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ABSTRACT

Control Benefits and CEO Discipline in Automatic Bankruptcy Auctions*

We argue that the existence of CEO private control benefits complements managerial reputation in counteracting costly shareholder risk-shifting incentives during severe financial distress, when job-loss may be imminent. We examine this argument empirically using bankruptcy filings in Sweden, where a filing automatically terminates CEO employment and requires the firm to be sold in an open auction. The median CEO income loss is a dramatic 40%, suggesting that bankruptcy filing damages CEO reputation. Empirical proxies for both CEO reputation and control benefits are significant determinants of the probability of the CEO being rehired by the buyer in the auction, as predicted. Moreover, we find that the rehired CEOs generate a post-bankruptcy accounting performance at par with industry rivals. The surprisingly strong survival characteristics of the reorganized firms are consistent with managerial conservatism *ex ante*, and help alleviate creditor concern with costly asset substitution designed to delay filing in an automatic bankruptcy auction system.

JEL Classification: D44, G33, G34 and K22

Keywords: bankruptcy, CEO turnover, executive compensation, post-bankruptcy performance, private benefits of control and risk-shifting incentives

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1 Introduction

In their seminal paper, Jensen and Meckling (1976) theorize that shareholders on the brink of bankruptcy have an incentive to "go for broke" by liquidating low-risk projects and invest the proceeds in high-risk ventures, resulting in a wealth transfer from creditors. A key insight of Jensen and Meckling (1976) is that since outside investors rationally anticipate shareholder risk-shifting incentives *ex ante*, establishing effective contractual mechanisms for suppressing such incentives increases the value of the firm. We argue in this paper that managerial concern with maintaining private benefits of control complements financial contracts in suppressing risk-shifting incentives. We then investigate this argument empirically by evidencing CEO labor market discipline and post-bankruptcy firm performance in Sweden, where a bankruptcy filing summarily terminates managerial employment contracts and automatically puts the firm up for auction.

There are several mechanisms for suppressing risk-shifting incentives during financial distress. As shown by Smith and Warner (1979), debt covenants are often designed to restrict risk-shifting either directly or by increasing the effectiveness of bondholder monitoring of the firm's investment policy. Examples include direct restrictions on investments and asset dispositions, such as mergers, sale-leasebacks, and collateralization. Green (1984) shows that convertible debt reduces risk-shifting incentives through the dilution of equity that follows from bondholder conversion. Moreover, most legal systems structurally affect opportunities for risk shifting by requiring the board of directors to shift its fiduciary responsibilities towards bondholders during periods of severe financial distress and bankruptcy. Also, formal bankruptcy procedures are designed to produce detailed information on the state of the firm and its decisions prior to filing, increasing the risk to managers and directors of being held liable for bondholder expropriation activities.

However, since risk-shifting activities are often unobservable by outsiders and difficult to verify in court, debt covenants and institutional controls represent imperfect deterrents. These mechanisms are probably best understood as complementing *managerial* incentives to withstand shareholder pressure to risk-shift during financial distress. Following Fama (1980), there is a large theoretical literature supporting the notion that managerial concern with labor market reputation mitigates agency problems. Particularly relevant to this paper are the discussions in Brander and Poitevin (1992), Hirshleifer and Thakor (1992), and Zwiebel (1995) where it is shown that

managerial compensation contracts, as well as informal labor market discipline, induce managerial conservatism. That is, these two forces counteract the limited-liability effect driving shareholder risk-shifting incentives. Below, we use a simple model to show that managerial concern with losing private benefits of control represents another source of managerial conservatism during severe financial distress.

We design empirical proxies for private benefits of control and managerial reputation, and examine whether labor market discipline in the Swedish automatic bankruptcy system is likely to induce managerial conservatism pre-bankruptcy. The degree of labor market discipline ultimately depends on the structure of managerial labor contracts, the external market for corporate control, and the legal protection of creditor rights. Discipline is weak when incentives to build managerial reputation are low. This would be the case when the firm writes long-term managerial employment contracts shielding managers from job termination, when the contracts contain provisions for large termination fees (golden parachutes), when the firm is allowed strong takeover defenses, and when the bankruptcy system itself offers strong management protection. In Sweden, however, there are few structural takeover defenses and bankruptcy filing automatically terminates managerial labor contracts. Managers may be rehired by the buyer in the auction, but they have no formal bargaining power to influence the rehiring decision. Thus, if labor market discipline is important, it should be apparent in our Swedish sample. In fact, the "hard" constraint on management presented by this automatic auction system has caused some authors to warn of excessive managerial risk-shifting incentives to delay filing [e.g., Aghion, Hart, and Moore (1992), White (1996) and Hart (2000)].¹

We show that bankruptcy filing is a dramatic event for the CEO, confirming the disciplining role of the instant managerial labor market transaction. Using public access to tax returns in Sweden, we report a median individual CEO income loss of 40% during a time period when the CEO income of non-bankrupt rival firms was increasing. In the sample of bankrupt firms surviving as a going concern, half of the firms retain their old CEOs. We find evidence that control benefits increase the probability of the CEO being rehired by an *inside* buyer (a saleback to the manager-owner), as predicted. We also find that the likelihood of an *outside* buyer rehiring the CEO is increasing in a

¹The Swedish system differs in important ways from the U.S., where takeover defenses are strong [Comment and Schwert (1995)], and managers retain substantial control rights in Chapter 11 bankruptcy [Bradley and Rosenzweig (1992)]. Moreover, although managerial compensation was largely independent of equity value until the early 1990s [Jensen and Murphy (1990)], the recent widespread re-alignment of manager-shareholder interests [Murphy (1999)] possibly also accentuates risk-shifting incentives in U.S. firms.

measure of CEO reputation that is available to the winning bidder in the auction.

A high-risk strategy of "going for broke" should produce a stripped-down firm that requires substantial restructuring if it fails. Thus, we examine the post-bankruptcy performance and survival characteristics of the restructured firms. None of the sample firms are publicly traded, and we use operating profitability and bankruptcy refiling rates to indicate the economic health of the firm's operations. We find that the firms sold as going concerns typically perform at par with their industry rivals. This finding contrasts with the U.S. evidence in Hotchkiss (1995), where public firms emerging from Chapter 11 bankruptcy underperform their industry peers. We also show that the bankruptcy refiling probability decreases with CEO control benefits and quality, possibly due to pre-filing managerial conservatism.

The rest of the paper is organized as follows. In Section 2, we model CEO investment incentives in the presence of financial distress, and show that control benefits induce managerial conservatism. This section also sets up the paper's main testable hypotheses. Details of the Swedish bankruptcy code, data sources and sampling procedures are contained in Section 3. Section 4 presents our empirical analysis, while Section 5 concludes the paper.

2 Managerial conservatism during financial distress

There is an extensive theoretical literature analyzing the effect of managerial reputation on the firm's investment policy.² An important insight of this literature is that managerial concern with reputation building may induce an investment policy with a more conservative risk-profile than what follows from shareholder preferences, reducing agency costs of debt. The purpose of this section is first to show that managerial concern with loss of control benefits can play a similar bonding role, even if control benefits are non-contractible. We then present the key cross-sectional predictions to be tested.

2.1 Control benefits and managerial conservatism

Jensen and Meckling (1976) observe that the limited-liability feature of equity causes shareholders to value investment projects based on cash flows in the non-default states only. This may result

²See, e.g., Fama (1980), Harris and Holmström (1981), Holmstrom and Ricart i Costa (1986), Gibbons and Murphy (1992), Hirshleifer and Thakor (1992) and Zwiebel (1995).

in inefficient project selection, in particular in our context where the risk of default is large. We demonstrate this effect within a simple framework. Suppose the firm has only three assets: I (\$) in cash, and access to two investment opportunities L and H . The two projects require an initial investment of I today, and return next period a cash flow in each of three states of $C \in \{0, c, 2c\}$. Project L is "low risk" with a probability distribution over the three states of $Pr_L[C] = [\pi, 1 - 2\pi, \pi]$, where $0 < \pi < 1$. Project H is "high risk" with $Pr_H[C] = [\pi + a, 1 - 2\pi - (a + b), \pi + b]$, where $0 < b < a$ and $2\pi + (a + b) < 1$. The face value of outstanding debt is $F > c > I$, payable in full next period.

Assuming risk neutrality and a discount rate normalized to zero, the value of project L is positive ($NPV_L = c - I > 0$) but the firm is in financial distress ($E(C) = c < F$). The firm faces bankruptcy next period in both the low and intermediate states. Bankruptcy costs are zero so that the buyer in the competitive auction pays c in the intermediate state. Since $NPV_L - NPV_H = (a - b)c > 0$, the firm-value maximizing (efficient) investment policy is to accept project L . However, with limited liability, shareholders prefer the riskier project H where the expected shareholder payoff is highest [$\pi(2c - F) > (\pi + b)(2c - F)$].³

However, *managerial* incentives deviate from shareholders' when managers enjoy private benefits of control. Suppose that the bankruptcy auction results in piecemeal liquidation in the low state and sale of the firm as a going concern in the intermediate state. The CEO leaves the firm in the low state, stays on in the high state, and is rehired with probability α in the intermediate state. The decision problem of the (risk-neutral) CEO now involves not only the expected cash flow from investment, but also the preservation of control benefits, β :

Proposition 1: *If the CEO's outside wage is fixed (independent of project payoff), she prefers the project yielding the highest expected benefits of control, $E(\beta)$. When the rehiring probability in the bankruptcy auction is high, this preference leads to managerial conservatism and counters shareholder risk-shifting incentives.*

The proposition follows when $E_L(\beta) > E_H(\beta)$, i.e., when $\alpha\beta(1 - 2\pi) + \pi\beta > \alpha\beta(1 - 2\pi - a - b) + (\pi + b)\beta$. This condition holds when $\alpha \geq 0.5$. As discussed in the empirical analysis below, this is in fact descriptive of our sample of bankrupt firms. If $\alpha < 0.5$, it is also required that

³If $\pi(2c - F) < I$, shareholders will invest only if the current debt contract prohibits a liquidating dividend of I .

$a/b > (1 - \alpha)/\alpha$, i.e., that project H 's probability "skewness" a/b in favor of the liquidation state is sufficiently high. Intuitively, with low α , managerial conservatism requires that the risky project has sufficient probability mass on the low state relative to the high state. This effectively increases the attractiveness of the intermediate state (and project L) where the CEO has a chance of retaining control benefits.

Next, suppose that outsiders believe that a bankruptcy filing is more likely the lower the (unobservable) quality of the CEO. In this case, bankruptcy lowers the CEO's reputation as well as her competitive outside wage rate. In our setting, there are two bankruptcy states, piecemeal liquidation and going-concern sale, and it is reasonable to believe that the former represents a more negative signal of CEO quality than the latter. However, for simplicity, let w_h denote the CEO wage in the high (non-bankrupt) state, while $w_l = w_h - \gamma$ is the wage in both the intermediate and low states. As summarized in Proposition 2, the effect of the wage decline γ is to counteract managerial conservatism:

Proposition 2: *If bankruptcy filing lowers the CEO's outside wage by $\gamma > 0$, she prefers the project that maximizes $E(\beta) - E(\gamma)$. This reduces managerial conservatism (increases risk shifting incentives) relative to the case with no wage decline.*

Again, managerial conservatism requires that the CEO selects the low-risk project, i.e., that $E_L(\beta) - E_L(\gamma) > E_H(\beta) - E_H(\gamma)$. This condition holds when $\gamma/\beta < \alpha(a/b + 1) - 1$.⁴ Thus, for a given rehiring probability α , the CEO selects the low-risk project only if the control benefits β are sufficiently large relative to the wage reduction γ . In other words, the wage decline from bankruptcy raises the bar for managerial conservatism.

Brander and Poitevin (1992) show that managerial conservatism can be induced through a wage bonus payable to the CEO when the firm's cash flow exceeds a certain threshold level. The bonus realigns CEO incentives with shareholders' *only* for cash flows up to the threshold level, thus mitigating extreme risk-shifting incentives. In our framework, the private benefits β play a role analogous to a bonus, *without* explicit contracting.⁵ In the empirical analysis below, we also

⁴This follows from a comparison of the expected total CEO compensation, $E(W)$:

$$E(W) = \begin{cases} w_h - (1 - \pi)\gamma + \beta\pi + \alpha\beta(1 - 2\pi) & \text{for } L \\ w_h - (1 - \pi - b)\gamma + \beta(\pi + b) + \alpha\beta(1 - 2\pi - a - b) & \text{for } H. \end{cases}$$

⁵Of course, it remains important to structure managerial compensation contracts so that private benefits of control

explore the possibility that observable proxies for managerial quality play a role in both the buyer's rehiring decision and in the labor market reaction to the bankruptcy event.

2.2 Empirical predictions

Following Proposition 1, private benefits of control create a managerial preference for investment projects that help maintain the firm as a going concern in bankruptcy. Absent direct information on pre-bankruptcy project selection, we use the above framework to motivate several testable, auxiliary hypotheses. Two fundamental drivers in propositions 1 and 2 are private benefits of control β and CEO quality q . Thus, we test whether the rehiring probability α and the managerial wage decline γ are functions of (empirical proxies for) β and q . Moreover, since firms sold as going concerns in the bankruptcy auction must be efficiently restructured for the CEO to continue to enjoy control benefits, we also look at post-bankruptcy performance measures.

The empirical analysis separates company salebacks (to the old manager-owner) from sales of the company to new (outside) owners. In the context of the rehiring probability, this is important for two reasons. First, a saleback represents a vehicle for the CEO to maintain control benefits by rehiring herself. Thus, in a saleback, large control benefits may override CEO quality considerations in the rehiring decision. Second, outside buyers may associate large control benefits with CEO entrenchment, which in turn reduces the probability of the CEO being rehired. These predictions are summarized in **H1**:

H1 (Rehiring probability): *The rehiring probability decreases in the private benefits of control when the buyer is a company outsider. In salebacks, the rehiring probability increases in CEO control benefits.*

When testing **H1**, we control for CEO quality, as well as for the degree of industry distress, both of which are also expected to influence α . The greater the level of industry distress, the greater the probability that the firm is liquidated piecemeally or merged into another company, eliminating CEO control.

Proposition 2 holds that a bankruptcy filing reduces the CEO's outside wage ($\gamma > 0$). The

do not produce suboptimal project selection when high-risk projects stochastically dominate low-risk projects. Our point is to introduce the incentive effect of private benefits of control, not to argue that explicit contracts are not needed.

empirical analysis provides evidence on the magnitude and determinants of γ . As summarized in **H2**, we expect to observe a wage decline in salebacks as well as when the firm is sold to outsiders. The CEO in a saleback, while in control, faces increased financing costs due to the reputational damage from filing. The greater financing costs reduce firm value and, we predict, the CEO's wage. Furthermore, if large private benefits of control signal CEO entrenchment, the outside wage offer is predicted to decrease as β increases:

H2 (CEO income loss): *Bankruptcy damages managerial reputation and lowers the CEO's wage. This wage decline occurs in salebacks as well as in sales to outsiders. Moreover, the outside wage offer is decreasing in the private benefits of control.*

While not a direct implication of the theory above, it is informative to also examine post-bankruptcy performance. Given the high cost of external financing, managers of firms in severe financial distress often resort to asset sales as a means to raise cash to pay off debt and stay out of bankruptcy.⁶ Asset stripping carries the risk of synergy losses and asset fire sales, both of which deplete the firm's going concern value.⁷ For example, the firm may lose key employees, deplete a valuable brand name, lose a locational advantage, etc.. Whenever the high-risk investment strategy fails to save the company from bankruptcy, the result is low debt recovery and poor post-restructuring cash flow performance. Thus, evidence on post-bankruptcy performance goes at the heart of the debate over shareholder risk-shifting and managerial conservatism.

To the extent that private benefits of control promote managerial conservatism ex ante, we expect post-bankruptcy performance and the prospect for survival to depend on magnitude of CEO control benefits. Post-bankruptcy performance also depends on the quality of the CEO hired to restructure and run the firm. The more effective the screening on CEO quality, the better the chance of survival:

H3 (Post-bankruptcy performance): *Managerial conservatism and effective screening of CEO by outside buyers lead to normal post-bankruptcy performance.*

We now turn to an empirical investigation of **H1** - **H3** using our sample of automatic bankruptcy

⁶See, e.g., John, Lang, and Netter (1992), John and Ofek (1995), Andrade and Kaplan (1999), and DeAngelo, DeAngelo, and Wruck (2002) for evidence of asset dispositions in distress.

⁷For evidence on asset fire sales, see, e.g., Pulvino (1998), Maksimovic and Phillips (1998), Strömberg (2000), and Eckbo and Thorburn (2001).

auctions in Sweden.

3 Data sources and sample characteristics

3.1 The automatic auction system

As indicated in the introduction, a bankruptcy filing in Sweden automatically terminates all employment contracts and results in an auction. A trustee, with a fiduciary duty to creditors, is appointed by the courts for the purpose of organizing this auction and subsequently distribute the auction proceeds.⁸ The trustee normally hires an outside consultant or retains the incumbent CEO on a temporary basis to oversee the firm's operations until the sale is completed. To protect the firm's operations during the bankruptcy process, all debt service is stayed upon filing and secured creditors have little rights to seize collateral. Moreover, senior debtor-in-possession financing is legal, although rarely observed.

In the first-price, open auction, bids may be for individual assets (piecemeal liquidation) or for the entire firm as a going concern. As shown by Eckbo and Thorburn (2001), these auctions typically attract substantial bidder interest. In going-concern sales, on average 6 bidders approach the trustee expressing an interest in placing a bid, half of which translate into actual bids. Bids must be in cash. This does not, however, appear to represent much of a constraint: the typical buyer sets up an empty corporate "shell" which permits financing of the cash with securities collateralized in the assets to be purchased, analogous to an LBO. The cash proceeds from the auction are distributed to creditors strictly according to absolute priority rules, in effect leaving nothing for the equity holders [Thorburn (2000)].

3.2 Data sources

Our data base expands on the sample of 263 Swedish bankruptcy cases originally compiled by Thorburn (2000). The sample, which consists of bankruptcy filings between January 1, 1988 and December 31, 1991, is identified using the proprietary database of UpplysningsCentralen (UC). To be included, the filing firm must have at least 20 employees. There are a total of 1,159 firms in

⁸Professional trustees are licensed and supervised by a provincial regulatory body ("Tillsynsmyndigheten i Konkurs"). This body reviews both the organization and outcome of the auction.

the UC database satisfying the above criteria. Of these, 581 firms are eliminated because the filing was in a remote geographical area,⁹ while another 315 cases are excluded for one of the following additional reasons: the case is still pending in bankruptcy as of June 30, 1995 (145 cases);¹⁰ there are tax fraud charges (59 cases); and the bankruptcy file is incomplete (111 cases). Of the 263 cases in the sample, 9 filings occurred in 1988, 27 in 1989, 71 in 1990, and 156 in 1991. The auction results in 200 firms sold as going concern, 60 piecemeal liquidations, while 3 cases have insufficient information to be classified by outcome. Throughout the paper, a "going-concern sale" is defined as a joint sale of the assets that are essential for the firm's continued operations. Examples of such assets are inventory, machinery, vehicles, unfinished products, intangible assets, industrial estate and rental contracts.

For each firm in the sample, information on firm- and case-specific characteristics is identified from the public court record. For 260 firms, the identity of the incumbent CEO is found by matching information in the court records with UC-supplied information on board membership. UC also supplied financial statements from the period 1987-1995 for the entire Swedish population of 16,000 firms with at least 20 employees that were either operating on December 31, 1991 or pending in bankruptcy. We use this information to calculate industry median operating performance and distress measures.

From the UC database, we construct post-bankruptcy financial statements for 158 firms auctioned as a going concern.¹¹ Moreover, UC provides the individual tax returns for 258 of the sample firms' CEOs for the years 1988-1991 and 1993-1994.¹² For comparison, tax returns for the period 1988-1994 are also obtained for a randomly selected sample of CEOs of 1,346 non-bankrupt Swedish firms with at least 20 employees.

⁹The sample is limited to firms located in the four largest provinces in Sweden: Stockholms län, Göteborg- och Bohus län, Malmöhus län and Upplands län.

¹⁰While the firm's assets are quickly auctioned off in bankruptcy, the old and empty corporate shell typically remains on file with the court for several years. This is a formality that has no implications for the sale of the firm's assets in the auction.

¹¹For 42 going-concern sales, we could not identify the firm post-bankruptcy.

¹²Due to limitations in UC's database, the 1990 and 1991 tax returns could be obtained for only 130 CEOs, and the 1992 tax returns could not be retrieved at all.

3.3 Sample characteristics

Table 1 lists several key characteristics of the sample firms. All firms are privately held and small, with average sales of \$5.0 million, total assets (*size*) of \$2.4 million, and 43 employees. The small firm size is a general feature of the Swedish economy and not of our sampling procedure. The sample represents over 30 different 2-digit Standard Industrial Classification (SIC) groups. Twenty-nine percent (76) of the firms are in manufacturing industries, while another 13% (33 firms) are in the construction industry. Thirty firms are in the wholesale business, while there are 26 firms (10%) in each of the hotel and restaurant industry, and the transportation industry.

Panel A of Table 1 lists selected financial characteristics for the sample firms. With the exception of the fraction secured debt, the source of this information is the last financial statement reported prior to the bankruptcy filing, which on average dates back 17.5 months (median 16.5 months). As expected, the firms perform poorly prior to bankruptcy with an average operating profitability (EBITDA to total sales) of -1% (median 2%). Industry-adjusted, the operating profitability (*profmarg*) averages -6% with a median of -4%. "Industry-adjusted" means that we are subtracting the contemporaneous median operating profitability of all Swedish firms with at least 20 employees in the same 4-digit industry (SIC) code as the sample firm. The average number of rival firms per industry used in this industry-adjustment is 299 (median 273), with a minimum of 20. Also as expected, filing firms have high leverage ratios: the average ratio of total book debt to total book assets is 92% (median 93%), and the average interest coverage ratio (EBITDA plus interest income divided by interest expense) is -2.3 (median 1.0). The fraction secured debt (*tangible*), which we use as a proxy for the proportion tangible assets, is identified from the bankruptcy file, and averages 39%.

Panel B of Table 1 lists personal characteristics of the CEO. As indicated by the variable *tenure*, 65% of the filing CEOs have been employed as CEO for at least two years. In other words, in excess of one-third of the CEOs in place two years prior to filing have been replaced when the firm files for bankruptcy. The firms exhibit concentrated share ownership, with a single shareholder typically controlling 50% or more of the equity. This controlling shareholder is often the CEO herself. As shown in the table, the average CEO equity ownership (*ownership*) is 57%, with a median of 60%.¹³

¹³We have information on CEO ownership for 205 of the 263 firms.

Furthermore, as shown in Figure 1, the distribution of *ownership* is skewed with 88 (43%) CEOs owning 100% of the firm's shares. Moreover, the CEOs of 50 firms (25%) own no equity, with a fairly even distribution between 0% and 100%. The typical CEO is 20 years from retirement at the time of filing, with an average age (*age*) of 45 (median 46). Finally, based on the income tax return two years prior to filing, the average CEO total income before tax is \$40 thousand.¹⁴ Thus, given the equity ownership information above, the typical CEO's wealth exposure to the equity value of the firm is substantial.

Panel C provides information on auction characteristics. Upon filing, the trustee is required to provide an estimate of when the firm became insolvent and could potentially have filed for bankruptcy. The variable *delay*, which is the number of months between this first insolvency date and the bankruptcy filing date, averages 4.8 months (median 4.0 months). That is, in the opinion of the trustee, the typical filing firm delayed filing by only 4 months. As discussed further below, this relatively short delay undermines the notion of substantial risk shifting and asset stripping activities following severe financial distress in the filing firms.¹⁵

Interestingly, the trustee is required to provide an assessment of the reason for the bankruptcy filing. As shown in the table, the trustee concludes in 32% of the cases that the filing is a result of CEO incompetence or economic crime (*inept*). Below, we use this important information, together with the variables *delay*, operating profitability, and debt recovery rate, to construct an empirical proxy for CEO reputation. The debt recovery rate in percent of the face value of total debt (*recovery*) averages 35% (median 33%).

Finally, Panel D reports the degree of industry distress at the time of the sample bankruptcy filings (*distress*). Industry distress is defined as the fraction of firms in the 4-digit industry of the filing firm that have an interest coverage ratio of less than one in the year of the filing or file for bankruptcy the following year. With this definition, on average 42% of firms in the industry are distressed (median 38%). Thus, the typical firm in our sample files for bankruptcy at a time when a substantial number of its competitors are also financially distressed.

We now turn to our empirical analysis of the paper's main hypotheses **H1 - H3**.

¹⁴This exceeds the average per capita income in Sweden during the sample period, which is predominantly from 1988-1989. The sample maximum CEO income is \$720 thousand.

¹⁵Most firms in our sample file for bankruptcy after running out of liquidity and defaulting on their debt payments. In excess of 90% of the filings are made by the firm's management, with the remaining filed by a creditor.

4 Empirical Analysis

4.1 Factor representation of CEO quality and private control benefits

The predictions in **H1** - **H3** are stated in terms of CEO quality q , henceforth denoted *quality*, and private control benefits β , henceforth *control*. These two factors are not directly observable and must be estimated. The typical approach is to include as explanatory variables in a multivariate regression framework a number of individual, observable characteristics that are believed to reflect quality and control aspects. Examples are various firm performance measures and personal characteristics for *quality*, and ownership-, voting-, tenure-, and asset characteristics for *control*. Unfortunately, this approach requires interpretation of a large number of individual regression coefficients of typically correlated characteristics, rendering interpretation difficult.

In this paper, we instead implement a factor-analytic approach to summarizing the information in the characteristics. The construction of the factors goes as follows: First, we designate key characteristics in Table 1 as determinants of either *quality* or *control*. Second, using generally available empirical evidence, as well as our own economic intuition, we determine *a priori* the coefficient on each characteristic to be either "1" or "-1". Third, we create a value for each of the two factors by summing the characteristics. When necessary, a characteristic is transformed to fall in the range $|0, 1|$ so that all characteristics have equal impact on the sum. We then use the factors themselves as regressors in tests of hypotheses **H1** - **H3**.

The factor *control* is constructed using the following characteristics:

$$control = ownership + tenure - tangible - n(size), \quad (1)$$

where the variables are defined as in Table 1. The transformation $n(size)$ is the logarithm of *size* standardized by subtracting the mean and dividing by its standard deviation. Motivated by the literature on turnover and corporate control, we constrain the characteristics *ownership* and *tenure* to enter with positive sign. Moreover, we follow the motivation in Dyck and Zingales (2001) and constrain managerial control benefits to decrease in asset tangibility. The characteristic $n(size)$ is constrained to have a negative sign as we believe that the smaller the firm, the more diverse the corporate responsibilities carried by the CEO (the less CEO specialization), and the greater the

scope for extracting private control benefits.¹⁶

The factor *quality* is constructed using characteristics available to the buyer in the auction, as follows:

$$quality = \sqrt{recovery} + profmarg - inept - \sqrt{delay}/\sigma, \quad (2)$$

where, again, all variables are defined as in Table 1, and σ is the standard deviation of the variable. We require *recovery* and *profmarg* to enter with a positive sign, believing that greater values for these characteristics in practice translate into greater CEO reputation.¹⁷ Moreover, *inept* and *delay* are constrained to enter with negative sign.

4.2 The CEO rehiring probability α (H1)

Of the 200 sample firms sold as going concerns, 166 could be classified as to whether the CEO was rehired. Of these, 80 CEOs (48%) are rehired. Adding the 63 piecemeal liquidations (where the CEO necessarily leaves the firm), the overall percentage of the filing CEOs that are rehired is 37%.¹⁸

We specify the rehiring probability α as a function the three factors *quality*, *control*, and *distress*, where, as in Table 1, the latter is the degree of industry-wide financial distress. Moreover, we add a control variable *age* for the CEO's actual age at filing. Controlling for CEO quality and control benefits, the probability of rehiring is expected to be lower the closer the CEO is to retirement age. The key empirical predictions are now as follows:

$$\alpha = f(\textit{control}, \textit{quality}, \textit{age}, \textit{distress}) \quad (3)$$

$$\frac{\partial \alpha}{\partial \textit{control}} > 0, \quad \frac{\partial \alpha}{\partial \textit{quality}} > 0, \quad \frac{\partial \alpha}{\partial \textit{age}} < 0, \quad \frac{\partial \alpha}{\partial \textit{distress}} < 0.$$

The full set of regressors and coefficient values resulting from the probit estimation is shown in

¹⁶Barclay and Holderness (1989), Lease, McConnell, and Mikkelson (1983), Zingales (1994), and Eckbo and Verma (1994) examine the impact of control benefits based on the market value of control-blocks, stocks with differential voting rights, and voting games. This type of information is not available for our private Swedish sample firms.

¹⁷As discussed below, several empirical studies report that the likelihood of CEO turnover decreases in firm performance.

¹⁸For comparison with top manager turnover ratios reported for large firms in Chapter 11, see, e.g., Gilson (1989), Gilson and Vetsuypens (1993), and Hotchkiss (1995). Overall, top manager turnover appears to be higher in our Swedish, small-firm auction system than following Chapter 11 filings in the U.S..

Table 2. The estimation is performed using two samples for which we have sufficient information on all the variables. The first is 112 going-concern sales and the second adds 38 piecemeal liquidations for a total of 150 cases. We report two models. Model 1 uses the four explanatory variables in Eq. (3). Model 2 classifies the factors *quality* and *control* in going-concern sales according to whether the buyer in the auction is the old owner (*saleback*) or a company outsider (*external*), and it includes an interaction variable for piecemeal liquidations (where no one is rehired).

The models in Table 2 have significant explanatory power, with pseudo- R^2 ranging from 8% (model 1) to 30% (model 2). Several of the coefficient estimates are as predicted by **H1**. First, the coefficient for *control* is positive and significant (model 1). Second, model 2 shows that the positive effect of *control* is restricted to salebacks, indicating that the incentive of manager-owners to repurchase the company is increasing in managerial control benefits. **H1** also predicts that outside buyers associate large control benefits with managerial entrenchment, which lowers their incentive to rehire the CEO. Given the insignificant coefficient on *control * external*, this effect is not present in our data. Notice also the significantly negative coefficient on *control * piecemeal*. In other words, managerial control benefits are on average lower when the firm ends up being liquidated. A consistent explanation is that lower control benefits reduces demand from the old manager-owner to repurchase the company as a going concern.

The variable *quality* is positive and significant at the 2% level or better in model 1, indicating that the buyers in the auction screen the old CEOs on quality before making the rehiring decision. As shown when using model 2, the significance of *quality* reflects screening by the *external* (outside) buyer, while managerial quality is insignificant in a *saleback* to the old owner-manager. This indicates that screening on CEO quality, while important to the outside buyer, is of secondary importance for an owner-manager, perhaps because she repurchases the company in order to preserve control benefits.¹⁹

Moreover, the coefficient on *quality * piecemeal* is insignificant. Since the CEO is never rehired when the firm is liquidated piecemeally, this suggests that the average CEO quality in firms that are liquidated is indistinguishable from the overall sample mean quality (conditional on model 2). In other words, we cannot conclude that firms end up being liquidated (as opposed to purchased as

¹⁹Since the old owner-manager knows her own *true* managerial quality, an alternative interpretation of the insignificant coefficient on *quality * saleback* is that our empirical proxy for quality is simply coarser than the CEO's own information.

going concerns) due to poor managerial quality. As discussed in Maksimovic and Phillips (1998), bankrupt firms divest their plants as a function of industry conditions. In our context, if bankruptcy is the result of declining product market demand, a decision to piecemeally liquidate may very well be taken independently of CEO quality.

The industry distress variable, *distress*, receives a negative coefficient that is significant at the 7% level or better in all four model specifications. As argued above, industry distress possibly lowers demand from industry insiders in the auction, increasing the chance that the firm will be purchased by an industry outsider or piecemeally liquidated. The lower demand possibly reflects lower CEO incentives to maintain control when the overall industry outlook is depressed. Finally, the variable *age* is insignificant. This may be a reflection of the relatively young age of the CEOs in our sample (mean 45). Replacing *age* with a dummy variable for age 59 or older also produces an insignificant coefficient. Thus, although we would expect CEOs close to retirement age to leave the firm voluntarily following bankruptcy filing, this effect does not influence our coefficient estimates.²⁰

While this is the first study of CEO turnover in automatic bankruptcy auctions, several U.S. studies provide evidence that variables such as profitability, managerial equity ownership, and firm size help determine CEO turnover in various other settings. For example, turnover is typically found to be increasing in firm size and decreasing in managerial equity ownership, which supports our use of a positive sign for *ownership* and negative sign for $n(\textit{size})$ in the construction of the factor *control* in Eq. (1).²¹ Moreover, operating performance is often found to be negatively related to CEO turnover, which supports the use of a positive sign for this variable in the construction of *quality* in Eq. (2).²² In sum, the results in Table 2 provide support for the key prediction of **H1**: the CEO rehiring probability α increases with private benefits of control in salebacks. In addition, the rehiring probability increases with outside reputation for quality, and decreases with industry-wide distress.

We now turn to an investigation of the effect of bankruptcy filing on total CEO income, as

²⁰As argued by Brickley, Linck, and Coles (1999), the labor market time horizon of CEOs may very well extend beyond formal retirement age. They find that greater CEO reputation (measured using firm performance) increases the likelihood of future board directorships. The lack of significance of our variable *age* for turnover contrasts with the finding on U.S. data reported by, e.g., Weisbach (1988), Murphy and Zimmerman (1993), Mikkelson and Partch (1997), and Goyal and Park (2002).

²¹See, e.g., Warner, Watts, and Wruck (1988), Gilson (1989), Ofek (1993), Denis and Denis (1994), Denis, Denis, and Sarin (1997), Mikkelson and Partch (1997).

²²See, e.g., Warner, Watts, and Wruck (1988), Weisbach (1988), Morck, Shleifer, and Vishny (1989), and Mikkelson and Partch (1997).

discussed in **H2**.

4.3 The CEO income loss γ (**H2**)

Table 3 shows median and mean annual rates of income change for 258 CEOs with available personal tax return information. Note that, although **H2** is stated in terms of the CEO *wage* loss ($\gamma = w_h - w_l$), we test this hypothesis using income from *all* sources. By its very nature, loss of reputation is likely to affect the CEO's outside income across all of the positions that the CEO might hold (professional manager, consultant, board member, etc.).

In the first panel, the rate of income change is defined as $\Delta c_t = (c_t - c_{t-1})/c_{t-1}$, where c_t is the net income before tax in year t and year $t = 0$ is the bankruptcy filing year.²³ In the second panel, we report $\Delta c_t^* = \Delta c_t - \Delta d_t$, where Δd_t is the *median* rate of CEO income change for the control sample of 1,346 non-bankrupt firms described in section 3.2 above. Thus, Δc_t^* is the "abnormal" rate of CEO income change relative to the median non-bankrupt firm.

As shown in Panel A, the typical CEO suffers a large income loss from bankruptcy filing. Over the two-year event period [0,2], the median value of $\Delta c_{0,2}$ is -0.396, with 70% of the sample CEOs having negative income changes. Using a standard binomial test, the hypothesis that the fraction of the sample with negative $\Delta c_{0,2}$ is 50% is rejected with a p-value of 0.001.²⁴ The CEO income decline is also illustrated in Figure 2, which plots the cumulative values of the median Δc_t and Δd_t in event time, normalized to 100 in year -3. As shown, CEO income in the control-sample firms is *increasing* over the same time period. Thus, the income decline in the sample of bankrupt firms is even more significant when measured using the abnormal income change measure, Δc_t^* . In Panel B of Table 3, the median Δc_t^* is a significant -0.596 over the [0,2] window, down from the -40% for the unadjusted value Δc_t reported above. As indicated by Figure 2, the cumulative income-difference between bankrupt and non-bankrupt firms' CEOs grow almost monotonically from year -2 through year 5.

The evidence in Table 3 and Figure 2 strongly supports the prediction of **H2** that bankruptcy filing will cause a significant wage decline for the typical CEO ($\gamma > 0$). Moreover, we estimate a

²³Since capital losses are not deductible against salary income in Sweden, Δc_t reflects the full salary loss of the CEO. Also, Sweden implemented a major tax reform in 1991, and we compute Δc_t strictly within each regime (1988-1990 and 1991-1994).

²⁴Due to a few outliers, the mean $\Delta c_{0,2}$ is much lower than the median (-10% vs. -40%). For this reason, our discussion focuses primarily on the median values.

cross-sectional regression model for the wage decline, defining $\gamma \equiv \ln(c_{-2}/c_3)$. Since **H2** holds that γ depends on CEO control benefits, we use the same regression specification as for the rehiring model (Eq. 3 and Table 2):

$$\begin{aligned} \gamma &= f(\textit{control}, \textit{quality}, \textit{age}, \textit{distress}) \\ \frac{\partial \gamma}{\partial \textit{control}} &> 0, \quad \frac{\partial \gamma}{\partial \textit{quality}} < 0, \quad \frac{\partial \gamma}{\partial \textit{age}} > 0, \quad \frac{\partial \gamma}{\partial \textit{distress}} > 0. \end{aligned} \tag{4}$$

The results are in Table 4. Due to data constraints on primarily the income variable, the regression employs a total of 114 cases; 85 going-concern sales and 29 piecemeal liquidations. The regression models have low explanatory power, with adjusted R^2 for model 2 of 4% and 6%, respectively. With the exception of *control*, the regressors receive statistically insignificant coefficients. Thus, the income decline, while large and significant on average, does not depend on CEO quality, CEO age, or industry distress.

The coefficient on *control* is positive and significant for the sample of going-concern sales (model 1), with a p-value of 8%. Thus, greater control benefits lowers the CEO's wage upon bankruptcy filing, possibly because high control benefits are associated with greater CEO entrenchment. This interpretation is reinforced by the significance of *control*external* (p-values of less than 2%). That is, the CEO income decline is greater when the firm is purchased by a company *outsider* and the CEO enjoys large control benefits, as predicted by **H2**.

To our knowledge, this study is the first to document compensation changes of individual CEOs *after* they leave the firm. Gilson and Vetsuypens (1993) compare the compensation given old and new CEOs following distressed restructurings and Chapter 11 bankruptcy. They report that if the CEO is replaced by an outsider, the median new CEO receives a cash compensation (salary and bonus) that is 36% higher than her predecessor, indicating a substantial wage differential to a CEO "untainted" by bankruptcy and distress. Moreover, if the CEO is replaced by an insider with ties to the previous management, the new CEO receives on average 35% *lower* cash compensation than the outgoing CEO. Thus, it appears that CEOs involved in distressed reorganizations experience significant compensation declines in both Sweden and the U.S..

4.4 Post-bankruptcy performance (H3)

In this section, we report post-bankruptcy operating performance, leverage ratios, and bankruptcy refiling probabilities. This information helps gauge the likelihood that the firm is severely and irreversibly "run down" by pre-filing risk-shifting and asset stripping, and whether the automatic auction process itself efficiently restructures the firm. As predicted by **H3**, evidence that the bankrupt firms tend to perform at par with their industry rivals supports the joint hypothesis of managerial conservatism ex ante and effective screening of CEO's by the buyer in the auction.

Post-bankruptcy performance estimation requires identification of the new restructured firm. Using information from the bankruptcy file and UC, a total of 158 of the going-concern sales could be identified post-bankruptcy. Of these, post-bankruptcy financial statements are available for 115 firms. Table 5 lists five performance and growth measures, adjusted for industry median, for this sample. The five measures are: annual operating profitability (EBITDA/sales), sales growth, growth in total (book value) assets, the ratio of capital expenditure to total assets,²⁵ and book value of total debt to total assets. The table reports median values with and without an adjustment for the industry median. The industry-adjusted value is the *median* of the difference between the firm and its median industry rival, where a rival is a firm with at least 20 employees in the same 4-digit SIC industry as the bankrupt company.

Using a Wilcoxon signed-rank test, the industry-adjusted operating profitability is indistinguishable from zero at a 5% level in each of the five years following bankruptcy, as predicted by **H3**. Computing operating profitability using total assets instead of sales produces identical inferences. By year 5, 63% of the surviving sample firms perform better than the median industry benchmark firm. Moreover, the growth rates in sales and assets are at par with the respective industry medians.²⁶

The level of capital expenditures is significantly above the industry median in year 2 (the first year of measurement) and converges to the industry level by year 3. Also, the auctioned firms emerge more highly leveraged than their industry rivals (median debt/assets of 0.90 vs. 0.80 in

²⁵Capital expenditure is the change in property, plant, and equipment from last year plus the current year's depreciation.

²⁶As there is no financial statement for the restructured firm in year 0 (the auction), the growth rates start in year 1.

year 1) and they tend to stay highly leveraged through year 4.²⁷ Overall, the information in Table 5 indicates that firms emerging as going concerns from auction bankruptcy are more highly levered but perform, grow and invest at the level of their industry rivals.

Next, we ask whether the industry-adjusted operating profitability π_t cumulated over years $t = 1$ and $t = 2$ are affected by our quality and control factors, using the following regression model:

$$e^{\sum_1^t \pi_t} = f(\text{control}, \text{quality}, \text{distress}, \text{merger}), \quad t = 1, 2, \quad (5)$$

$$\frac{\partial e^{\sum_1^t \pi_t}}{\partial \text{control}} > 0, \quad \frac{\partial e^{\sum_1^t \pi_t}}{\partial \text{quality}} > 0, \quad \frac{\partial e^{\sum_1^t \pi_t}}{\partial \text{distress}} < 0, \quad \frac{\partial e^{\sum_1^t \pi_t}}{\partial \text{merger}} > 0.$$

Here, *merger* is a dummy variable indicating that the buyer in the auction merged the bankrupt firm into another going concern (and not into an empty corporate shell).²⁸ The variable *merger* controls for possible synergy effects of the acquiror's existing assets. We focus on years 1 and 2 only, as the impact of the pre-filing characteristics in *control* and *quality* on the subsequent performance of the restructured firm are greatest in the early years.

We use Eq. (5) to investigate whether the cross-sectional variation in the old CEOs control benefits and quality help explain the auctioned firms' industry-adjusted operating profitability. Under **H3**, high-quality managers with high control-benefits exhibit conservatism in their pre-bankruptcy choices. Coupled with effective screening by the (external) buyer in the auction, the presumption is that this conservatism makes it easier to restructure the firm and run it in a profitable manner post-bankruptcy. Thus, it follows from **H3** that the industry-adjusted operating performance is increasing in *control* and *quality*.

The results are in Table 6. Due to data constraints on post-bankruptcy financial statements, the regression employs a total of 66 going-concern sales. The adjusted R^2 ranges from 4% (model 1) and 10% (model 2), respectively. The factor *control* is insignificant in all four models. However, *quality* receives a significantly positive coefficient in year 1 (model 1), which is consistent with **H3**. Model 2 in year 1 shows that the significance of *quality* is greatest in the sample of salebacks. This

²⁷While not shown in Table 5, the relatively high debt level is also reflected in a lower-than-industry interest coverage ratio. Studying firms emerging from Chapter 11, Gilson (1997) also finds that debt levels remain high.

²⁸Approximately one-third of the going-concern sales were merged into an existing going concern.

result is intuitive since, in our framework (and supported by the results in Table 2), there is more extensive screening of CEO quality when the buyer is external. Effective screening tends to eliminate the correlation between *quality* (measured using the pre-bankruptcy CEOs) and subsequent post-bankruptcy performance. The cumulative performance over years 1 and 2 is also increasing in the variable is *merger*. That is, merging the bankrupt firm with the buyer’s assets appears to improve the subsequent two-year industry-adjusted operating performance.

Finally, we examine our second measure of post-bankruptcy performance: the likelihood that the restructured firm is forced to refile for bankruptcy. Again, pre-bankruptcy managerial conservatism coupled with effective CEO quality screening, are predicted to increase survival, i.e., reduce the refiling probability. In our sample of 158 identified post-bankruptcy firms, a total of 39 (25%) refile for bankruptcy within two years, and 59 (37%) within five years. The median time to refiling is 20 months (average 23). These refiling rates are higher than the 19% five-year filing frequency for the population of Swedish firms with 20 employees or more over the same time period (source: Statistics Sweden).²⁹ Table 7 estimates, using the explanatory variables in Eq. (5), the probability of refiling for 94 going-concern sales over 1, 2, and 3 years following bankruptcy.³⁰ The probit regressions are significant for years 2 and 3 (Chi-square test) with values of the pseudo- R^2 ranging from 9% (model 1) to 13% (model 2). The insignificance of the year-1 regression is not surprising given the proximity to the auction itself (recall that the median refiling firm files in 20 months).

Focusing on the year-2 regression (the results are similar for year 3), greater values for both *control* and *quality* lowers the probability of refiling. The significance of *control* in model 2, year 2, is predominantly driven by subsample of external buyers. As discussed above, external buyers have a greater incentive to screen on CEO quality, which by itself improves post-bankruptcy performance. The significance of *control * external* further implies that, within the sample of external buyers, the greater the private benefits of control, the lower the chance of refiling. This is consistent with **H3** where greater control benefits leads to greater pre-bankruptcy managerial conservatism, which in turn improves the firm’s chance of long-term survival. Also, as with the earlier regression on operating performance, the significance of *quality* is driven by the subsample of salebacks. The

²⁹Our sample period contains a severe business downturn in the fall of 1991, causing the annual bankruptcy filing rate for firms with at least 20 employees in Sweden to peak at 6% in 1992.

³⁰The sample size is up from 66 in Table 6 as the regressions in Table 7 do not require post-bankruptcy financial statements. We also ran the estimation for years 4 and 5, with similar results.

intuition for this result is identical to the one given above for Table 6: there is more extensive screening of CEO quality when the buyer is external, eliminating the correlation between *quality* and subsequent post-bankruptcy performance.

Overall, the evidence in tables 5-7 is interesting. The typical restructured firm performs at par with its industry rivals. The operating performance increases in *quality*, while the refiling probability is decreasing in both *quality* and *control*. These findings are consistent with the joint hypothesis of managerial conservatism ex ante and efficient screening on CEO quality in the auction (**H3**). The evidence provide little support for the alternative view that the auction bankruptcy system induces costly risk-shifting and asset stripping activities to avoid bankruptcy.

In contrast to our findings for Swedish small-firm bankruptcies, Hotchkiss (1995) reports that a sample of 197 public firms emerging from Chapter 11 significantly underperform industry rivals over a five-year post-bankruptcy period. Moreover, operating profitability suffers—and bankruptcy refiling probability is increased—when the reorganized firm retains the old management.³¹ She concludes that there is little evidence that the Chapter 11 process effectively rehabilitates distressed firms.

5 Conclusions

We present a simple model demonstrating that CEO private benefits of control complement managerial reputation, compensation schemes, and financial contracts in counteracting costly shareholder risk-shifting incentives during financial distress. The implied managerial conservatism in project selection attenuates agency costs of debt and benefits shareholders ex ante. We then take this model to a sample of bankruptcy filings in Sweden, where a filing summarily terminates managerial employment contracts and automatically puts the firm up for auction. The "hard" constraint on management makes this an ideal laboratory for examining the opposing theories of risk-shifting and managerial conservatism prior to filing. While we do not have data on specific pre-filing project choices or asset substitutions, the theory predicts that managerial concern with maintaining private benefits of control will manifest itself in the buyer's decision to rehire the CEO, the CEO income loss from filing, and the post-bankruptcy performance of the restructured firm.

³¹In her sample, 32% of the firms refile for bankruptcy or initiates a private debt workout within five years.

Our empirical analysis employs two factors representing private benefits of control and CEO reputation (quality). The factors, which are constructed using a set of characteristics that are observable to the buyer in the bankruptcy auction, turn out to significantly determine the CEO rehiring probability, as predicted. Greater levels of control benefits increase the probability of a saleback of the firm to the old manager-owner (where the CEO essentially rehires herself), while higher CEO quality increases the probability that an external buyer will rehire the manager.

Using personal tax returns (publicly available in Sweden), we are able to track the CEO's income also *after* she leaves the firm. We find that a bankruptcy filing is a costly event: the median CEO income loss over the two years following bankruptcy is -40%. The contemporaneous income change for a control sample of CEOs of non-bankrupt firms is positive. The income loss of a filing CEO does not depend on whether the CEO stays or leaves the firm, and it does not vary with our CEO quality factor. Thus, it does not appear that high-quality CEOs avoid the wrath of the labor market following bankruptcy filing. Interestingly, the CEO income loss increases with the factor measuring private benefits of control provided the buyer is a company outsider. This is consistent with the hypothesis that outside buyers associate prior CEO control benefits with entrenchment and lower the CEO's equilibrium wage accordingly.

We also find that the firms emerging from the bankruptcy auction perform well. Post-bankruptcy operating profitability is at par with (healthy) industry rivals in every year over a five-year period following the auction. The firms show healthy growth rates in sales and total assets, and capital expenditures are at par or above that of rival firms. We also find that the post-bankruptcy operating performance increases in our CEO quality factor. Greater control benefits and CEO quality reduces the probability that the firm will refile for bankruptcy over the years following the initial filing, suggesting reduced pre-filing risk-shifting.

Overall, our results indicate that a bankruptcy filing in the Swedish automatic auction system is costly for the filing CEO, and that the probability of the CEO maintaining her position depends on publicly available information about her control benefits and quality. We conclude that the ex ante incentive effects of the instant labor market transaction (upon filing) help explain why the firms emerging from the bankruptcy auctions as going concerns are economically healthy. There is no empirical support for the alternative hypothesis that CEOs systematically run down distressed firms by means of costly risk-shifting and asset stripping strategies in order to stay out of bankruptcy.

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Table 1**Pre-filing and auction characteristics for Swedish firms filing for bankruptcy, 1988-1991.**

The table shows characteristics for 263 privately held firms filing for auction bankruptcy in Sweden, 1988-1991.

Characteristic	Variable name	Mean	Median	Standard deviation
A: Pre-filing firm characteristics¹				
Sales in \$ million		5.0	2.7	7.3
Book-value of assets in \$ million	<i>size</i>	2.4	1.3	3.6
Number of employees		43	29	48.3
Operating profitability ²		-0.01	0.02	0.14
Industry-adjusted operating profitability ³	<i>profmarg</i>	-0.06	-0.04	0.14
Debt-to-assets ratio ⁴		0.92	0.93	0.21
Interest-coverage ratio ⁵		-2.32	1.02	35.4
Proportion secured debt of total debt	<i>tangible</i>	0.39	0.38	0.25
B: CEO characteristics				
CEOs tenure exceeds two years (dummy) ⁶	<i>tenure</i>	0.65	-	-
Fraction CEO equity ownership in the filing firm	<i>ownership</i>	0.57	0.60	0.43
CEO age at filing	<i>age</i>	45.1	46.0	7.3
Pre-filing income in \$ thousand ⁷		39.7	26.0	73.9
C: Auction characteristics				
Delay from insolvency to filing in months ⁸	<i>delay</i>	4.8	4.0	4.9
CEO deemed incompetent by trustee (dummy)	<i>inept</i>	0.32	-	-
Debt recovery rate as a fraction of face value	<i>recovery</i>	0.35	0.33	0.21
D: Industry characteristics				
Industry distress ⁹	<i>distress</i>	0.42	0.38	0.16

¹The firm characteristics are from the financial statement last filed prior to bankruptcy filing, dated back on average 17.5 months (median 16.5 months). The exception is the variable *tangible*, which is from the bankruptcy file.

²Operating profitability is EBITDA divided by total sales.

³The firm's operating profitability less the contemporaneous median operating profitability for all Swedish firms with 20 employees or more, and the same 4-digit industry code as the sample firm.

⁴Book value of total debt divided by the book value of total assets.

⁵EBITDA plus interest income divided by interest expense.

⁶Fraction of CEOs in office two years prior to filing who are still in office at the time of bankruptcy filing.

⁷Net income before tax two years prior to filings, as reported in the CEO's individual tax return.

⁸The delay is based on the trustee's estimate of when the firm became insolvent.

⁹Industry distress is the fraction of all Swedish firms with at least 20 employees and the same 4-digit SIC code as the sample firm that either reports an interest coverage ratio of less than one in the year of filing, or files for bankruptcy during the next calendar year.

Table 2**Determinants of CEO rehiring for private Swedish firms filing for bankruptcy, 1988-1991.**

The table shows the coefficient estimates for probit regressions of the probability that the incumbent CEO is rehired by the buyer in the auction (rehired=1) vs. leaves the firm (rehired=0). The regressions use 150 privately held Swedish firms filing for bankruptcy during 1988-1991. P-values are shown in parentheses.

Explanatory variables	Going concern sales		All filings	
	model 1	model 2	model 1	model 2
Constant	-0.04 (0.966)	0.68 (0.546)	-0.09 (0.914)	0.16 (0.870)
CEO control benefits				
control	0.31 (0.015)	-	0.25 (0.022)	-
control*saleback	-	0.55 (0.000)	-	0.67 (0.000)
control*external	-	-0.14 (0.543)	-	-0.01 (0.963)
control*piecemeal	-	-	-	-0.82 (0.022)
CEO reputation				
quality	0.48 (0.018)	-	0.43 (0.013)	-
quality*saleback	-	0.22 (0.349)	-	0.14 (0.550)
quality*external	-	1.42 (0.011)	-	1.46 (0.012)
quality*piecemeal	-	-	-	1.33 (0.126)
age	0.01 (0.581)	-0.00 (0.936)	0.01 (0.628)	0.01 (0.963)
Industry control				
distress	-1.39 (0.066)	-1.79 (0.031)	-1.60 (0.015)	-2.02 (0.009)
Sample size	112	111	150	149
rehired=1	56	56	56	56
rehired=0	56	55	94	93
Pseudo R-square	0.08	0.21	0.08	0.30
Chi-square	12.7 (0.013)	32.9 (0.000)	15.2 (0.004)	59.2 (0.000)

Table 3**CEO income change for private Swedish firms filing for bankruptcy, 1988-1991.**

The table shows the rate of income change for CEOs of 258 private Swedish firms filing for bankruptcy, 1988-1991.

Event window (year) ¹	Median	Mean	Standard deviation	Fraction $\Delta c_t < 0$	p-value	Sample size
A: CEO income change³, Δc_t						
[-3, -2]	0.027	0.718	3.96	0.46	0.447	140
[-2, -1]	0.093	1.309	12.20	0.41	0.053	142
[-1, 0]	-0.163	-0.144	0.72	0.59	0.262	51
[0, 2]	-0.396	-0.100	1.07	0.70	0.001	73
[2, 3]	0.162	3.632	22.97	0.36	0.003	120
[3, 4]	-0.010	0.464	3.43	0.50	1.000	54
[4, 5]	0.146	1.658	6.95	0.30	0.093	23
B: Abnormal CEO income change⁴, Δc^*_t						
[-3, -2]	-0.076	-	-	-	0.520	140
[-2, -1]	-0.138	-	-	-	0.033	142
[-1, 0]	-0.161	-	-	-	0.034	128
[0, 2]	-0.596	-	-	-	0.001	82
[2, 3]	0.058	-	-	-	0.035	125
[3, 4]	-0.138	-	-	-	0.048	54
[-2, 3]	-0.656	-	-	-	0.000	195

¹Year $t=0$ is the calendar year of bankruptcy filing.

²P-value is the probability of rejecting the null-hypothesis that the fraction negative Δc_t and Δc^*_t , respectively, equals 0.5 using a two-tailed binomial test.

³CEO income change is defined as $\Delta c_t = (c_t - c_{t-1})/c_{t-1}$, where c_t is the CEO's net income before tax in year t . Due to the Swedish tax reform in 1991, Δc_t is computed strictly within the periods 1988-1990 and 1991-1994.

⁴The abnormal CEO income change is $\Delta c^*_t = \Delta c_t - \Delta d_t$, where Δd_t is the median income change for CEOs in a control sample of 1,346 non-bankrupt firms.

Table 4**Determinants of CEO income loss for private Swedish firms filing for bankruptcy 1990-1991.**

The table reports the OLS coefficient estimates in cross-sectional regressions of the income loss for CEOs of 114 private Swedish firms that filed for bankruptcy 1990-1991. CEO income loss is defined as $\gamma = \log(c_2/c_3)$, where c_t is the CEO's income before tax in year t relative to the filing year. P-values are shown in parentheses.

Explanatory variables	Going concern sales		All filings	
	model 1	model 2	model 1	model 2
constant	-1.36 (0.164)	-1.23 (0.215)	-1.09 (0.200)	-1.00 (0.200)
CEO control benefits				
control	0.23 (0.079)	-	0.12 (0.297)	-
control*saleback	-	0.09 (0.572)	-	0.03 (0.823)
control*external	-	0.46 (0.019)	-	0.47 (0.008)
control*piecemeal	-	-	-	-0.28 (0.144)
CEO reputation				
quality	0.16 (0.457)	-	0.06 (0.354)	-
quality*saleback	-	0.19 (0.467)	-	0.19 (0.416)
quality*external	-	0.02 (0.951)	-	0.05 (0.889)
quality*piecemeal	-	-	-	0.18 (0.616)
age	0.02 (0.319)	0.02 (0.426)	0.02 (0.354)	0.01 (0.448)
Industry control				
distress	0.59 (0.486)	0.82 (0.348)	0.60 (0.381)	0.93 (0.160)
Sample size	85	83	114	111
Adjusted R-square	0.02	0.04	-0.01	0.06
F-value	1.38 (0.249)	1.54 (0.177)	0.75 (0.600)	1.84 (0.077)

Table 5
Post-bankruptcy financial characteristics for firms sold as going concerns, 1988-1991.

The table shows post-bankruptcy performance, growth and leverage for 115 private Swedish firms auctioned in bankruptcy as going concerns, 1988-1991.

Event year t^1	Sample size	Firm value		Industry-adjusted value	
		Median	Fraction <0	Median	Fraction <0
A: Operating profitability (EBITDA/sales)					
1	111	0.054	0.23	0.005	0.49
2	103	0.043	0.21	- 0.007	0.54
3	88	0.064	0.16	- 0.003	0.52
4	85	0.079	0.15	0.001	0.47
5	45	0.096	0.11	0.020 ^b	0.37
B: Growth in sales					
[1, 2]	104	0.015	0.48	0.027	0.48
[2,3]	88	0.076	0.32	0.029 ^b	0.45
[3,4]	81	0.111	0.27	0.060	0.43
[4,5]	45	0.040	0.42	-0.030	0.59
C: Growth in total book assets					
[1,2]	103	0.022	0.48	0.011	0.47
[2,3]	89	0.029	0.43	-0.002	0.51
[3,4]	83	0.077	0.36	0.010	0.48
[4,5]	46	0.054	0.46	-0.023	0.52
D: Capital expenditure/assets³					
[1,2]	99	0.000	0.47	0.008	0.48
[2,3]	84	0.000	0.34	0.020	0.48
[3,4]	76	0.000	0.43	-0.036	0.59
[4,5]	40	0.000	0.35	-0.045 ^a	0.69
E: Total book debt-to-assets ratio					
1	111	0.902	-	0.105 ^{aa}	0.28
2	105	0.895	-	0.088 ^{aa}	0.27
3	90	0.877	-	0.094 ^{aa}	0.32
4	87	0.832	-	0.093 ^{aa}	0.36
5	46	0.760	-	-0.001	0.50

¹Year $t=1$ denotes the first year of operations following the bankruptcy auction.

²Industry-adjusted median is the median difference between the firm and the median value for its industry rivals, where industry rivals are all Swedish firms with 20 employees or more, and the same 4-digit SIC code as the sample firm. The probability of rejecting the null-hypothesis that the industry-adjusted value equals zero at the 1%, 5% and 10% significance level is denoted ^{aa}, ^a, and ^b, respectively, using a two-tailed Wilcoxon signed-rank test.

³Capital expenditure is the difference in book value of property, plant and equipment from last year plus the current year's depreciation.

Table 6**Determinants of the post-bankruptcy industry-adjusted operating profitability of Swedish firms auctioned as going concerns, 1988-1991.**

The table shows coefficient estimates for OLS regressions of the post-bankruptcy industry-adjusted operating profitability (π_i) of 66 private Swedish firms sold as going concerns, 1988-1991. The dependent variable π_i is cumulated over years $t=1$ and $t=2$, and π_i is defined as the difference between the firm's operating profitability (EBITDA/sales) and the contemporaneous median operating profitability for all Swedish firms with at least 20 employees and the same 4-digit SIC code. P-values are shown in parentheses.

Explanatory variables:	Dependent variable: Industry-adjusted operating profitability π_i			
	e^{π_1}		$e^{\pi_1+\pi_2}$	
	model 1	model 2	model 1	model 2
constant	1.04 (0.000)	1.04 (0.000)	1.07 (0.000)	1.06 (0.000)
CEO control benefits				
control	-0.01 (0.405)	-	-0.05 (0.163)	-
control*saleback	-	-0.01 (0.585)	-	-0.03 (0.467)
control*external	-	-0.02 (0.466)	-	-0.08 (0.135)
CEO reputation				
quality	0.06 (0.050)	-	0.08 (0.182)	-
quality*saleback	-	0.08 (0.043)	-	0.09 (0.277)
quality*external	-	0.03 (0.587)	-	0.03 (0.784)
Industry control				
distress	-0.07 (0.534)	-0.06 (0.565)	-0.09 (0.699)	-0.07 (0.752)
merger	0.05 (0.121)	0.05 (0.167)	0.19 (0.014)	0.21 (0.014)
Sample size	66	66	60	60
Adjusted R-square	0.06	0.04	0.10	0.07
F-value	2.11 (0.090)	1.51 (0.192)	2.66 (0.042)	1.82 (0.135)

Table 7**Determinants of refiling probability for Swedish firms sold as going concerns, 1988-1991.**

The table shows the coefficient estimates for probit regressions of the probability that the firm refiles for bankruptcy ($y_t=1$) versus does not refile for bankruptcy ($y_t=0$) within t years of the auction, where $t=[1,2,3]$. The regressions use 94 private Swedish firms that were auctioned as going concerns in bankruptcy, 1988-1991. P-values are shown in parentheses.

Explanatory variables	Dependent variable: Dummy for bankruptcy refiling through year t					
	y_1		y_2		y_3	
	model 1	model 2	model 1	model 2	model 1	model 2
constant	-1.83 (0.003)	-2.03 (0.003)	-1.57 (0.001)	-1.73 (0.000)	-1.36 (0.001)	-1.52 (0.001)
CEO control benefits						
control	0.11 (0.585)	-	-0.26 (0.074)	-	-0.20 (0.145)	-
control*saleback	-	0.22 (0.297)	-	-0.15 (0.347)	-	-0.09 (0.546)
control*external	-	-0.37 (0.442)	-	-0.66 (0.026)	-	-0.59 (0.031)
CEO reputation						
quality	-0.52 (0.105)	-	-0.46 (0.061)	-	-0.51 (0.027)	-
quality*saleback	-	-0.83 (0.032)	-	-0.63 (0.028)	-	-0.66 (0.016)
quality*external	-	0.22 (0.832)	-	-0.39 (0.472)	-	-0.61 (0.219)
Industry control						
distress	0.37 (0.753)	0.36 (0.773)	2.09 (0.019)	2.23 (0.017)	2.03 (0.018)	2.20 (0.014)
merger	0.50 (0.913)	0.46 (0.386)	0.18 (0.602)	0.45 (0.241)	0.19 (0.562)	0.43 (0.231)
Sample size	94	94	94	94	94	94
refiling=1	8	8	25	25	35	32
refiling=0	86	86	69	69	59	62
Pseudo R-square	0.06	0.15	0.09	0.13	0.09	0.13
Chi-square	3.54 (0.472)	8.15 (0.227)	10.2 (0.037)	14.15 (0.025)	11.8 (0.026)	15.6 (0.016)

Figure 1
Distribution of percentage CEO ownership in the filing firm

The figure shows the distribution of the percentage CEO equity ownership in the filing firm. Sample of 205 private Swedish firms filing for auction bankruptcy, 1988-1991.

Number of cases

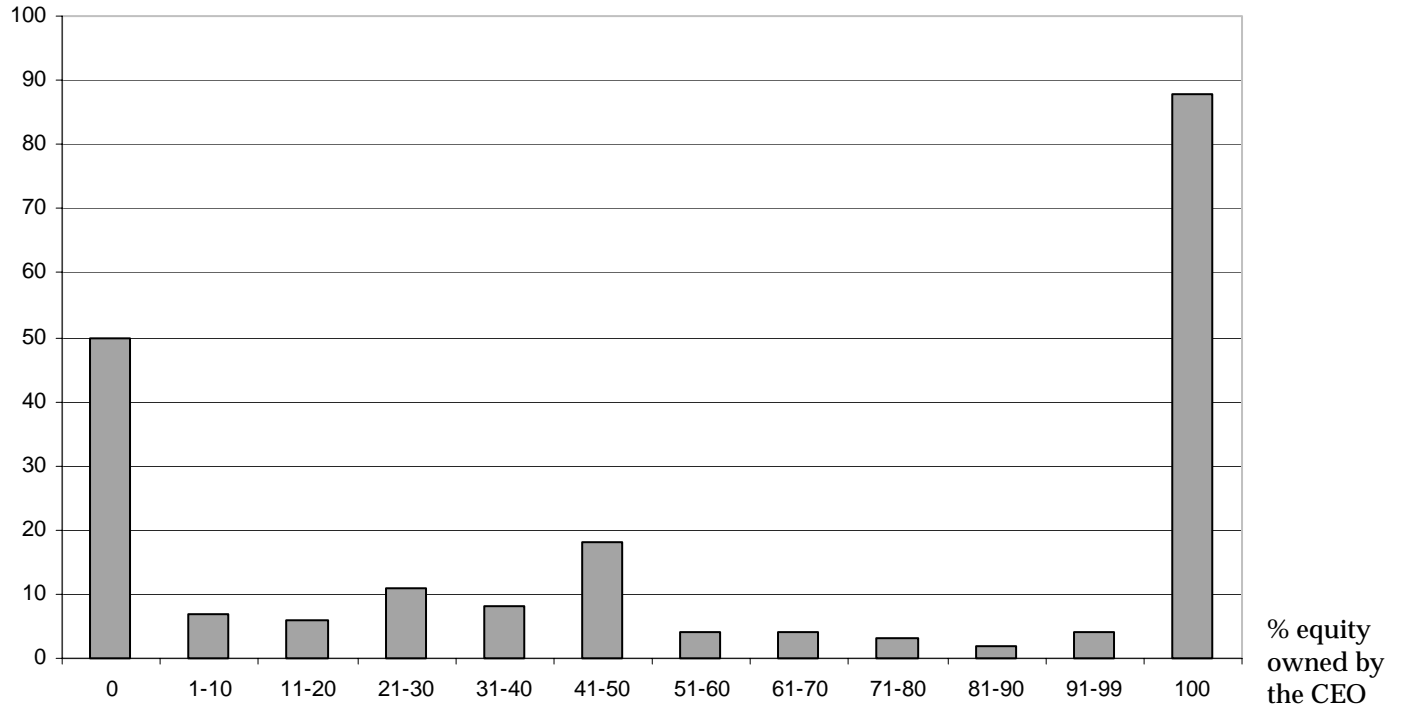


Figure 2
Median CEO income change for Swedish firms filing for bankruptcy 1988-1991.

Development in event time of the median CEO income for 258 private Swedish firms filing for bankruptcy in 1988-1991, \hat{c}_t , and for a control sample of 1,346 non-bankrupt firms, \hat{d}_t . The figure plots $\hat{c}_t \equiv \hat{c}_{t-1} \Delta c_t$, where $\Delta c_t = (c_t - c_{t-1}) / c_{t-1}$, c_t is net income before tax in year t reported in the CEO's tax return, and the median value of Δc_t is used. Both \hat{c}_{-3} and \hat{d}_{-3} are normalized to 100. The values of \hat{c}_t and \hat{d}_t are plotted over the period $t=-3$ to $t=5$, where $t=0$ is the calendar year of bankruptcy filing.

