Economic Power:
The Political Structure of Voluntary Exchanges*

Samuel Bowles and Herbert Gintis
Department of Economics
University of Massachusetts
Amherst, Massachusetts, 01003

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I Introduction

"Economics has gained the title Queen of the Social Sciences by choosing solved political problems as its domain" (Lerner 1972):259. When Abba Lerner addressed these lines to a meeting of the American Economic Association almost a quarter of a century ago, it was the prose that caught one's attention. The substantive claim was uncontroversial. But how many economic theorists today would agree with Lerner's premise: "An economic transaction is a solved political problem…"?

In the professional journals, and even the undergraduate textbooks, one now encounters terms such as discipline, strategy, retaliation, monitoring, hostage-taking, enforcement, and first-mover advantage, concepts which one might have thought more appropriate to a handbook on diplomacy or military tactics than to the social science long criticized for its purported assumption of social harmony.[1] The growing importance of game theory, transactions cost economics, the theory of rent seeking, the economic analysis of law, bargaining, and mechanism design has rendered Lerner's insight anachronistic, for each of these contributions dramatizes the

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[1]For example, Milgrom and Roberts (1992) and cnschotter94.

often incomplete nature of contracts and the importance of what might informally be termed the *exercise of power* in the determination of the *de facto* terms of an exchange. The positive theories of labor markets, credit and capital markets, some goods markets, and even marriage 'markets' have all been substantially affected by this new attention to the endogenous enforcement of claims by the exchanging parties themselves.

Contemporary microeconomic theory thus contrasts sharply with the older Walrasian model in which complete contracts were implicitly assumed to be enforced by a third party (the judicial system) at no cost to the exchanging parties. With contract enforcement now partially displaced from the state to private economic actors the problem of power, if not the term itself, has assumed greater importance in economic theory.

The analytical treatment of economic power itself, however, has languished.[2] Most economists regard the term as ill-defined and not part of a scientific lexicon.[3] Political scientists, by contrast, make scholarly reference to power, often invoking Robert Dahl's definition, "A has power over B to the extent that he can get B to do something that B would not otherwise do," and distinguishing among types of power by the object of its exercise, as in the power to set agendas, to achieve military objectives, to influence preferences, or to determine policy choices.[4] But these conceptions of power often provide little insight into the mechanisms by which power might be exercised in a competitive environment of voluntary economic transactions. It is this *lacuna* that we will address here.

Common usage suggests several characteristics that must be present in a plausible representation of a power relationship. First, power is *interpersonal*, an aspect of a relationship among agents, not a characteristic of a solitary individual. Second, the exercise of power involves the *threat and appropriate use of sanctions*. Indeed, many political theorists regard this as the *sine qua non* of power. Thus Harold Lasswell and Abraham Kaplan (1950):74–75 make the use of "severe sanctions. . . to sustain a policy against opposition" a defining characteristic of a power relationship, and Talcott Parsons (1967):308 regards the "presumption of enforcement by negative sanctions. . . in the case of recalcitrance" a necessary condition for the exercise of power.

[2]Some exceptions are Harsanyi (1962), Chichilnisky (1993) and Chichilnisky and Heal (1984). We are not concerned with the effect of the economy on political power and state policy, which has an extensive literature of its own.

[3]On the critique of the concept of power in the economy, see March (1988) and Williamson (1993).

[4]Dahl (1957):202-203, Bachrach and Baratz (1970), Lukes (1974).

In addition, the concept of power should be *normatively neutral*, allowing Pareto-improving outcomes, as has been stressed by students of power from Hobbes to Parsons, but susceptible to abuse and capable of being exercised to the detriment to the well-being of its subjects and in violation of ethical principles.

Moreover, power must be *sustainable as a Nash equilibrium* in an appropriately defined social context. Power may be exercised in disequilibrium situations, of course. But because one commonly conceives of power as an enduring aspect of a social institution or structure, power must be a capacity capable of being exercised in equilibrium seems compelling.

Finally, power should be *susceptible to measurement*. We routinely give weight to statements of the form: policy X increases the power of A over B, as for example in saying "the elimination of unemployment insurance would increase the power of employers over workers." Also reasonable are even more ambitious comparisons such as A has more power over B than C has over D, as for example, "in capitalist economies consumers have more power over producers than in centrally planned economies."

Other conceptions of power are entertained, some quite widely, that do not draw upon choice theory. But we will neither argue against these alternatives or for the above *desiderata*, which we take to represent a broad consensus among social scientists. Rather, we will use these conditions to generate a concept of economic power based on the use of sanctions in competitive exchanges.

Treating sanctions as central to the exercise of power allows us to distinguish between power and other means of securing an advantageous position including those, like wealth, that may operate even in the complete absence of strategic interaction. We focus on competitive exchanges because it is in this arena that the exercise of power (and in particular the imposition of sanctions) often appears anomalous, given that competitive equilibrium is commonly thought to offer all agents the opportunity to exit from an exchange at zero cost.

2 Power in Economic Theory

The lack of theoretical standing of 'power' in economics is suggested by the diversity of its most common uses: purchasing power, market power, and bargaining power. There is a common element in the three usages: power confers an advantage to an actor by comparison with some counterfactual in which said power is absent. Yet the concepts are otherwise virtually unrelated. Purchasing power, the extent to which an actor can buy goods and services, is a measure of wealth.

Market power, by contrast, arises in 'thin' markets where the number of actual or potential competitors is limited.[5] Bargaining power has no single conventional usage, though it commonly is applied to situations in which cooperation among two or more actors gives rise to a surplus above what could have been obtained in a non-cooperative interaction; bargaining power refers to the ability of an actor to secure an advantageous division of this surplus.

Two of the three usages, purchasing power and market power, make no reference to the use of sanctions. While purchasing power involves the capacity to acquire goods and services (one's wealth allows their purchase), this capacity does not generally entail the command over people suggested by 'severe sanctions' or 'enforcement by negative sanctions.' For this reason one does not generally deem the exchange between a shopper and a grocer a power relationship. The exercise of market power likewise does not require the use of sanctions by those said to hold power. In addition, the capacity to sanction may be present in situations where bargaining power applies, but often in ways contrary to that suggested by the conventional identification of power with sanctioning.

Many of what observers would consider unambiguous examples of economic power escape coverage by these usages, especially in exchanges governed by competitive markets. Charles E. Lindblom (Lindblom 1977):171–172 writes: "Corporate executives... decide a nation's industrial technology, the pattern of work organization the location of industry, market structure, resource allocation, and, of course executive compensation and status....*In* In short in any private enterprise system, a large category of major decisions is turned over to businessmen both small and large."

Lindblom's list implies that the decision-making authority of business executives may be enhanced by market and bargaining power, but requires neither. The manager of a small business in a competitive market might command neither market nor bargaining power; but could he not be in a position to make decisions in the areas of concern to Lindblom? He can, as Lindblom points out, impose the severe sanction of firing on his employees. And if the wealth of the shopper is not conventionally regarded as a source of power over the grocer, why would it afford power to the businessman?

The discrepancies among the current usages of the term power in economics and their evident inconsistencies with what we consider to be desiderata for a

[5]The textbook formulation, that market power allows an agent to be a price maker rather a than price taker, is not exactly right, for the point is not that perfect competition requires that no actor can alter the price of the good, but that none can benefit by doing so. The importance of this distinction will be made clear below.

conception of power suggest an alternative conception. We propose the following sufficient condition for the exercise of power: agent A has power over agent B if, by credibly threatening to impose sanctions on B, A can induce B to act in ways that further A's interests, while B lacks this capacity with respect to A.

We will show that where complete and third party enforceable contracts are absent so that the claims arising from exchanges are enforced by the parties to exchange themselves, even competitive exchanges may exhibit a power relationship in the sense defined. The lack of third party enforcement may arise because of asymmetric information (for example where labor effort is variable and not costlessly observable by the employer), the possible unenforceablility of some claims (as in the promise to repay a loan), the lack of a sovereign body with appropriate jurisdiction (as in the case of international debt) and for other reasons.

We use the term *endogenous claim enforcement* to cover these cases where costless third party enforcement of claims is absent, and we term the resulting transactions *contested exchanges*.[6] We model a generic case of a contested exchange in the next section.

In addition to the examples already given, problems of endogenous enforcement arise between consumers and producers of goods of variable quality, where the quality of the good is not costlessly observable, the result being a relationship between many principals (the consumers) and a single agent (the producer). A parallel case arises between citizens in a democratic polity as principals and government officials as agents where electoral or other promises are not third party enforceable. Relationships between parents and children or between adult members of couples also generally exhibit problems of endogenous enforcement, as the goods and services transacted are either not easily monitored or impossible to enforce. Landlord-tenant relationships, both agrarian and residential, give rise to analogous problems of endogenous enforcement as the tenant's care of the property is generally difficult to observe. Finally, relationships between the owners and manager of an asset (a firm, for example) provide an archetypal case of endogenous enforcement, as the manager's work effort, job perquisites, and choice of risk

[6]We prefer this terminology to the more traditional 'asymmetric information' to cover this set of cases, not only because ours represents more clearly the relationship to power, but also because the presence of asymmetric information is neither necessary nor sufficient for the lack of third party enforcement. As the literature on mechanism design shows, where agents are risk neutral and do not face wealth constraints, the design of optimal contracts may eliminate endogenous enforcement costs even in the presence of asymmetric information. Moreover, even where all agents possess the same information, it may be impossible or excessively costly to write an enforceable contract based upon such information.

exposure for the asset, cannot be secured through costlessly enforced contracts. Endogenous enforcement, we conclude, is ubiquitous both in the economy and in society in general.

Where characteristics of an exchange preclude contracting for specific agent services, and where there is a potentially long-term relationship between the exchanging parties, the threat of non-renewal of the exchange by one of the parties may serve as a sanctioning device. In such cases markets will not clear in competitive equilibrium, and agents on the short side of the market hold power over agents on the long side of the market.[7] We term this *short-side power*.

We prove the following. First, short-side agents may exercise power over long side agents in competitive equilibrium (Section 3). Second, optimal bonding, entrance fees, and other contractual modifications that result in market clearing do not eliminate short-side power (Section 4). Third, the exercise of short-side power is Pareto-improving and hence is consistent with voluntary participation by both those with and without such power under fully competitive conditions (Section 5). Fourth, in the absence of optimal bonding those holding short-side power may adopt practices that impose first-order costs on those over whom they have power at zero or only second-order costs to themselves. Some of these practices would be termed 'abuses of power.' Where short-side power does not obtain, these abuses of power cannot be sustained (Section 6). Section 6 also addresses the measurement of economic power, and analyzes the effect of changes in tastes, technology, and social policy on the extend of power. In Section 7 we comment on the relationship between short-side power and the other usages of 'power' in economics.

One limitation of our concept of power should be mentioned at the outset. Our analysis is limited to the case of radically asymmetric power, in which one party to exchange has positive power and the other none. We have not explored extensions of the concept to cases in which actors exercise power multilaterally.

3 Contested Exchange

Consider a relationship between a principal who is residual claimant to the returns generated by a project, and an agent who provides the principal with some good or service relevant to the success of the project. The agent may be an isolated individual or a member of a team. We model the case of the individual. The

[7]The short side of a nonclearing market is the side on which the number of desired transactions is least; thus employers (demanders) may be on the short side of a labor market, and lenders (suppliers) may be on the short side of the credit market.

project yields a stochastic return per time period with expected value $r(q)$, where q is a measure of the 'quality' of the service supplied by the agent, where $0 \leq q \leq 1$, $r' > 0$, and $r'' < 0$. We may then think of q as the probability that the agent's actual performance meets some exogenously given standard of acceptability. The utility $u = u(y, q)$ of the agent depends on the payment y received from the principal for performing the service and the quality q of the service supplied. Over the relevant range of variation, we assume $u_y > 0$ and $u_q < 0$ (denoting partial derivatives by subscripting functions).

We assume that contracts based on the level q of quality supplied by the agent cannot be enforced,[8] and the principal monitors the agent in each period in such a manner that substandard quality is discovered with probability m, where $0 \leq m \leq 1$.[9] Again for simplicity we will assume that the cost of monitoring is a linear function of the monitoring intensity m.

We assume the principal is first mover in an infinitely repeated game, and in each period selects the payment y and the monitoring intensity m that maximizes net income, subject to the agent's best response function (agent attributes, and hence the agent's best response function, are taken to be common knowledge). The agent then chooses q, the principal receives the stochastic return with expected value $r(q)$, and based on the results of monitoring the agent, the principal decides whether or not to renew. The probability of detecting substandard performance is simply $p(q, m) = m(1-q)$, the product of the probability that substandard performance occurred and the probability that it was detected. We assume an agent found wanting is terminated with probability one. If terminated, the agent receives an exogenously determined fallback z. Otherwise the interaction is renewed, replicating the structure of the previous period.

We call this a *contingent renewal* model of endogenous contract enforcement.[10] In many cases of contingent renewal, additional incentive mechanisms may be present as well; e.g., a variable payment as a function of the signal, a bond posted by the agent, or profit-sharing in which the agent's payment depends on the principal's

[8]Incentive mechanisms based on the resulting output $r(q)$ and, for the case of teams, group incentive mechanisms that might address the non-observability of individual actions generally fail in the presence of stochastic elements in the return schedule and agent risk aversion, for reasons pointed out by Holmström (1982) and others.

[9]More general formulations of quality measurement and monitoring strategies are analyzed in Gintis and Ishikawa (1987), which derive and analyze optimal monitoring and termination schedules. Our basic results extend to this more general treatment.

[10]The analysis of contingent renewal is developed in Gintis (1976), Calvo (1979), Shapiro and Stiglitz (1984), Bowles (1985), and Gintis and Ishikawa (1987).

actual return. We abstract from these for analytical convenience.

To derive the agent's best response function, we define v, the *value of the relationship* for the agent as the discounted present value of net benefits from the relationship, including the utility of the payment y and the disutility of supplying quality q. The agent's *fallback position* z is the present value of net benefits upon termination, including the cost of search, the startup costs in another endeavor, and the discounted present value of that endeavor. We call $v - z$, the difference between the value of the relationship and the fallback position, the *enforcement rent*, or the *cost of termination*. Clearly the principal's threat of termination affects the agent's behavior only if the enforcement rent is positive.

Given the agent's discount rate ρ and fallback z, the agent will choose q to maximize

$$v = \frac{u(y, q) + [1 - p(m, q)]v + p(m, q)z}{1 + \rho}$$

where $u(y, q)$ is the current flow of utility, assumed for convenience to accrue at the end of the period, and the other terms in the numerator measure the expected present value of the agent at the end of the period. Simplifying, we get

$$v = \frac{u(y, q) - \rho z}{p(m, q) + \rho} \tag{1}$$

which has the simple interpretation: value of relationship = enforcement rent + fallback value. The term ρz in the numerator is the forgone flow of utility from the fallback, so the numerator is the net flow of utility from the relationship per period, while $p(m, q)$ in the denominator is added to the discount rate, reflecting the fact that future returns must be discounted both by the probability of termination and the rate of time preference. The agent chooses q to maximize v, setting $v_q = 0$, giving us the first order condition:

$$u_q - p_q(v - z) = 0, \tag{2}$$

according to which the agent increases quality to the point where the marginal disutility of providing quality is equal to the marginal reduction in the expected asset loss occasioned by the effect of increased quality on the probability of retaining the position. Solving (2) for q gives us the agent's *best response function*[11]

$$q = q(m, y). \tag{3}$$

[11] Standard arguments ensure the existence and smoothness of the best response function, given appropriate functional forms for $u(y, q)$ and $p(m, q)$, and over the appropriate range of (m, y). Where (m, y) is such that $v < z$, we assume $q = 0$. We deal with such issues below when they are relevant to our analysis.

We assume the principal is risk-neutral, and in addition to the direct payment y to the agent, he incurs a cost sm for monitoring at intensity m, where $s \geq 0$, and incurs a cost of c to replace a terminated worker. The principal then maximizes net expected revenue π, solving

$$max_{y,m} \quad \pi = r(q(m, y)) - (y + (1 - q)cm + sm).$$

This yields the first order conditions

$$\pi_y = (r' + cm)q_y - 1 = 0 \tag{4}$$

$$\pi_m = (r' + cm)q_m - ((1 - q)c + s) = 0. \tag{5}$$

We depict the best response function and the principal's choice of an optimal payment y^* in Figure 1, which plots quality against the payment, holding monitoring intensity fixed at its optimal value m^*. The iso-v function v^* is one of a family of loci of quality levels and salaries that yield identical present values of the transaction to the agent. Their slope, -v_y/v_q, is the marginal rate of substitution between payment and quality in the agent's objective function. Preferred iso-v loci lie to the right.

Figure 1 About Here

By the agent's first order conditions, the iso-v loci are vertical where they intersect the best response function. The slope of the iso-v functions above $q(m^*, y)$ is positive because higher levels of both quality and the payment yield equivalent present values. The unusual negative slope of the iso-v functions below the best response function results from the fact that in this region the effects of an increase in quality on the probability of retaining the position (via $p_q(v - z)$) outweigh the quality-disutility effects. Because v rises along $q(m^*, y)$, the agent is unambiguously better off at higher payment position.[12]

Figure 1 also depicts one of the family of iso-profit functions $\pi(m^*, y, q) = \pi^*$. The principal's first order condition (4) identifies the equilibrium payment y^* as the tangency between the iso-profit function π^* with slope of $1/(r' + cm^*)$ and the agent's best response function, with slope q_y (point x in Figure 1). We will see presently that most of our propositions can be demonstrated by an inspection of this equilibrium.

[12]In general $q(m, y)$ in increasing and concave in y only in a neighborhood of the passive ownership equilibrium (by the second order conditions of the owner's maximization), but we have drawn it so throughout.

But before doing this the reader may want to know if reasonable assumptions concerning the utility function generate the type of equilibrium we have identified. A simple example suggests an affirmative answer. Let the agent's utility function be

$$u = ay - \frac{b}{1-q}, \qquad a, b > 0 \tag{6}$$

so the marginal utility of income is a positive constant and the disutility of providing quality rises with quality with a vertical asymptote at $q = 1$. Using (2) we find that the agent's best response function is given by the positive solution to the quadratic equation

$$m(ay - \rho z)(1-q)^2 - 2mb(1-q) - b\rho = 0.$$

To see that this curve has the shape depicted in Figure 1, note that $q(m^*, y)$ is strictly increasing in y, since $q_y = m(1-q)^3/2b(m(1-q)+\rho) > 0$ and is concave, since $q_{ww} = -(1-q)^2 m\beta(2(1-q)m\beta + \rho(3(1-q)-\beta))/4b^2(m\beta+\rho)^2 < 0$ where $\beta = b/(ay-\rho z)$ (noticing that $1-q > \beta$). Moreover, $q(m^*, y)$ has a horizontal asymptote at $q = 1$, since as $y \to \infty$, $q \to 1$. One slight complication is that $q(m^*, y)$ has a discontinuity at the corner solution where $q = 0$. For when $y = y_{min} = (\rho z + 2b + b\rho/m^*)/a > 0$, $q = 0$, while $q = 0$ can be attained more cheaply by setting $y = 0$. With this utility function, the greatest lower bound of positive enforcement rents is strictly positive, since the net flow of utility from the relationship at $q = 0_+$ is

$$ay_{min} - b - \rho z = b(1 + \rho/m^*) > 0.$$

For the sake of concreteness, suppose $a = b = c = s = 1$, $\rho = 7\%$, $z = 10$, and $r(q) = 20q$. It is impossible to find a closed-form solution to the optimization problem, but the method of successive approximations gives the solution $m^* = 0.6381$, $y^* = 7.1725$, so $q^* = 0.6440$, $v^* = 22.3620$, $\pi^* = 4.8312$, and the probability of termination is $m^*(1-q^*) = 22.72\%$. The value of the enforcement rent is $v^* - z = 12.3620$.[13]

4 Short-Side Power

We shall now prove

[13] We solved this by simulating the model in a Pascal computer program, and check the answer against mercury, a commercially available equation solver.

Proposition 1. *Short side agents exercise power over long side agents in competitive equilibrium.*

To show that the principal (whom we will call A) has power over the agent, B, four conditions must be met. First, A must be able to sanction B. This A can do by terminating $B's$ contract, reducing $B's$ present value by the amount of the employment rent, $v^* - z$. But how do we know that the equilibrium employment rent is not zero? In this case the optimal level of monitoring would be zero, as there would be no reason to hire costly surveillance equipment if there were no sanctions which could be applied. As a result the agent would provide whatever level of q that maximized her utility, which we denote by $\bar{q}$. This case cannot be ruled out *a priori*, but it will not obtain if at the agent's reservation position the marginal effect of a variation in payment on the level of quality, q_y exceeds the inverse of the marginal benefits (to the principal) of increased quality, $1/(r' + cm)$.[14]

Thus for (4) to be satisfied as an inequality, yielding a corner solution, the best response function would have to be flatter than the iso-π function at the reservation position. This will be the case only if the marginal utility of income is low (even at low levels of payment), the marginal disutility of quality is substantial even at low levels of quality, and the marginal benefit to variations in quality is limited even at low levels of quality. Income-satiated agents who have little conflict of interest with the principal concerning the level of quality might fulfill these conditions.[15]

Second, the threat of sanctions must be credible. As we presume that the rationality of both actors is common knowledge (ruling out revenge, for example), the threat of termination is effective in influencing the actions of the agent only if it is in the principal's interest to carry it out under the appropriate conditions. To clarify the issue of credibility we assume that all potential agents with whom the principal may deal are identical and we abstract from search, recruitment and learning costs. Thus replacing an agent detected providing insufficient quality with another cannot improve the quality of the agent from the perspective of the principal. The termination of an agent however, convinces potential agents that low levels of quality incur a higher probability of termination, thus affecting their choice of an optimal quality level should they be engaged by the principal, as long

[14]As we have seen, with the agent utility function $u = ay - b/(1 - q)$, the employment rent is strictly positive for all nonnegative quality levels.

[15]Totally differentiating $v_q = 0$ with respect to y gives $q_y = -v_{qy}/v_{qq} = p_q u_y/(u_{qq}(\rho + p)^2 - (u - \rho z)p_{qq})$. An increase in ρ clearly shifts this schedule down. An increase in the constant intercept of p has the same effect. Thus we can identify other conditions contributing to a low value of q_y: a high rate of time preference or a high probability of termination independent of the level of quality.

as the relationship with the principal is valuable to a potential agent. The threat of sanctions is thus credible.

Third, A must induce B to act in A's interest. This is the case, since $q^* > \bar{q}$ ("B is influenced") and $\pi(q^*, y^*) > \pi(\bar{q}, \bar{y})$ ("in A's interest"), where $(\bar{q}, \bar{y})$ is the quality-effort pair where the employment rent is zero.

Fourth, B must be unable to issue credible threats against A. This is the case, as B is identical to other potential agents with whom A could transact. A is indifferent between this particular transaction and any other, and hence should B make any offer other than to provide q^* for y^* under monitoring conditions m^*, A would simply select a different agent. The fact that there exist other principals identical to A with whom B can transact does not alter this conclusion.

Thus A has power over B. To demonstrate Proposition 1 it remains to be shown that this transaction is consistent with a competitive equilibrium. This is equivalent to requiring that no actor can improve his or her position by altering any variable over which the actor has control (i.e., the equilibrium is Nash in the agents' strategies). For the principal and the agent this is assured by the fact that the solution (y^*, q^*) satisfies the first order conditions of both. But what of other agents? Consider C, identical to B except that C has not secured a principal with whom to transact and whose present value of utility is z, the reservation position. Could C make any offer which would alter the outcome (y^*, q^*)? Should C offer to provide the same q^* at a for less than y^*, A would, of course disbelieve him, as B and C are identical. Thus our result is indeed a competitive equilibrium, and Proposition 1 is sustained.

We have termed the resulting relationship of A to B *short-side power*, as A is on the short side of a market exhibiting excess supply in equilibrium. The agent B is a long-sider, as is C, the difference being solely that B has secured a transaction. The short side need not be the demand side of the market, of course; lenders may occupy short side positions in competitive credit markets, for example.[16]

It may be objected that our model has arbitrarily restricted the contracting alternatives and other strategies open to the principal, and that for this reason Proposition 1 is uncompelling. The premise of the objection is true, but the inference is false. We have already noted that most optimal contracting devices fail where agents

[16]Though different substantively in a number of respects, our concept of power may be recast in terms initially introduced by Dahl (1957), Harsanyi (1962), March (1957), Simon (1957), and J. R. P. French and Raven (1959). For example, following Dahl we may describe the 'base' of short-side power as economic sanctions, the 'means' of its exercise as contingent renewal, and its 'scope' as the contested attributes of the exchange, summarized by q. Following Harsanyi we may take the 'cost' of exercising power as the enforcement rent $v^* - z$.

are risk averse and credit constrained, so their general applicability in the cases addressed here may be limited.

However there is a profitable contracting opportunity available to the principal, one which we have not considered and which is not precluded by either risk aversion or credit constraints: the principal could charge the agent an initial non-refundable fee (sometimes misleadingly termed a bond) as a condition for engaging in the transaction. As long as v exceeds z the agent will be willing to pay such a fee. Indeed the optimal fee, f^*, will be that which reduces the present value of taking the job to zero or $f^* = v - z$, the result being that *prior to the transaction* agents are indifferent between making or failing to make the transaction. Thus optimal fees eliminate *ex ante* rents and result in market clearing equilibria.

It is not difficult show that such fees, even if institutionally feasible, would not eliminate short-side power, although as we shall see they would render more costly the abuse of power.[17] We thus show

Proposition 2. *Optimal bonding, entrance fees, and other contractual modifications that result in market clearing do not eliminate short-side power.*

The equilibrium offer by the principal, given the opportunity to charge a fee, will be the solution to the problem of maximizing profits (taking account of the contribution of the fee itself to profits) by varying y and f, subject to the agent's participation constraint: $f \leq v - z$. Because the optimal fee satisfies this constraint as an equality we have, from Proposition 1,

$$f^* = \frac{u(y,q) - \rho z}{\rho + p(m,q)}.$$

Thus a positive fee is feasible only if the transaction yields positive per period benefits to the agent net of the opportunity cost ρz. But this implies that optimal fees, where positive, eliminate *ex ante* rents but require *ex post* rents: otherwise the agent would not pay the fee. The fee is a pure case of a transaction specific

[17] In many contingent renewal markets, such as the labor market and the market for firm managers, initial fees are uncommon. Carmichael (1985) presents a compelling critique of contingent renewal models of the labor market based on the optimality of such fees, one which has not been adequately addressed in the related literature (but see Eaton and White (1982)). Some argue that these fees are infeasible because job-seekers are credit constrained. Yet clearly credit constraints reduces the *size* but not the *existence* of optimal fees. Employer moral hazard, in the form of unwarranted dismissals, is also offered to explain the absence of fees. But under plausible conditions is can be shown that profit-maximizing including the returns from fees again changes the size but not the existence of an optimal fee.

investment: though indifferent *ex ante*, the agent is not indifferent to termination of the exchange once the specific investment has been made. But the resulting *ex post* rent, $v - z$, gives the principal power over the agent, as we have seen. Thus Proposition 2 is sustained.

Because the empirical significance of optimal transaction fees appears limited and because the possibility of charging such fees does not contradict the existence of short-side power in competitive equilibrium we will assume that transaction fees are absent in what follows, indicating where their presence alter the results (as in Proposition 4 below).

5 The Use and Abuse of Power

We now prove

Proposition 3. *The exercise of short-side power is Pareto-improving and hence is consistent with voluntary participation by both those with and without such power under competitive conditions.*

That the equilibrium outcome is a Pareto improvement over the counterfactual position in which no power is exercised is easily seen, for the counterfactual position is simply $(\bar{y}, \bar{q})$ and $v^* = v(y^*, q^*) > v(\bar{y}, \bar{q}) = z$ and $\pi(y^*, q^*) > \pi(\bar{y}, \bar{q})$. Both agent and principal are better off at the equilibrium outcome supporting the exercise of power than at the reservation position in which power is absent.[18] The condition guaranteeing an interior solution (above) in which short-side power is an equilibrium outcome is sufficient to ensure that this exercise of power is Pareto improving.

Notwithstanding its Pareto-improving nature, short-side power may be exercised in morally unacceptable ways at little or no cost to the principal. By morally unacceptable we have in mind such behaviors as racial, ethnic, and sexual harassment, or other assaults on dignity of the agent. We show that

[18] It may be asked if the competitive equilibrium outcome is Pareto optimal. This is equivalent to asking: could the equilibrium outcome have resulted from a different optimizing problem, one in which either actor maximizes his or her objective function subject to a constraint that the others's objective function not fall below some arbitrarily given level? Pareto optimality thus entails the equation of the slope of the principal's iso-cost function, $\pi^* = r(q) - (y + cm^* + sm^*)$, and the agent's iso-v function, $-v_y/v_q$. But this is obviously not the case in competitive equilibrium, for at this position $-v_y/v_q$ is infinite (the denominator is zero by the agent's first order condition). The same result obviously holds for any point on the agent's best response function.

Proposition 4. *In the absence of optimal bonding those holding short-side power can adopt practices that impose first-order costs on those over whom they have power at zero or only second-order costs to themselves. In the absence of short-side power, such practices do not exist.*

We term such practices 'unaccountable abuses of power.' The fact that A has power over B thus implies not that $B's$ preferences will be ignored, but that the costs to the principal of acting indifferently towards $B's$ preferences will be smaller than would obtain were A to lack power over B. To demonstrate Proposition 4, we begin by noting that small variations in the payment have first-order effects on the agent, but second-order effects on the principal. This follows directly from the fact that the payment is chosen by the principal to maximize profits, so as long as the optimal payment involves a cost of job loss, $d\pi/dy = 0$ and hence small variations in y have only second-order effects on profits (the first-order loss to the principal from a higher payment is offset by the first-order gain in the quality supplied by the agent). But clearly a change in the payment has a first-order effect on the agent, since $dv/dy = u_y/(\rho + p) > 0$.

But we can treat an abuse of power as either a one-time or a repeated action of the principal that lowers the flow of utility to the agent in one or multiple periods. A one-time abuse does not change the future value of the position to the agent, and hence does not change the quality supplied by the agent. Thus the cost to the principal is zero. A repeated abuse lowers the expected flow of utility to the agent in each future period, so it is equivalent to a decrease in the payment to the agent, which we have already seen has second-order effects on the principal (in the form of lower quality supplied), but first-order effects to the agent.

More formally, suppose the principal has utility function $U(\pi, \delta)$, where π is profits and δ is an index of the abusive action, so $U_\delta > 0$, while the agent's utility function is $u = u(q, y, \delta)$ with $u_\delta < 0$. We assume that δ is costlessly observable but its level is not regulated by a third party. Because δ is now an argument of the agent's utility function we can thus rewrite the best response function as $q = q(y, \delta)$, and it is easy to show that $q_\delta < 0$. Now consider a point (y^*, δ^*) on the agent's best response function which is a profit maximum. By the principal's first order conditions, we have $r'q_y = 1$ and $U_y r' q_\delta + U_\delta = 0$. Increasing δ by $\Delta\delta$ leads to a direct increase of $U_\delta \Delta\delta$ in the principal's utility. The agents quality supplied decreases by $q_\delta \Delta\delta$, so revenue decreases by $r'q_\delta \Delta\delta$, the disutility of which is $U_y r' q_\delta \Delta\delta$. The total utility change is then $(U_y r' q_\delta + U_\delta)\Delta\delta = 0$. So in the neighborhood of equilibrium the principal incurs second-order losses in profit for acting on anti-social preferences. By contrast, we have seen that the costs to

the agent are clearly first-order.

To finish the proof of Proposition 4, note that where short-side power is absent, the agent need tolerate no abuse, since there is no loss to the agent from replacing this relationship with its next best alternative. More formally, in the absence of short-side power, to change δ from its equilibrium level δ^*, the principal must increase y enough to leave the agent indifferent to the change. Thus we must have $v_y\Delta y+v_q(q_y\Delta y+q_\delta\Delta\delta)+v_\delta\Delta\delta = v_y\Delta y+v_\delta\Delta\delta = (u_y\Delta y+u_\delta\Delta\delta)/(\rho+p) = 0$, so $\Delta\delta > 0$ implies $\Delta y > 0$. The cost to the principal is then $U_y(r'q_\delta\Delta\delta - \Delta y) + U_\delta\Delta\delta = -U_y\Delta y < 0$, which is a first-order loss to the principal.

Our suggestion that the imposition of first-order costs of an objectionable nature at no (or only second-order) costs to oneself constitutes an unaccountable abuse of power perhaps needs some explication. First we do not suggest that an assault on the dignity of an agent is abusive only when it is costless. Rather, its costlessness makes unaccountable what is already abusive. Second, to study the cost of indulging one's preferences for antisocial behavior by reference to a counterfactual level of abuse which would occur in the absence of these preferences does not condone any particular level of abuse. It is not reasonable to argue that the level of sexual harassment or racial discrimination that maximizes profits is for that reason morally acceptable.

It might appear that because the agent has optimized with respect to variables under his or her control, analogous reasoning would imply that the agent could (in the neighborhood of equilibrium) vary any of these to impose first-order costs on the principal at only second-order cost to himself or herself. If so, the agent could abuse the principal at zero cost. But the analogy is false because the principal is indifferent between this transaction and any other and hence would terminate the exchange if the agent were to impose more than second-order costs additional to those selected by the principal.

We illustrate this result in Figure 2, depicting the agent's best response function with y fixed at some arbitrary level. Compensation along $u = u^*$ is clearly more costly in foregone profits of the principal than the agent's response along the best response function. Figure 2 motivates a second comparison of the Walrasian and contingent renewal case: the level of δ offered in a contingent renewal equilibrium will be greater than that in a market-clearing equilibrium constrained so that the utility level of B be not less than under contingent renewal. Recall that in the continent renewal equilibrium $q_\delta < -u_\delta/u_q$. It follows readily that maximizing either U or π subject to the constraint that $u \geq u^*$ (the constrained Walrasian case) will entail a higher level of δ than in the contingent renewal case.[19]

Figure 2 About Here

The introduction of optimal fees considerably alters this conclusion. Because, as we have seen, the equilibrium fee transfers to the principal the agent's entire net benefits of the transaction, first-order reductions in the well-being of the agent entail first-order costs to the principal. Power may nonetheless be abused, but the principal must pay costs in forgone transaction fees. Moreover because the agent's level of well-being is a constraint in the principal's optimal fee problem, the foregone fees correctly measure the agent's relevant marginal rates of substitution. Thus Proposition 4 does not apply where optimal bonding is operative.

The upshot of Proposition 4 is thus that optimal fees will reduce the well-being of the agent to his or her reservation position but in so doing will force the principal to account accurately for the agent's relative valuation of the instruments under the principal's control. The optimal fee equilibrium thus more efficiently addresses the agent's preferences but at a lower level of agent utility than the equilibrium without fees. The paradoxical result is thus that where power is thus efficiently wielded it cannot be abused at zero cost. The abuse of power as defined here arises because in the absence of optimal fees, the contingent renewal equilibrium is not Pareto-optimal. Thus Propositions 3 and 4 are related: the first asserts the Pareto-improving status of short-side power and the second is true because equilibria supporting the exercise of short-side power are not generally Pareto optimal.

6 The Extent of Power and its Determinants

These last remarks suggest that holding short-side power is not reducible to such conventional economic desirata as profitability, wealth and well-being. The asset-rich are better positioned to hold power because they have the means to pay for it. This indicates a positive association between power on the one hand and wealth or well-being on the other. But for those not holding power, being subject to the power of others increases wealth and well-being, since the present value of begin subject to a contingent renewal threat is tautologically greater that the value of the

[19]This result does not imply that the level of δ sustainable in equilibrium would be higher if contracts in q were third party enforceable. The reason is that two effects of opposite sign would be at work in moving from the contingent renewal equilibrium to the Walrasian equilibrium: though in the latter B's valuation of variations in δ would be fully accounted for in A's optimization, A would also be in a position to make B an offer equivalent to his or her reservation position z, and as a result the resulting equilibrium would disfavor B, one result of which can be a lower level of δ.

fallback position. In addition, while power may be deployed to enhance wealth, as it is in our principal-agent model, our analysis of the abuse of power illustrates that power may be exercised with other objectives. Conversely, the abuse of power is curbed by an optimal fee structure that *reduces* the agent's wealth and well-being.

If power cannot be reduced to other measures of economic status, might it be itself measurable, so that its determinants could be more precisely identified and studied using standard analytical methods? The central role of sanctions in the exercise of power suggests the size of the equilibrium enforcement rent, $v^* - z$, as a measure of power. This measure is attractive because it represents exactly the cost to the agent of the sanctions that can be imposed upon him. Moreover variants of this index in employment relationships have been used successfully in the econometric explanation of secular movements in labor effort, labor productivity, strike activity, and profit rates.[20]

This measure however does not serve all purposes. Since $v^* - z$ is measured in the agent's utility units, it does not directly measure the *cost* of holding power; i.e., what the principal has given up in order to hold the short-side position. For instance, we might not consider a principal equally powerful before and after some exogenous change which required a substantial increase the payment y needed to sustain the same level of threatened sanction. Thus the cost of holding power is better measured by the flow variable $(y + cm + sm - \underline{y})$, where $\underline{y}$ is the minimum payment needed to induce the agent to accept the position.[21] Moreover, $v^* - z$ does not perfectly measure the extent to which the agent acts differently than in the absence of power. For this we might prefer the quantity $(q^* - \bar{q})$ as a measure. Nor does $v^* - z$ measure perfectly the expected costs to the agent of acting in a manner adverse to the principal's interests, for which the expression -$p_q(v^* - z)$ is the relevant expression. Indeed, these two measures are ordinally equivalent,

[20]A common measure of the enforcement rent in the employment relationship is (w-u)d, where w is the weekly after tax earnings and nonmonetary compensation, u is the expected weekly level of income replacing transfers available to those who have lost their jobs and d is the number of weeks of expected duration of the spell of unemployment. Bowles, Gordon and Weisskopf (1983), Schor and Bowles (1987),Bowles, Gordon and Weisskopf (1989). **?** calculate employment rents as present values of expected income streams and find that for the U.S. since 1945 they constitute a significant fraction of an employed worker's annual income. Schor (1988) used a measure of the employment rent to predict direct measures of work effort for a sample of firms in the U.K. Bowles (1991) used a variant of the first-order condition (2) to derive a wage equation for the U.S. using as explanatory variables the exogenous elements in the employment rent.

[21]Of course distinguishing between the cost of exercising power and other costs (e.g. costs of production) is virtually impossible in some situations, as for example, where technologies or methods of organizing production are selected in part for their value in lowering the cost of monitoring.

since by the agent's first order condition (2) $-p_q(v^* - z) = -u_q$, and -u_q varies monotonically with $(q^* - \bar{q})$. We may refer to these ordinally related measures as *behavioral effects* of the exercise of power.

We shall leave aside the cost and the quantitative effects of the exercise of power to study how power itself, as measured by $v^* - z$, varies in response to the displacement of equilibrium by exogenous changes in the parameters of the model. We base our results on the example presented in Section 3, with dismissal function $p(m, q) = m(1-q)$, utility function $u(y, q) = ay - b/(1-q)$, and profit schedule $\pi = rq - (y + cm(1-q) + sm)$. The base position for the analysis, as before, will be the parameter values $a = b = c = s = 1$, $\rho = 7\%$, $z = 10$, and $r = 20$.[22]

We first explore the effect of a change in the marginal utility of income, allowing the parameter a to vary from 0.60 to 100.[23] As Figures 24 and 25 show, both power and profit increase with the marginal utility of income of the agent. Figures 21-23 show why: as the marginal utility of income increases, the principal lowers both monitoring intensity and the payment (Figures 21 and 22), while equilibrium quality increases (Figure 23). We may summarize by saying that the less the cost of using the threat of sanctions as an incentive device, the more it will be used, and hence the greater will be the equilibrium power of the principal.

We might expect changes in the marginal disutility of effort to have the opposite effect, but this is not the case. Figures 19 shows that as the disutility of effort increases from $b = 0.01$ to 1.8 (after which profits become negative), profits do decline, but Figure 20 shows that the equilibrium power of the principal increases monotonically. Figures 16-18 show that the principal reacts to an increase in b by increasing both the monitoring intensity and the payment, but equilibrium quality nevertheless falls. We may summarize by saying that the greater the incentive of the agent to supply low quality, the greater the equilibrium power of the principal.

Equally interesting, and perhaps at first counterintuitive, is the behavior of equilibrium power in response to changes in the cost of replacing the agent. In the range $c = 0$ to 70 (after which profits are negative), profits decrease as expected (Figure 9), but in this case equilibrium power *increases* monotonically as the cost of replacement increases (Figure 10). This behavior is explained by the fact that as c increases, monitoring intensity declines (Figure 6) and the payment to the agent

[22]The qualitative results reported here persist for a wide variety of base point positions, and we have encountered no exceptions where the solutions themselves are economically meaningful. However we have found the general comparative static equations too complex to solve or to sign in general.

[23]Below $a = 0.60$ profits are negative, and above $a = 100$ no new phenomena occur.

increases (Figure 7), both of which are expected. While quality declines (Figure 8), the probability of termination also declines (not shown) from about 26% to under 6% per period, again as expected. The result is an increase in $v^* - z$. In other words, the more costly it is to replace an agent, the greater will be the optimal enforcement rent of the agent, and hence the greater the power of the principal.

Variations in the size of the entrance fee f charged a new agent will of course the same effect as a reduction in the replacement cost to the principal.[24] Therefore large fees imply larger profits and lower power in equilibrium for the principal. This behavior is explained by the fact that as f increases, monitoring intensity increases (this is the so-called 'moral hazard effect' and the payment to the agent declines (again, because the principal is not averse to replacing the agent and receiving another fee). Thus the probability of termination increases, while equilibrium power $v^* - z$ falls. In other words, the greater the entrance fee, the less the optimal enforcement rent to the agent, and hence the less the power of the principal.

How does the cost of monitoring affect the equilibrium level of power? As monitoring costs vary from $s = 0.40$ to $s = 25.0$, profits fall, as might of been expected (Figure 14),[25] but again it is somewhat surprising to find that power increases with monitoring cost (Figure 15). This occurs because the level of monitoring falls (Figure 11), while the payment remains fairly stable until $s = 2$ (Figure 12), and then begins to rise sharply. Even though quality falls (Figure 13), the employment rent unambiguously rises. It is clear that an increase in the agent's discount rate, or equivalently on the probability of termination independent from the level of quality (for instance, a change in the intercept of the $p(m, q)$ schedule, which we have assumed is the origin), should entail a fall in profits for the principal, the effect on power is not obvious, although of course the direct effect is a reduction in the present value of the position. In fact, varying the discount rate from $\rho = 1\%$ to $\rho = 25\%$ (where profits become negative), profits fall (Figure 29) and equilibrium power does decline (Figure 30), even though the wage increases throughout (Figure 27).

Finally, while an increase in the agent's fallback position unambiguously increases the payment and decreases profits, it has no effect on the employment rent and hence on the equilibrium level of power. This is exhibited in Figures 1-5. In

[24] This is the moral hazard problem concerning the principal, whose has an incentive to terminate an agent simply to acquire the additional fee (Carmichael 1985).

[25] Some students of work organization have suggested that increasing the transparency of the process of work and rendering substandard effort levels more noticeable may have been an initial motive for the introduction of assembly line production (Marglin 1974, Gordon, Edwards and Reich 1982).

effect, the principal's real choice variables are m and $(y - \rho z)$, so both m and $(y - \rho z)$ are fixed independent of z. This result should not be surprising, since short-side power is not synonymous with advantage. Rather power is the capacity to secure advantage by the threat of imposing sanctions, and the improved position of the agent vis-a-vis the principal does not in general entail a reduction in this capacity of the principal.

7 Conclusion

There is no presumption that power and profits vary in the same direction in response to changes in the underlying parameters of a contingent renewal market. This is the ultimate reason for requiring both concepts in a theory of competitive equilibrium under conditions of endogenous enforcement. For instance, we have seen that changes in the fallback position, the marginal utility of income, and the discount rate of the agent cause profits and power to move in the same direction, while changes in replacement costs, monitoring costs, and the disutility of effort cause profits and power to move in opposite directions. These inverse relationships between power and wealth returns our attention to the three other concepts of power: purchasing power, bargaining power and market power, and to their relationship to short-side power.

We have observed that purchasing power is measured by wealth and need not involve the use of sanctions. While it may seem redundant to invoke the term power in reference to the size of a person's budget, this usage is consistent with Dahl's definition cited at the outset, for the purchaser of a can of tuna has caused someone else (strictly speaking, many other people) to do something they would otherwise not have done. In our model, by contrast, an increase in the wealth of the agent increases both purchasing power and the agent's fall back position, but we have seen that this has no necessary impact on the power of the principal over the agent. While wealth is often a precondition for exercising short-side power, it need not be, and variations in the wealth of the principal in our example would not affect the extent of the principal's power over the agent in any determinate way (though it clearly might affect the number of agents over whom the principal had power).

In covering the case of purchasing power exercised on a perfectly competitive market with exogenous enforcement of claims, Dahl's definition thus is considerably broader than our sufficient condition for the exercise of power. However, as it entails the tuna shopper's power over the stock handler in a distant warehouse

(causing him to ship the replacement can to the shopper's grocer) this breadth extends beyond the customary usage of the term and requires that all social interactions even of the most remote, indirect and possibly symmetrical types be represented as power relationships. Strictly speaking, according to this definition, every actor in a general economic equilibrium may have power over every other actor, for each purchase has effects on the vector of equilibrium prices thereby altering not only the incentives facing others, but their budget constraints and hence level of purchasing power as well. But if all the relevant transactions take place on clearing markets with exogenously enforced contracts, we think it odd to say that in purchasing some commodity A (the shopper) has power *over* any B, for in equilibrium each actor is indifferent to marginal variations in the quantity sold, and thus experiences a vanishingly small variation in utility or profits as the result of A's actions.[26] If a political designation is to be applied to the size of one's feasible set of purchases, freedom (suggesting a relative lack of constraint) rather than power would seem to be more apt.

By contrast to purchasing power, which like short-side power may obtain in perfectly competitive exchanges, market power is generally equated with a capacity to set prices and presumes monopolistic competition. It is common to describe large firms, unions, and other major economic actors as powerful, and to attribute this power to some less than fully competitive aspect of market structure.[27] In economic exchanges a large firm may face a strategy set and associated payoffs which are in some sense less constraining than those facing perfectly competitive actors. But it is not clear that this constitutes power in any well defined sense.

To see this, notice that in the standard monopolistic competition case, profit maximizing prices exceed marginal cost by an amount that varies inversely with the elasticity of the demand curve. It might thus seem natural to measure the degree of market power by $(p - mc)/mc$, or what is sometimes termed the markup. But the markup, far from providing a compelling measure of market power, reveals a serious ambiguity. A seller with market power defined in this way is not indifferent to small variations in sales at the equilibrium price: the seller receives a rent $(p - mc)$ on the marginal unit sold. Thus, paradoxically, a buyer may sanction

[26]Our reservations concerning Dahl's definition are more general than our objections to the concept of purchasing power. If the agent in our model, by providing a higher level of q, can alter the probability of that A will terminate the exchange with B can we say that B exercises power over A? In focusing solely on behavior, Dahl's definition requires a positive answer; by including a consideration of interests and sanctions in our sufficient condition we avoid this apparent anomaly.

[27]Large economic actors often exercise substantial influence over public policy, for example, but our concern here is power in economic exchanges not in the realm of government.

the holder of market power by withdrawing the marginal purchase, incurring only second order costs while inflicting first-order costs on the monopolistic competitor. Indeed, the degree of market power is a measure of the size of the possible sanction against the putative power holder.

But does the buyer rather than the seller thereby exercise power (in this case of the short-side type)? The buyer is indeed the short-sider, for the desired level of purchases falls short of the desired level of sales at the equilibrium price: the seller with market power is quantity constrained. However, given the institutional assumptions of the monopolistic competition case, the buyer is not generally able to behave strategically toward the seller, for example, to use the threat of withdrawing the rent to affect the behavior of the seller. short-side location in itself thus does not confer short-side power; the apparent potential for short-side power of the buyer is not operative against the seller holding market power.

The fact that the buyer cannot be said to exercise power over the actor with market power is not sufficient, of course, to establish market power as a coherent concept. It remains unclear what the price setting associated with "market power" allows and why it depends on the absence of competition. If charging a price other than that which maximizes profits is not in the interest of the monopolist, it is difficult to see why the capacity to do this should be called power. Unlike the short-sider, who carries out the treat of termination as an equilibrium strategy, the monopolist appears to exercise no power in equilibrium. One might (correctly) observe that in the neighborhood of equilibrium an oligopolist (as price setter) can vary the price at second-order small cost, perhaps punitively imposing first-order costs on a buyer.[8] But in this the monopolist is no different from the principal in a contingent renewal model, which as we have seen requires no non-competitive elements. If purchasing power may be said to be vague by reason of excessive breadth, market power is vague by reason of conceptual ambiguity.

The term bargaining power is generally used to designate either the determinants of a division of shared gains or the outcome of the division itself. Thus in non-cooperative sequential offer bargaining games of the type studied by Rubinstein and others the division of the pie depends on such variables as the rates of time preference of the players, the frequency and attractiveness of outside offers, and which player moves first.[28] As these determine the equilibrium outcome, they might be said to jointly constitute bargaining power, perhaps measured by the resulting division of the pie. Similarly, in cooperative bargaining games one might simply take the division itself as a measure of bargaining power, as is commonly

[28]Osborne and Rubinstein (1990).

done implicitly in the Nash bargaining solution.[29]

The two concepts of bargaining power may be contrasted; the former deriving from an explicit model of the bargaining process and the latter considering only the results, for example. But they both differ considerably from short-side power in that bargaining power is either measured by or determines what may be termed bargaining rents, namely the extent to which an actor's outcome is an improvement over his or her reservation position. The short-sider, by contrast, is indifferent to the continuation of the transaction and holds power precisely because the long-sider with whom he or she transacts receives a rent in the transaction, namely a level of well-being above and beyond the long-sider's fallback (equal to $u(q, y) - \rho z$ per period). Thus bargaining rents are associated with the possession of bargaining power while enforcement rents are associated with the status of being subjected to the short-side power of another actor.

Though apparently contradictory, both concepts point to capacities which one would uncontroversially term power. If we observed a group of workers paid considerably in excess of their fallback wage by a firm which is indifferent between relocating or remaining in production with these workers, we cannot conclude on the basis of this information anything about the extent of power held by each, though conceptions based on bargaining rents and enforcement rents would surely suggest compelling yet opposed answers. If we were to discover, for example, that the firm is prohibited from relocating or closing down, we might conclude that the workers had used their bargaining power to reduce the firm to its fallback position, capturing all of the bargaining rents and thereby holding all of the power. But if we were to find instead that the wages had been set by the firm and that the workers were subjected to job termination at zero cost to the firm, we might conclude that the firm, not the workers, held power. Analogous differences might arise in studying the power of two members of a couple, the one indifferent to dissolution of the bond and the other enjoying a level of well-being in the relationship considerably in excess of their fallback.

The discrepancy stems not from a flaw in one or the other of the two concepts, but from a difference in the structure of the social interactions being studied in the two cases. The concept of bargaining power derives from a model of a division of costlessly contractible gains in which (if there are joint gains to be had) it is never credible to threaten withdrawal from the game. By contrast short-side

[29] If the fallback utilities for two bargainers i and j are scaled to zero and the bargained outcomes yield utilities u_i and u_j, we may term β the bargaining power of i if the outcomes represent the Pareto optimal outcome which maximizes $u_i^{\beta} u_j^{(1-\beta)}$.

power arises in repeated games concerning endogenous enforcement of claims in which termination of an agent by the principal is often an equilibrium strategy. Interactions approximating both models would seem to be quite common. The two concepts thus appear to be complementary.

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