Pyramidal Discounts:

Tunneling or Overinvestment?

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Abstract

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JEL classification: G32

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I. INTRODUCTION

In the corporate world outside the Anglo-Saxon countries pyramiding is the most frequently used mechanism to exercise control over a number of large listed firms with a minority share of the capital [La Porta et al., 1999]. A pyramidal structure separates control from ownership via a hierarchical chain: owners at the apex of the pyramid control a holding company that in turn controls other firms that in turn control other firms and so on. Since control over the other shareholders´ capital in a firm that is placed higher up in the chain is used to establish control of a firm further down, the ultimate controlling owners' own capital investment becomes smaller the further down in the pyramid the firm is placed. For example, if ownership of 50 percent of the shares is needed for control of each firm in a four-level pyramid, the owner at the apex (Level 1) controls a firm at the bottom (Level 4) by only providing 1/8 ($1/2^3$) or 12.5 percent of its capital. If firms also use dual-class shares and a 25 percent capital investment is sufficient for control, the ultimate owner controls the bottom firm by only contributing 1/64 ($1/4^3$) or about 1.5 percent of its capital. The separation between ownership and control is thus enhanced *multiplicatively* when pyramiding is combined with dual-class shares.

The control structure of *Ericsson*, the world's leading manufacturer of telecommunication systems, is illustrative. Before an extra general meeting in August 2004 changed the voting differential between A- and B-shares (equal dividend rights) from 1/1000 to 1/10, The *Wallenbergs* via its family foundation at the top of a three level pyramid controlled 40% of the votes but provided less than 1% of Ericsson's capital. Since *Handelsbanken* via a similar mechanism also controlled 40% of the votes, the two jointly controlled Ericsson with extremely small investments. After the reform they still jointly control 40% of the votes, which is sufficient to block takeover attempts since it triggers a mandatory bid rule that forces the bidder to extend the offer to *all* shareholders.

Via their holding companies, *Investor* and *Industrivärden,* that are organized as *closed-end investment funds* (CEIFs), the two pivotal owners in Ericsson controlled 50 percent of the total market capitalization on the Stockholm Stock Exchange (SSE) in 2000. Since their own capital investments correspond to only two percent of the market capitalization, their combined control multiplier was about 24. Since other CEIFs use the same combination of pyramiding and dual-class shares, the Swedish control structure is one of the most highly leveraged in the corporate world [see La Porta et al., 1999].

But despite the pervasiveness and pivotal economic importance of pyramids around the globe, the economics of pyramiding is not well understood.[1] Why do investors value the prospect to *indirectly* own the pyramid's portfolio by investing in the holding company (CEIF) at only 75 percent of the market value of the *same* (or essentially the same) portfolio if they bought it *directly* in the market-- the closed-end fund puzzle? The 25 percent average discount on control-oriented Swedish CEIFs is significantly higher than the 8 to 12 percent discounts on portfolio-oriented Anglo-Saxon CEIFs [Gemmill and Thomas, 2002]. Unlike business groups in financially less developed countries, controlling owners are subject to substantially more scrutiny in Sweden as accounting and judicial standards, tax compliance and enforcement, corruption indices and press freedom are among the very best in the world. Proxies for pecuniary private benefits of control are also small [Dyck and Zingales, 2004 and Nenova, 2003]. Is there more to pyramiding in financially developed countries than mere extraction of pecuniary private benefits? How do e.g. pyramidal firms' financing and investment behaviors affect the discounts?

Our empirical analysis of Swedish pyramids first establishes that the multiplicative separation between ownership and control in pyramiding is discounted in the share value of *both* (i) the holding company (CEIF) *and* of (ii) the firms at the bottom of the pyramid (portfolio firms), and then analyzes *why* the discounts exist: What is that the controlling owners (managers) actually do that causes the discounts?[2] Two mechanisms or theories may explain why pyramidal control is associated with significant discounts.

The *tunneling* or *corporate stealing theory* says that the non-controlling shareholders demand compensation for corporate resources expected to be diverted by the controlling owners. The highly leveraged control in pyramiding over the non-controlling shareholders' capital provides the controlling owners with incentives to extract pecuniary private benefits by expropriating (stealing) corporate resources at the lower levels of the pyramid where they have lower cash flow rights and then tunnel them upwards where they have larger cash flow rights [Bebchuk et al., 2000]. Almeida and Wolfenzon [2004a] develop a theory of pyramidal

1. Morck et al [2004] recently surveyed the growing literature on pyramids. For example, Bae et al [2002] study Korean business groups, while Khanna [2000], Palepu and Khanna [2000] and Bertrand et al [2002] study Indian business groups in particular, and Aganin and Volpin [2004] focus on Italian pyramids. Morck et al [2000] analyze Canadian pyramids. Barca and Becht (eds) [2001] and Faccio and Lang [2002] study European control structures. See also Johnson et al [2000] about tunneling.

ownership that predicts that pyramiding is most frequent in countries with less developed financial markets and weak minority protection; both conditions are conducive to pyramiding by giving internal financing as well as corporate stealing comparative advantages. Bertrand et al [2002] provide empirical support for the theory by documenting tunneling within Indian business groups while Claessens et al [2002b] find that firms higher up in East Asian pyramids perform better than firms at the bottom. The general prediction is thus that pyramiding implies tunneling – at least if minority shareholder protection is weak. Using Bertrand et al's [2002] battery of tests, we find, however, no evidence of tunneling in Swedish pyramids.

Instead we develop and test an alternative mechanism, the *overinvestment hypothesis for pyramids*, that says that discounts are not compensation for expected stealing of corporate resources but primarily for *inefficient* investment decisions due to the highly leveraged control over firms' internal cash flows (financing). The discount rate associated with investments of internal cash flows is too low. The hypothesis causally links pyramiding to the discounts via how the control structure systematically affects firms´ financing and investment decisions.

The main economic difference between the tunneling hypothesis and the overinvestment hypothesis is related to Mark Roe's conjecture that because of bad decision making *managers can lose for shareholders as much as, or more than, they can steal from them* [Roe, 2002]. Even though minority shareholders are compensated for both tunneling and overinvestment by discounts, the misallocation of capital associated with overinvestment is of general character and, if pyramiding is widespread, affects the whole business sector. Thus, overinvestment costs might be of greater economic importance than costs associated with tunneling.

We start from the political economy of pyramiding, i.e. how the tax system is designed to affect the controlling owners' and portfolio firms' behaviors, since without political acceptance of highly leveraged corporate power there would be no pyramids. A case in point is the absence of important pyramids in the United States. Pyramiding became politically unacceptable in the 1930s and was stigmatized as economically harmful by FDR in *American Economic Review*: *Interlocking financial controls have taken from American business much of its traditional virility, independence, adaptability, and daring without compensating*

2. Cronqvist and Nilsson [2002] have documented that Swedish firms with controlling shareholders who use dual class shares are valued at a discount. They interpret the discount in terms of entrenchment and lower return on assets. Cronqvist

advantages. They have not given the stability they promised. [Roosevelt, 1942].[3] He argued in favor of *the intercorporate dividend tax to discourage holding companies*; the tax in effect eliminated U.S. pyramids. In a cross-country analysis, Morck [2003] shows that pyramiding is prevalent *only* in countries with *no* intercorporate dividend tax; the United Kingdom being the exception to this rule. The *Appendix* presents the politics of pyramiding in Sweden.

Three tax rules are particularly important for Swedish pyramids. (i) After the major tax reform in 1990/91, the holding company (CEIF) is exempt from paying intercorporate dividend taxes if it transfers *all* incoming dividends to its shareholders [Erlandsson, 1997]; (ii) realized capital gains from active portfolio management by the CEIF are tax exempt if reinvested; and (iii) the controlling foundation at the top of the pyramid is tax exempt if it distributes 90 percent of received dividends to scientific, societal and humanitarian purposes.[4] The design of taxes implies that dividends just pass through the pyramid on their way from the portfolio firms to the ultimate shareholders of the CEIFs (we find empirical support for this), which limits the ultimate owners' incentives to let portfolio firms pay larger dividends. The investor controlling the pyramid will only receive a very small fraction of any dividends distributed by the portfolio firms. The ultimate controlling owners' incentives to extract pecuniary private benefits at the top are also limited. Because of the politically sensitive nature of pyramiding, the tax system rather than the legal protection of minority shareholders seems to limit the controlling owners' incentives to extract pecuniary private benefits [see Desai et al., 2004].

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and Nilsson do not explore the effect of pyramid structures.

3. Bonright and Means [1932] provide an insightful analysis of the early U.S. pyramids, often used to avoid the anti-trust legislation. The following excerpts from Roosevelt [1942] and quoted by Morck [2003] illustrate the political intentions. *Close financial control, through interlocking spheres of influence over channels of investment, and through the use of financial devices like holding companies and strategic minority interests, creates close control of the business policies of enterprises which masquerade as independent units….Private enterprise is ceasing to be free enterprise and is becoming a cluster of private collectivisms; masking itself as a system of free enterprise after the American model, it is in fact becoming a concealed cartel system after the European model…..And industrial empire building, unfortunately, has evolved into banker control of industry. We oppose that.*

4. The major tax reform eliminated double taxation on capital gains for shareholders by abolishing such taxes for CEIFs. Instead an imputed income of two percent (later adjusted to 1.5 percent and finally abolished in 2003] of the Net Asset value (NAV) was taxed-- independently of the return on the portfolio. This tax could be reduced if more dividends were paid out than received but could not be negative. The net result was that it became more advantageous for investors to indirectly own shares via CEIFs than owning them directly; see Erlandsson [1997]. But lower discounts did not materialize. The value weighted discount between 1986 and 1991 was around 21 percent before the reform but almost 30 percent afterwards (see Figure 2). Since capital gains are tax exempt, Malkiel's [1977] theory that unrealized capital gains explain discounts has no bearing on Swedish CEIFs nowadays and an open ending has no tax consequences. Due to the

Hence, we focus on two main questions: (a) How *efficient* is the active portfolio management of the holding company (CEIF) when investing realized capital gains, and (b) how *efficient* are the investments of portfolio firms when the legislator provides incentives to reinvest profits rather than to distribute them as dividends to shareholders? We conjecture that the highly leveraged control in pyramiding over other shareholders' capital (retained earnings) tends to make portfolio firms overcapitalized and leads to overinvestment rather than to stealing. Costs and potential losses from overinvestment are borne disproportionally by non-controlling shareholders. Our hypothesis, therefore, predicts that the most likely *single* cause behind the discounts of *both* CEIFs and portfolio firms is compensation for systematically lower returns when financing comes from retained earnings.

Since new external shareholders demand compensation (discount) ex ante for such *agency costs* that increase with the separation between ownership and control, pyramiding endogenously drives a significant wedge between the costs of internal and external capital that systematically affects firms' financing *and* investment decisions. (i) Pyramid firms will follow an *enhanced pecking order* of financing where the CEIFs in particular but also portfolio firms avoid Seasoned Equity Offerings, especially Public Offers, since they are extra costly both in terms of discounts and dilution because of their larger size. (ii) Portfolio firms will have significantly higher investment-cash flow sensitivities than comparable non-pyramid firms without necessarily being financially constrained since *internal* equity is relatively inexpensive due to the highly leveraged control of internal cash flows [Erickson and Whited, 2000 and Kaplan and Zingales, 1997]. By limiting the dependence on the primary equity markets, pyramiding de facto (in equilibrium) restricts portfolio firms' financing primarily to internal cash flows and debt.

Our overinvestment hypothesis thus predicts (i) no empirical evidence of significant tunneling but strong indications of overcapitalization; (ii) CEIF-controlled firms have significantly higher investment-cash flow sensitivities; (iii) both CEIFs and portfolio firms have marginal Tobin's q significantly below one when capital gains and retained earnings are used to finance investments; and (iv) that such overinvestment costs are directly linked to the two discounts and increasing in separation of control and ownership.

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old tax system, CEIFs accumulated large unrealized capital gains in the 80s but discounts were lower then than in the 90s. Share repurchases were not allowed in Sweden during our sample period, i.e. only dividends are relevant.

The unique features of our analysis are that it incorporates pivotal effects of taxation on pyramidal behavior, and provides a unified explanation of the two discounts. It causally links pyramiding to discounts via how the strong separation between ownership and control imposes costs on the non-controlling shareholders by systematically affecting the firms' financing and investment decisions. Desai et al [2004] analyze the impact of corporate taxes on firm behavior but does not apply it to pyramiding where taxes appear to be specifically designed to regulate behavior. Harvey et al [2004] analyze how international debt contracts *mitigate* agency costs due to overinvestment by highly leveraged pyramidal firms but do not causally link overinvestment costs to the two discounts on equity. Our hypothesis implies that highly leveraged control over a soft source of financing *primarily* leads to overcapitalization and overinvestment, not necessarily only to corporate stealing as in Almeida and Wolfenzon [2004a] who do not consider the effects of taxes.

We use two unbalanced panels to test our theory. Data on (i) 13 CEIFs between 1985 and 2000 with 125 fund year observations, and on (ii) the 156 largest non-financial firms between 1984 and 2000 with 1276 firm year observations; one third of the firms were controlled by a CEIF at some point. The empirical results do not reject the overinvestment hypothesis but are inconsistent with the tunneling theory.

The total pyramidal discount is on average more than 30 percent since first the portfolio firms are discounted by around 10 percent, and then the CEIFs on top of this trade at a 25 percent discount. How are overinvestment costs because of financing via capital gains and retained earnings directly linked to discounts on the CEIF and portfolio firms, respectively? Using the transparency of Swedish pyramids, we empirically estimate the costs of active portfolio management as the difference in annual returns between a *fixed* portfolio that just passively holds the CEIF's investments at the beginning of the year and the *actual* (managed) portfolio. The difference is on average significantly positive and gauges the marginal cost (loss) for pyramidal investors due to (i) administrative and expense costs, (ii) pecuniary private benefits extracted by owners and management, and (iii) overinvestment costs due to reinvestment of capital gains. We estimate the median size of pecuniary private benefits plus agency costs to be 0.7 percent per year of the CEIFs portfolio value. These costs increase with separation between votes and capital. Because taxes restrict incentives to channel private benefits to the apex, and no evidence of tunneling in general, we interpret it as primarily a marginal gauge of overinvestment costs (a proxy for a marginal Tobin's q below one).

A neoclassical model predicts that the discount equals the ratio of the capitalized value of these three outflows, which do not go to the CEIF's shareholders, to the total value of all outflows from the CEIF, i.e. including the dividends going to the shareholders [Ross, 2002]. Our empirical estimate of this *theoretical* ratio is a discount of 25.3 percent compared to the *actual* average discount of 26 percent. Consistent with our hypothesis, overinvestment costs are thus directly linked to the size of the CEIF discount, i.e. it provides an alternative explanation to the *closed-end fund puzzle*.[5]

For portfolio firms, we show directly that the cause behind their significantly lower (average) Tobin's q is their overly strong dependence on retained earnings that leads to overcapitalization and then to overinvestment; their marginal Tobin's q are significantly below one *only* when financed via retained earnings. Even if their investment-cash flow sensitivities are significantly larger than for non-pyramid firms, portfolio firms are not capital constrained since they on average invest only a fraction of their available cash flows. As overcapitalization leads to substandard investment decisions, the single major cause behind *both* types of discounts is overinvestment due to the highly leveraged control over cash flows.

The primary objective of pyramiding is most likely not corporate power as such but to exploit a comparative financial advantage by using the strong separation between ownership and control to establish control over several large, listed firms' internal cash flows via a very small investment. Such a non-market source of capital is particularly important and relatively cheap when (i) equity markets are underdeveloped and supply of outside capital is limited; (ii) when capital-intensive firms need long-term capital to finance large restructurings; or (iii) when owners want to limit their equity dependence by relying more on retained earnings due to the non-controlling shareholders softer return requirements. Large, capital-intensive and old firms in mature industries with significant fixed assets and large financing needs are thus typical portfolio firms.

Controlling owners become more dependent on multiplicative separation over time as use of dual class shares is intensified in order to maintain control. Because of the political economy (tax structure), dual-class shares and pyramiding are not perfect substitutes empirically. If the sole purpose of pyramiding would be tunneling, we would expect the full potential of pyramiding (increasing number of levels) to be exploited. The design of taxes limits such incentives. Since separation of ownership and control is costly at *all* levels, ultimate

5. Dimson and Minio-Kozerski [2000] survey the large literature on closed-end investment funds.

owners have to trade off the benefits of highly leveraged control (cheaper financing) against inefficiencies and increased costs of external capital. The full potential in pyramiding is thus not used.

The next section provides descriptive statistics for Swedish pyramids. Section III analyzes how the discounts on CEIFs and on portfolio firms are related to the separation of votes from capital within the pyramid. In the following sections we first test for evidence of tunneling and then analyze if systematic overinvestment costs explains the existence of the two discounts. The penultimate section puts our results in perspective. Finally, we summarize with some concluding comments.

II. DESCRIPTIVE STATISTICS FOR SWEDISH PYRAMIDS

In this section we first portray a very powerful pyramid and then present our two data bases (i) on pyramid holding companies— Closed-End Investment Funds (CEIFs)— and (ii) on large listed non-financial firms.

II.A. The Wallenberg Family Pyramid

Figure I shows the transparent structure of the Wallenberg family pyramid -- the most influential pyramid in Sweden. Through its tax-exempt foundation at the apex, *Knut och Alice Wallenbergs Stiftelse,* the family controls *Investor*, the pivotal CEIF at the intermediary level of the three-level pyramid, which in turn controls some of the largest listed firms like *Electrolux, Ericsson,* and *SKF*. At this time the three firms had dual class shares with a voting differential of 1/1000 between A- and B-shares but equal dividend rights. Because *Investor* also (strategically) uses dual-class shares, the family controls 40 percent of the votes but only 23 percent of its capital. Their *direct* private ownership is, however, less than one percent. *Investor* had working control over *SEB*, the old Wallenberg bank that exercised the pyramidal control before *Investor* fully developed its investment banking functions after the death of the old patriarch Marcus Wallenberg in 1982. Note that with around 40 percent each of the votes, the family controls *Ericsson* together with *Industrivärden* (SHB) by contributing less than one percent of the capital (0.23x0.04; ownership in Investor and Ericsson, respectively). In Electrolux, the family controlled 46 percent of the votes by only contributing 0.23 percent of the capital (0.23x0.01). Combining pyramiding with dual-class shares, the typical Swedish pyramid has only three levels while e.g. Canadian pyramids may have up to ten [Morck et al., 2004].

Panel A in Table I shows that in 2000 the controlling owners' investments were worth 80 billion SEK, which amounts to 2.6 percent of the market capitalization of the SSE. The total market value of listed firms de facto controlled by CEIFs (largest fraction of votes) was 1 786 billion SEK or 57 percent of the market capitalization of 3 135 billion SEK (excluding the market value of CEIFs). The control multiplier has grown over time and was 22 (57/2.6) in 2000; 4 (12) of the 10 (20) largest firms were controlled by CEIFs. Panel B shows the dominance of the two most powerful CEIFs-- *Investor* and *Industrivärden*— where the pivotal owners controlled almost 50 percent of the market capitalization by investing only two percent of the market capitalization; a control multiplier for the two combined of 23.[6] Even if separation of ownership and control in pyramids is a well-established international phenomenon, the very large control multiplier may have wider economic implications in Sweden as CEIF-controlled firms generated 38 percent of the GDP in 2000, and their investments was 28 percent of the gross capital formation in the business sector in 1999.[7] The pyramids' investment decisions thus have a significant impact on the allocation of resources in the economy.

An interesting example is the Wallenberg family's traditional financing and investment philosophy that stresses the long-term perspective in contrast to the equity markets' perceived short-termism. It is reiterated in a comment to a recent quarterly report (3rd quarter, 2004) by *Investor's* CEO, Marcus Wallenberg: *Investor's general view is that a strong financial position should primarily be used to finance profitable investments in our own portfolio…The turbulent conditions of recent years have demonstrated the importance of a strong balance sheet to weather periods with weak demand and illiquid markets. Only when these factors have been taken into account should portfolio firms consider the possibility to pay out any remaining overcapitalization to the shareholders*. Potential costs of this philosophy due to overcapitalization, overinvestment and hanging on to losers too long are seldom mentioned.

One effect of the highly leveraged control structure is that the 25 percent average discount on Swedish CEIFs between 1986 and 2000 is 13 to 17 percent larger than for portfolio-oriented U.K. and U.S. CEIFs

6. The dramatic increase in the CEIF control multiplier in 1991 is due to intra group takeovers. *Industrivärden* acquired *Bahco* (previously named Promotion), the other CEIF controlled by the SHB group, while *Investor* acquired another Wallenberg-controlled CEIF: *Providentia*. The value under control remained roughly the same, but the value of the controlling owners listed investments decreased. The same year *Investor* also acquired Saab where the Wallenbergs had a large direct ownership. In 1994 *Investor* also acquired *Export-Invest*, another CEIF within the Wallenberg sphere.
7. GDP and capital formation numbers are collected from Statistiska Centralbyrån (SCB, Statistics Sweden)

[Gemmill and Thomas., 2002]. The extra discount is thus a rough *direct* measure of the costs of pyramidal control imposed on other shareholders. But it does not include the negative indirect effects of pyramiding on the value of portfolio firms (discounts). The average annual discount on *Investor* between 1930 and 2002 was 27 percent and has only been below 15 percent in three years since the 1930s (1964, 1965, and 1997) [Lindgren, 1994, pp. 93, 149, 177, and 255]. The dominant vehicle for controlling many of the largest firms in Sweden during the last 70 years has thus been traded at a significant discount that hardly can be explained by tax considerations, administrative costs, management fees, or small investor sentiment alone.

II.B. Descriptive Statistics on CEIFs

From the records of the Stockholm Stock Exchange (SSE) we identify 29 CEIFs that were listed at some point between 1986 and 2000. We only consider funds that satisfy the legal conditions for preferential tax status (previously discussed) as a CEIF. Due to missing information, the sample is reduced to 13.[8] The majority of the missing CEIFs were either delisted or ceased to be classified as a CEIF between 1986 and 1988. Since some of the 13 CEIFs leave the sample before 2000 and some enter after 1986, we have an unbalanced panel with a total of 125 fund year observations. Since some funds control a large share of the market cap, the number of CEIFs is almost by necessity small. Typically, other studies use small samples, e.g. Malkiel [1977] has a sample of 24 funds, and Brickley and Schallheim [1985] use a sample of 13 funds.

We collect accounting data and market data from the *Dextel Findata* TRUST database, and use annual reports for additional information about the funds, e.g. age, managerial compensation, and board remuneration. Ownership data comes from Sundqvist [1986-1993] and Sundin and Sundqvist [1994-2000] who report major shareholders for all listed firms together with detailed information on coalition structures. A coalition includes voting rights and cash flow rights owned by family members, family-controlled firms and family-controlled foundations. Since the ownership data because of tax reasons is first rate, and the Swedish accounting standard is rated number one in the world [La Porta et al., 1998], we expect to have very reliable and accurate estimates of discounts using data on ownership in both listed and unlisted firms. Using this information it is e.g. relatively

8. These are Atle, Bure, Cardo, Custos, Export-Invest, Gorthon Invest, Hasselfors, Latour, Industrivärden, Investor, Providentia, Ratos, and Öresund.

easy to form the CEIFs' portfolios in January each year. Portfolios are remarkably stable over time; median annual change in equity fraction in portfolio firms is one percent.

Panel A in Table II defines the variables used in our empirical analysis of CEIFs. Table III reports descriptive statistics on the 13 CEIFs. The ownership characteristics in Panel A show that on average the controlling (largest) shareholder has 36 percent of the voting rights (*Vote in Fund*) and 30 percent of the cash flow rights (*Capital in Fund*), which results in an average excess votes (*Excess Votes in Fund*) of almost 6 percent. The fund has on average 2.2 percent excess votes in the portfolio firms (*Average Excess Votes Portfolio)*. The average fraction of excess votes in the portfolio firms for the ultimate controlling owner of the pyramid is 7 percent (*Average Excess Votes Pyramid*). On average (median), the pyramid has had the same controlling owner for 25 years (9 years) (*Control tenure*).

Splitting the sample in two groups according to if funds have a fraction of excess votes above or below the median of 3.7 percent, we find that both subgroups have roughly the same fraction of cash flow rights but the control tenure is significantly longer for the more leveraged group. Fraction of excess votes in the fund is positively correlated with fraction of excess votes in portfolio firms. If excess votes in the fund are above (below) the sample median, median excess votes in portfolio firms is 3.4 percent (0.2 percent).

From the fund characteristics in Panel B we infer that the average fund is almost 50 years old (*Fund Age*), has a Net Asset Value (*NAV*) of 11 Billion SEK, and trades at a 25.9 percent discount. *Premium* is defined as the natural logarithm of Market Value of Fund Equity (MVE)/NAV. More excess votes in the CEIFs are associated with older and larger funds, and a larger average discount (premium) of 30.9 percent, compared to an average of only 20.4 percent for the group of less leveraged and younger CEIFs.

Panel C reports statistics on the funds' cash flow characteristics. The sum of administrative costs (*Adm. Costs*) and managerial compensation and board remuneration (*Comp*) is on average less than 0.5 percent of NAV, and significantly lower for the group of more leveraged funds; differences in discounts are thus not due to higher expense ratios. Received dividends from portfolio firms on average equal 2.6 percent of NAV while the CEIFs' dividend yield (paid dividend/NAV) averages 3.2 percent; the difference between the two is due to the CEIFs' realized capital gains. However, on average realized capital gains constitute almost eight percent of NAV. The high *Retention ratio*-- fraction of available cash flows (the sum of received dividends and realized

capital gains) that are not paid out as dividends— shows that the median fund keeps and reinvests 65 percent of available cash. While received dividends are paid out, realized capital gains are thus to a large extent reinvested. This behavior is expected since received dividends that are not transferred to the shareholders are taxable while realized capital gains are tax exempt if reinvested in the fund.

II.C. Descriptive Statistics on Large Non-Financial Firms

From *Dextel Findata* TRUST we collect accounting and market data for our second data base on 156 large non-financial firms listed on the SSE sometime between 1985 and 2000. On average, the sample contains 100 firms each year and constitutes more than 70 percent of the stock market capitalization of non-financial firms each year. About one third of the firms were at some point controlled by a CEIF. The sample contains 1276 firm year observations of which 345 are from CEIF-controlled firms.

Panel B in Table II defines the variables used in our empirical analysis of portfolio firms. Table IV presents summary statistics for the sample. Panel A reports firm characteristics. The average (median) firm in our sample has a Tobin's q of 1.372 (1.166), invests an amount equal to 11.3 percent (8.6 percent) of total assets, finances 25.5 percent (22.9 percent) of total assets with long term debt, earns a 11.2 percent (11.3 percent) return on total assets, retains 75.8 percent (82.1 percent) of the net cash flow, has total assets that are worth SEK 9596 million (SEK 1317 million) in 2000, and is 61 years (48 years) old.

The median firm's market value of assets increases by 9.7 percent per year. New financing increases the market value of assets by 10.3 percent (median). But since the median firm does not raise any new capital in Seasoned Equity Offers (*SEO*) and increases long term debt by only about one percent (*ΔDebt*), the brunt of new financing comes form retained earnings-- about 8 percent of the market value of assets.

Comparing our two subgroups of controlling owners, the CEIF-controlled firms invest significantly less, have higher earnings, lower leverage but are larger and older. The univariate analysis does not, however, indicate significant differences in q-values (*Q*). The higher earnings but similar q ratios are consistent with the conjecture that pyramid firms use investment and management strategies that generate higher (perhaps also more stable) current cash flows, their major source of financing, but do not develop new future growth

opportunities. These differences may be partly explained by the fact that the typical CEIF-controlled firm is a large and old firm operating in a mature industry.

Using data from Sundqvist [1985-1993] and Sundin and Sundqvist [1994-2001], Panel B presents ownership characteristics. Looking at *all* firms, the controlling owner on average has more than 50 percent of the votes and holds one third of the cash flow rights. After adjustment for pyramiding (*Adj Capital in Firm*), the average fraction of cash flow rights falls to 26 percent. The control lever is substantial as the majority shareholder on average holds 24.9 percent more voting rights than cash flow rights (*Excess Votes Firm*).

The ultimate owner in CEIF-controlled firm is highly leveraged since (s)he on average (median) controls almost 40 percent (33 percent) of the voting rights, which is sufficient for operational control, with only 7 percent of the cash flow rights. The effect of pyramiding is a drop in her/his average fraction of cash flow rights from 27 to 7 percent.[9] For non-CEIF-controlled firms, the average fraction of excess votes due to dual class shares is 20.2 percent but only 12.8 percent for CEIF-controlled (*Dual Class Excess Votes*). Both means to separate votes from cash flow rights thus have significant impact individually but are particularly efficient when combined multiplicatively in pyramiding; pyramiding explains about 61 percent of the combined effect while use of dual-class shares accounts for 39 percent.

But how does the highly leveraged control and high retention ratios affect the equity values of funds, in particular of older and more entrenched funds, and of the portfolio firms, respectively?

III. DISCOUNTS AND SEPARATION OF OWNERSHIP AND CONTROL

In this section, we first analyze how the strong separation in pyramiding, gauged by excess votes and control tenure, affects the CEIF premium (dependent variable) using OLS and fixed effect regressions. We then study the effect of pyramiding on the valuation of portfolio firms (Tobin's q) using fixed effect regressions.

9. Non-CEIF-controlled firms' fraction of cash flow rights decrease from 35.3 percent to 33 percent since some minor pyramids have no CEIF status; the average (median) fraction of excess votes from pyramiding is 2.4 percent (0 percent) (*Pyramid Excess Votes).*

III.A. Discounts on Closed-End-Investment Funds

In Panel A of Table V we first report results from regressing the fund premium (*Premium*) on the controlling owner's excess votes (*Excess Vote Fund*) and on length of control tenure (*Ln(Control Tenure)).*[10] These two variables are highly correlated but capture different aspects of leveraged control. We also include the fraction of available cash flows that the fund retains (*Retention Ratio Fund*) as a main explanatory variable since each SEK paid out as dividend is worth one SEK to investors while only one minus the discount if reinvested; a higher retention ratio thus implies a lower fund value relative to NAV. Since the *Premium* is defined as the natural logarithm of *MVE Fund/NAV*, a market value below the fund's NAV means a negative premium (discount); a positive (negative) regression coefficient is interpreted as a marginally lower (higher) discount.

Since an excess vote of 10 percent might have a different impact on the controlling owner's incentive depending on whether (s)he owns 10 percent or 30 percent of the capital, we include her/his fraction of the fund's capital (*Capital in Fund)* as control. Fund expenses are paid indirectly by the investor as a lower realized return, and should thus increase the discount. Since administrative costs (*Adm Costs*) and managerial compensation (*Comp*) may have a differential impact, we separate the two, and account for the fact that these costs become smaller relative to the NAV as funds become older and larger by including the natural logarithms of *Fund Age* and *NAV* as controls [Gemmill and Thomas, 2002]. Finally, we include four time dummies for the 86-88, 89-92, 93-96, 97-99 periods, respectively. Figure 2 shows that the average discount decreased during the 86-88 and the 93-96 periods, and increased during the 89-92 and 97-99 periods. We include these time dummies instead of year dummies in order to limit the loss of degrees of freedom.

We draw cross-sectional data from time-series of fund data. Pooling firm-year observations treats each observation as independent, which underestimates standard errors and overstate reported t-values if fund values are correlated from year to year. The Huber-White Sandwich estimator for variance used in the OLS regression asymptotically relaxes the assumption of independent observations. Using the fact that observations are drawn from the same fund, we also report results for fixed effect regressions.

10. We prefer to use of the excess vote variable to the V/C ratio (votes over capital ratio for the controlling owner) since regressions are less sensitive to outliers and easier to interpret economically; see Claessens et al [2002a].

We first test the hypothesis that the discount increases with separation of control from ownership as measured by the *Excess Votes Fund* variable. Consistent with our conjecture, this variable has a significant negative effect on the discount in Model 1 while the *Capital in Fund* variable is insignificant in all models. Each percent increase in separation raises the discount by half a percent. But when we include the natural logarithm of control tenure (*Ln (Control Tenure*)) as control variable in model 2, it becomes insignificant while control tenure is negatively significant at the 1 percent level. As the two variables are correlated, the separation of voting rights from cash flow rights appears to be a proxy for longer control tenure. Control over cash flows has the predicted significant negative effect as a higher retention ratio increases the discount.

In model 3 to 6 we report results of fixed effect regressions. When we in model 3 use the same specification as in model 1 but with fund specific effects, the coefficient for our variable for separation remains negative but becomes insignificant. However, when the control tenure variable is included in model 4, the *Excess Votes Fund* variable is significant at the 10 percent level. *Control Tenure* is negatively significant in all regressions and so is the retention ratio variable. Even though part of the fund discount is due to administrative costs and compensation to management, they do not seem to explain the *variation* in discounts over this time period. Larger funds are not associated with higher discounts. But older funds are associated with smaller discounts once firm specific effects are taken into account. In the last two models we exclude fund age since the descriptive statistics in Panel B of Table III suggests that fund age and excess votes are highly correlated. Excess Votes is then significant at the 10 percent (5 percent) level in model 5 (6).

We also test other models (unreported) with different control variables but the significant results for excess votes and control tenure remain unchanged.[11] For example, Brickley, Manaster, and Schallheim [1991] argue that when an investor holds the fund instead of the portfolio itself (s)he might lose valuable tax timing options, which might decrease the value of the fund relative to the portfolio. We follow Brickley et al [1991] and approximate the loss of valuable tax timing options by the volatility of the portfolio but it does not affect size of the discount. Furthermore, inspired by Gemmill and Thomas [2002], we approximate the risk due to

11. We also regress the *Excess Votes Fund* variable on *Control Tenure* controlling for fund age and size plus time dummies. Separation of control and ownership seems to increase with control tenure in the fund. The additional discount associated with longer tenure seems to capture the effect of increased entrenchment by long-term controlling owners who increase separation of control and ownership, i.e. a gauge of dynamic lock-in (agency) costs.

lack of perfect hedge when arbitraging between the value of the fund's equity and its portfolio value (aka replication risk) with the variance of the residual errors from a regression of NAV on the market index. But costs of risky arbitrage do not affect the size of the discount. Based on Gemmill and Thomas [2002], we also define what they label noise risk. It is the discount's sensitivity to the value-weighted average discount of the funds in the sample, and supposed to capture systematic noise trader risk due to small investor sentiment. Inconsistent with Gemmill and Thomas' [2002] results for UK funds but consistent with the arguments of Lee, Shleifer, and Thaler [1991], the discount increases with noise risk.[12]

To sum up, each of our three variables (excess vote fund, control tenure and retention ratio) that gauge different aspects of control increase the fund discount even if marginal effects are comparatively small.

III.B. Portfolio Firms

Using our second data base on large non-financial firms, we report results from tests if firms controlled by pyramids are valued at a discount in Panel B of Table V. We run fixed effect regressions with the natural logarithm of Tobin's q (Q) as dependent variable since the distribution is skewed [see Allayannis and Weston, 2002].[13] We control for *Cash Flow*, *Retention Ratio*, *Investment* level, *Leverage*, *Firm Size*, *Firm Age, Firm specific effects* and *Year effects* in all models. Their coefficients are generally consistent with previous studies. *Investment* and *Cash Flow* are positively significant while *Retention Ratio, Leverage* and *Firm Age* are negatively significant.[14] Once we control for *Firm Age*, *Firm Size* is insignificant.

We include the ultimate controlling owner's capital investment in the portfolio firms after adjusting for the effect of pyramiding (*Adj Capital in Firm*) to gauge possible positive incentive effects but the coefficient is insignificantly negative in all models. To capture the effect of separation between control and ownership in pyramiding we include the *Excess Votes Firm* variable in the first model. The significantly negative coefficient suggests that a one percent increase of excess votes by the ultimate controlling owner decreases the value of the

12. Since CEIFs' equity are not particularly popular among small investors and primarily held by domestic and foreign institutions that often arbitrage between the fund's equity and its portfolio to lock in gains from perceived trends in the change of the discount, the noise trader risk is most likely due to institutions rather than small investor sentiments.
13. All estimated models suggest significant firm specific effects; pooling the data and running OLS regressions would thus generate biased estimates. If we use q-values without the logarithmic transformation results are similar but somewhat weaker.
14. Ownership results are robust if we exclude the *Cash Flow* variable and instead define *Leverage* in terms of value of total debt.

firm 0.16 percent. Since his/her average excess votes in CEIF-controlled firms is on average about 10 percentage points larger than in other firms, pyramiding implies an additional discount between 1.5 and 2 percent. In model 2 we differentiate between the effect on excess votes due to pyramiding and to dual class shares. Both are significantly negative at the 5 percent level and imply an additional discount from the more leveraged control in pyramiding of 5 to 6 percent.

To gauge the effect on value when a firm comes under pyramidal control, we instead use a dummy variable that equals one if the firm is controlled by a CEIF in a particular year and zero otherwise. The highly significant regression coefficient implies that pyramidal control is associated with about an 8 percent direct discount on the value of a portfolio firm. When we include both the *CEIF dummy* and the two excess votes' variables in model 4, the *CEIF Dummy* and *Dual Class Excess Votes* are both significantly negative at the 1 percent level while the *Pyramid Excess Votes* is insignificant. The *CEIF Dummy* is thus in effect an indicator variable capturing all pyramidal separation, i.e. pyramidal control *per se* causes about a 10 percent discount on portfolio firms, while separation due to dual-class shares per se also increases the discount. The total effect of these two means to separate control from ownership is thus a +10 percent discount on value of portfolio firms *after* we control for leverage and firm age, which both have significantly negative effects on firm value. (We will shortly discuss the results from models 5 and 6.)

Since a higher retention ratio also significantly increases the discount on portfolio firms, each of our variables gauging different aspects of separation of control from ownership in pyramidal control increases separately the discount. The equity values of portfolio firms we use to calculate our benchmark for the discounts on CEIFs, i.e. the Net Asset Value of the fund's portfolio, are thus already subject to a substantial discount because of pyramidal control. Since the 25 percent average discount on CEIFs comes on top of this, the total discount caused by pyramiding is thus on average well above 30 percent; a 10 percent discount on portfolio firms, which our results suggests, implies a total pyramidal discount of almost 33 percent.

The results so far show that both CEIFs themselves and their portfolio firms are subject to substantial discounts that increase with the pyramidal separation of control from ownership. But what is it that the controlling owners actually do that causes the large discounts? Is it because they systematically divert corporate resources (tunneling) or because they make outright bad investment decisions (overinvestment)?

IV. TUNNELING

Using Bertrand et al's [2002] methodology, we first investigate if tunneling is prevalent within pyramids. To do the tests we need to predict the profitability of all firms in the sample using *Industry Return On Assets* (ROA): Aggregate *Earnings Before Interest, Taxes and Depreciation* (EBITD) in the industry divided by the aggregate value of total assets in the industry. We group firms into 13 industries based on the two-digit SIC codes. The value of each firm's total assets is then multiplied by the *Industry ROA* to generate the *Predicted EBITD*; Bertrand et al [2002] label this variable *Own Shock*. This variable is then used as an explanatory variable in a regression with *actual* EBITD as dependent variable.

To test for tunneling, we interact the *Predicted EBITD* variable with the *CEIF Dummy*. A significantly negative interaction term suggests that profitability of portfolio firms is less sensitive to industry shocks than stand alone firms because profits are tunneled within the pyramid. In Panel A of Table VI, results from our first tests of tunneling show that for model 1 *Predicted EBITD* is highly significant and almost equal to one as expected. But the interaction term is insignificant indicating that there is no or little tunneling. Since CEIF-controlled firms are larger and older than stand alone firms and may be more sensitive to industry shocks, we include interaction terms of firm size (model 2) and of firm age (model 3) with *predicted EBITD*. The firm size interaction term is indeed positively significant but the CEIF interaction term is still insignificant.

Tunneling means that resources are transferred from firms where the ultimate owner has small cash-flow stakes to firms where (s)he has larger cash-flow stakes. But the CEIF dummy does not take the level of cash flow ownership into account. In model 4 we, therefore, focus on the 349 firm years where there is at least one more firm in the sample that is controlled by the same CEIF. *Predicted EBITD* is interacted with the ultimate owner's fraction of cash flow rights after adjustment for pyramiding. The tunneling hypothesis suggests that the more cash flow rights the ultimate owner possesses, the more sensitive the firm should be to industry shocks, i.e. less profits should be tunneled to other firms within the pyramid. Our results suggest the opposite. The more cash flow rights the ultimate owner holds, the less sensitive is the firm to industry shocks.

Another test for tunneling is if a pyramid firm's profitability is sensitive to the profitability of the other firms within the same pyramid. We define the *Group Shock* variable as in Bertrand et al [2002]: Predicted EBITD of all firms within the same pyramid, excluding the investigated firm. This variable is used as

explanatory variable in the regressions in panel B with actual EBITD as dependent variable. In contrast to the tunneling hypothesis, the *Group Shock* variable is *negatively* significant in model 1.

The tunneling hypothesis suggests that especially firms in which the ultimate owner has large equity stakes should to be sensitive to group shocks. We, therefore, construct two dummy variables according to whether the ultimate owner has more (*Large Equity Stake Dummy*) or less (*Small Equity Stake Dummy*) than 4.8 percent (sample median) of the firm's cash flow rights. In model 2 the two dummy variables are interacted with the *Group Shock* variable. Again the tunneling hypothesis is rejected. Even for firms in which the ultimate owner has large equity stakes, the sensitivity to group shocks is negative. An individual pyramid firms' profitability is thus not sensitive to the profitability of the other firms within the pyramid.

As a final tunneling test, we investigate if the CEIFs' cash flows are sensitive to the profitability of the portfolio firms, once dividends are controlled for. If resources are tunneled from the portfolio firms (at the bottom) to the CEIF (right below the apex), we should find a *negative* relation between the fund's cash flow and the portfolio firms' cash flows.[15] The fund's EBTD is the dependent variable with the aggregate group EBITD (adjusted for paid dividends) and *Dividends* paid by portfolio firms to the CEIF as explanatory variables. The results in Panel C show that the *Group Cash Flow* variable is *positive* and insignificant, which is again inconsistent with tunneling. The *Dividend* variable is highly significant expected even if its coefficient of 1.78 is high-- perhaps because not all portfolio firms are in the sample, e.g. financial firms.

Our results imply that there are no evidences of significant tunneling within Swedish pyramids. Instead, reverse signs of key variables indicate the opposite; too much capital may be retained.

V. OVERINVESTMENT TESTS

We now explore our alternative hypothesis that the single cause behind the large pyramidal discounts is not diversion of corporate resources but compensation to non-controlling shareholders for overinvestment costs. The highly leveraged control in pyramiding over firms' cash flows implies overcapitalization that leads to overinvestment; costs and potential losses are borne disproportionally by non-controlling shareholders who demand compensation. First, we show how the CEIF discount is related to overinvestment using the

neoclassical model of Ross [2002]. Second, we demonstrate that CEIF-controlled firms are overcapitalized but have higher investment-cash flow sensitivity; we use fixed effect regressions and models based on Euler equations estimated using GMM in system. Finally, we run marginal Tobin's q models to test for overinvestment, in particular when investments are financed out of retained earnings.

V.A. Overinvestment and Discounts on CEIFs

To relate costs of overinvestment to the discount on CEIFs, we use the neoclassical model of Ross [2002]. An investor who *indirectly* acquires the fund's portfolio by investing in the fund's stock, instead of directly acquiring it in the market, has to pay extra costs in terms of the fund's (i) management compensation fees and (ii) other administrative costs, but receive (iii) dividends from the CEIF. These three flow variables are assumed to be a constant percentage of NAV in perpetuity. In steady state, the discount then equals the proportion of the sum of these flows that does not go to the shareholders, i.e. the sum of extra costs divided by the sum of the extra costs and the dividend yield. For example, since in our sample management compensation and other administrative costs are 0.4 percent of NAV, and the median dividend yield is 2.9 percent, the predicted discount is 12 percent (0.4/(2.9+0.4)), i.e. close to the average discount for Anglo-Saxon CEIFs. But the median discount for Swedish CEIFs is twice as large at 24 percent.

A key implicit assumption in Ross' model is that the fund's investments are expected to generate a return equal to the market's required rate of return. But if due to control considerations and access to free cash flows, the fund *overinvests*, i.e. generates a lower return than required by outside investors, we must add the (positive) difference between the two to the extra marginal costs shareholders have to pay when investing in a CEIF. Control considerations reinforced by taxation effects (previously discussed) imply that funds at the margin rather reinvest capital gains than distribute them to shareholders, and rather invest within the pyramid instead of investing in outside firms. Controlling owners may also extract pecuniary and non-pecuniary private benefits. Even if the capital is allocated efficiently within the pyramid, the overall rate of return may not be what outside investors require [Almeida and Wolfenzon, 2004b].

15. In order to be included in the test, the CEIF must have at least one listed firm in our sample of Swedish large non-financial firms. The sample is, therefore, reduced to 56 fund year observations from primarily the largest funds.

Using data from Sundin and Sundqvist [1985-2001], we construct an estimate of all the extra costs investors have to pay, i.e. fees, administrative costs and lower marginal returns, by comparing the return on a fixed portfolio that just passively holds the CEIF's 1st of January portfolio over the year to the annual return on the actual, managed portfolio (change in NAV) from the annual reports. For non-listed equity we use the book values provided in the annual reports. In Table VII we report that the median difference between the return on the fixed portfolio and on the CEIFs' actual portfolio is +1.1 percent (*Gross Leakage*), and significantly different from zero. If we use this measure of extra costs for shareholders, Ross' model predicts a discount of 27.5 percent (1.1/(1.1+2.9)) that is somewhat higher than the average discount for the sample at 25.9 percent; if we use the average dividend yield of 3.2 instead, the predicted discount is 25.6 percent.[16]

If we split the sample by whether the controlling owner's fraction of excess votes exceeds the sample median, shareholders' marginal costs are 1.4 percent (1 percent) for the more (less) leveraged CEIFs. The model then predicts a discount of 31.6 percent (21 percent) compared to the actual average discounts of 30.9 percent and 20.4 percent, respectively.[17] Theoretical predictions are thus close to actual discounts *only* after we have accounted for the extra marginal cost shareholders pay since returns from the CEIFs' active portfolio management are systematically below the required market returns, in particular for the more leveraged CEIFs.

If we subtract the management compensation fees and other administrative costs from the total marginal costs to shareholders (*Gross Leakage*), we get a median marginal cost of 0.7 percent (*Net Leakage*) that is significantly different from zero. The CEIF shareholders thus demand compensation (discounts) for the lower marginal return on the fund's portfolio activities (agency costs) and/or for consumption of pecuniary private benefits of control. Since we find no evidence of significant tunneling in general and incentives for the tax exempt family foundation at the apex of the pyramid to extract private benefits are limited, we interpret the *Net Leakage* variable *primarily* as a gauge of the marginal *overinvestment* costs that are imposed on the shareholders due to the highly leveraged control over cash flows.

16. Ross [2002] suggests that it is unclear if administrative expenses are payments that decrease the value for the marginal direct holder of the portfolio. If we consider half of the administrative expenses (0.15 percent) to be such payments, the model suggests a discount of 25.3 percent, i.e. close to the average discount in our sample at 25.9 percent.

17. In these predictions we used half of the administrative costs (0.15 percent) for both subsamples, and the actual dividend yields of 2.7 percent and 3 percent, respectively. Our approach thus predicts the level of discounts fairly well even it somewhat overestimates.

We analyze if our approach also captures the cross-sectional variation in discounts by running OLS regressions (fund specific effects are insignificant in fixed effect regressions) with *Net Leakage* as dependent variable, and *Control Tenure*, *Retention Ratio*, *Fund Age* and *Size* as explanatory variables; see Panel B in Table VII.[18] We use the *Excess Votes Dummy* as a measure of separation between control and ownership: equals one if excess votes exceed 3.7 percent, and zero otherwise.[19] The change in the fraction of non-listed assets is also included as an explanatory variable to control for the effect of book values on the change in NAV. We find a significant *positive* relation between overinvestment costs (*Net leakage*) and *Control Tenure* (Model 1), *Excess Votes Dummy* (Model 2), and (weaker) *Retention Ratio* (Model 4), respectively. When all three variables are included in model 4, *Excess Votes Dummy* is still significant at the 1 percent level. More leveraged control over CEIFs thus implies significantly larger overinvestment costs.

The link we established in this subsection between overinvestment costs and CEIF-discounts shows that it is the high retention of realized capital gains, which leads to inefficient investment decisions, that is the major cause of CEIF-discounts, which increase in the separation between control and ownership.

V.B. Overcapitalization in Portfolio Firms

We start our analysis of discounts on portfolio firms by returning to the results of model 5 and 6 in Panel B of Table V where the Tobin's q of large non-financial firm's is the dependent variable. When we interact the *CEIF dummy* with the *Retention Ratio* variable, the CEIF dummy per se becomes insignificant while the interaction term is negative and highly significant. Since the significance of the *Retention Ratio* variable per se goes from one percent to 10 percent, it is the retention of CEIF-controlled firms that also drives this result. The discount on CEIF-controlled firms thus seems to be caused by the high retention ratio in such firms. This interpretation is reinforced by the results of model 6 where we also include the two distinct effects on separation from pyramiding and use of dual-class shares, respectively. Since the *Pyramid Excess Votes* variable is insignificant while *Excess Votes Dual-Class shares'* variable is significantly negative, it is the high retention ratio, around 80 percent on average, due to pyramiding reinforced by the use of dual-class shares that causes

18. Regressions with the discount as dependent variable and the leakage as explanatory variable do not generate significant results. This is not surprising since the discount should capture the expected long term average leakage, not necessarily leakage in a particular year.

the substantial discounts of CEIF-controlled firms.[20] We interpret this as evidence of substantial *overcapitalization* due to the highly leveraged control over portfolio firms in pyramids; shareholders are aware of this and demand compensation.

But what is that the controlling owners actually do with the retained capital that causes the discounts?

V.C. Financing and Overinvestment in Portfolio Firms

We test our hypothesis that overcapitalization leads to overinvestment in two steps. First, if CEIF-controlled firms are particularly dependent on retained earnings as a source of finance, as previous results suggest, these firms should have significantly higher investment-cash flow sensitivities than comparable firms without being financially constrained. Second, if CEIF-controlled firms overinvest because of their control over retained earnings, we should observe a marginal Tobin's q significantly below one for these firms *only* when financed out of retained earnings, i.e. firms do inferior investments due to leveraged control over cash flows.

Higher investment-cash flow sensitivity occurs because costs of external and internal capital differ [Erickson and Whited, 2000]. The cost of internal capital for the controlling owners of portfolio firms decreases as separation between votes and capital grows while discounts on CEIFs and on CEIF-controlled firms gauge the extra return that investors demand to provide new external equity. Pyramiding thus *endogenously* creates a wedge between costs of internal and external capital because of the strong separation of votes and capital. Since pyramid-controlled firms, therefore, are more dependent on internal cash flows, they follow an *enhanced* pecking order of financing, and have a significantly higher investment-cash flow sensitivity than comparable firms, i.e. pyramiding is a simple identifying criterion for these implications.

We first test investment-cash flow sensitivity by an average Tobin's q-model estimated with a fixed effect panel data procedure. Besides common independent variables as average q (*AvQ*) and *Cash Flow*, we also include *Output* and *Leverage* to facilitate comparisons with our next results from Euler equation models. Since investments also grow with total sales, we estimate the following model:

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19. Estimating the same models with the continuous variable, *Excess Votes Fund*, instead of dummy, results are generally weaker.

20. For U.S. firms, DeAngelo et al [2004] find that dividend payments prevent significant agency problems since higher retention of earnings would have given managers access to more capital without having better investment projects and subject to less monitoring. In recent years, two funds, *Ratos* and *Öresund*, interestingly trade at a premium by in effect becoming a buy-out fund and by pursing an aggressive, shareholder-friendly pay-out strategy, respectively.

$$I_{i,t} = \alpha_1 (AvQ)_{i,t} + \alpha_3 CF_{i,t} + \alpha_4 Y_{i,t-1} + \alpha_5 L_{i,t-1} + \gamma_i + \lambda_t + \varepsilon_{i,t},$$

where *I* denotes *Investment*, *CF* is *Cash Flow Firm*, *Y* stand for *Output*, *L* indicate *Leverage* (see Panel B in Table II for definitions of variables). *AvQ* is sum of *Q* at the beginning and at the end of year divided by 2. γ_i is a firm specific effect, λ_t a time specific effect, and $\varepsilon_{i,t}$ the error term.

The results in Panel A of Table VIII show that for Model 1, where investment is regressed on *AvQ*, cash flow, output, leverage, and year dummies, the *AvQ* variable is highly significant; investments by large firms are sensitive to the firms' market value. Leverage is associated with less investment while output growth increases investment. The insignificant *Cash Flow* variable indicates that investments by large firms are in general insensitive to internal cash flows. In model 2 we interact the four independent variables with an indicator variable that equals one if the firm was controlled by a CEIF in that particular year, and zero otherwise. The *CEIF*Cash Flow* interaction term is positive and significant suggesting that investments by CEIF-controlled firms are more sensitive to internal cash flow. But CEIF-controlled firms are not more sensitive to *Q*, *Leverage*, and *Output* growth than other firms. Even if the descriptive statistics in Table IV shows that CEIF-controlled firms invest significantly less than other firms, the significantly higher investment-cash flow sensitivity indicates that such firms may *overinvest* relative to their internal cash flows and to other firms; we soon return to this issue. In particular, they are most likely *not* capital-constrained since their investments on average are smaller than their available cash flows; see Table IV.

Results so far are consistent with our hypothesis that CEIF-controlled firms have higher investment-cash flow sensitivity because pyramiding drives a wedge between costs of internal and external capital. But Chirinko and Schaller [1995] show that the average Tobin's q model is flawed as it reflects the *average* return on a firm's total capital whereas the *marginal* return on capital is the relevant gauge. Bond and Meghir [1994] derive an Euler equation model based on the first-order conditions of a maximization process that deals with these shortcomings. The Euler equation model controls for the influence of expected future profitability on investment spending whilst no explicit measure of expected demand or expected costs is required as future unobservable values are approximated by instrumental values [Goergen and Renneboog, 2001]. The theoretical model translates into the following empirical specification:

$$I_{i,t} = \alpha_1 I_{i,t-1} + \alpha_2 I_{i,t-1}^2 + \alpha_3 CF_{i,t-1} + \alpha_4 Y_{i,t-1} + \alpha_5 L_{i,t-1}^2 + \gamma_i + \lambda_t + \varepsilon_{i,t-1},$$

where *I* denotes *Investment*, *CF* is *Cash Flow*, *Y* represents *Output*, and *L* stand for *Leverage* (see Panel B in Table II for definitions). γ_i is a firm specific effect, λ_t a time specific effect and $\varepsilon_{i,t}$ the error term.[21]

Results from the basic Euler equation model in Panel B shows the cash flow term is still insignificant. But since the interaction term between the CEIF indicator variable and the cash flow variable is significantly positive in model 2, this method also suggests that CEIF-controlled firms have significantly higher investment-cash flow sensitivity. Results are thus consistent with the idea in the enhanced pecking order theory that pyramiding drives a wedge between costs of internal and external capital. But since higher investment-cash flow sensitivity per se does not necessarily imply overinvestment [Kaplan and Zingales, 1997], do CEIF-controlled firms also overinvest because of their leveraged control over retained earnings?

Using the approach by Gugler et al [2003], we, therefore, analyze the marginal returns on investment in Panel C. Since all variables are defined in terms of first differences, we estimate OLS regressions with the change in the market value of the firm's total assets ($\Delta MV\ Assets$) as dependent variable. Aggregating all financing sources into a *Total Financing* variable (see Panel B in Table II), we estimate

$$\Delta MV\ Assets_{i,t} = \alpha_1 + \alpha_2 Total\ Financing_{i,t} + \lambda_t + Ind_i + \varepsilon_{i,t},$$

where λ_t is a time specific effect, Ind_i an industry effect, and $\varepsilon_{i,t}$ the error term. The null-hypothesis is that α_2=1, i.e. each SEK of financing should increase the market value of the firm's total assets with at least one SEK. Coefficients are reported with (p-values) from a Wald test if the coefficient is different from one. None of the coefficients for the total sample or for the CEIF-controlled firms in model 1 and 2 are significantly different form one. There is thus no evidence any overinvestment problem in general.

21. The empirical specification of the Euler equation where lagged values of the dependent variables are used as independent variables has to be estimated by Generalized Method of Moments (GMM) in systems [Blundell and Bond, 1998]. The system consists of level equations which use lagged differences of the dependent and independent variables as instruments and difference equations which use levels of the dependent and independent variables as instruments. We use levels of all variables dated t-2 and t-3 for the differenced equations and the first differences of all variables for the level equations. Using GMM in system also controls for the possibility that the investment-cash flow sensitivity we documented by fixed effect regressions above is a result of omitted variables. The lagged terms of the dependent variable stem from structural adjustment costs.

We define a more precise test of our overinvestment hypothesis by differentiating between sources of financing-- long term debt, new external equity, and internal equity (retained earnings)-- and instead estimate

$$\Delta MV\ Assets_{i,t} = \alpha_1 + \alpha_2 SEO_{i,t} + \alpha_3 \Delta Debt_{i,t} + \alpha_4 Retained\ Earnings_{i,t} + \lambda_t + Ind_i + \varepsilon_{i,t}\ .$$

The null hypothesis is that $\alpha_2=\alpha_3=\alpha_4=1$. For the full sample in model 3, none of the coefficients is significantly different from one. When we estimate the model only with CEIF-controlled firm observations, coefficients on external equity (*SEO*) and debt (*ΔDebt*) are not different from one but the coefficient on internal *Retained Earnings* is significantly smaller than one at the 5 percent level. If one SEK from retained earnings is invested, the value of the firm's total assets increases by significantly less than one SEK— a *marginal* Tobin's q below one. CEIF-controlled firms thus appear to make inefficient investment decisions because of the highly leveraged control in pyramiding with access to *all* of the firm's internal cash flows. Overcapitalization via retained earnings leads to overinvestment; just holding cash does not satisfy the return requirements. The very large fraction of the retained earnings (Table V) thus explains why investors discount CEIF-controlled firms.

We interpret evidences of overcapitalization, significantly higher investment cash-flow sensitivity and marginal Tobin's q below one *only* for retained earnings as suggestive proof of overinvestment by CEIF-controlled firms due to the highly leveraged control of internal funds. Overinvestment costs (inefficiencies) rather than diversion of corporate assets would then explain discounts associated with pyramidal control both on the CEIFs and on the CEIF-controlled firms.

VI. DISCUSSION

A plausible interpretation of our results is that corporate stealing as such is not ruled out but it is not the main cause behind the pyramidal discounts. In a country with a well-develop financial system with very high transparency and low corruption, first rate accounting and judicial standards, and high levels of tax compliance, the significant discounts instead gauge compensation for inefficient investment decisions caused by the highly leveraged control structure. Unlike emerging markets with pyramids, most often studied in the literature, measures of pecuniary private benefits in Sweden are among the lowest in the corporate world.

Why are overinvestment costs particularly important in firms controlled by pyramids? There are three principal reasons. First, because of their politically sensitive character, taxation of pyramids is pivotal, and

determines their behavior to a larger extent than for almost any other corporate structure. By regulating distribution of cash flows and capital gains within the pyramid, taxes have a profound effect on the pyramids' financing and investment behaviors, in particular by supporting a too high retention ratio, and as substitute for weak legal minority protection. The tax man is often a more efficient and faster enforcer than courts.

Second, the highly leveraged control of internal cash flows provides firms with access to a large source of capital that is relatively inexpensive compared to external equity. Such a comparative financing advantage is particularly valuable for old firms in mature industries with large capital needs for long-term investments and low expected returns, the typical firm controlled by pyramids. Since such firms have high levels of assets in place and limited growth opportunities, they are more likely to overinvest because of access to a free cash flow [see Jensen, 1986]. The significantly higher capital-labor ratios reported for pyramid firms are consistent with this claim; see Morck et al [2000]. Third, because of softer return requirements than on external capital, firms controlled by pyramids are more likely to be discounted because they make inferior acquisitions, overinvest in long-term R&D projects with uncertain and unclear benefits in a distant future, and hang on to losers too long. Chirinko and Schaller [2004] report that the effective discount rate of Canadian firms with large agency costs is 350 to 400 basis points below the market rate due to overinvestment. The link between pyramiding and overinvestment behavior is thus rather direct.

Harvey et al [2004] also explore this link when analyzing pyramids in emerging markets. Because of the more stringent loan requirements, they show that internationally syndicated loans mitigate agency costs most efficiently in pyramidal firms with high expected managerial agency costs. Since such firms are also most likely to have larger overinvestment problems according to the authors, their results are consistent with our more general analysis of how more leveraged access to internal equity generates higher overinvestment costs but that debt financing does not lead to overinvestment.

Our finding that compared to other large listed firms, pyramid-controlled firms have significantly higher investment cash-flow sensitivities *and* overinvest (marginal Tobin's q below one) but only when retained earnings are used has several implications. First, the causal factor behind the larger wedge between costs of internal and external equity, which explains the higher sensitivity, is not extra costs on external equity

because firms become more financially constrained as often assumed in the literature; see e.g. Moyen [2004].[22] But primarily lower cost of internal equity because of the highly leveraged control over internal cash flows in pyramiding.[23] If higher cost for external equity is the pivotal cause, we would most likely observe a significant underinvestment problem instead of strong indications of systematic overinvestment. The same would be true if diversion of corporate resources would be significant and the major cost in pyramiding.

Second, the importance of lower cost of internal equity as the cause of the wedge is also emphasized by Lewellen and Lewellen [2004] who find that internal equity has a significant tax advantage over external equity as personal taxes are deferred when capital is retained rather than distributed; the benefit depends on the size of the capital gains tax, not on taxes on dividends. The wedge between the two costs of equity is, however, much larger due to pyramiding, and so are the effects on the firm's leverage, payout policy and cost of capital when the standard assumption of equal costs for the two types of equity does not hold. That we observe a lower average leverage for firms controlled by pyramids (Table IV) is thus no surprise!

Third, Hadlock [1998] claims that since he finds that investment cash-flow sensitivities increase with insider holdings but only up to a point, his results are inconsistent with an agency cost explanation of the sensitivities. However, our result that only large, listed firms controlled by pyramids have significantly higher sensitivities, is consistent with an overinvestment explanation since such firms have very high agency costs due to the extreme separation of votes from capital in pyramiding.[24]

Almeida and Wolfenzon [2004a] develop a hybrid model of pyramiding that combines the idea that (i) the leveraged control over several firms' cash flows creates a financial advantage with the key assumption that (ii) stealing of corporate resources is significant since protection of minority shareholders is weak. The

22. CEIF-controlled firms are most likely not financially constrained since they are not *equity-dependent* as defined by Baker et al [2003]. While Tobin's Q (AvQ) in Table VIII has a significant positive effect on investments, the interaction term for pyramid-controlled firms (CEIF*AvQ) is *negative* but insignificant. If anything, such firms are thus less equity-dependent as their investments are not as sensitive to current stock prices as gauged by Tobin's Q.

23. Somewhat more formally, Kaplan's and Zingales' [1997] key derivative (d2I/dWdk) is positive **if** a larger k (wedge between cost of external and internal equity) occurs because of a lower cost of internal equity due to pyramiding. Access to more internal capital (W) increases investments (I)— dI/dW positive— but at an increasing rate if also internal equity becomes cheaper (larger k); the mixed second derivative is positive, i.e. pyramid firms have higher investment cash-flow sensitivity. But if a larger k instead occurs because of higher cost for external equity, the sign of the derivative is ambiguous.

24. The significant discounts on second generation family firms found by Villalonga and Amit [2004] may also be related to overinvestment costs and non-organic growth as the family becomes more entrenched over time and the entrepreneurial spirit fades.

controlling owners may use the capital of an already existing firm together with new equity capital from external investors to finance a new firm that they also control at the pyramid level right below. By controlling all the capital in the existing firm, the owners de facto let the incumbent, non-controlling shareholders pay for the expected costs for corporate stealing (discounts) that the new external shareholders demand compensation for. Because of the pecuniary private benefits, the investment has a positive net present value for the controlling owners but a negative for the other incumbent shareholders, i.e. due to *overinvestment* of their capital, the marginal Tobin's Q is below one. The financial advantage in pyramiding is thus used *only* to cover for overinvestment costs due to expected corporate stealing in the newly set up firm. More generic overinvestment costs in either firm due to inefficient decisions because of the highly leveraged control are not considered. But we find such costs much more empirically relevant than costs of outright corporate stealing.

Unlike in a conglomerate, the main economic problem in pyramiding is not inefficient internal capital markets since *direct* capital transfers between portfolio firms are illegal, and tunneling is limited. But instead that too much capital is inefficiently retained and overinvested due to the highly leveraged control structure. Investments thus tend to be determined by historical profits and not by expected future profits because of the biased financing. The limited dependence on primary equity markets, however, hampers both development of financial markets and overall growth in economies where pyramiding is frequent; CEIF-controlled firms are often in mature industries with low growth opportunities, and dividends are not efficiently distributed and channeled to firms in faster growing industries. This is socially costly but not for shareholders per se as they are compensated through discounts on the CEIFs and on the portfolio firms. Unlike the discount on conglomerates, the large discount on pyramid holding companies cannot be explained by inefficiencies in the portfolio firms since this is already reflected in the value of the holding firm's portfolio.

VI. CONCLUSIONS

We think the paper makes three general contributions. First, the major one is that we develop and find strong empirical support for an alternative explanation of why large discounts on pyramidal ownership exist. The highly leveraged control in pyramiding does not only provide controlling owners with incentives to steal corporate resources as the leading theory suggests. But also to systematically overinvest since they have access

to a relatively inexpensive source of capital with lower and softer return requirements than the external capital markets. The discounts are thus compensation to the non-controlling shareholders either for expected corporate stealing or for inefficiencies caused by overinvestment or both.

The overinvestment hypothesis is more plausible since the raison d'être behind pyramiding seems to be to exploit a comparative financial advantage because of the leveraged control over internal cash flows. Tax rules that regulate cash flows within the pyramid substitute for weak minority protection and limits incentives for outright stealing. The general implications are thus that (i) the overinvestment hypothesis can not be ruled out a priori, and that (ii) exclusive focus on legal minority protection is too narrow when analyzing pyramids, the most leveraged corporate control structure around the corporate world.

Second, we present an alternative and more general solution to the closed-end fund puzzle when the holding company of a pyramid is organized as a closed-end investment fund. The significantly larger discounts on Swedish CEIFs are not explained by the standard theories; either extra managerial and administrative costs for shareholders due to the indirect ownership or because of high arbitrage costs due to large replication risks of the fund's portfolio. Instead, due to the leveraged control over cash flows, the controlling owners impose extra costs on the other shareholders by re-investing the fund's tax-exempt capital gains inefficiently; realized returns are significant lower than the required rate of return in the market. Compensation for such overinvestment costs explains the larger part of actual fund discounts as well as the discounts on listed firms controlled by pyramids.

Third, we find a simple institutional criterion to identify firms with significantly higher investment-cash flow sensitivities that does not depend on how financially constrained they are because of higher costs for external equity. Firms controlled by pyramids have significantly higher investment cash-flow sensitivities because of their pivotal dependence on internal equity. But they are not financially constrained. Instead, because of the leveraged control, they are overcapitalized, have lower leverage than comparable firms, and seem to systematically overinvest rather than to underinvest. The combination of higher investment cash-flow sensitivities and overinvestment behavior for pyramid controlled firms is a new empirical result. The focus in the existing literature on the extra cost on external equity as the driving force behind higher sensitivities is thus too narrow. Further implications of lower cost of internal equity due to institutional factors and tax reasons (deferred capital gains taxes) as causes behind higher sensitivities are worth pursuing in future work.

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APPENDIX
Short Historical Background to the Politics of Swedish Pyramiding

Pyramids were frequent and important in the U.S. at the beginning of the previous century but became extinct after the radical regulatory changes in the 30s, see Bonright and Means [1932], Roosevelt [1942] and Morck [2003]. The opposite happened in Sweden. The regulatory changes gave birth to pyramids that have exerted a dominating and remarkably stable influence over the largest listed firms since then [see e.g. Fritz, 1990, Högfeldt, 2005, and Lindgren 1994]. The concentration of corporate control has no counterpart in Western Europe and North America [La Porta et al., 1999]. This is an interesting example of historical path dependency where acute regulatory responses to specific events cause permanent institutional changes with profound and lasting economic impact. The different outcomes in the two countries are most likely explained by the disparity of the banking systems and of the political structures.

The most severe financial crisis in Sweden was triggered by the suicide of Ivar Kreuger in Paris in 1932. His large and very opaque international empire of highly leveraged firms collapsed and the large Swedish commercial banks that financed his extremely risky financial operations became the new controlling owners of the largest listed firms. However, as part of the regulatory changes, commercial banks were no longer allowed to *directly* own shares in other firms (a right granted them in 1911) when the Swedish version of the *Glass-Steagal Act* was enacted in 1934. The solution was to transfer the banks' portfolios of controlling interests to holding companies that were organized as closed-end investment funds (CEIFs) and distribute the funds' shares to the banks' existing shareholders. The controlling owners of the commercial banks at the apex of the pyramid thus controlled the largest firms at the bottom via CEIFs at the intermediary level that were listed. Another group of pyramids (CEIFs) were later created around family foundations in order for the family to avoid wealth taxation. The separation between votes and ownership was multiplicative since pyramiding was combined with use of dual-class shares. The effect was particularly amplified by the previously Kreuger-dominated firms (e.g. Electrolux, Ericsson and SKF) where A-shares typically had one vote but B-shares only 1/1000 vote but equal dividend rights. As the last listed firm on SSE, Ericsson abolished this voting differential in August, 2004. The control over the largest firms in Sweden is therefore exercised through a pyramid where either a bank or a family controls a CEIF that in turn is the largest vote holder in many other listed firms.

Unlike in the U.S. the banks were not the problem in Sweden but the solution to the problem of how to create financial and social stability, and to restructure the large industrials. The main banks were financially healthy enough and experienced as investment bankers. To weather the acute crisis by transferring control over the main corporate assets to CEIFs controlled by the largest financiers was a logical step, in particular since the equity markets de facto closed down in the early 30s. And more importantly, the ruling Social Democrats were the political architects behind the deal. Without strong political support and control it is unlikely that the pivotal corporate control over the largest listed firms would be allowed to be exercised by a small group of bankers. The birth of the Swedish pyramids was part of the package of reforms that lay the foundation for a consensus-based and lasting relationship between two adversaries: labor and capital. Since the Social Democrats have been in power since 1932, except for 9 years, corporate control and governance are highly political issues in Sweden. It is thus not surprising that the largest listed firms have had the same CEIF (bank or family) as controlling owners for decades and firms have not been nationalized, see Högfeldt [2005].

Why was a pyramid ownership structure with separately listed firms preferred to a conglomerate solution with a closer integration of the firms? The historical context suggests a plausible answer. The deep economic and financial crisis in the early 20s, after an unprecedented boom since the 1890s, was still vivid in the bankers' minds. The spectacular collapse of the Kreuger-empire, an intricate and very opaque web of intra-firm financial connections, was a reminder of how exposed the largest export-oriented firms were to unstable exchange rates and volatile international conditions. The bankers' primary objective was thus to guarantee survival of the firms. Since separate listings in effect provides a bundle of default options that allow individual firms to go bankrupt without simultaneously jeopardizing the survival of all firms, a pyramid structure increases the survivability of the firms as a group and allows the banks to properly diversify their loan portfolio.[25] Potential gains from an integrated managerial structure were also limited since the firms operated in distinctly different industries.

25. Ghatak and Kali [2001] develop a model that explores the idea that financial interlinkage between firms can be viewed as a way to solve credit rationing caused by asymmetric information. If firms possess better information about each other than a bank, then business groups can be a mechanism to induce firms to sort on the basis of this information. Banks can offer a menu of contracts that vary in the extent of financial interlinkage. This argument is, however, not valid since asymmetric information is less of a problem when banks are the controlling owners of the firms.

Table I
Market Values Controlled by Closed-End Investment Funds (CEIFs) 1986-2000

Aggregate statistics for total market value of equity controlled by CEIFs and as percentage of market capitalization (value of CEIFs excluded), total value of personal investments (investments by foundations controlled by the family/ organization included) by the controlling owners of the CEIFs and as percentage of market capitalization, and the ratio between value under control and the net investment by the controlling owners.

Panel A: Market value controlled by CEIFs is the sum of equity values in Million SEK of firms where one of more CEIFs are part of the controlling block (largest voting block) with the values of CEIFs excluded, and the personal investments on SSE by the controlling owners of the CEIFs (controlling foundations included).

Year	Value under CEIF control	Market Cap SSE (CEIFs excluded)	% of SSE Value (CEIFs excluded) under CEIF-Control	Personal Investments on SSE by controlling owners of CEIFs	Personal Investments as % of SSE value	Control/ Capital
1986	284328	405505	70.1	25008	6.2	11.4
1987	235598	402100	58.6	21063	5.2	11.2
1988	342266	566403	60.4	31218	5.5	11.0
1989	447512	701360	63.8	41022	5.8	10.9
1990	296758	504560	58.8	31054	6.2	9.6
1991	352133	516247	68.2	20444	4.0	17.2
1992	368878	505439	73.0	20050	4.0	18.4
1993	691817	831846	83.2	40135	4.8	17.2
1994	587787	964558	60.9	33394	3.5	17.6
1995	743420	1137772	65.3	41223	3.6	18.0
1996	1067296	1743868	61.2	60963	3.5	17.5
1997	1343580	1984227	67.7	75378	3.8	17.8
1998	1373303	2249611	61.0	73156	3.3	18.8
1999	2151551	3644555	59.0	106431	2.9	20.2
2000	1786520	3134973	57.0	80259	2.6	22.3

Panel B: Sum of market values for firms where *Investor* (Wallenberg) or *Industrivärden* (Handelsbanken--SHB) is part of the controlling block (largest voting block) in Million SEK, market capitalization of SSE in Million SEK with CEIFs excluded, and the personal investments on SSE by the Wallenbergs and SHB (foundations included), either through the CEIFs (Investor , Providentia, and Export Invest) and Industrivärden (Promotion/ Bahco)) or through direct investments.

Year	Value under Wallenberg or SHB control	Market Cap SSE (CEIFs excluded)	% of SSE Value under Wallenberg or SHB Control	Personal Investments on SSE by Wallenbergs and SHB	Personal Investments as % of SSE value	Control/ Capital
1986	214167	405505	47.6	14467	3.2	14.8
1987	188426	402100	42.9	12659	2.9	14.9
1988	284120	566403	46.0	20589	3.3	13.8
1989	378846	701360	48.9	27034	3.5	14.0
1990	275475	504560	50.3	21935	4.0	12.6
1991	294597	516247	53.4	14691	2.7	20.1
1992	310584	505439	56.8	15459	2.8	20.1
1993	561866	831846	62.9	32699	3.7	17.2
1994	560923	964558	54.6	28911	2.8	19.4
1995	702468	1137772	58.1	36073	3.0	19.5
1996	1004736	1743868	54.4	52806	2.9	19.0
1997	1340257	1984227	63.4	66426	3.1	20.2
1998	1341042	2249611	56.6	63944	2.7	21.0
1999	2088542	3644555	55.0	96148	2.5	21.7
2000	1632428	3134973	49.3	69707	2.2	23.4

Table II
Definitions of Variables

Panel A: Data Base on Closed-End Investment Funds

Variable	Definition
Vote in Fund	Controlling shareholder's (largest voting block) fraction of voting rights
Capital in Fund	Controlling shareholder's fraction of cash flow rights
Excess Votes Fund	*Vote in Fund – Capital in Fund*
Average Vote Portfolio Firm	The fund's average voting fraction in portfolio firms
Average Excess Votes Portfolio	The fund's value weighted average excess votes in portfolio firms
Average Excess Votes Pyramid	*Excess Votes Fund* times *Average Excess Votes Portfolio*
Control Tenure	Number of years the same controlling shareholder has controlled the fund
Fund Age (year)	Number of years since the fund was founded
NAV (M SEK)	Net Asset Value in Million SEK at the end of each year
MVE Fund (M SEK)	Market Value of the Fund's equity in Million SEK at the end of each year
Premium	The natural logarithm of *MVE Fund/ NAV*
Adm Costs (in %)	Administrative costs less management compensation divided by *NAV (in %)*
Comp (in %)	Management compensation divided by *NAV (in %)*
Dividend Yield	Amount of dividends paid out by the fund divided by *NAV*
Dividends Received	Amount of dividends received by the fund divided by *NAV*
Capital Gains	Realized capital gains divided by *NAV*
Cash Flow Fund	*Dividends Received + Capital Gains*
Retention Ratio Fund	*(Cash Flow Fund - Dividend Yield)/ Cash Flow Fund*
ΔNon-Listed Assets	Annual change in fraction of non-listed assets

Panel B: Data Base on Large Non-Financial Firms Listed on SSE

Variable	Definition
Q	Sum of market value of equity and book value of total debt divided by book value of total assets.
Investment	Total capital expenditure divided by book value of total assets at beginning of the year
Cash Flow Firm	Earnings Before Interest, Taxes and Depreciation (EBITD) divided by book value of total assets at the beginning of the year
Retention Ratio Firm	(Net Income – Dividends + Depreciation)/ (Net Income + Depreciation)[a]
Leverage	Long term debt divided by book value of total assets
Output	Total sales year t-1 divided by book value of total assets year t-1
MV Asset$_{t-1}$	Market value of firm equity plus book value of long term debt at the beginning of the year
Δ MV Assets	Change in *MV Total Asset* during the year
SEO	Total value of Seasoned Equity Offers during the year/ *Market Value Total Asset*$_{t-1}$
ΔDebt	Annual change in book value of firm's long term debt/ *Market Value Total Asset*$_{t-1}$
Retained Earnings	(Net Income – Dividends + Depreciation)/ *Market Value Total Asset*$_{t-1}$
Total Financing	*SEO + ΔDebt + Retained Earnings*
Firm Size	Book value of total assets in Million SEK
Firm Age	Number of years since the firm was founded
Vote in Firm	Fraction of votes controlled by the largest voting coalition.
Capital in Firm	Fraction of cash flow rights controlled by the largest voting coalition
Adj Capital in Firm	Fraction of cash flow rights controlled by largest voting coalition after adjusting for pyramid structures.
Excess Votes Firm	*Vote in Firm* minus *Adj Capital in Firm*
Pyramid Excess Votes	*Excess Votes* due to pyramiding per se
Dual Class Excess Votes	*Excess Votes* due to Dual Class Shares per se

[a] If Net Income + Depreciation < 0, *Retention Ratio Firm* is = 0. If Net Income – Dividends + Depreciation <0, *Retention Ratio Firm* is = 0.

Table III
Descriptive Statistics on Closed-End Investment Funds

Summary statistics for 13 Swedish CEIFs 1986-2000 with 125 fund year observations. The fund years are split according to if the controlling shareholder's (largest voteholder's) excess votes exceed 3.7 percent (sample median) or not. Mean differences tested by t-test. Median differences tested by Wilcoxon's Ranksum test. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. (See Panel A of Table II for definition of variables)

Panel A: Fund Ownership Characteristics

	All, N=142		Excess Votes Fund > 0.037, N=64		Excess Votes Fund < 0.037, N=61		Difference Test	
	mean	median	Mean	median	mean	median	mean	median
Excess Votes Fund	0.058	0.037	0.116	0.082	-0.003	0.000		
Vote in Fund	0.360	0.310	0.416	0.407	0.301	0.268	4.027***	3.645***
Capital in Fund	0.302	0.242	0.300	0.246	0.304	0.239	0.144	0.571
Average Excess Votes Portfolio	0.022	0.013	0.032	0.034	0.011	0.002	3.549***	3.645***
Average Excess Votes Pyramid	0.070	0.066	0.087	0.079	0.052	0.042	3.760***	3.477***
Control Tenure	25	9	34	21	15	5	5.499***	5.191***

Panel B: Fund Characteristics

	All, N=125		Excess Votes Fund > 0.037, N=64		Excess Votes Fund < 0.037, N=61		Difference Test	
	mean	median	Mean	Median	mean	median	Mean	median
Fund Age (year)	47	49	33	28	60	56	6.387***	5.801***
NAV (M SEK)	11671	4420	18958	7420	4026	2800	6.304***	5.339***
MVE Fund (M SEK)	8827	3590	14113	6130	3281	2140	5.699***	4.853***
Premium	-0.259	-0.240	-0.309	-0.294	-0.204	-0.194	3.409***	3.408***

Panel C: Fund Cash Flow Characteristics

	All, N=125		Excess Votes Fund > 0.037, N=64		Excess Votes Fund < 0.037, N=61		Difference Test	
	mean	median	Mean	median	mean	median	Mean	median
Adm Costs (in %)	0.342	0.281	0.322	0.279	0.363	0.287	0.950	1.294
Comp (in %)	0.076	0.055	0.057	0.040	0.100	0.073	2.855***	4.534***
Received Dividends	0.026	0.022	0.026	0.021	0.025	0.022	0.169	0.168
Dividend Yield	0.032	0.029	0.030	0.027	0.034	0.030	1.377	0.845
Realized Capital Gains	0.079	0.054	0.071	0.049	0.087	0.061	1.147	1.793
Cash Flow Fund	0.104	0.076	0.097	0.071	0.112	0.083	1.044	1.546
Retention Ratio Fund	0.499	0.654	0.536	0.619	0.564	0.674	0.385	1.087
Δ Non-Listed Assets	0.014	0.000	0.028	0.000	-0.002	-0.010	0.637	0.662

Table IV
Descriptive Statistics on Large Non-Financial Firms Listed on SSE 1984-2000

Summary statistics for 156 large non-financial firms listed on the Stockholm Stock Exchange (SSE) at some point between 1984 and 2000 with N=1276 firm year observation sorted by whether the firm is controlled by a Closed-End Investment Fund (CEIF) or not that particular year. Median differences tested by Wilcoxon's Ranksum test. ***, **, and * denote significance at 1%, 5%, and 10% level, respectively. (See Panel B in Table II for definition of variables)

Panel A: Firm Characteristics

	All N=1276		CEIF-controlled Firms N=354		Non-CEIF-controlled Firms N=922		Difference Test	
Variable	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Q	1.372	1.166	1.361	1.142	1.376	1.172	0.363	0.055
Investment	0.113	0.086	0.096	0.077	0.119	0.091	4.011***	-3.112***
Leverage	0.255	0.229	0.233	0.214	0.263	0.237	3.129***	-2.145**
Cash Flow Firm	0.112	0.113	0.123	0.117	0.108	0.109	2.747***	2.278**
Retention Ratio Firm	0.758	0.821	0.778	0.812	0.751	0.826	1.833*	1.520
Output	1.055	1.125	0.923	0.925	1.106	1.220	4.824***	6.690***
Δ MV Asset	0.183	0.097	0.162	0.114	0.191	0.092	1.050	0.486
Total Financing	0.137	0.103	0.122	0.091	0.143	0.107	1.449	1.667*
SEO	0.021	0.000	0.016	0.000	0.022	0.000	1.076	1.939*
ΔDebt	0.039	0.010	0.024	0.006	0.045	0.011	1.901*	1.872*
Retained Earnings	0.077	0.079	0.082	0.082	0.075	0.078	1.345	1.413
Firm Size	9596	1317	24299	14499	4147	744	17.047***	19.835***
Firm Age	61	48	89	73	50	42	9.364***	9.040***

Panel B: Ownership Characteristics

	All N=1276		CEIF-controlled Firms N=354		Non-CEIF-controlled Firms N=922		Difference Test	
Variable	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Vote in Firm	0.509	0.505	0.395	0.335	0.551	0.583	11.699***	11.546***
Capital in Firm	0.331	0.295	0.272	0.215	0.353	0.327	7.119***	7.437***
Adj Capital in Firm	0.260	0.202	0.070	0.048	0.330	0.295	25.342***	24.381***
Excess Votes Firm	0.249	0.243	0.326	0.283	0.221	0.229	10.892***	8.363***
Pyramid Excess Votes	0.072	0.000	0.196	0.154	0.024	0.000	25.837***	24.028***
Dual Class Excess Votes	0.181	0.176	0.128	0.072	0.202	0.220	7.909***	10.309***

Table V
Regressions with Fund Premium and Portfolio Firms' Tobin's Q as Dependent Variables

In Panel A the *Fund Premium* is the dependent variable. If the fund's Market Value of Equity (MVE) is below its Net Asset Value (NAV), the *Fund Premium* (ln(MVE/NAV)) is negative. A positive (negative) regression coefficient is interpreted as a marginal increase (decrease) in premium. In Panel B the separation of control and ownership gauged by the controlling owner's *Excess Votes Fund* is the dependent variable. In panel C the *Tobin's Q* of large, non-financial firms is the dependent variable. Coefficients are reported with t-values (z-values) in parenthesis. In the OLS models the standard errors are adjusted for correlated observations using the Huber-White sandwich estimator for variance. Coefficients are reported with heteroscedastic robust t-values in parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% level, respectively. ln denotes the natural logarithm. (See Table II for definition of variables)

Panel A: OLS and fixed effect regressions with *Fund Premium* as dependent variable. Four time dummies for the 86-88, 89-92, 93-96, and 97-99 periods, respectively, are included (for motivation see Figure 2).

	M1 OLS	M2 OLS	M3 Fixed Effect	M4 Fixed Effect	M5 Fixed Effect	M6 Fixed Effect
Capital in Fund	0.082	0.047	0.063	0.189	0.040	0.134
	(1.18)	(0.76)	(0.27)	(0.93)	(0.17)	(0.65)
Excess Votes Fund	-0.534	-0.307	-0.536	-0.536	-0.652	-0.705
	(-2.10)**	(-1.21)	(-1.61)	(-1.70)*	(-1.96)*	(-2.18)**
Ln(Control Tenure)		-0.035		-0.062		-0.052
		(-3.00)**		(-3.68)***		(-3.64)***
Retention Ratio Fund	-0.0200	-0.023	-0.020	-0.022	-0.020	-0.022
	(-2.39)**	(-3.63)***	(-2.82)***	(-3.03)***	(-2.85)***	(-3.00)***
Adm. Costs (in %)	0.0047	-0.015	0.026	-0.013	0.034	0.528
	(0.08)	(-0.25)	(0.42)	(-0.20)	(0.54)	(0.08)
Comp (in %)	0.219	0.268	0.181	0.187	0.173	0.174
	(1.31)	(1.74)	(0.86)	(0.91)	(0.82)	(0.84)
Ln(NAV)	0.011	0.024	0.057	0.065	0.061	0.070
	(0.77)	(1.38)	(1.64)	(1.94)*	(1.80)*	(2.12)**
Ln(Fund Age)	0.014	0.028	0.133	0.206		
	(1.15)	(2.66)**	(2.01)**	(3.11)***		
Time Dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Adj R^2	0.232	0.280	0.285	0.354	0.278	0.327
p-value Fund Specific Effects	n.a.	n.a.	0.078	0.025	0.109	0.051
N	125	125	125	125	125	125

Panel B: Fixed effect regressions with the natural logarithm of Tobin's Q as dependent variable. The sample consists of 156 large non-financial firms listed on the SSE at some point 1984-2000. N=1276 (Firm years).

	M1	M2	M3	M4	M5	M6
Adj Capital in Firm	-0.0217	-0.0244	-0.0296	-0.0668	-0.0282	-0.0650
	(-0.28)	(-0.34)	(-0.41)	(-0.87)	(-0.39)	(-0.84)
Excess Votes Firm	-0.1636					
	(-2.29)**					
Pyramid Excess Votes		-0.1861		0.0592		0.0548
		(-2.49)**		(0.57)		(0.52)
Dual Class Excess Votes		-0.2553		-0.2794		-0.2767
		(-2.44)**		(-2.63)***		(-2.60)***
CEIF Dummy			-0.0797	-0.1074	0.0753	0.0468
			(-3.32)***	(-2.97)***	(1.26)	(0.73)
Cash Flow	0.6742	0.6764	0.6689	0.6735	0.6484	0.6532
	(5.91)***	(5.92)***	(5.88)***	(5.90)***	(5.74)***	(5.76)***
Retention Ratio Firm	-0.1001	-0.1023	-0.0988	-0.1019	-0.0641	-0.0675
	(-2.85)***	(-2.92)***	(-2.83)***	(-2.92)***	(-1.72)*	(-1.82)*
*CEIF Dummy*Retention Ratio Firm*					-0.2032	-0.2005
					(-2.76)***	(-2.67)***
Investment	0.0388	0.0397	0.0377	0.0399	0.0356	0.0379
	(0.68)	(0.69)	(0.66)	(0.70)	(0.62)	(0.67)
Leverage	-0.1620	-0.1629	-0.1530	-0.1569	-0.1551	-0.1590
	(-2.25)**	(-2.26)**	(-2.17)**	(-2.17)**	(-2.21)**	(-2.21)**
Ln(Firm Size)	0.0172	0.0164	0.0180	0.0126	0.0167	0.0113
	(0.72)	(0.70)	(0.74)	(0.54)	(0.69)	(0.48)
Ln(Firm Age)	-0.1230	-0.1279	-0.1222	-0.1262	-0.1213	-0.1252
	(-3.24)***	(-3.36)***	(-3.19)***	(-3.33)***	(-3.18)***	(-3.31)***
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.653	0.654	0.653	0.656	0.655	0.657
p-value Firm Specific Effects	0.000	0.000	0.000	0.000	0.000	0.000
N	1276	1276	1276	1276	1276	1276

Table VI
Tunneling Tests

In Panels A and B, the sample consists of 156 large non-financial firms listed on the SSE at some point 1984-2000 with N=1276 firm year observations; 349 firm years were controlled by a CEIF that also controlled at least one more firm in the sample. In Panel A we investigate the sensitivity to own shocks (industry shocks). In Panel B we analyze sensitivity to group shocks. Earnings before Interest, Taxes and Depreciation (EBITD) is the dependent variable in the fixed effect regressions in Panels A and B. *Predicted EBITD* is defined as the ratio of total EBITD in the industry and the aggregate value of total assets in the industry multiplied by the value of the firm's total assets. *CEIF Dummy* is equal to one if the firm is controlled by a CEIF (largest vote holder) in that particular year, and zero otherwise *Adj Capital in Firm* is fraction of cash flow rights controlled by largest voting coalition after adjusting for pyramiding. *Group shock* is total *predicted EBITD* to the group in the particular year minus the *predicted EBITD* of the particular firm. *Large (Small) Equity Stake Dummy* is equal to one if the CEIFs stake in the firm is above (below) 4.8% (median) and zero otherwise. In Panel C we investigate sensitivity of the CEIFs' cash flows to the cash flows of firms placed lower in the pyramid. The sample consists of 56 fund years. The fund's *Earnings Before Taxes and Depreciation* (EBTD) is the dependent variable in the OLS regression. Reported t-statistics are adjusted for correlated observations using the Huber-White sandwich estimator for variance. *Group Cash Flow* is the group firms' total EBITD minus dividends paid. *Dividends* are equal to the sum of dividends paid to the CEIF by the group firms. Coefficients are reported with heteroscedastic robust t-values in parenthesis. ***, **, and * denote significance at 1%, 5%, and 10% level, respectively.

Panel A: Fixed Effect Regressions with firms' EBITD as dependent variable

	M1	M2	M3	M4
Predicted EBITD	0.982	0.851	0.860	1.023
	(10.25)***	(6.51)***	(6.56)***	(11.72)***
*CEIF Dummy*Predicted EBITD*	0.095	0.139	0.150	
	(0.92)	(1.41)	(1.56)	
*Adj Capital in Firm*Predicted EBITD*				-1.597
				(-2.96)***
Firm Size	-0.010	-0.036	-0.035	0.004
	(-0.63)	(-3.13)***	(-3.00)***	(0.23)
*Firm Size*Predicted EBITD*		0.001	0.001	
		(1.82)*	(1.87)*	
*Firm Age*Predicted EBITD*			-0.001	
			(-0.61)	
Adj R^2	0.948	0.950	0.950	0.959
p-value Firm Specific Effects	0.000	0.000	0.000	0.000
N	1276	1276	1276	349

Panel B: Fixed Effect Regressions with the firms' EBITD as dependent variable

	M1	M3
Predicted EBITD	1.066	1.067
	(10.30)***	(10.30)***
Group Shock	-0.027	
	(-2.19)**	
*Large Equity Stake Dummy*Group Shock*		-0.034
		(-2.43)**
*Small Equity Stake Dummy*Group Shock*		-0.022
		(-1.71)*
Firm Size	-0.005	-0.005
	(-0.24)	(-0.24)
Adj R^2	0.953	0.953
p-value Firm Specific Effects	0.000	0.000
N	349	349

Panel C: OLS regression with the Closed-End Investment funds' EBTD as dependent variable

	M1
Group Cash Flow	0.036
	(1.77)
Dividends	1.788
	(10.04)***
Adj R^2	0.225
N	56

Table VII
Measures of Marginal Costs Paid By CEIFs' Shareholders

We replicate the CEIFs' portfolios as of 1st of January and estimate the return from passively holding the portfolio over the year. We compare it to the annual return of the CEIFs' actual (managed) portfolio, measured as the change in Net Asset Value reported by the fund at the end of the year. The difference between these two returns, denoted *Gross Leakage*, is interpreted as the (total) marginal costs CEIFs' shareholders pay because of Administrative costs, Management Compensation, Tunneling, and Agency Costs (inferior investment decisions). *Net Leakage* is defined as *Gross Leakage* minus Administrative Costs (*Adm Costs*) and Compensation (*Comp*). Medians are reported with median significance in parentheses. Only medians are reported since observations are positively skewed. Median significance tested by Wilcoxon's Signrank test while median differences tested by Wilcoxon's Ranksum test. ***, **, and * denote significance at 1%, 5%, and 10% level, respectively. *Excess Votes Dummy* is equal to one if *Excess Votes Fund* > 0.037, and zero otherwise. The change in the fraction of Non-Listed Assets *(Δ Non-Listed Assets)* is included as an explanatory variable to control for the effect of book values. ln denotes the natural logarithm. The reported t-statistics in the OLS regressions are adjusted for correlated observations using the Huber-White sandwich estimator for variance. We report OLS regressions since the fund specific effects are insignificant in fixed effect regressions. (See Panel A in Table II for definitions of variables)

Panel A: Estimated *Gross* and *Net Leakages*

	All, N=125	Excess Votes Fund > 0.037, N=64	Excess Votes Fund < 0.037, N=61	Difference test
	Median	Median	median	Ranksum test
Gross Leakage	0.011	0.014	0.010	
	(3.980)***	(3.440)***	(2.145)**	0.651
Net Leakage	0.006	0.011	0.003	
	(3.084)***	(2.884)***	(1.478)	0.792

Panel B: OLS Regressions with CEIFs' *Net Leakage* as dependent variable

	M1	M2	M3	M4
Ln(Control Tenure)	0.015			0.012
	(2.12)**			(1.88)*
Excess Votes Dummy		0.042		0.0289
		(3.76)***		(3.68)***
Retention Ratio Fund			0.011	0.009
			(1.74)*	(1.46)
Ln(Fund Age)	-0.007	-0.012	0.001	-0.012
	(-0.91)	(-1.63)	(0.01)	(-1.50)
Ln(NAV)	-0.012	-0.011	-0.003	-0.014
	(-2.14)**	(-2.91)**	(-0.76)	(-2.65)**
Δ Non-Listed Assets	0.021	0.025	0.030	0.022
	(0.33)	(0.38)	(0.47)	(0.33)
Adj R^2	0.030	0.027	0.013	0.039

Table VIII
Overinvestment Tests

The sample consists of 156 large non-financial firms listed on the SSE at some point between 1984 and 2000. In Panel A we report fixed effect regression results with *Investment level* as dependent variable. *AvQ* is average Tobin's *Q* during the year ((Q(Jan 1)+Q(Dec 31))/2). The *CEIF* dummy equals one if the firm is controlled by a CEIF in that particular year, and zero otherwise. In Panel B we estimate Euler Equation investment models using GMM in system. m_1 and m_2 are tests of the absence of first-order and second order correlations in the residuals, respectively. The Sargan test statistic is a test of over-identifying restrictions under the null of valid instruments. The models are linear systems of first-difference and level equations. The instruments are levels of all independent variables dated t-2 and t-3 for the difference equations, and first differences of all independent variables dated t-1 for the level equations. Panel C reports marginal Tobin's *Q* regression models. The dependent variable is the annual change in the market value of the firm's total assets divided by the market value of the firm's total assets at the beginning of the year (*Δ MV Assets)*. The market value of the firm's total assets is defined as the market value of equity plus the book value of the firm's long term debt. Coefficients are reported with heteroscedastic robust t-values in parenthesis. ***, **, and * denote significantly different from zero at 1%, 5%, and 10% level, respectively

Panel A: Fixed effect regressions of investment models

	M1	M2
AvQ	0.023	0.0272
	(3.08)***	(3.17)***
Cash Flow	0.059	0.035
	(0.52)	(0.31)
Leverage	-0.183	-0.193
	(-4.55)***	(-4.18)***
Output	0.041	0.039
	(2.07)**	(1.96)**
*CEIF*AvQ*		-0.026
		(-1.40)
*CEIF*Cash Flow*		0.362
		(2.03)**
*CEIF*Leverage*		0.051
		(0.87)
*CEIF*Output*		-0.002
		(-0.05)
Year Dummies	*Yes*	*Yes*
Adj R^2	0.231	0.233
p-value Firm Specific Effects		
N	1276	1276

Panel B: Estimation of Euler equation investment models using GMM in system

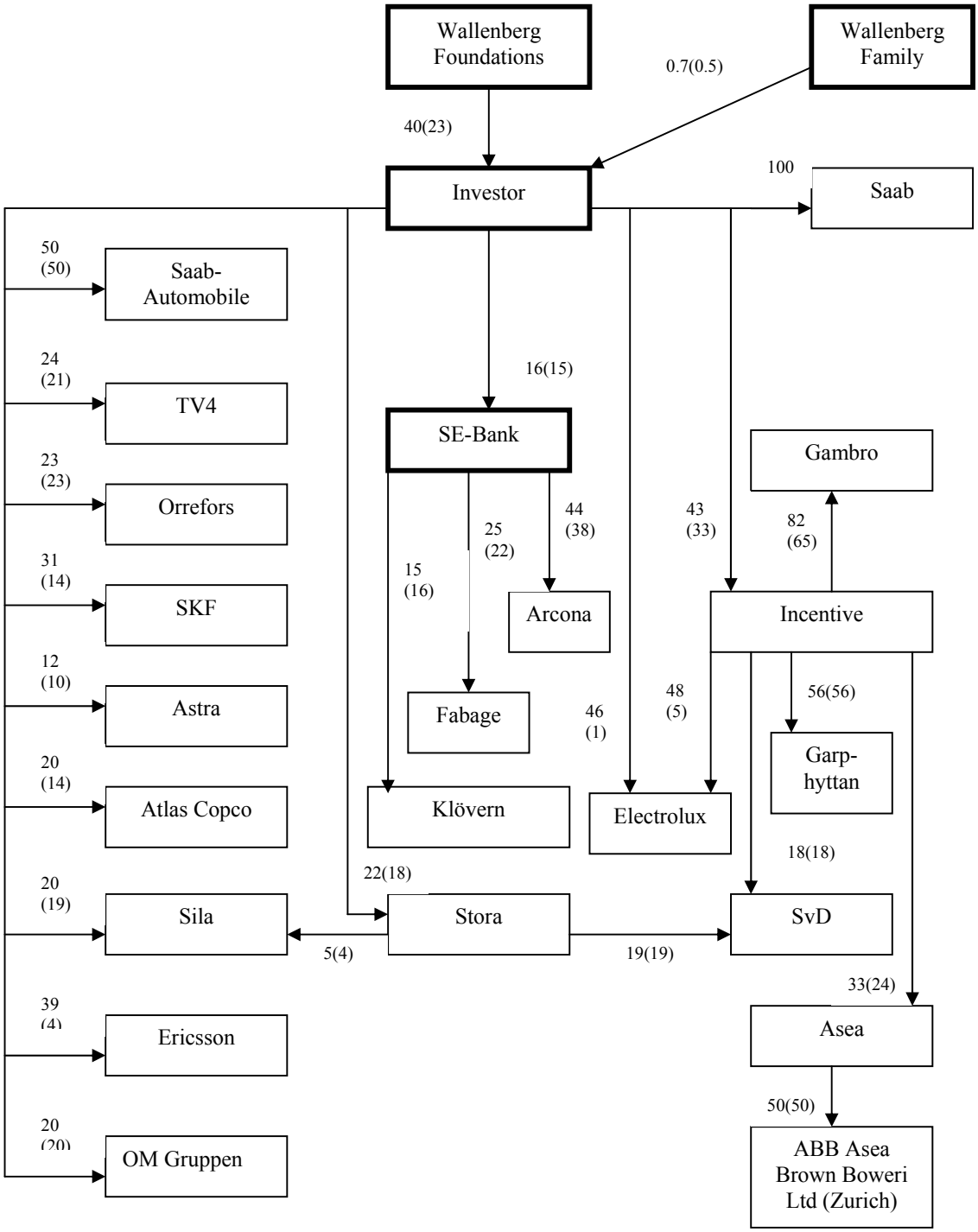
	M1	M2
$Investment_{t-1}$	0.113	0.268
	(2.00)**	(2.30)**
$Investment^2_{t-1}$	-0.178	-0.238
	(-1.06)	(-1.45)
$Cash\ Flow_{t-1}$	-0.087	0.044
	(-0.40)	(0.62)
$Leverage^2_{t-1}$	-0.062	-0.068
	(-0.85)	(-0.97)
$Output_{t-1}$	0.021	0.017
	(0.91)	(0.76)
$CEIF*Investment_{t-1}$		-0.135
		(-0.75)
$CEIF*Investment^2_{t-1}$		0.037
		(0.12)
$CEIF*Cash\ Flow_{t-1}$		0.275
		(2.06)**
$CEIF*\ Leverage^2_{t-1}$		0.009
		(0.07)
$CEIF*\ Output_{t-1}$		-0.045
		(-2.37)**
Year Dummies	*Yes*	*Yes*
p-value m_1	0.000	0.000
p-value m_2	0.388	0.528
p-value Sargan	0.371	0.999
N	1270	1270

Panel C: OLS regressions with change in the value of the firm's total assets (*ΔMV Assets*) as dependent variable. Coefficients are reported with p-values from a Wald test of the coefficient being different from one in parenthesis. [a], [b], and [c] denote significantly different from one at 1%, 5%, and 10% level, respectively.

	M1 All Firms	M2 CEIF-controlled Firms	M3 All Firms	M4 CEIF-controlled Firms
Total Financing	1.025 (0.517)	1.036 (0.568)		
SEO			0.844 (0.101)	1.024 (0.903)
ΔDebt			1.046 (0.354)	1.098 (0.229)
Retained Earnings			1.157 (0.118)	0.538 (0.034) [b]
Industry Dummies	*Yes*	*Yes*	*Yes*	*Yes*
Year Dummies	*Yes*	*Yes*	*Yes*	*Yes*
Adj R^2	0.501	0.554	0.502	0.559
N	1276	354	1276	354

Figure I
The Wallenberg Pyramid

Fraction of votes controlled and invested equity capital (in parenthesis) in January 1996 of the three-level pyramid with *Investor* as the holding company organized as a Closed-End-Investment Fund (CEIF).



Source: Reproduced from Sundin and Sundqvist [1996].