agency to capture a higher percentage margin, as the coefficients for ln *bill rate* in Model 3 indicate. If we did not control for bill rates, the worker–Agency relationship coefficient in Model 3 would be 40% higher.

These increases in the Agency's margins cast doubt on an alternative explanation for the positive effect of *worker–Agency relationships* on *bill rates* (Model 1). We have argued that *worker–Agency relationships* increase *bill rates* because the broker can create more value as it learns about a worker; but could the increases instead result solely from changes in how the broker captures value from clients? Specifically, if workers gain power as their relationship with the Agency evolves, then could higher bill rates be caused by the Agency's attempt to maintain its margins by raising its prices to clients? The higher pay rates in longer worker–Agency relationships suggest that there may indeed be some increase in worker power over time (Model 3). Yet the fact that the Agency's margin increases with its relationship with workers demonstrates that bill rates are also being driven

by factors above and beyond an attempt to maintain margins. This pattern of results is more consistent with our argument that learning allows the Agency to achieve more valuable matches with clients—and charge higher prices for those matches.

Among the controls in these models, we find that projects for clients that have done more business with the Agency in the past (*months client–Agency post-1998*) have significantly lower bill rates and margins, presumably reflecting the pricing power of these clients. Projects for preferred clients have higher margins, which may be one reason why these clients are listed as "preferred." Counter to our expectations, we found that benefits eligibility has a negative effect on the broker's margins. Further investigation suggests that this occurs because workers are most likely to work continuously for the Agency when they are placed in projects for the same client without a break. These are also the occasions when brokers are least likely to be able to raise bill rates. When we include a variable for such renewals in the regressions, the *benefits eligibility* dummy loses significance ($p < 0.21$), but all other results are unchanged. A number of the dummies for *industry*, *skill segment*, and *month* are also significant. These coefficients are not shown but are available from the authors.

Supplementary Analyses: The Effects of Client–Agency Relationships

Although we focus primarily on how worker–Agency (seller–broker) relationships affect the broker's returns, it is instructive to explore whether the same theoretical mechanisms hold for the client–Agency (buyer–broker) relationship. As noted above, we are unable to separate the determinants of value creation versus value capture in examining client–Agency relationships. However, we can make some predictions. We have argued that long-term relationships allow brokers to generate more economic value by achieving better matches. Hence, a longer relationship between broker and client should allow the broker to understand the client's needs better and therefore provide more appropriate workers for its projects. We have also proposed that brokers are able to capture a higher share of the returns created in their long-term relationships with the brokered parties. Where a given broker understands the needs of a client better than alternative intermediaries, the client will become relatively more dependent on that broker. This in turn will allow the broker to charge higher prices. Combining these two dynamics presents us with a clear prediction: the bill rates charged to a given client will rise with the length of the client–Agency relationship.

As noted above, our sampling strategy creates measurement error in the *client–Agency relationship* variable, because we can only observe these relationships for the subset of projects in our data. Given this limitation, the analyses of the effects of client–Agency relationships are intended as an attempt to explore how our findings might translate to the other half of the brokered exchange, rather than as a rigorous test of the symmetry of our theory. We parallel our analysis of *worker–Agency relationships* on *bill rates* (Model 1, Table 3) using a client fixed effects model. The main independent variable in this case is the *client–Agency relationship duration* (*months client–Agency post-1998*). Table 4 presents the results, which are consistent with our theory, albeit at marginal significance levels. We find that the bill rate increases with the duration of the client–Agency relationship ($p < 0.074$). These results suggest that the basic mechanisms are symmetrical for worker–Agency and client–Agency relationships.

Table 4 Client Parallel Analysis (Client Fixed Effects)

	Ln (*bill rate*)
Months worked with Agency	0.01413**
	[0.00209]
Months worked with client	−0.01100**
	[0.00269]
Months client–Agency post-1998	0.00088+
	[0.00049]
Benefits eligibility	0.01683
	[0.01909]
Time in database	−0.00081
	[0.00115]
Project duration	−0.00009
	[0.00007]
Gender (1 = female)	−0.03188+
	[0.01829]
Years of education	0.01896**
	[0.00622]
College in the field	0.06057**
	[0.01690]
Special training in the field	0.04750*
	[0.02015]
Years of experience	0.01076*
	[0.00173]
Contractor in last job	0.02275
	[0.01873]
Constant	2.79450**
	[0.13586]
Observations	1,464
Number of clients	461
R^2 (within)	0.49

Notes. All tests are two-tailed. The model includes controls for *skill segment* and *month*. Standard errors are in brackets.
+Significant at the 10% level; *significant at the 5% level; **significant at the 1% level.

Discussion and Conclusions

There is plenty of evidence that individuals and organizations can obtain superior returns from brokering other actors (see Burt 2000 for a review). Brokers play a particularly prominent role in the operation of many

markets, where they make connections between buyers and sellers. This paper argues that the duration of the relationships that such market brokers maintain with their counterparties is a crucial—yet understudied—determinant of those brokers' returns. We find that the broker is able to charge higher prices for its services when it has longer relationships with sellers, consistent with our theory that long-term relationships improve the broker's ability to match potential exchange partners. We further show that relationship duration not only allows the broker to charge higher prices, but also to capture a higher share of the value that it creates as relationships evolve. These results reveal the importance of bringing a longitudinal perspective to the study of market brokerage. They also suggest that, where relationships help brokers overcome information asymmetries, the returns from market brokerage may not decay over time (see Buskens and Van de Rijt 2008), and may even increase. At the same time, our findings highlight the importance of distinguishing value creation from value capture in understanding the determinants of brokers' returns over time (Ryall and Sorenson 2007).

The broker's ability to appropriate more of the rents from its long-term relationships raises an important question: Would its counterparties benefit from establishing relationships with multiple different brokers? Within the context that we investigated, workers actually appear to be better off transacting through a single staffing firm. Although it is true that pay rates rise more slowly than bill rates, pay rates still increase significantly as the broker is able to find better matches over time. Specifically, we find that an individual that works solely for the Agency for 12 months will receive a 5.6% increase in pay, whereas the Agency's bill rate will increase by 9.6% during the same period. Were the same worker to split her work between two staffing firms, the bill rate would rise by only 4.8% over the course of the year, based on six months with each staffing firm. No matter how great her increased bargaining power, her pay rate would not increase faster than this increase in the bill rate. Overall, the gains accruing from better matches appear to outweigh the costs of increasing dependence on the broker, at least in this context.

We have drawn on power-dependence theory (Emerson 1962) and recent theoretical treatments of brokerage (e.g., Ryall and Sorenson 2007) to explain how changes in the availability of alternative partners affect brokers' margins. Unfortunately, we lack data on the exact number of each actor's alternatives, which prevents us from testing their effects directly. To be able to measure dependence directly, we would need to observe all the alternative staffing firms available to a worker and the amounts that these firms were offering, and how much another worker would accept to do the same job. We do not have this detailed information. Raw comparisons of the Agency's numbers of long-term relationships versus the proportion of time that workers spend on assignments with the Agency confirm our base assumption that, on average, these actors have structurally different numbers of alternatives. Yet it is difficult to exploit variation in these basic measures to assess the relative dependence of different workers. Workers that are placed less often by the Agency may have more alternatives, or may simply be of relatively little value to the Agency. Similarly, using fewer workers for a particular skill segment may lead to the Agency becoming more dependent on the workers in that segment, but might also mean that the Agency is asked to staff fewer of those kinds of assignments. Our results on bill rates, pay rates, and margins are all consistent with our theorized changes in dependence over time. They are also consistent with our in-depth fieldwork. Moreover, we are able to rule out most other alternative explanations that might be generating the same findings. However, detailed empirical examination of how dependence changes within these relationships would require much more detailed data on how the number and value of sellers' and brokers' alternatives change over time.

Similarly, our focus in this paper is squarely on studying the overall effects of relationship duration on brokerage, from a longitudinal perspective, rather than on specifying all the possible power-dependence relationships that may occur within triads at a given point in time. We draw on the most relevant interdependencies among actors when developing our hypotheses, but given our focus on the seller–broker side of the triad, we hold buyer–broker relationships largely constant in our theory and control for their salient characteristics in the empirical analysis. Buyer–broker relationships would need to play a larger role in a broader study of the nature of power dependence in triadic systems, but developing a comprehensive model of resource exchange and power dependence in triads is beyond the scope of this paper.

Our finding that the broker's margin increases with relationship duration also has implications for the broader literature on relational embeddedness. Whereas several studies have explored the costs and benefits of constructing long-term ties (e.g., Uzzi 1996, Uzzi and Lancaster 2004), less attention has been paid to how those returns are shared within the relationship. Some authors look at mutual dependence (Casciaro and Piskorski 2005), and others point out that it can lead to embeddedness (Gulati and Sytch 2007). Our paper highlights the corollary to their arguments: actors in an embedded relationship can become dependent on one another. We suggest that long-term relationships change the availability of alternatives in different ways for different actors, affecting their ability to capture the returns from those relationships. A key implication of this argument is that the returns to embeddedness need not be shared equally.

Another of our findings is that brokers are less able to obtain returns from their long-term relationships when they repeatedly match the same buyers and sellers. Long-term relationships between the two brokered parties limit the broker's ability to take advantage of its private information by reducing its ability to raise prices and exploit access to alternative sellers. The ultimate effects are similar to the predictions of structural holes theory, which argues that broker's rents should be eroded once its counterparties meet (Burt 2000). Yet we show how the broker's returns can decline even when classic disintermediation is prevented by the institutional context. Thus, the findings suggest that the sustainability of brokers' returns may depend on their ability to reduce the extent to which their counterparties establish long-term relationships with one another. Although the broker can take some action to prevent buyers and sellers from interacting repeatedly, its ability to keep them apart will be constrained by its need to maintain relationships with both parties. In other words, it may be in the interest of the broker to accept a certain degree of disintermediation in exchange for being able to draw benefits from its long-term relationships with buyers and sellers.

We have developed and tested our hypotheses within a single setting: a staffing firm in the IT sector. Yet we draw on general theories of matching and power dependence to develop our theory. The theoretical mechanisms that we propose, therefore, should be applicable to a wide variety of brokered exchanges, although their magnitude and importance may differ across settings. Further research is needed to confirm how the results generalize to other firms and industries, but our theory allows us to speculate about how our findings might translate to different situations.

First, the ability of brokers to create value from relationships relies on the importance of private information that is not readily accessible through short-term ties. Hence, we would expect to find similar effects in markets such as loan syndication, where important aspects of the borrower's quality are hard to quantify. By contrast, in contexts where exchange is very standardized, such as in buying and selling highly liquid securities, long-term relationships may be less important. Second, our theory depends on the nature of the specific mechanisms by which the broker adds value (Rodan 2007). We focus on situations where brokers create value by identifying potential partners. Buyers and sellers recognize the advantages of trade, but struggle to find a good match on the other side of the market. Brokers may be more vulnerable to disintermediation in markets where they create value by identifying entirely new market opportunities (Burt 2000, p. 356). Similarly, long-term relationships are likely to be of little benefit to brokers whose returns come entirely from playing off actors on the same side of the market, but without adding any value in the process (Ryall and Sorenson 2007, Rodan 2007).

A particular question is how our findings about seller–broker relationships extend to buyer–broker relationships. We have shown that our high-level predictions about the effects of these relationships hold in the data (albeit at marginal significance levels). Nonetheless, the theoretical mechanisms may not be equally intense on both sides of the market. If private information about buyers is less important to match quality, or if buyers are able to maintain more long-term relationships than sellers, we would expect to see weaker effects of relationship duration on the buyer–broker side of the market.

The extent to which investment in long-term relationships affects access to available partners for brokers versus their counterparties should also vary across settings. In the staffing sector, we have good reason to believe that workers' investment in long-term relationships with staffing firms closes off alternatives for them more than for the staffing firm. This allows the broker to increase its margin over time. By contrast, brokers' margins would decrease with relationship duration in settings where investing in long-term relationships reduces alternatives for the broker more than for its counterparties. Similarly, our finding that sellers' negotiating power with respect to the broker increases as they enter long-term relationships with buyers is most relevant in settings where buyer–seller relationships are sticky. Where buyers do not value repeated interactions with sellers, they are more likely to offer new transactions to different sellers, possibly represented by different brokers. To the extent that repeated buyer–seller ties do not help brokers win new business, sellers will have less power versus the broker and be less able to capture a higher proportion of the transaction price as they develop long-term relationships with buyers. As we have explained, clients often prefer to continue working with the same contractor in the market for temporary help. Such a preference likely stems from workers' acquisition of client-specific skills, as well as problems that new workers may have in unlearning routines and habits acquired in other jobs (see Dokko et al. 2009). It is possible, however, that such buyer–seller stickiness is not as important in other markets.

Future research could explore the effects of long-term relationships on alternative outcome measures. Our study differs from much other work on brokerage in examining the determinants of prices rather than the performance of firms or individuals. The use of prices carries many advantages; it gives us transaction-level performance data and allows us to explore how returns are distributed within relationships (Kollock 1994). Yet

exploiting prices and margins brings its own complications. Because we do not have data on the broker's costs, we cannot draw firm conclusions about overall profits (although industry informants viewed margins as a key driver of profitability). It is thus important to examine how relationship duration affects the overall performance of brokers.

Finally, this study contributes to our understanding of the temporary labor market. We show that employment relationships in this market differ from conventional employment in two important ways. First, we note the sheer volatility of pay rates. It is very rare in traditional employment relationships for nominal wages to fall (Bewley 1999), yet in our case, the data show that wages regularly fall from one assignment to the next. This finding emphasizes the insecurity of workers in the temporary work market: it is not just that jobs are short term; there is also great instability in the amounts that workers are paid. Further research should examine the consequences of this instability for workers' careers in the long-run, and whether these consequences vary by demographic group or other individual characteristics (see Fernandez-Mateo 2009 for a study of gender differences in this context).

Second, we show that the most important relationships for temporary workers may be not with the firms in which they are placed, but with the intermediaries that staff them. Temporary employment relationships can help workers find a good match for their skills by providing them with a set of opportunities that span many different firms. Yet these short-term relationships can also make it harder for firms and workers to find good matches, because it often takes time for employers to learn how a worker's abilities fit different types of positions. Our findings suggest that labor market brokers can help to resolve this dilemma by providing access to opportunities across firms for workers, while also allowing employers to accumulate knowledge about worker's skills. If the temporary help industry continues to grow at current rates, these intermediaries will play an ever more important role in managing the labor market.

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Appendix. Ordinary Least-Squares Analysis of *Bill Rates*

	Ln (*bill rate*)
Months worked with agency	0.012**
	[0.0022]
Months worked with client	−0.0089**
	[0.0028]
Months client–Agency post-1998	−0.00088
	[0.00060]
Client–Agency affiliation pre-1998	−0.00044
	[0.00030]
Ln client size	0.0056
	[0.0036]
Preferred client	0.038
	[0.032]
Benefits eligibility	0.00017
	[0.019]
Time in database	0.0012
	[0.0017]
Project duration	0.00001
	[0.00009]
Female	−0.033
	[0.025]
Years Education	0.014
	[0.0090]
College in field	0.044
	[0.028]
Special training	0.076**
	[0.029]
Years experience	0.011**
	[0.0035]
Contractor in last job	0.041
	[0.028]
Constant	3.12**
	[0.20]
Observations	1,464
R^2	0.63

Notes. All tests are two-tailed. The model includes controls for *skill segment*, *industry*, and *month*. Standard errors are in brackets.
*Significant at the 5% level; **significant at the 1% level.

Endnotes

[1]With the exception of the client–worker relationship, we do not consider the broader network around the broker. It is possible, for example, that the existence of relationships between different workers (or between different clients) might also affect brokers' outcomes (see Sasson 2008). However, we lack the empirical data required to explore this issue, and our theory does not rely on the existence of these relationships. Nor did our fieldwork suggest that such broader networks are an important influence on matching and price setting in this context.

[2]Notice that we focus on long-term relationships that involve actual and continuous exchange of resources, not merely affiliation or emotional attachment (see also Cook and Emerson 1978, Kollock 1994). The embeddedness literature (Uzzi 1996, Granovetter 1985) understands long-term relationships similarly as repeated patterns of interaction, although it also includes assumptions about trust that are not part of our theoretical model.

[3]Note that this hypothesis involves no assumption about how much the seller knows about the buyer's price or the broker's margin. We follow Emerson (1962) in grounding our analysis of bargaining power purely in the availability of similar alternatives; even if all prices and margins were known to both parties, the actor that finds exit from the relationship more costly should extract a lower share of the surplus created within the relationship.

[4]We were told that, exceptionally, the Agency can receive a zero margin if it is compensating clients for prior problems. Our results are fully robust to dropping the two observations with zero margins.

[5]In supplementary analyses (available from the authors) we used other indicators of clients' volume of sales generated for the Agency (e.g., a dummy for the *highest sales volume clients*). These supplementary controls had no effect on our results. However, including several highly correlated measures of *client–Agency relationships* does affect the coefficients of the controls themselves. For example, when entered on its own, the *preferred client* dummy is negative and significant on *bill rates*, but it is not significant when the model also includes the *months client–Agency post-1998*, because high values of the latter also characterize the clients that are most valuable for the Agency.

[6]There might be a concern that we have more accurate measures of *client–Agency relationships* later in our sample. For early assignments, measures of *client–Agency relationships* largely rely on our less accurate client–Agency affiliation measure pre-1998. For later assignments, we can use the more detailed interaction-based measure. Any biases this might cause are corrected for by the detailed time controls, because we include in the regressions dummy variables for each individual month.

[7]Beginning work is measured either as the start date of the very first position or, if only the most recent jobs are listed, as the end of full-time education. Summer jobs or internships are not included in the count, but part-time jobs held while the individual was working toward a college degree are included.

[8]The three clusters are *technical* and *Web and multimedia*; *writing*, *secretarial*, *spreadsheet*, and *presentations*; and *print design and creative* and *print production*.

[9]This stickiness is not due to clients always paying the same rates for similar jobs. We found that when the Agency staffed a different worker to a given client, the bill rate would change 74% of the time, even within the same skill segment. The frequency of these changes suggests that clients do not always pay the Agency the same rate for the same type of work. Rather, a client tends to pay the same rate for the same worker.

[10]We assessed three alternative explanations for this finding. First, we examined whether the reduced bill rates in long-term client–worker relationships could reflect a greater likelihood of workers going permanent from these positions. We found that clients did not receive lower bill rates in projects before workers went permanent. Second, we tested whether the negative effects of *client–worker relationships* on *bill rates* might reflect slower learning by the worker when she is matched with the same client repeatedly, rather than the effects of price stickiness. We found that a variable that measured the maximum time spent with any client did not affect prices—only time spent with the focal client had an effect. Third, we assessed whether reductions in price could represent a "bulk discount" for long projects. We did not find that longer projects had lower bill rates or lower margins. Also, Table 2 shows that client–worker relationships do not lead to an increase in price declines, as a discount story would suggest, but rather to an absence of price rises.

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