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People Pay for Power*

by

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Abstract

Power is a central and extensively discussed issue in most social sciences. In economics, however, power plays a very small role, at least in modern neoclassical theory. This paper undertakes a new effort to look at power from an economic point of view. We concentrate on how particular aspects of power are *reflected in markets*. The basic premise is that people value both income and power, and that therefore they have a *willingness to pay for power*. Conversely, they must be *compensated* for being subjected to power by others. Such a concept yields empirically testable hypotheses. We present econometric estimations of wages paid in Switzerland and of returns on US capital markets, which reveal that people are indeed willing to give up income in order to have the possibility to exert more power. Thus, power does no longer 'fall from heaven' but is acquired by people who are willing to pay for it.

1. Introduction

With respect to power, economics differs fundamentally from the other social sciences. Power plays a very small role in economics, at least in modern neoclassical theory¹. 'Power in the Economy' – whatever its definition – tends to be neglected not only by economists but also by the other sciences which mainly consider power in political and social relations. Thus, economist Boulding, who looks at the issue in a broad way in his book *Three Faces of Power* (1989), does not present any testable propositions or empirical estimates. Wrong (1979) in his extensive book survey on power in the social sciences fails to even mention aspects of power in the economy, as well as in economic science.

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¹ 'Power' even fails to make an entry in the modern encyclopaedias in economics, such as Palgrave's *Dictionary* (1987) and Palgrave's *Dictionary of Law and Economics* (1998).

Heterodox economics has paid more attention to power, especially Marx and his followers and the 'old' institutional and historical schools. Also, great economists of the past (such as Böhm-Bawerk) have dealt extensively with the phenomenon of power.

According to Rothschild (1971, p. 8), the major reason why neoclassical economics disregards power is the "complete victory of perfect competition". This statement is certainly as true today as it was almost thirty years ago. Outside perfect competition, there are monopolistic firms exerting power but this aspect is not analyzed in these terms by modern theory, in particular industrial economics. There are two areas in contemporary economics where 'power' plays a prominent role. First, the game theoretic *ex ante* power concept devised by Shapley and Shubik (see e.g. Roth, 1988), and Bhanzaf (a good overview can be found in Brams, 1976) attributes power to those actors who transform a losing coalition into a winning one. The corresponding power index has been widely used to empirically compute the deviation between the number of votes and the chance to be the pivotal, and therewith powerful, actor (see e.g. Dreyer and Schotter, 1980 who use that concept to investigate the consequences of a quota change in the International Monetary Fund). Second, there exists an extensive literature on the bargaining power in the theory of noncooperative bargaining games (i.e. the power to receive a large fraction of some joint surplus e.g. by having the power to make take-it-or-leave-it offers).

After what has been said, it is certainly risky to deal with power in the economic context. This paper therefore consciously focuses on a *very special aspect* of power. We do not venture a formal definition of the 'essence' of power but rather observe what individuals themselves take to be power by looking at their *behavior*. We start from a common sense concept – at least to economists – and look at how this aspect is *reflected in markets*. The basic premise is that people value both income and power, and that therefore they have a *willingness to pay for power*. Conversely, they must be *compensated* for being subjected to power by others. Our approach thus relies on the standard concept of compensating wage differentials to identify and measure power.

That power is an important part in most individuals' utility functions was realized long ago by Bentham (1789), one of the founders of today's utility theory. The sources of utility he lists include not only pleasures of sense and wealth but also the pleasures of skill, self-recommendation, a good name and *power*. Just like Bentham's, our notion of power refers to an *intrinsic enjoyment* of personal domination or political influence. Another 'intrinsic' reason why people value power may involve expressive motives. For example, media owners or journalists may derive utility from being able to express their views. Such an intrinsic notion of power is sharply contrasted by conceptualizing power as instrumental. In such a view, people would not value both income and power; they value income only, but power is a means to obtain more income. Even though people might have a willingness to pay for power also under the second notion of power, such willingness can

be regarded as an investment today to receive more income in the future rather than as a willingness to pay for exerting power. Both areas in which power plays a role in contemporary economics (i.e. the game theoretic power indices as well as the theory of noncooperative bargaining games) fall under the latter notion of power. This implies that the intrinsic aspects of power have so far been neglected by economic research, although we know from sociological research that the intrinsic notion of power is of tremendous importance for the behavior of many people (see e.g. the surveys of Zelditch, 1992; Orum, 1988 or Philp, 1985). For this reason, we will concentrate on the intrinsic conception of power in this paper and carefully separate the willingness to pay for power from any investments made.

The approach chosen makes sense when individuals have sufficient freedom to choose, i.e. dispose over a significant opportunity set. In our empirical estimates, we look at power as reflected in the *labor market* as well as in the *capital market*. While on the former, people who value the exertion of power are prepared to pay for that privilege by *ceteris paribus* accepting a lower wage, they accept a lower rate of return when investing in companies that can exert 'political power' on the latter.

The remaining parts of this article are organized as follows: Section 2 considers how power is reflected in labor and capital markets. The following section 3 focuses on how power is revealed in *labor markets* as well as *capital markets*, formulates corresponding empirically testable hypotheses and presents econometric estimates using survey data for Switzerland as well as US capital market data. Also, alternative interpretations of the results presented are discussed. The final section 4 concludes.

2. Power as Reflected in Markets

Power is hard to define and even harder to measure. The procedure followed in this section therefore follows a different path: *Conditions* under which people can exert or are subjected to power are isolated. Conditions may differ *between* sectors, firms or organizations but also *within* firms or organizations.

The procedure chosen has the advantage that we do not have to start with a formal definition of power but rather leave it to the individuals to evaluate what subjectively they consider to be power. In order to determine the conditions under which people subjectively feel to have power a broad approach is needed. We focus on very large markets and seek to identify situations in which we as outside observers *a priori* expect that people experience power. However, we do *not* stipulate that such power is in actual fact exerted but deduce the existence or non-existence of power from actual behavior.

People's willingness to pay for holding power, and their willingness to be compensated for being subject to power, can be empirically observed on the labor and the capital market.

2.1 Labor Markets

Following the fundamental economic principle of compensating wage differentials (see e.g. Thaler and Rosen, 1976; Brown, 1980 or, for a literature survey, Rosen, 1986), employees who derive higher than average utility from part of their work (or from their income) have to be compensated less. Certainly "power", in the form of either having political influence or being able to direct and give orders to subordinates, belongs to this category (a good survey on the importance of power as a motivator for managers is given in McClelland and Burnham, 1995). This reasoning is based on the (reasonable) assumption that people enjoy both income (Y) and power (P), i.e. their utility function is of the form $U = U(Y, P)$, with both first derivatives being *non-negative*. Therefore, having more power can compensate for a lower income, and having less power can be compensated by a higher income, while utility remains constant. As a result, in equilibrium, employees with positions of higher power receive a *lower* (or at least *not higher*) compensation.

Two labor market areas are of particular interest:

1. *Political and bureaucratic power.* People are prepared to accept lower wages for working in sectors with *political influence*. Typical economic sectors for which we expect this to hold are the media sector (newspapers, television and radio stations, etc.), strategically located sectors which are able to effectively disrupt the economy such as utilities (gas, water, electricity) or transportation (buses, trains, tubes, taxis, etc.). Traditionally, heavy industries (steel, coal) as well as the defense industry can also be expected to be in a strategic position. The same holds for public administration (police, customs, tax collection etc.). In all the sectors mentioned above, employees have some amount of discretionary power which they value (i.e. it does not only go to the firms' owners, which is, of course, part of the principal-agent problem). Thus, they are prepared to work for a lower salary than in a corresponding activity without such influence (e.g. instead of doing journalistic work for a firm whose products they have to advertise). We refer to this kind of power as *external power*.
2. *Position within firms and organizations.* According to Dahl (1963, p. 52–53) "... an actor's power is closely correlated with his position in a ... hierarchy". As we assume that people value power, we would expect, that the higher a person ranks in an organization's hierarchy, the *lower* is the salary. We call this phenomenon *internal power*. This hypothesis follows immediately from the economic idea of compensating variation. However, it is not trivial at all: in most other social sciences it is assumed as a matter of course that higher power goes with higher income (see e.g. the 'managerial power model' discussed in Lambert, Larcker and Weigelt, 1993).

2.2 *Capital Market*

Some of the power aspects noted for labor markets are also reflected on capital markets. Thus, for example, if the media can exert political influence, investors interested in public influence or power are prepared to pay a higher price and accept a lower rate of return for respective property titles. This is true for all the sectors mentioned above under the premise that investors either hold a majority of the respective company and therefore can extract all the power-benefits or identify very strongly with the company even if they hold only a fraction of its shares. The former is of particular importance when analyzing mergers or acquisitions. Surcharges over marketprice for firms engaged in one of the power sectors defined above tend to be much larger than for firms that do not have any political power. A good example would be the media business where in the last years huge conglomerates emerged that are willing to pay enormous surcharges to enlarge their influence (see, e.g. *The Economist* (1995) for the case of Time-Warner buying CNN from Ted Turner).

As for the latter, we will argue in section 3.2 that companies active in one of the power sectors perform worse on capital markets even if there is no dominant shareholder. This is true even in the long run, which might be somewhat disturbing, as there should not be any systematic differences in return on efficient markets. As we will argue, a behavioral model of financial markets will resolve the puzzle.

There are also specific forms of power visible only on financial markets. An important one relates to the structure of ownership. There is a price and return differential between stocks with and without voting rights (see e.g. Hart, 1995). People are prepared to pay for the right to vote in a company's general meeting by paying a higher price for shares with voting rights (and thus accepting a lower rate of return). As shown in many studies (see e.g. Bergstrom and Rydquist, 1990, or Levy, 1982), the difference cannot solely be explained by lower liquidity. As Gardiol, Gibson-Asner and Tuchschnid (1997, p. 300) put it, "the valuation of corporate control benefits is an important explanatory variable in the price formation mechanism of dual class shares". In their most recent analysis, two economist from Credit Suisse First Boston (von Ballmoos and Pernet, 1998) estimated the unexplained price-difference between shares with voting rights and shares with equal financial rights but no voting rights to be as large as 18 percent on the Swiss capital market in 1998.

Also, marginal stocks that allow dominance over a firm carry a higher price than other stocks (see e.g. Rydquist, 1989). Such price differentials play a prominent role in mergers and acquisitions.

3. Econometric Analysis

3.1 Labor Markets

Hypotheses

In order to test whether power is reflected in differential incomes, the following wage equation is considered:

$$\text{wage} = f(\text{education, experience, tenure, institutions, } \dots, \text{power})$$

and we empirically test the proposition that

$$\frac{\partial \text{wage}}{\partial \text{power}} < 0$$

The first arguments in the wage function (education, experience, tenure, ...) comprise all determinants taken into account in standard wage functions. Their purpose is to control for those factors that influence the productivity of a worker and therefore for economic reasons affect wages.

With respect to *external power*, the following hypothesis can be formulated:

Hypothesis S: Power can be captured between firms; i.e. there are sectors of occupation with hypothesized power (*p*-sector) and others without such power. As argued above, the media, public administration, utilities as well as transportation are expected to be power sectors.

The second hypothesis refers to *internal power*. It is quite difficult to compare the hierarchical level of two persons as there are a great variety of titles. We therefore concentrate on the number of subordinates as a proxy for hierarchical position as did many authors in the managerial power literature, e.g. Finkelstein (1992).

Hypothesis R: Power can also be captured within firms; the higher the rank in an organization, measured by the number of inferiors, the more power can a person exert.

Especially for the second proposition, the *ceteris paribus* condition is crucially important. Persons in higher positions receive higher incomes because they have, on average, higher education, have been associated with the firm for a longer period of time, are predominantly male etc. Our proposition thus refers to the "pure" effect of power (derived from a certain position) on compensation.

The two hypotheses can be expressed as follows:

$$\text{power} = \Psi(\text{p-sector, rank})$$

with

$$\frac{\partial \text{power}}{\partial p\text{-sector}} > 0 \quad (\text{Hypothesis S})$$

$$\frac{\partial \text{power}}{\partial \text{rank}} > 0 \quad (\text{Hypothesis R})$$

The two influences may positively interact

Hypothesis S&R: Only those people working in a *p*-sector who can take discretionary decisions, i.e. the superiors, can exert power.

This yields

$$\frac{\partial \text{power}}{\partial (p\text{-sector} \times \text{rank})} > 0 \quad (\text{Hypothesis S\&R})$$

In the econometric estimation both terms, the *p*-sector as well as the interaction term will be included.

The Data

The hypothesis developed is tested using data from the 1996 Swiss Labor Force Survey (SLFS). It includes roughly 16'000 respondents, who were asked detailed questions about their incomes, work experience, education and other variables concerning their work-life, as well as demographic characteristics. We restrict our attention to employees only. By doing so, we exclude people in education, the retired and unemployed, as well as the self-employed, whose income tends to understate the flow of monetary benefits from their jobs (this is mainly due to the Swiss tax system, which allows the self-employed to deduct many expenses). We also exclude those that refused to report their incomes. This, of course, might introduce a problem of selectivity. However, we believe that it is unlikely that the variables of interest are correlated with the probability of accepting or refusing to make an income statement.

The SLFS focuses on total compensation. Thus, the survey also includes questions on bonuses or non-monetary compensation (like company cars or company apartments). SLFS attributes monetary values to all these items to get a detailed picture of total compensation. To make wages even more comparable, we moreover correct for differences in weekly working time, vacation and overtime. The resulting average *wage per hour* is 39.65 Swiss Francs, with a maximum of 979.40 and a minimum of 0.10 Swiss Francs. Since an hourly wage of 0.10 Swiss Francs is not credible, we excluded all respondents that stated a wage per hour of less than

five Swiss Francs. By doing so, we exclude another 79 people, so that the final sample comprises 6941 observations².

Exactly 2400 people in our sample (or roughly 34 percent of the respondents) have at least one subordinate and are therefore considered to be superiors. The corrected average wage per hour of the superiors is 46.95 Swiss Francs. Comparing this to the average wage of the non-superiors (which is 36.25) reveals that superiors earn about 29 percent more on average.

Approximately one third of the respondents (35 percent) work for companies with more than 100 employees, only 10 percent work in very small companies (up to 30 employees), while the majority works for middle-sized companies with 30 to 100 employees. This corresponds roughly to the Swiss industry structure. Representativeness not only refers to the firm size but also to the industries that are included in the sample. Companies were grouped according to the industry classification provided by the Swiss Federal Statistical Office (SFSO).

The Estimates

As discussed above, we capture power by looking at mainly two different sets of data: (1) People working in power sectors can exert power; this measures power between firms or *external power*. (2) Power within a firm is measured by the rank in the firm hierarchy; we refer to this kind of power as *internal power*.

All our estimates are weighted using the cross sections weights provided by SLFS. The weights are necessary to correct for the representativeness, since the SLFS does not use a random, but a weighted sample.

The results of a weighted OLS regression explaining wages in Switzerland are reported in table 1. We use the logarithm of wages as the dependent variable. The coefficients can therefore be interpreted as the percentage changes in hourly wages for an individual with the respective characteristics over the wage of the reference group (male Swiss with just compulsory education not working in one of the sectors controlled for). In what follows, we will first discuss the results with respect to external power and then turn to empirical findings concerning internal power.

External power: The marginal effect on wages of working as a superior in one of the power sectors (media, public administration, utilities, transportation and heavy industry) is *negative*. This is consistent with hypothesis *S&R*. This results holds although the marginal effect of working in the power sectors is *positive* (although not on any traditional level of significance), which in fact does not support Hypothesis *S*. Two implications follow: (1) The interaction term more accurately mirrors power between firms than the occupation in a power sector as such.

² Excluding these people, however, leaves the average wage almost unaltered, and does not significantly influence the results.

(2) The hypothesis that the ability to exert more 'external power' reduces wages is supported by the estimation results.

Internal power: Superiors earn more than those that do not have anybody who works for them. However, the higher they climb the career ladder, the less they get compensated in monetary terms. Once they have more than 50 inferiors they do not receive any additional monetary reward for climbing additional hierarchi-

*Table 1 Power within and between Firms Dependent Variable is log(wage)
Fixed Effects-Model with 84 Sector-Fixed-Effects*

Variable	Coefficient	T-Statistic
Constant	3.08**	107.29
<i>Power Sector</i>	0.03	1.48
<i>Sup5</i>	0.09**	6.71
<i>Sup10</i>	0.11**	5.22
<i>Sup20</i>	0.12**	5.68
<i>Sup49</i>	0.16**	5.33
<i>Sup99</i>	0.14**	4.55
<i>Sup100+</i>	0.15**	5.19
<i>Superior in Power Sector</i>	-0.18**	-2.57
Tenure	0.01**	6.57
Tenure ²	-0.00**	-5.27
Experience	0.02**	11.27
Experience ²	-0.00**	-7.41
Female	-0.15**	-10.44
Married	0.08**	7.53
Temporary Resident	-0.13**	-3.32
Green Card	-0.06**	-4.22
Number of included Observations		6'912
Adjusted R ²		0.42

a *Sup5* means that the respective respondent has five people working for her. *Sup10* stands for a superior with 5 to 10 inferiors.

b Other control variables include: Company Size, Saturday, Sunday and night work, total working hours as well as a number of variables capturing education.

Data source: Swiss Labor Force Survey, 1996.

cal levels. This finding is consistent with hypothesis *R*. According to orthodox theory, one would expect 'big bosses' to earn much more than 'small fishes': having more inferiors increases responsibility (and therewith the risk of the respective superior to loose her job) and potentially productivity, which should be compensated by higher wages. But superiors with a larger number of inferiors at the same time enjoy comparatively more power. Hence, they are prepared to work for a lower wage, *ceteris paribus*. While on lower hierarchical levels the produc-

tivity/risk effect dominates, the compensating wage differentials effect eventually becomes more important as people are prepared to pay more money to reach more power. Hypothesis *R* regarding 'internal power' is therefore consistent with the data.

In addition to the two power hypotheses, the data support standard economic hypotheses: Education, sex, tenure, experience, etc. systematically influence wage rates in the expected directions.

The possibility that interacting rank with other sectors than the mentioned p-sectors would have a negative effect on wages has been tested. No other interaction term has a significantly negative coefficient. Also, none of the other results are reversed or became insignificant. Finally, it should be noted that the adjusted R^2 is extraordinarily high for a cross section analysis based on individual data.

Alternative Explanations

Our empirical estimation of power is based on a compensating wage differential approach. This conception is open to two types of criticism:

- (1) The correct value of the argument in the utility function in question – in our case power – is only revealed in an unconstrained competitive equilibrium, i.e. all adjustments must be assumed to have taken place.
- (2) The value reflected by the lower pay can be attributed to any argument in the utility function.

For example, there may be other benefits of occupying a position with a number of inferiors. The approach chosen does not provide any guidelines to differentiate between alternative explications. However, we believe that there are good reasons to attribute our findings to power. In the following we will discuss three of the explications most commonly put forward against our interpretation of the results.

Lower returns as an investment. The instrumental notion of power would attribute low income at the beginning of a career to people investing in future income growth. At the beginning of a career one might want to signal that one is a 'motivated talent' by accepting lower wages. Moreover, working for a low income at the beginning might help to stress one's commitment to the company. In both cases people do not accept lower wages because they value power but simply because they invest today in order to receive higher wages in the future. In our eyes, this argument is not convincing. As can be seen from table 1, having more subordinates, i.e. having further climbed up the career ladder, does *not* have a positive impact on wages. If the investment argument were true, exactly the opposite should occur: One would expect prospective managers to earn less at the beginning and then successively cash in as they move up the hierarchy.

Fringe benefits. Goods and services (such as using a car, or living in a low priced apartment, provided by the employer) may accompany a position with

many inferiors. Such privileges have the same character as monetary income, but may be unrelated to power. As pointed out above, SLFS tries hard to put a monetary value to fringe benefits in order to calculate total compensation. However, it might very well be that it systematically misses some. But unless one comes up with a good argument why such systematic errors should occur in power sectors only, we consider this highly unlikely.

Status and Recognition. A position in a power sector (such as the media) may provide high visibility, recognition and fame. Moreover, a higher position within the hierarchy might also be associated with a better status. According to Frank (1984) people have a willingness to pay for such things as status and recognition. The (cet. par.) lower compensation going with a particular position thus does not necessarily reflect power; it might also reflect people's willingness to pay for status. If this were the case, the results presented would be subject to a considerable missing variable bias. In order to distinguish between power and status we draw on a study conducted by Leu, Burri and Priester (1997). In 1992 they conducted an extensive survey focused on poverty in Switzerland among more than 6000 randomly drawn Swiss residents. Among many other questions, Leu et al. asked respondents to assess their social status. On a scale ranging from 1 to 10 people were asked whether they considered themselves to have a lower than average, average or above average social status. We took averages of the answers for each of the professional categories distinguished above. The professions with the highest self-declared social rating are (among others) pilots, teachers in primary schools and judges. Among those with the lowest status are steel workers and cleaning personnel.

The averages were added as an additional explanatory variable in the regression on power. As there were not enough observations in the sample of Leu et al. to compute reliable averages for all of the professional categories in our sample, the number of observations is reduced by 19. However, this reduction in the sample size does not have any qualitative effects on the coefficients. The results of the augmented wage equation are displayed in table 2 below. The inclusion of the status term adds significantly to the explanatory power of the equation. As can be seen from table 2, the qualitative results concerning our variables of interest remain unaltered: Being a superior in one of the power sectors still has a negative influence on wages and having more inferiors still does not positively influence wages.

The status term itself has a *positive* sign, which, in the light of Frank's theory of people having a willingness to pay for status, comes somewhat at a surprise. The positive sign most likely stems from the fact that the self declared social status is closely correlated with education. People with better education, on average, indicate a higher status. Including the status term can therefore be expected to reduce the importance of the traditional educational variables included in the regression and it in fact does so. The coefficients of all educational variables are reduced by roughly 10 percent and also the significant levels are somewhat smaller

(although all of them are still highly significant). Nevertheless, since our regression includes both, the educational level as well as the social status, the results indicate that people are not willing to give up money for higher social status.

A final remark on status seems appropriate: While the introduction of the status term helps to distinguish between status and power *between sectors*, it certainly does not help to do so *within* a given sector. Therefore, we cannot exclude the possibility that our findings regarding internal power are caused by a willingness to pay for status. Most likely, it is a combination of both, status and power, people are willing to pay for.

Table 2 Power and Status
Dependent Variable is $\log(\text{wage})$

Variable	Coefficient	T-Statistic
Constant	1.67**	16.06
Power Sector	0.06**	3.46
Sup5	0.09**	6.89
Sup10	0.12**	5.46
Sup20	0.12**	5.59
Sup49	0.19**	5.54
Sup99	0.17**	5.35
Sup100+	0.18**	5.32
Superior in Power Sector	-0.22**	-3.09
Status	0.22**	12.74
Tenure	0.01**	6.46
Tenure ²	-0.00**	-4.72
Experience	0.02**	10.75
Experience ²	-0.00**	-7.59
Female	-0.08**	-5.46
Married	0.12**	8.57
Temporary Resident	-0.15**	-3.63
Green Card	-0.08**	-5.58
Number of included Observations		
Adjusted R ²		0.46

Notes: see table 1.

Status stands for the self indicated social status of roughly 6'500 respondents in Switzerland. The study was conducted by Leu et al. (1997).

3.2 Capital Markets

Hypotheses

In this section, a compensating differentials' approach as in the preceding one is used. Now we seek to explain differences in returns on stocks. There exists a large literature showing that profitable arbitrage possibilities exist even if markets are competitive and the amounts traded are large. People prefer cash dividends (although this makes no sense as dividends are taxed while capital gains either are not at all or only at a lower rate), invest rather in formerly winning than losing portfolios (although this is much less profitable) and are way too risk averse when it comes to portfolio decisions (as compared to other risky engagements). This branch of literature is usually referred to as behavioral finance (an overview is given in Thaler, 1993). Behavioral refers to the enrichment of the basic economic model by recurring on insights gained by psychologists and other social scientists.

The approach suggested here lies on the same foundations. An augmented behavioral model is applied to financial markets in which people not only value monetary returns but also *power*. Thus, we hypothesize that returns on stocks depend on factors influencing the expected future flow of monetary returns as well as on the political power one associates with an investment. Therefore, we stipulate the following return equation:

$$\text{return} = r(\text{sales}, \text{employees}, \dots, \text{power}, \dots)$$

and empirically test the proposition that

$$\frac{\partial \text{return}}{\partial \text{power}} < 0.$$

As argued above, the political power associated with a company crucially depends on the sector within which a company is active. It is important to note that these are exactly the *same sectors* as those that were used to test for power on labor markets in the preceding section.

This leads us to the following hypothesis:

Hypothesis P: The political power of a firm is different according to the sector it is predominantly engaged in, i.e. there are sectors with hypothesized power (p-sectors) and others without such power. The different extent of political power is reflected in the returns on the stocks of the respective company.

Investors holding a majority of the respective company can extract all the power-benefits and are therefore more willing to pay for that privilege. But most publicly traded companies are owned by a great number of investors each owning only a fraction. Why should these people individually be willing to give up money

while the benefits have to be shared with a large number of others? To resolve the puzzle we draw on a branch of finance literature showing that many people identify very strongly with the companies they invest in, even if they hold only a fraction of the shares (see e.g. Christopherson, 1995). This identification might also be a reason for the surcharge paid on shares with voting rights as the identification with a firm tends to be strengthened if one can vote in the general meeting. Moreover, it helps to explain why many people are more reluctant to sell their shares than to buy new ones³. However, although people identify with companies they invest in, we hypothesize that their identification is not independent of the share of the company they own. Rather, the willingness to accept lower rates of return for a company active in a power sector decreases the less concentrated the shareholder structure of a company is. This leads us to the following hypothesis:

Hypothesis C: The higher the share the average investor owns of a company in a power sector, the more he or she is willing to pay for the political power associated with that firm.

Note that hypothesis *C* predicts exactly the opposite of traditional finance and principal agent theory. While according to traditional theory a higher concentration in the shareholders of a company results in *higher* returns (as the principal agent or public good problem becomes less severe), power theory predicts *lower* financial returns (in power sectors). The word 'financial' has to be stressed, as, of course, people that accept lower financial returns for companies in power sectors are getting compensated by owning part of a company that is able to exert political power (which yields utility, too).

The two hypotheses can be summarized as follows:

$$\text{power} = \Psi (\text{p-sector, concentration of shareholders})$$

with

$$\frac{\partial \text{power}}{\partial \text{p-sector}} > 0 \quad (\text{Hypothesis P})$$

$$\frac{\partial \text{power}}{\partial \text{concentration}} > 0 \quad (\text{Hypothesis C})$$

As we hypothesize that people are prepared to pay for power, we expect lower returns on shares for firms in power sectors as well as for firms in which the concentration of shareholders is higher.

³ There are, of course, alternative explanations for that observation, most prominently loss aversion (see Kahneman and Tversky, 1979).

The Data

The hypotheses are tested using capital market data from the United States. More specifically, we analyze returns on shares of the 500 US blue chips summarized in the Standard & Poor's 500 (S&P500) Index. The S&P500 Index is one of the most widely used benchmarks of U.S. equity performance. It consists of 500 stocks chosen for market size, liquidity and industry group representation. It therefore gives a good overview of all relevant US industries.

We analyze Compustat (a subsidiary of Standards and Poor's) data covering the period 1978 to 1997. This theoretically leads to 10'000 observations. However, there is a substantial number of missing observations for some of the variables we use. This may introduce a problem of selectivity. However, we believe it to be very unlikely that the variables of interest are correlated with the probability of the companies reporting proper data to Compustat. Moreover, we analyze first differences of all variables in order to make them stationary and comparable, which further reduces the sample. We finally end up with roughly 5800 observations.

In order to exclude as many alternative explanations as possible, we include a number of variables that might be responsible for differences in the capital market performance of a company. Three variables, which refer to the *risk associated with an investment*, are included. The first one is the Standard & Poor Debt Rating which covers the possible risk of default while the second one is the volatility of the respective share and therefore mirrors capital market risks. The last risk-variable is the percentage change in the number of shares traded; it refers to the liquidity risk. Four variables try to capture the *future performance of a company*. While this is inherently difficult, we follow Hall (1993) who considered percentage changes in sales, income, total invested capital as well as in the number of employees to be good proxies for the future development of a firm. We further include three variables describing changes in the *capital structure of a company*. They include the percentage change in the number of stocks and the number of shareholders. Moreover, we consider changes in the number of shares per shareholder, which we include as a proxy-variable for the concentration of shareholders. Finally we include the *Price-Earnings-Ratio (P/E-Ratio)* which is used very often by portfolio managers (see, e.g. Reilly, 1994, especially chapter 16) and up to five lags of the dependant variable 'return'.

The variable of interest for our purposes is the *power variable*. It is defined as a dummy, which can either take the value of 0 if the firm is not active in one of the power sectors or 1 if the firm is engaged in a power sector. The sectors are defined as above: About one third of the companies considered as 'powerful' are in the media business (print and electronic media as well as the film industry). The rest are companies in the defense and heavy industry sector, transport and utility companies as well as medical firms. It must again be stressed that exactly the same sectors are considered as power sectors as in the proceeding estimates concerning power on labor markets.

As noted above, percentage changes of all variables are used in order to make the companies comparable as they differ greatly in number of employees, capital employed or sales. The average return on shares of the 500 companies in the sample over the 20 years time span is 10.1 percent. This corresponds roughly to the returns found in other studies, which lie between 8 and 12 percent (see e.g. Campbell, 1996 for the United States, Bremer and Hiraki, 1999, for Japan or Buhler, Hax and Schmidt, 1999, for Germany). The average company sells goods or services for about 5.9 billion US\$ and grows with a rate of almost 15 percent per year (in nominal terms). It employs roughly 37'000 people and its labor force grows about 9.4 percent per year. Finally, it has almost 64'000 shareholders, a capital market value of more than 10 billion US\$ and the annual turnover in its shares reaches 3.6 billion. Compared to these overall figures, companies in power sectors are somewhat larger (with an annual turnover of 6.8 billion US\$), employ less people (29'500) and grow a little bit slower (12 percent per year in terms of turnover and 4 percent in terms of employees). An interesting difference is that 'power firms' have more than twice as many shareholders as the rest (136'000) and a market value which is more than twice the average market value of S&P500 firms (20.2 billion US\$). Both these differences persist despite the fact that non-power firms grow faster. This is especially interesting because it indicates that many people are interested in owning part of a 'power firm', which induces prices to rise.

Estimates

We try to capture power in the capital market by testing the two different hypotheses developed above: (1) We expect lower returns on shares of firms engaged in a power sector. (2) We expect higher returns for companies in power sectors if their shareholders become less concentrated. This stands in sharp contrast to the general expectation that returns are reduced if shareholders are less concentrated (because this accentuates the principal agent problem).

The following equation is estimated:

$$\text{return} = \beta_0 + \beta_1 \text{Power Sector} + \beta_2 \Delta \text{Shares per Shareholder in Power Sector} \\ + \sum_{i=3}^{12} \beta_i \text{ControlVariables} + \varepsilon$$

where the β s are the coefficients to be estimated, the *ControlVariables* stand for the controls introduced in the last section and ε is a white noise error term.

Table 3 presents the results of an OLS regression of the above equation. Only one lag of the dependent variable is included in the regression shown as explanatory variable; however, the introduction of up to five lags does not significantly change the coefficients of interest (although it somewhat reduces their signific-

ance levels). Besides the variables of interest and the control variables mentioned, we added dummy variables for each year (except for the base year 1978). This is done in order to eliminate effects stemming from monetary policy, business cycles, etc., which have roughly the same influence on all shares and which are of no interest here. Introducing these yearly dummies reduces the size of almost all coefficients and lowers the significance levels of most variables. Table 3 reports these corrected results.

The results are consistent with both hypotheses. The return on shares of companies active in a power sector is significantly lower than for the rest of the companies which corroborates hypothesis *P*. As this is the result of a *ceteris paribus* comparison (which takes into account different growth rates, etc.) our findings suggest that for the total returns to equalize between alternative investments, investors must get some other compensation for the financial loss they accept by investing in power firms. Returns from being able to exert political power fill that gap. One advantage of the approach chosen is that we are able to quantitatively determine how much people value political power. The regression results reveal that investors are willing to give up roughly *two percent* in financial returns when investing in power companies.

Table 3 Results of OLS Regression
Dependent Variable is Return of Shares

Variable	Coefficient	T-Statistic
Constant	0.142**	7.05
Power Sector	-0.020**	-2.30
Δ Shares per Shareholder in Power Sector	-0.050**	-3.24
S&P Debt Rating	-0.007**	-5.01
Volatility	0.146**	14.82
Δ Number of Shares traded	-0.116**	-19.93
Δ Sales	0.160**	6.15
Δ Income	0.001**	4.12
Δ Total Invested Capital	0.046**	3.23
Δ Employees	-0.018	-0.74
Δ Number of Stocks	-0.094**	-7.03
Δ Number of Shareholders	0.016**	4.13
Δ Shares per Shareholder	0.082**	5.09
P/E-Ratio	-0.000	-0.46
lag (return)	-0.096**	-7.70
Number of included Observations		5729
Adjusted R ²		0.29

Notes: All Changes are relative changes

Dummies account for yearly level effects for each year (except for 1978)

The results are also consistent with hypothesis C. The more the (political) power exercised by a company in a power sector has to be shared with other people, i.e. the less concentrated shareholders of a power company are, the less investors are willing to pay for the privilege of owning part of such a company. As can be seen from table 3, lower concentration indeed leads to higher returns in power sectors and vice versa. Exactly the opposite is true for non-power companies. For these firms, a decrease in the concentration leads to lower returns as the public good problem becomes more severe.

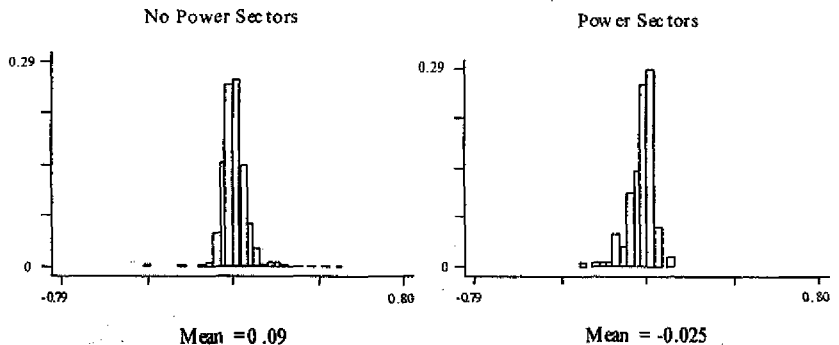
The coefficients of the control variables confirm earlier findings. Higher risks through low trading volumes or high volatility are reflected in higher returns. Expectations about the future prospects of a firm are important for today's performance and issuing more shares has a negative effect on existing shareholders.

Alternative Explanations

It could be argued that the above results are simply due to a missing variable bias. While some factors that affect returns were controlled for, it is certainly not possible to control for all of them. In order to put our results to a test, we took advantage of the panel data-features of the dataset and estimated fixed effects on the firm level as well as on the industry level. The distribution of the fixed effects, which account for all firm or industry specific effects that exist, are presented in figure 1 and 2. They are derived from an estimation of exactly the same equation as above (albeit without the power variables).

As can be seen in figure 1, the distribution of the firm level fixed effects of firms active in power sectors is moved towards the origin as compared to firms in non-power sectors. This results in a negative mean of the fixed effects of -0.025 while the mean of the non-power sectors is positive. This difference in the mean is not the result of an outlier but of a shift in the distribution and a test verified that the two means are different from each other at the 99 percent confidence level.

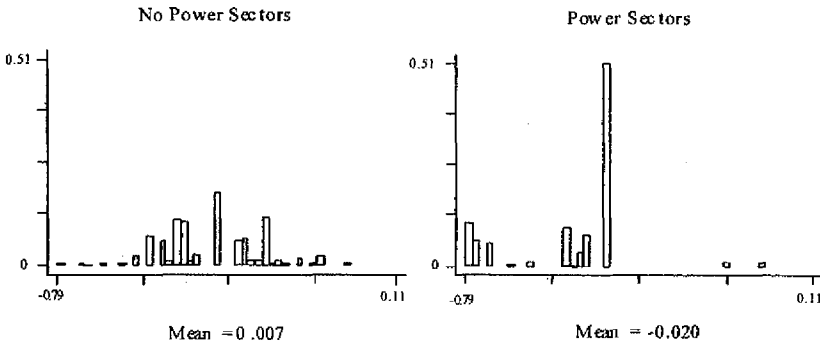
Figure 1 Distribution of Firm-Fixed Effects between the Sectors



Calculating fixed effects on the industry level shows the same picture. Industry is defined as the two digit SIC code. According to figure 2 the distribution shifts to the left and results in a negative mean for the power sectors while the mean for the non-power sectors remains positive.

The difference between the two means is significant at the 99 percent confidence level for the industry fixed effects as well.

Figure 2 Distribution of Industry-Fixed Effects between the Power-Sectors



4. Conclusions

The concept of "power" has been mostly disregarded in economic analysis but takes a central place in the other social sciences, in particular traditional political science. The concept is used here in a very specific sense, namely as an instance of compensating wage and return differentials. As power is undisputedly an element in the utility function of many or even most persons, such people are prepared to pay for exerting power, e.g. they are prepared to accept lower pay for work positions with power over other persons.

The idea used here of people who have a willingness to pay for power adds a new dimension to the concept of power discussed in various social sciences. Power does no longer 'fall from heaven' but is acquired by people who are willing to pay for it. Most importantly, our concept yields empirically testable hypotheses. In an econometric estimation of wages paid in Switzerland, we show that people are indeed willing to give-up income in order to have the possibility to exert more power. The same is true for the case of the US capital markets where investors accept lower stock returns in order to share the political power of the respective firms. It has to be stressed once more that the same sectors were considered power sectors in the case of capital markets as before in the case of the labor market.

Our analysis of power is presented with the understanding that the results are provisional, and that there are many possibilities to improve on them. In particu-

lar, our quantitative results are based on specific data for Switzerland and the United States.

With these reservations in mind, these are the two major results of our analysis:

- (1) People are willing to pay for having political influence (or *external power*). People are willing to earn less in a sector with political power and investors accept lower returns on capital markets in order to participate in the political power of a particular firm.
- (2) Having more inferiors increases *internal power*. Employees are willing to accept lower wages to exert this form of influence.

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