BLOCK TRANSACTION PREMIA AND PARTIAL PRIVATE BENEFITS. AN EMPIRICAL INVESTIGATION

Giovanna Nicodano*

(Università di Torino e Centro "P. Baffi")

Alessandro Sembenelli^

(Ceris-CNR)

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*** Dipartimento "G. Prato", Università di Torino, Corso Unione Sovietica, 218bis, Turin, Italy, E-mail: nicodano@econ.unito.it**

^ Ceris-Cnr, Via Avogadro, 8, 10121, Turin, Italy, E-mail: sembenel@ceris.to.cnr.it

ABSTRACT

Following Zwiebel (1995) and Zingales (1995) the block premium is related to the share of total control rents which is being transferred through a block transaction relative to the share of control rents enjoyed by the market. The former share is measured by the difference in the seller's (the buyer's) power index before and after the transaction. Unobservable control rents are estimated by resorting to balance sheet figures which, according to the literature on corporate control, should be correlated with them. Estimates of such a pricing equation are based on a sample of block transactions of listed Italian companies. Implied control rents are also recovered.

NON-TECHNICAL ABSTRACT

Most control-related trading in continental Europe occurs in large blocks in the upstairs market. This paper proposes a method for pricing blocks of shares and shows its functioning using data of block transactions of listed Italian companies.

The valuation of a block of N shares is usually greater than N times the market valuation of one share. This occurs because the voting power conferred by a share in the block is usually larger than the voting power conferred by a share in the market, although both give the same right to company cash-flow. Voting power, in turn, allows to shift corporate decisions to the benefit of the coalition of shareholders. We call such benefits, which are enjoyed by members of the controlling coalition only, total private benefits or control rents.

In order to price a given block of shares, the value of private benefits accruing to its owner must be estimated. Barclay and Holderness (1989) were able to do so for that subset of block transactions transferring majority control from one shareholder to another. In such a limiting case total control rents coincide with both control rents accruing to its owner and the block premium. In section 2.1 we argue that in general block premia underestimate total control rents. Our pricing formula relates the block premium to the share of total control rents which is being transferred through the block transaction relative to the share of total control rents which is enjouyed by the market. Following Zwiebel (1995) we measure such a share with the buyer's and the seller's voting power indexes. Thus per-share block premium increases in the voting power lost (acquired) by the seller (buyer) through the block transfer.

Total private benefits deriving from control of a company are unobservable, unless a majority control transaction is taking place. However the corporate governance literature points to balance sheet and ownership variables that are expected to be correlated with control rents. In section 3 we explain why we use company net worth, leverage, market strategic relevance and the portion of non-voting equity in order to parameterise unobservable control rents.

In section 4, after describing our data and empirical methodology, we recover estimates of total private benefits from 121 block transactions. They are on average equal to 25% of the market value of common shares. Total private benefits are positively correlated with net-worth and non-voting equity, whereas mildly correlated with leverage in the manufactuiring sector only. These correlations align with predictions of existing theories. The last section shows through a simulation how our estimates can be used in order to price a block of shares which does not belong to our original sample.

1. Introduction

Most control-related trading in continental Europe occurs in large blocks in the upstairs market (Berglöf, 1996). Block shareholding is a common feature of corporate governance in the U.S. as well where large blocks of shares tend to be passed on in negotiated transactions rather than fragmented (Shleifer and Vishny, 1986). The price of a voting share belonging to a negotiated block in the upstairs market differs from and is usually greater than the price of one share which is traded in the marketplace. It has been suggested that this difference reflects control rents that accrue to the blockholder alone - the private benefits from control (Barclay and Holderness, 1989). These benefits are unverifiable consumption and investment opportunities which derive from discretion in allocating company resources. Such private benefits, in turn, have played an increasing role in models explaining features of corporate control. In this paper we reconsider the approach used by Barclay and Holderness in estimating private benefits in the light of recent contributions to the corporate control literature.

We borrow Zwiebel's (1995) notion that total control rents are divisible and that the share accruing to a block investor depends on the strategic importance of the investor's block in forming controlling coalitions. More precisely, the value of a negotiated block is bounded below by the seller's valuation and above by the buyer's valuation, which depend on the share of total control rents commanded by such a block. This share, in turn, increases in the strategic importance of the block in forming controlling coalition[1].

The exchange price is assumed to be similarly related to the share of control rents accruing to shareholders who choose to trade in the marketplace. If the market appropriates some control rents thanks to its strategic relevance then the price of voting shares exceeds the value of future cash-flows. This is not a common assumption in the literature although it is recognized that corporate decisions concerning payout policy, spin offs, information revelation and dual class recapitalizations influence both the exchange price and market traders' welfare without necessarily affecting the stream of future profits. The main reason for allowing the market to appropriate some control rents is offered by empirical studies

[1] Meeker and Joy (1980) already suggested that coalition size should influence control premia.

showing that common shares trade at a premium relative to nonvoting shares (Castellino, 1989; De Angelo and De Angelo, 1985; Lease, McConnell and Mikkelson, 1984; Levy, 1982; Rydquist, 1992; Zingales, 1995b) also in countries where hostile takeovers are infrequent.

Our pricing formula relates the block premium to the share of total control rents which is being transferred through the block transaction relative to the share of control rents enjoyed by the market. It shows that total control rents do not in general coincide with the premium, as had been suggested by Barclay and Holderness (1989)[2]. Equality obtains only when a majority controlling block is changing hands. If the block carries less than the absolute majority of votes, block premia underestimate control rents when the latter are positive.

Total private benefits deriving from control of a company are by and large unobservable. We hence turn again to the corporate governance literature, which points to balance sheet and ownership variables that are expected to be correlated with control rents. We use company net worth, leverage, market strategic relevance measured by its Shapley value and the portion of non-voting equity in order to parameterise unobservable control rents.

After computing voting power indexes for the block seller, the block buyer and for the market we assess the performance of our pricing equation in a cross section of block transactions of listed Italian companies. The Italian upstairs market - similarly to the German one - was not subject to extensive regulation in the years of our empirical analysis. Moreover there is nothing like the NYSE obligation to "clear the book"; nor there are rules concerning maximum deviations from market prices, as those prevailing in Paris or Brussels. Thus we can rule out marked influence of trading restrictions on block prices[3].

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[2] These authors do not ignore the relationship between fractional ownership and premia. They indeed document the existence of a non-linear relation between private benefits and the size of the block. However, their approach implies that the block premium does not depend on ownership distribution, i.e. that (i) a 5% block in two different companies (with the same financial structure) would be equally priced; (ii) a 5% (30%) block in a given company has the same price as a 24% (49%) block.

[3] Beginning from January 1992, block size and prices had to be disclosed within one hour from the transaction and a (small) lower bound on the size of blocks which could be taken upstairs was established.

Our analysis overlooks risk aversion and private information in order to focus on control rents. In this respect it complements work by Keim and Madhavan (1996) and a large literature which was pioneered by Scholes (1972), which focus on the information and liquidity impact of a block transaction on stock market prices and overlooks the effect of ownership structure.

The remaining of the paper is organized as follows. Section 2 lays out our simple pricing model. Section 3 offers a parameterisation for total control rents. Section 4 describes our data and presents empirical results. Section 5 concludes.

2. Block Premia and Partial Benefits from Control

2.1 The Basic Model

Zwiebel (1995) suggests that private benefits are divisible and that the share of private benefits accruing to a block investor depends on the strategic importance of the investor's block in forming controlling coalitions. According to this view, a moderate-sized block in a firm owned by many disperse individuals confers large control rents. On the contrary, a moderate-sized block investor receives negligible control rents if one investor enjoys a majority position. Therefore Zwiebel (1995) sets control rents accruing to blockholder i equal to a share φ_i of total control rents C, where φ_i is the Shapley value of agent i in a majority weighted game. φ_i - which is also called a power index - is equal to i's probability of being pivotal in random coalitions of shareholders[4]. Previous literature, which will be discussed in the next section, assumed instead that control rents would only accrue to one manager or one controlling shareholder, independently of the share of votes held.

[4] More precisely, let n shareholders of a given company be arranged in order at random, with each possible ordering having probability (1/n!). Let shareholder i be awarded the gain that he brings to the coalition consisting of his predecessors in the ordering. His expected gain under this scheme is measured by his Shapley value. In *simple games* there is exactly one player (called the pivot) in each ordering that receives a non zero gain. Moreover, a player's value is equal to his probability of being pivotal. A value for a simple game is called a power index. *Weighted majority games* are a class of simple games in which the expected gain of a coalition equals 1 if the number of votes of members of the coalition does not fall short the required majority, and 0 otherwise. The Shapley Shubik power index (1954) assigns to

We now use the notion of partial benefits in order to price voting shares in a stock market - composed of both an upstairs market where blocks are transferred in bilateral negotiation and a multilateral exchange - at the time of a block transaction. A number of simplifying assumptions allow us to focus on voting power as key determinant of block premia. Investor's risk neutrality permits to overlook changes in risk premia and market liquidity. We also assume that managers are induced to act - through monitoring or incentive contracts - in the interest of controlling shareholders, be it a large blockholder or a coalition of small shareholders[5]. Finally, block transactions are assumed not to change the expected stream of profits and total control rents. The latter assumption will shortly be relaxed[6].

The amount received by a seller in a negotiated block transaction must be at least as large as the seller's valuation of her block. The seller must be compensated for the loss in private benefits, which is proportional to the seller's reduction in her power index, and for the loss of pecuniary benefits, which increases in the number of shares in the block, N^T. Let φ'_s be the seller's power index after the transaction, q the per-share discounted cash flow, P the price paid for one share in the block and N the total number of shares outstanding. Then:

$$PN^T \geq (\varphi_s - \varphi'_s)C + qN^T. \tag{1}$$

The buyer's valuation of the block, in turn, cannot be smaller than the sum paid for the block:

$$PN^T \leq (\varphi'_b - \varphi_b)C + qN^T, \tag{2}$$

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player i the power $\varphi_i=(1/n!)\Sigma(t-1)!(n-t)!$ where the summation is extended to all coalitions of t members for which the i-th player is pivotal.

[5] External monitoring by the stock market and performance compensation (Fama and Jensen, 1983; Holmström and Tirole, 1993; Shleifer and Vishny, 1986); internal organization (Williamson, 1983) and capital structure (Aghion and Bolton, 1992); outside members of corporate board and managerial stock ownership (Demsetz, 1983) should be able to align managerial and investor preferences.

where φ_b (φ'_b) is the buyer's power index before (after) the transaction. The market price of common shares (conditional on a block transaction) should similarly depend on the valuation of shares by those investors who trade in the market. Let N'_o be the number of common shares held by the market and P'_e be per-share price after the transaction, respectively. Then the exchange price of common shares after the transaction equals expected control rents plus pecuniary benefits accruing to the market:

$$P'_eN'_o \equiv \phi'C + qN'_o \tag{3}$$

where $0 \leq \phi' \leq 1$ is voting outsiders' expected share of total control rents after the block transaction. It is different from outsiders' share before the transaction, ϕ, if the market expected share of control rents changes at the time of the block transaction. For instance, if a block has been assembled in a series of small open market transactions before being sold in the negotiated market, then market traders may have lost voting power, in which case $\phi' \leq \phi$. However, a change in voting power need not be associated with abnormal trading in the market. A negotiated sale of common stock by a blockholder to another blockholder who gains the majority of votes through this transaction changes the market Shapley value without any abnormal trading taking place in the market.

Our assumption that market voting power has positive value is consistent with evidence showing that common shares trade at a premium relative to non-voting shares. Indeed, it has already been suggested that the value of control rents is reflected in the exchange price of a vote in proportion to outsiders' Shapley value; and that this proportion may change when an event modifies the distribution of ownership (Zingales, 1995b)[7].

The post-transaction block premium can be obtained by combining previous equations:

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[6] We do not address the choice between negotiation, public tender offer or trading in the market. Motivation for negotiated block trading is offered by Shleifer and Vishny (1986) and Burkart, Gromb and Panunzi (1996).

(4) $$\bar{\zeta}_s C \le (P - P'_e)N^T \le \bar{\zeta}_b C,$$

where $$\bar{z}_s \equiv \left(j_s - j'_s - \frac{f' N^T}{N'_o} \right) \text{ and } \bar{z}_b \equiv \left(j'_b - j_b - \frac{f' N^T}{N'_o} \right).$$

For a given distribution of bargaining power between the seller and the buyer and assuming positive control rents C, per-share block premium increases in the voting power lost (acquired) by the seller (buyer) through the block transfer. The block premium decreases in the voting power of the market, since the latter raises stock market price.

(4) shows that control rents accruing to the seller (the buyer) do not in general coincide with the block premium, as had been suggested by Barclay and Holderness (1989). Equality obtains only when a majority controlling block is changing hands, i.e. when $(\varphi_s - \varphi'_s) = 1 = (\varphi'_b - \varphi_b)$ and $\phi = \phi' = 0$. If the block carries less than the absolute majority of votes, block premia underestimate control rents. This observation is relevant when private benefits, after having been estimated out of block premia, are compared across companies/countries with different ownership structures.

Relative bargaining power of block traders does not matter for block valuation when the buyer's and the seller's valuations coincide. Under our assumptions of constant total value this happens when a majority controlling block is changing hands, i.e. when $(\varphi_s - \varphi'_s) = 1 = (\varphi'_b - \varphi_b)$. They also coincide when the company is controlled with an absolute majority, and both the seller and the buyer are not the controlling shareholder. The subset of cases when $(\varphi_s - \varphi'_s)$ potentially differs from $(\varphi'_b - \varphi_b)$ is then given by transactions concerning companies which are not controlled with the absolute majority of votes.

2.2. Extensions

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[7] In Zingales' model private benefits accrue to the controlling party alone. Therefore the voting premium on common shares held by the market reflects the expectation that voting rights become valuable in case of a battle for control.

We now allow for a difference between post-transaction profits q' and control rents C', and their pre-transaction counterparts. The upper and lower bounds for the value of the block become:

(5) $$\varphi_s C - \varphi'_s C' + qN^T + (q-q')N'_s \leq PN^T \leq \varphi'_b C' - \varphi_b C + q'N^T + (q'-q)N_b .$$

The term $(q-q')N'_s$ in the seller's valuation shows that the seller's valuation of his block increases (falls) if he incurs in pecuniary losses (gains) proportional to the N'_s shares that he keeps after the transactions. Similarly $(q'-q)N_b$ shows that the buyer's valuation of his block increases (falls) if pecuniary gains (losses) are obtained on her initial toehold N_b thanks to the block purchase.

The market price of common shares after the transaction is equal to:

(6) $$P'_e N'_o \equiv \phi' C' + q'N'_o$$

It follows that the post transaction block premium can be written as:

(7) $$\varphi_s C - \left(\varphi'_s + \frac{f' N^T}{N'_o}\right) C' + (q-q')\left(N'_s + N^T\right) \leq \left(P - P'_e\right) N^T \leq \varphi'_b C - \left(\varphi_b + \frac{f' N^T}{N'_o}\right) C' + (q'-q) N_b .$$

3. Control Rents, Pecuniary Benefits and Capital Structure

Control rents are largely unobservable. We hence turn to the corporate governance literature which relates control rents in a company to its financial structure. In this literature debt reduces private benefits by constraining managerial discretion through both restrictive covenants and the commitment to pay out future cash flows (Harris and Raviv, 1988a). Larger equilibrium private benefits are associated with dual-class shares. Their existence allows shareholders to construct portfolios with a high vote to cash flow ratios. If pivotal investors' portfolios are such that "little weight is assigned to cash flows, the winner will be determined primarily by who can pay more for votes, i.e., which candidate has the larger

benefits from control. If, however, portfolios are such that equal weights are assigned to votes and cash flows, the winner will be the candidate with higher total value, since the winning candidate must compensate investors fully for the difference in cash flows" (Harris and Raviv, 1988b, p. 206)[8].

It has also been suggested that the extraction of control rents may reduce the total value of the company because of inefficient self-serving actions. In such a case control rents should be negatively correlated with pecuniary benefits (Cornelli and Li, 1994). A larger incumbent's ownership share should however be associated with increased incentive to refrain from inefficient actions and therefore with smaller equilibrium control rents (Burkart et al, 1995b). Non-voting stock and leverage should be positively correlated with control rents for this reason, too, because both allow to keep control of a given amount of assets with a smaller ownership share.

Market shareholders are willing to reduce control rents below levels that would obtain if such shareholders were also managers, because they derive no direct utility from on-the-job consumption of management. This should imply a negative correlation between the extent of diffuse ownership ϕ and control rents and a positive one between per-share profits q and ϕ.Yet the sign of such correlations is not so obvious because monitoring costs increase with the extent of diffuse ownership (Demsetz, 1983; Burkart et al, 1995a). In our analysis we allow for non-zero correlations between control rents, pecuniary benefits and market voting power.

Our parameterisation for control rents before the transaction is:

$$(8) \qquad C = \alpha_1 \text{ net worth} + \alpha_2 \text{ leverage} + \alpha_3 \frac{\text{non-voting equity}}{\text{voting equity}} + \alpha_4 \phi$$

The above arguments imply that α_1 and α_3 are positive; α_2 has an uncertain sign because leverage allows to increase the amount of assets under control but limits the controlling

[8] These ideas have been developed by Gromb (1993) and Zingales (1995a).

party's discretion in allocating such assets; $\alpha_4 < 0$ if control rents fall when the market strategic relevance increases.

Following the above discussion, the per-share variation in the discounted stream of profits is a function of the change in market voting power:

$$q'-q = \beta_1 (\phi'-\phi), \tag{9}$$

where we expect $\beta_1 \geq 0$.

4. Empirical Analysis

4.1. Data

Our sample consists of 121 block transactions of 78 listed companies which took place in Italy between 1987 and 1992. For each transaction, the price of the block, the name of the company, the number of shares in the block, the name of block traders come from Nomisma directory "Data on Mergers and Acquisitions".

The date of the announcement of the block transaction to the public and further information on block price were retrieved through the business newspaper "Il Sole-24 Ore". Daily exchange prices were provided by Maurizio Murgia (Università di Pavia) from 120 days before the announcement to 120 days after the announcement. The distribution of shareholdings before/after the transaction comes mainly from the directory "Taccuino dell'Azionista", which was complemented with the directory R&S and the "Archivio Sperimentale delle Partecipazioni" edited by Banca d'Italia-Consob. In measuring voting shares we consolidated shareholdings which were controlled - through pyramiding - by the same shareholder. Balance sheet data also come from "Taccuino dell'Azionista", and refer to capital structure before the transaction date[9].

[9] Our original sample consisted of 545 transactions. We excluded 344 observations which were either within-group transactions and/or cases when the announcement was either missing or incomplete. For the remaining observations, in 41 cases the exchange price was either missing (because the company was listed after the transaction) or drawn from the third market; in 26 cases the block price had not been reported; in 8 cases we could not identify the seller or the buyer. After eliminating five outliers we remain with 121 observations, 94 of which concern companies in manufacturing.

In order to identify the market share of common stock, we adopted the following procedure. After the top shareholders - together with the size of their holdings - had been identified, we set the market share equal to the difference between the total number of voting shares and the sum of top shareholders' holdings of voting shares. The Shapley-Shubik voting power indexes for buyers, sellers and outsiders were calculated using an algorithm described in Gambarelli (1996).

In computing debt, we only consider financial debt (deposits by clients for banks and technical reserves for insurance companies). Leverage is the ratio between debt and net worth.

4.2. Descriptive Statistics[10].

The price paid for one share in the block exceeds on average the post-transaction market price by 28.3% for the full sample and by 26.7% for the sub-sample of firms operating in the manufacturing sector (Table 1). As expected, the premium is higher when larger blocks are traded. In fact, when shares in the block exceed 10% of voting shares, the premium equals 35.1% (30.2% for manufacturing), whereas for blocks smaller than 10% it falls to 21.8% (23.1% in manufacturing). By analyzing the quartile distributions further information can be drawn. First, median values are systematically lower than the corresponding mean values, suggesting that the distributions are positively skewed. Second, first quartiles are always negative implying that a non-trivial number of cases exists where the block is traded at a price which is lower than the market price. This result also holds when only large blocks are taken into account[11]. Finally, third quartiles look high, both in absolute and in relative terms, (53.9% for the full sample and 41.1% for manufacturing) for the sub-samples including only larger blocks. As expected, it is here that a significant number of large premia can be found.

In our restricted model (4), block premia are associated to transfers of voting power alone. It is then reassuring to see that in our sample block transactions are non-neutral from a corporate control perspective. Table 2, which reports pre- and post-transaction Shapley

[10] Detailed studies of control transfers of listed Italian companies can be found in Caprio et al. (1994) for 1970-1991 and Bianchi et al. (1996) for 1990-1995.

values, shows that the seller's mean power index almost halves while the buyer's increases dramatically after the transaction. This is associated with a much more modest fall in the Shapley value of the market.

Equation (4) shows that $\overline{\zeta}_s$ should not exceed $\overline{\zeta}_b$ if a transaction has occurred. Table 3 contains information on $\overline{\zeta}_i$, which measures the transfer of voting power relative to the market voting power: indeed $\overline{\zeta}_s$ is on average smaller than $\overline{\zeta}_b$. We see that there are several cases when minority blocks trade in majority controlled companies $\left(\overline{z}_i = 0\right)$ and a relatively small number of cases when minority blocks trade in companies where market power is relevant $\left(\overline{z}_i < 0\right)$.

Finally, Table 4 reports the mean values of all the accounting figures later used in order to parameterise unobservable private benefits. We refer the reader to the legenda of Table 4 for details on each variable and focus here on two points. First, both average net-worth and average financial leverage are much higher in the full sample than in the manufacturing sub-sample. Taking this finding to its face value, this would imply that in our sample banks and insurance companies are much larger in net-worth and much more levered than their manufacturing counterparts. However this results is, at least partly, a statistical artifact, because of the way net worth is measured. Also for this reason in the next section we estimate block premia not only for the full sample but also for the manufacturing sub-sample where problems of accounting data consistency are likely to be negligible. Second, the ratio of non-voting to voting shares looks on average rather small (17.2% and 14.4% for the full sample and the manufacturing sub-sample respectively). It must be pointed out, however, that not all firms issue non-voting shares. In fact, contingent on issuing non-voting shares, the average is 36.4% (30.8% in manufacturing).

4.3. Regression Results

It is convenient to standardize the block premium with the market value of common equity $P'_eN'_e$ for estimating purposes, as the distribution of the standardized block premium turns out to be normally distributed. The model specification we focus on is:

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[11] Even if measurement errors are possible they are unlikely to explain the full story.

(10) $$\zeta_s C - (q'-q)\gamma_s \leq \frac{(P - P'_e)N^T}{P'_e N'_e} \leq \zeta_b C + (q'-q)\gamma_b$$

where

$$\zeta_s \equiv \left(\iota_s - \iota'_s \frac{\phi' N^T}{N'_o}\right) / P'_e N'_e, \quad \gamma_s = \left(N'_s + N^T\right) / P'_e N'_e,$$

$$\zeta_b \equiv \left(\iota'_b - \iota_b \frac{\phi' N^T}{N'_o}\right) / P'_e N'_e, \quad \gamma_b = N_b / P'_e N'_e,$$

which is a standardized version of equation (7) with the restriction C=C'.

Since we cannot observe bargaining power, our strategy consists in regressing the standardized block premium on the seller's and the buyer's valuation independently. In both cases we substitute equation (8) for unobservable control rents, C, and equation (9) for the change in per-share profits, q'-q. We estimate equation (10) with standard OLS techniques both for the full sample (121 observations) and for the manufacturing sector (94 observations).

We confine ourselves to post-announcements premia because the exchange price should then incorporate new information concerning profitability (Barclay and Holderness, 1989). The market price is averaged in order to reduce the impact of idiosyncratic liquidity shocks. Therefore the dependent variable is an average of the standardized premium over days +7 to +30 after the announcement[12]. Our regression results are reported in Table 5, where the first two columns refer to the full sample (seller's and buyer's valuation respectively) whereas the last two refer to the manufacturing sub-sample. Since the presence

[12] Regression results do not substantially change when the average is taken over days +1 to +7. Premia are indeed smaller when measured from t+1 to t+7 because there is a temporary price increase around the announcement of the block transaction. The behavior of the premium from -120 to +120 and univariate

of heteroskedasticy in the residuals cannot be rejected, we compute standard errors using White's consistent estimator of the covariance matrix.

Estimates based on the full sample and on the manufacturing subsample are similar. Company net-worth as well as non-voting equity[13] have a positive sign and are statistically significant, thus lending support to the hypothesis that control rents increase in the amount of assets controlled. The results for leverage are mixed. For the full sample we are not able to reject the hypothesis that leverage has no impact on the amount of private benefits. This could be justified on theoretical grounds since debt is a double-edged sword: it allows to acquire more assets without loosing control, but it limits discretion in allocating them. However, as already mentioned, it might also be due to problems in accounting data consistency. Indeed, the coefficient turns out to be positive and marginally significant when the model is tested against transactions which occurred in manufacturing, where data problems are less worrying.

The expected variation in profits is positively correlated with the variation in the Shapley value of the market, suggesting that market monitoring improves on pecuniary benefits. Control rents are only mildly negatively correlated with the market Shapley value, suggesting in turn that the extraction of private benefits is not markedly limited by market monitoring in our sample[14]. Dummies relating to industry sectors and to the business cycle were not statistically significant.

4.4. Private Benefits and Per-Share Premia Simulations

Estimates of private benefits can be recovered by using data on financial structure. We propose a simulation for the manufacturing sector, based on the buyer's valuation. In Table 6 we report private benefits estimates for alternative values of both the non-

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correlations with the size of the block and shareholders' Shapley values are described in Nicodano and Sembenelli (1996).

[13] Separation of cash-flow rights from control rights is often obtained in Italy through the creation of a hierarchy of companies - a pyramidal business group - controlled at the top by a holding company. Group net-worth and group debt had less explanatory power than the holding figures. Similarly, the ratio between consolidated net-worth of the group minus company net-worth divided by company net-worth never had explanatory power in our regressions.

[14] We could not examine the effect of the controlling coalition's ownership stake on private benefits, because data on ownership of non-voting shares are not available.

voting/voting equity ratio and leverage, while keeping the other explanatory variables to their sample mean values. For instance, private benefits increase from 20.77% to 34.97% of the market value of voting shares, as the portion of non-voting equity varies from 0 (first decile) to 0.5 (ninth decile), while leverage is kept to its median value. As can be easily seen from Table 6, the sensitivity to leverage is much smaller.

These estimates can be translated into an implied per-share premium, given the size of the block and ownership distribution. For example, a share in a block consisting of (slightly over) 50% of common stock - in a manufacturing company with the median capital structure and q=q' - commands a percentage per-share premium of $z_i\left(C / P'_e N'_e\right)\left(N'_e / N_T\right) = 1*20.77*2 = 41.54\%$. In this special case the seller's and the buyer's valuations coincide. It follows that in order to derive punctual estimates of the per-share premium it is not necessary to assume a given distribution of bargaining power.

Things become more complicated when minority block transactions are involved. This occurs because not only seller's and buyer's valuation are likely to diverge but also the distribution of ownership dramatically affects the size of the premium. An extreme example of the latter point is offered in Table 7, where per-share premia attached to a 5% block are related to the pre-transaction distribution of ownership in three different hypothetical companies[15]. In the first case (Firm A) the premium is obviously zero since the largest shareholder already owns the majority of votes. In the other two cases (firm B and C) the premia are positive (138.5% and 207.7%) since the 5% block is strategically relevant. The increasing size of the premium is explained by the larger probability for the block of being pivotal in the case of firm C.

5. Concluding Comments

Estimates of our pricing model lend support to Zwiebel's (1995) hypothesis that control rents are divisible and that the share accruing to a block investor can be measured by her power index. The pricing of blocks can therefore be improved by accounting for the strategic relevance which is being transferred through the block transaction. This also allows

to estimate control rents from observed block premia without going through prior selection of control transactions.

Private benefits are always positively correlated with net-worth and non-voting equity, whereas they are only mildly correlated with leverage in the manufacturing sector. These correlations align with predictions of existing theories.

The expected variation in profits is positively correlated with the market Shapley value, suggesting that market monitoring increases pecuniary benefits. It is worth stressing, though, that "market shareholders" in our sample are those shareholders who are not considered as the top shareholders by our data sources. Hence they need not be the atomistic outsiders often considered as "the market" in corporate control literature. Sensitivity of this result to the computation of Shapley values is in our agenda for further research.

[15] In all cases bargaining power is assumed to be equally distributed between the two players.

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Table 1 - Post-Transaction Block Premia $[(P-P'_e)/P'_e]$

	Cases	Mean (Std. dev.)	1st quartile	Median	3rd quartile
Full Sample	121	0.283 (0.586)	-0.020	0.106	0.369
Blocks≥10%	59	0.351 (0.582)	-0.020	0.147	0.539
Blocks <10%	62	0.218 (0.587)	-0.027	0.067	0.175
Only Manufacturing	94	0.267 (0.629)	-0.027	0.069	0.324
Blocks≥10%	48	0.302 (0.594)	-0.026	0.121	0.411
Blocks<10%	46	0.231 (0.668)	-0.027	0.050	0.147

Legend:
P = Price paid for a share in the block.
P'_e = Average market price of common shares between t+7 and t+30.
t = Announcement day of block transaction.

Table 2 - Pre- and Post-Transaction Shapley Values

	Full sample	Manufacturing
	Mean (Std. dev.)	Mean (Std. dev.)
"Pre" seller's SV (φ_s)	0.493 (0.474)	0.529 (0.471)
"Post" seller's SV (φ'_s)	0.262 (0.417)	0.279 (0.424)
"Pre" buyer's SV (φ_b)	0.036 (0.139)	0.040 (0.146)
"Post" buyer's SV (φ'_b)	0.282 (0.422)	0.326 (0.446)
"Pre" outsiders' SV (ϕ)	0.149 (0.297)	0.167 (0.319)
"Post" outsiders' SV(ϕ')	0.133 (0.287)	0.136 (0.300)

Table 3 - Descriptive Statistics on $\overline{\zeta}_s$ and $\overline{\zeta}_b$

	Mean	Std. dev.	Cases: $\overline{\zeta}_i<0$	Cases: $\overline{\zeta}_i=0$	Cases: $\overline{\zeta}_i>0$
Full sample					
$\overline{\zeta}_s$	0.212	0.400	17	55	49
$\overline{\zeta}_b$	0.230	0.413	20	49	52
Only Manufacturing					
$\overline{\zeta}_s$	0.233	0.416	13	40	41
$\overline{\zeta}_b$	0.274	0.438	15	34	45

Legend:
$\overline{\zeta}_s = (\varphi_s - \varphi'_s - \phi' N^T/N'_o)$
$\overline{\zeta}_b = (\varphi'_b - \varphi_b - \phi' N^T/N'_o)$

Table 4 - Descriptive Statistics on the Determinants of Private Benefits

	Mean	1st quartile	Median	3rd quartile
Full sample				
Net worth (billion Lira)	442.7	66.2	243.1	573.5
Leverage (%)	205.1	16.9	58.2	197.1
Non-voting/Voting Shares (%)	17.2	0.0	0.0	20.2
Manufacturing				
Net worth (billion Lira)	407.0	54.7	171.1	439.6
Leverage (%)	69.7	8.1	38.4	84.9
Non-voting/Voting Shares (%)	14.4	0.0	0.0	17.3

Legend:
All variables are computed using book values.
Net worth = Equity and other reserves.
Leverage = Financial Debt/Net worth, for manufacturing firms
= Deposits by clients/Net worth, for banks
= Technical reserves/ Net worth, for insurance companies.

Table 5 - Econometric Estimates of the Parameterised Version of the Model

	Full Sample Seller's Valuation	Full Sample Buyer's Valuation	Manufacturing Seller's Valuation	Manufacturing Buyer's Valuation
ζ_i * Net worth	0.378 (0.097)	0.395 (0.089)	0.316 (0.099)	0.309 (0.087)
ζ_i * Leverage	0.003 (0.005)	0.002 (0.005)	0.007 (0.004)	0.008 (0.004)
ζ_i * Non-voting/Voting Shares	0.384 (0.147)	0.399 (0.160)	1.493 (0.269)	1.649 (0.323)
ζ_i * Outsiders' Shapley Val.	-0.199 (0.120)	-0.214 (0.059)	-0.180 (0.127)	-0.199 (0.073)
χ_i* Δ Outsiders' Shapley Val.	-0.262 (0.008)	1.621 (0.531)	-0.263 (0.008)	1.346 (0.517)
Adjusted R-squared	0.433	0.408	0.466	0.458
F-test	23.87 [4]	21.68 [4]	21.28 [4]	20.62 [4]
BP-test for Homoskedasticity	109.40 [4]	92.14 [4]	60.69 [4]	43.81 [4]
Implied Estimates of C/ $P'_eN'_e$	25.42%	26.48%	24.99%	24.83%

Legend:
$\zeta_s = (\varphi_s - \varphi'_s - \phi'N^T/N'_o)/P'_eN'_e$
$\zeta_b = (\varphi'_b - \varphi_b - \phi'N^T/N'_o)/P'_eN'_e$
$\chi_s = (N^T+N'_s) / P'_eN'_e$
$\chi_b = N_b/ P'_eN'_e$

(..) = standard errors, based on White's consistent estimator of the covariance matrix.
[..] = degrees of freedom.

BP = Breusch-Pagan test for homoskedasticity, X^2 distribution.

Implied estimates are computed for mean values of all the independent variables.

Table 6 - Private Benefits Simulations According to Different Financial Structures

Non Voting/Voting Shares						
	Percentiles	10th	25th	50th	75th	90th
Leverage	10th	20.72	20.72	20.72	25.55	34.92
	25th	20.73	20.73	20.73	25.56	34.93
	50th	20.77	20.77	20.77	25.6	34.97
	75th	20.83	20.83	20.83	25.66	35.02
	90th	20.92	20.92	20.92	25.75	35.11

Legend:
All values are computed as percentages of the market value of voting shares.
Simulations based on buyer's valuation for manufacturing (Table 5, column 4).
Percentiles are computed using the actual distributions of the two variables.

Table 7 - Percentage Per-Share Premium Simulations According to Block Strategic Relevance

	Pre-transaction Distribution of Ownership (Number of owners in brackets)				Per-Share Premium
Firm A	51 (1)	5 (9)	4 (1)		0%
Firm B	46 (1)	44 (1)	5 (2)		138.5%
Firm C	46 (1)	46 (1)	5 (1)	3 (1)	207.7%

Legend:

This table reports the per-share premia for a 5% block under different distributions of ownership. The 5% block is assumed to add to the shares owned by the largest shareholder in all cases. Private benefits (C) are assumed to be equal to 20.77% of post-transaction equity capital. Bargaining power is assumed to be distributed equally between the buyer and the seller.

Per-share premium = $1/2(\bar{\zeta}_s + \bar{\zeta}_b)(C/ P'_e N'_e)(N'_e/N^T)$