

A theory of private equity turnarounds[☆]

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Abstract

This paper explores the advantage of private equity in fixing turnaround situations. Meaningful corporate value creation may require addressing operational problems, replacing management, or changing the incentive structure. Change may be implemented under either without change of ownership or through a buyout. The paper derives scenarios under which transferring ownership to private equity prior to implementing a turnaround can emerge as an optimal solution, even when current ownership can conceivably implement the same operational changes as private equity. Also considered is the possibility of investment syndication in which the private equity buyer shares the transaction with other private equity firms. Various alternatives are considered for implementing turnarounds; in particular, ones that allow for management replacement and others that are effectively management buyouts. © 2007 Elsevier B.V. All rights reserved.

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1. Introduction

Private equity is an asset class which has received considerable recent attention due to its perceived exceptional returns.² Not surprisingly, it has grown to a mammoth size, both in terms

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² Private equity refers to buyouts and is distinct from venture capital in American usage (and in this paper), while venture capital is traditionally considered synonymous with private equity in European usage. Whether PE funds actually realize excess returns is debated. For example, Ljungqvist and Richardson (2003) find PE funds generate excess risk-adjusted returns, on average. Kaplan and Schoar (2005) find average PE fund returns approximately equal that of the S&P 500, after fees. Zollo and Phalippou (2005) argue PE funds underperform the S&P 500 by about 3% annually. Kaserer and Diller (2004) find mixed performance results for European PE funds. For recent reviews of the industry, see Moon (2006) and Financial Services Authority (2006).

of assets under management and deal size. Private equity funds are actively involved in overseeing and “managing the managers” of their portfolio companies, setting them apart from other institutional investors such as money managers and hedge funds. As a result, the industry has been proclaimed *The New Kings of Capitalism* in two recent cover stories of *The Economist*.³

Value enhancement in private equity buyouts is largely attributed to improving operations. From an academic viewpoint, an ownership change before a turnaround seems at odds with the separation of ownership and control. This is particularly puzzling since most private equity funds do not claim to possess industry-specific skills.⁴ Rather, turnarounds often involve an assessment by professional consultants with such abilities.⁵ The availability of industry experts is common knowledge, certainly within the industry itself, and their skills can be equally accessed by others, including the existing owners. According to the Turnaround Management Association, an international trade association comprised of turnaround consultants, there is no shortage of business and their industry is fast-growing (Stockham, 2003). Other arguments for the role of private equity buyouts include improving managerial incentive contracts and the use of higher leverage. For such arguments to be compelling, they should explain why incentive contracts and capital structure changes cannot be structured under current ownership. Without such arguments, the economic rationale for a non-strategic sale of an ailing firm to improve its operational performance remains unclear.

This paper focuses on the *process* of evaluating a potential turnaround opportunity, identifying roles for a costly private equity takeover before executing a turnaround. Two key roles for private equity are identified. First, private equity allows inquiry into all turnaround possibilities, including those replacing current management, while avoiding direct confrontation between the board and management. Second, private equity can generate stronger incentives for current management to provide their insight into possible turnaround opportunities, leading to more effective turnaround plans.

Before exploring buyouts in detail, it is important to consider the related literature of venture capital, which, like private equity, typically consists of funds actively overseeing illiquid long-term corporate investments, albeit with early stage high-growth firms. Kaplan and Strömberg (2003) document the features of venture capital contracts and link them to agency problems. Sahlman (1990) and Lerner (1995) provide evidence on the oversight by venture capitalists, whereas Hellmann and Puri (2002) validate that the professionalization of the business by the venture capitalists is economically significant. On the modeling side, Casamatta (2003), Schmidt (2003) and Repullo and Suarez (2004) model the advisory role of the venture capitalists within a double-sided moral hazard framework which gives rise to features in convertible securities used in venture capital financing. Berglöf (1994) designs an optimal venture capital contract and shows its similarity to convertible instruments. Subsequent studies show that the use of convertible securities aligns interests for the exit decision (Bascha and Walz, 2001), and mitigates the incentive to engage in window dressing practices (Cornelli and Yosha, 2003).⁶

Turning next to mature companies, Jensen (1989, 1993) sharply criticizes the inherent structure of the modern publicly-held corporation, which seriously impairs value maximization

³ *The Economist*, November 25, 2004, pp. 3–5 and February 8, 2007, pp. 81–83.

⁴ This is consistent with Lossen (2006), who finds no decrease in a fund's rate of return due to diversification across countries, while diversification across industries is actually associated with an increased rate of return.

⁵ For an overview of the private equity approach to generate economic value, see Rogers et al. (2002).

⁶ For a more comprehensive coverage of venture capital, see Gompers and Lerner (2006).

behavior. Jensen claims that legal and regulatory restrictions have resulted in inefficient corporate governance and lack of incentive alliance between managers and owners. This, in turn, generates a wide range of agency problems such as ineffective internal oversight, managerial entrenchment, and operational inefficiency. The problem is partially mitigated by boosting ownership by managers.⁷ Oversight and control are also enhanced in situations where there is a large block of external shareholders. Denis et al. (1997) report that ownership structure, such as blockholding, plays an important monitoring role and significantly affects top executive turnover. This finding is supported by McConnell and Servaes (1990) who find a positive relation between institutional ownership and Tobin's q .

Ownership restructuring and going private has been suggested as an effective remedy to many of the agency problems outlined above. In particular, management buyouts (MBOs) and takeover transactions by concentrated and active financial intermediaries have been identified as the main mechanisms to exploit what may be termed "governance arbitrage." Thompson and Wright (1995) discuss in detail how corporate restructurings address the various governance failures due to diffused ownership and control.⁸ There is significant empirical evidence on the effectiveness of MBOs. Using plant level data, Lichtenberg and Siegel (1990) examine productivity changes in buyouts and find that productivity is significantly improved for at least three years post-buyout. They also report that buyout plants were already more efficient than non-buyout ones, indicating that these MBOs address misalignment of incentives more than structural problems. For the longer run, Wright et al. (1996) provide evidence on superior performance over the ten years following a MBO, with new market and product development as the most important influences on sales profitability growth.

When a company is underperforming, unless there is something structurally wrong with the business (leading to stagnation), deteriorating performance may arise either due to not properly rewarding competent management, in which case an MBO could result, or from keeping incompetent management, in which case a private equity takeover would involve management dismissal as part of the turnaround. Without *ex ante* knowledge on the precise nature of the operational problem, it may be impractical to judge in advance whether top management change is needed, since the problem could be structural. The firm has three alternative strategies: management may hire a turnaround specialist, the board may hire a turnaround specialist with a wider mandate of recovery plans including management change, or the company could be sold (possibly with a potential buyer syndicating the transaction with multiple private equity firms).

Section 2 describes the game and decision sequence. The model is provided in Section 3 and analyzed in Section 4. Section 5 extends the model to also allow corporate governance failure. Section 6 demonstrates model robustness. Section 7 examines empirical implications. Section 8 concludes.

2. Stages of the game

The corporate board knows that the firm has some possibility of benefiting from a turnaround, which requires both a turnaround plan and a capital infusion. Corporate difficulties could stem from either management or operations. The board commits to one of three possible

⁷ Optimal managerial incentive contract using mechanism design is derived by Stoughton and Talmor (1999).

⁸ For further analysis, see Nikoskelainen and Wright (2007-this issue).

strategies.⁹ In each, a consultant is hired to investigate turnaround feasibility, propose a turnaround plan (if turnaround is feasible), and investigate the value of a successful turnaround (if a plan is proposed). The first strategy is for the manager to hire a consultant who reports directly to her on the potential for a turnaround (keeping her in her current position).¹⁰ Since the manager filters information (and thus, decision-making), this is denoted the *managerial process*. The second strategy is to hire a consultant to report directly to the board on any turnaround, either keeping or replacing the manager, as the consultant deems appropriate. As the board is the focus, this is denoted the *board process*. The third strategy opens the firm to the possibility of a private equity buyout by beginning negotiations with an outside private equity investor. Here, the private equity investor employs a consultant who reports to the investor on any turnaround, either keeping or replacing current management.¹¹ This is denoted the *external process*, since the agent of change is external to the firm. The hired consultant is of equal quality under all three processes.

The manager, after observing the strategy choice, and knowing whether she is a source of corporate difficulties, chooses how much she should co-operate with the consultant by generating higher quality information to increase the consultancy report's accuracy.¹² Managerial co-operation is not directly observable (she may generate unhelpful, misleading, or even incorrect information), is costly for her, and affects her by changing the probability of her job being terminated.

After receiving a consultant report with a turnaround plan, the board (in the managerial and board processes) decides whether to execute the plan. In the external process, the private equity investor decides whether to buy the firm (either solely or through a syndicate) and execute the plan. Turnaround requires a capital investment at this point, and succeeds when the proposed turnaround plan is accurate.

In investment syndication, commonly known as a club deal in the context of private equity, the private equity investor offers to take partial ownership in the firm, with the rest taken by other private equity investors. These investors (the rest of the syndicate) analyze the turnaround plan to determine the successful turnaround value before deciding whether to proceed.¹³

In summary, decisions are as follows. First, the corporate board commits to a strategy (managerial, board or external process) to maximize the expected firm value (to current owners). Second, having observed the strategy choice, the manager chooses her report co-operation level to maximize her expected benefits of keeping her position less her information production cost. The consultant then produces a turnaround report, possibly including both a turnaround plan and the value of a successful turnaround. Third, if turnaround is feasible, the board (in the managerial and board processes) decides whether to execute the plan; in the external process, the private equity investor decides whether to withdraw, buy the firm and execute the plan, or try to form a syndicate

⁹ Since time is of the essence in an operational turnaround, changing strategies is assumed to be prohibitively costly.

¹⁰ Although the board oversees the manager, and ultimately decides whether to implement the turnaround plan, here it chooses neither to commission a more-wide-ranging report, nor to begin private equity negotiations. Since the report recommendations are delivered directly to the manager, before being passed on to the board, the possibility of managerial replacement is effectively eliminated.

¹¹ In practice, private equity investors can, and do, employ outside consultants to plan a turnaround strategy and evaluate its viability. However, since the consultant in our model has no agency conflict, the model also allows the private equity investor to have the consulting analysis done in-house (or even personally, assuming he has the skills), if desired.

¹² For clarity of exposition, we refer to the manager as “she” and the consultant as “he.”

¹³ Syndication can also diversify both portfolios (allowing larger deals) and board composition, in addition to conducting additional valuation analysis (Lerner, There's nothing wrong with sharing, Wall Street Journal, December 7, 2006).

to do so. Fourth (under syndication), potential syndicate members decide whether to proceed. Private equity investors maximize their own present value. To execute a turnaround, capital is invested, then the turnaround outcome is realized, and parties receive their agreed payoffs.

3. The model

In its current underperforming state, the firm has a relatively low base value B . With probability p , turnaround is feasible for the firm. With conditional probability q , turnaround requires replacing the manager; otherwise, it requires keeping the manager. There are thus three turnaround possibilities: turnaround replacing management is feasible, probability pq ; turnaround keeping management is feasible, probability $p(1-q)$; turnaround is infeasible, probability $1-p$.

The board commits to one of three possible strategies (managerial, board or external) as described in the previous section, with the goal of maximizing expected firm value. (All parties are risk neutral. Current firm owners have a zero discount rate.) The cost of hiring a consultant is assumed to be relatively small, so is unmodeled.¹⁴

In the board process, by commissioning a report explicitly allowing the possibility of managerial replacement, the board shows a lack of confidence in the manager. This generates emotional friction between the manager and board, lowering future corporate performance by an amount $E < B$.¹⁵ This occurs neither in the managerial process, which disallows the possibility of managerial replacement, nor in the external process, in which the report is delivered to the private equity investor, shielding the board from emotional repercussions.

The manager, after observing the board's strategy choice, and knowing whether she is a source of corporate difficulties, decides upon her (unobservable) co-operation level. Co-operation produces better information quality for the consultant, increasing the report accuracy θ above the minimal level θ_0 ($0 \leq \theta_0 \leq \theta \leq 1$). The manager has known private benefit b associated with employment, and incurs known private cost $c(\theta)$ of co-operation, with $c'(\theta_0)=0$, $c'(1) \geq b$, and $c'' > 0$. Thus, her optimization is

$$\text{Maximize } b \text{ Prob}(\text{manager keeping her job}|\theta) - c(\theta), \quad (1)$$

$$\theta \in [\theta_0, 1]$$

where θ may depend upon the board strategy.

In the board and external processes, the consultant correctly recognizes the firm's problem and proposes an appropriate turnaround plan (when feasible) with probability θ . The report provides an inaccurate diagnosis or ineffective plan with probability $1-\theta$. An inaccurate diagnosis falls into one of the three turnaround categories (replace manager, keep manager, infeasibility) according to original priors. In the managerial process, the only difference is that any outcome that would otherwise register as a management-replacing turnaround will instead register as turnaround infeasibility. Report accuracy θ is both the probability the plan addresses the firm's real operational problems and the unconditional success probability when executing the plan.

A successful turnaround either pays off high value H (probability a , independent of p and q), or low value $L < H$. An unsuccessful turnaround pays off 0. If the report offers a turnaround plan,

¹⁴ If the consultant fee is constant across strategies, it has no effect on the strategy choice.

¹⁵ This emotional cost, disrupting the personal relationship between the manager and board, may be incurred by both the manager and board. The cost may be especially acute in the case of family firms, where the manager may be a relative of board member(s).

then it also (correctly) reports the payoff of a successful turnaround with probability ϕ ; it contains no payoff signal (“uncertain value”) with probability $1 - \phi$.

After receiving a report with a turnaround plan, the board decides whether to execute the plan. In the external process, after receiving such a report, the private equity investor decides whether to buy the firm (possibly through syndication) and execute. Execution requires capital investment Y , and succeeds when the report is accurate.

Private equity investors have a higher effective cost of capital $e \geq 0$ than the current firm owners. There are at least four reasons to expect this. First, private equity investors have limited capital. In practice, a private equity fund raises a fixed amount of capital for a finite-lived fund. Multiple funds run by the same private equity manager are typically disallowed from making common investments. Thus, an investment commitment potentially foregoes an option to make an attractive turnaround opportunity later.¹⁶ Second, private equity is less liquid. Third, private equity funds report their IRR as their success measure. Presumably simply returning the stock market average is unsatisfactory. Fourth, any cost in the private equity fund structure requires a superior pre-cost return to justify its existence. These all raise the effective cost of capital.¹⁷

In determining the firm buyout price P , it is assumed that the private equity investor(s) and the firm split the potential expected turnaround gains, with private equity investor(s) capturing a fraction $f \in [0, 1]$. This recognizes bargaining power on both sides: time is of the essence, and breaking off negotiations to find other partners is a costly process. The gain accruing to the current owners is $P - B$, and the expected gain to the private equity investor(s) is $(B + \text{Payoff}) / (1 + e) - (P + Y)$, where “Payoff” denotes the expected turnaround payoff. Splitting the gains via f implies

$$P = B + (1 - f)[(\text{Payoff} - eB) / (1 + e) - Y]. \quad (2)$$

The buyout price reflects the higher private equity cost of capital e , including committing scarce capital to the firm’s base value B . To guarantee high value turnaround plans, and only those, are executed, it is assumed that $\theta H > (1 + e)Y + eB$ and $aH + (1 - a)L < Y$.

If the buyout is offered for syndication, the other syndicate investors observe correctly whether a successful turnaround has high or low value. They then decide whether to buy the firm at price P in (2), and execute the turnaround. The private equity investor takes a fraction $s \in (0, 1)$ of the syndicated deal, both for the initial investment and final payoff. If the syndicate does not invest, neither buyout nor turnaround occurs.

4. Analysis

An extremely simplified version of the model, with no information effects, is first analyzed to build basic intuition. The general model is then considered.

¹⁶ An analogy is that imposing an artificial capital constraint on a division of a firm, forcing capital rationing, increases the division’s effective opportunity cost of capital. The marginal foregone project, which determines the effective cost of capital, becomes a relatively valuable internal project rather than a less valuable external one. Therefore, under limited capital, the capital supply curve is no longer flat.

¹⁷ Jones and Rhodes-Kropf (2003) provide a model in which the private equity manager faces idiosyncratic risk, which then increases the discount rate applied to investments.

4.1. A simplified model

The following simplifying parametric assumptions are made in this section. Reports are perfectly accurate and always reveal successful turnaround value; $\theta_0 = \phi = 1$. Private equity investors have no bargaining power; $f = 0$.

Under these assumptions, syndication is never worthwhile since no useful information can be revealed. Only high value turnaround plans are executed. The probability of reporting a high value turnaround plan is $p(1-q)a$ in the managerial process, and pa in the board and external processes. Across strategies, the expected gains for current owners are:

$$\text{Gain(Managerial process)} = pa(1-q)(H-Y), \quad (3)$$

$$\text{Gain(Board process)} = pa(H-Y) - E, \quad (4)$$

$$\text{Gain(External process)} = pa[(H-eB)/(1+e) - Y]. \quad (5)$$

The optimal strategy depends upon the probabilities of turnaround feasibility p and need for managerial replacement q . By comparing (3), (4) and (5), the parameter values for which each strategy is most preferred can be inferred. If the emotional friction cost is not overly large, specifically $E < e(B+H)/(1+e)$, then all three regions exist; otherwise, the board process optimality region may be empty. (All proofs are in the Appendix.)

Proposition 1. *Assume that: reports are perfectly accurate and reveal the successful turnaround value, $\theta_0 = \phi = 1$; private equity investors have no bargaining power, $f = 0$. The optimal strategy is the managerial, board or external process in the respective regions (6), (7), (8). If emotional friction is not too large, all three regions exist.*

$$q < e(B+H)/[(1+e)(H-Y)] \text{ and } pq < E/[a(H-Y)] \quad (6)$$

$$p > (1+e)E/[ae(B+H)] \text{ and } pq > E/[a(H-Y)] \quad (7)$$

$$p < (1+e)E/[ae(B+H)] \text{ and } q > e(B+H)/[(1+e)(H-Y)] \quad (8)$$

Managerial process foregoes turnarounds requiring managerial replacement; this strategy is optimal when such turnarounds are unlikely (low q). The higher cost of private equity capital only matters when turnaround is attempted in external process, while the emotional friction of board process occurs regardless. Therefore, when a manager-replacing turnaround is likely (high p , high q), board process and an internal turnaround is optimal; when turnaround feasibility is lower (low p , high q), external process is optimal.

Corollary 1. *Under the assumptions of Proposition 1: Ceteris paribus, the private equity (external process) strategy is more likely to be best as E or q increase, and as e , B , Y or p decrease.*

Intuition is as follows. Increasing either the emotional friction E of the board process or the probability q of foregoing a manager-replacing turnaround under the managerial process makes private equity (external process) more attractive. Private equity requires committing capital with higher cost e , both to assets in place B and capital investment Y ; increasing these make external process less attractive. Decreasing the turnaround likelihood p makes the board process relatively less attractive due to its fixed emotional cost.

The next sections analyze the general model under each of the three strategies, including when to execute the turnaround plan, when the private equity investor should attempt syndication to generate additional information on the turnaround value, optimal managerial co-operation and report accuracy, and the expected firm value. Calculation details are presented in the Appendix.

4.2. Board process

In all three strategies, possible reports are of four types: turnaround plans with high, low, or uncertain payoff (of a successful turnaround), or turnaround infeasibility. Under the board process, the turnaround plan is executed only when the report indicates a successful turnaround has high payoff.

Knowing whether she is responsible for corporate difficulties, the manager chooses the report accuracy θ to maximize her expected benefit b of remaining employed less her co-operation cost $c(\theta)$. If she is the problem, the manager co-operates at the minimal level θ_0 . If not, she wants a more accurate report reflecting this, and co-operates at a higher level $\theta_{BP} > \theta_0$, where $c'(\theta_{BP}) = bpq\phi a$.

The problem is either the manager (probability q , report accuracy θ_0) or operations (probability $1 - q$, report accuracy θ_{BP}). Both accurate and inaccurate reports have probability $p\phi a$ of a turnaround plan with high turnaround value, which will be executed. The success rate for turnarounds is $[q\theta_0 + (1 - q)\theta_{BP}]$. The current firm owners' expected gain is:

$$\text{Gain(Board process)} = p\phi([q\theta_0 + (1 - q)\theta_{BP}]H - Y) - E. \quad (9)$$

4.3. Managerial process

The turnaround plan is executed only when the report indicates a successful turnaround has high payoff.

Since the manager has no possibility of replacement, and co-operation is costly, she chooses the minimal report accuracy $\theta = \theta_0$. The probability of a report leading to an executed turnaround plan is $p(1 - q)\phi a$, with turnaround success rate θ_0 . The current firm owners' expected gain is:

$$\text{Gain(Managerial process)} = p\phi(1 - q)(\theta_0 H - Y). \quad (10)$$

4.4. External process

Buyout followed by turnaround plan execution occurs when the report indicates a successful turnaround has high payoff; probability $p\phi a$. When a successful turnaround has uncertain payoff, syndication is attempted; probability $p(1 - \phi)$. If the rest of the syndicate finds payoff is high, the syndicate buys the firm and executes the turnaround plan; conditional probability a .

If the manager is the problem, she co-operates at the minimal level θ_0 . If not, she co-operates at a higher level $\theta_{XP} > \theta_{BP} > \theta_0$, where $c'(\theta_{XP}) = bpqa$; co-operation is higher here than in the board and managerial processes.

The problem is either the manager (probability q , report accuracy θ_0) or operations (probability $1 - q$, report accuracy θ_{XP}). Both accurate and inaccurate reports have conditional probability pa of a turnaround plan with high turnaround value, leading to a buyout. Using (2), with Payoff = $[q\theta_0 + (1 - q)\theta_{XP}]H$, the current firm owners' expected gain is

$$\text{Gain(External process)} = pa(1 - f)([q\theta_0 + (1 - q)\theta_{XP}]H - [eB + (1 + e)Y]) / (1 + e). \quad (11)$$

4.5. Strategy comparisons

The analyses of the three strategies can be summarized as follows:

Proposition 2. *The current firm owners' expected gain from following the managerial, board and external processes are respectively given by (10), (9), (11). The optimal strategy is determined by which of these is largest.*

The intuition from the simplified model still holds: each strategy has an embedded cost. Board process generates disruptive emotional friction between the manager and board, reflected by E in (9). Managerial process disallows the possibility of manager-replacing turnarounds, reflected by $(1 - q)$ in (10). Private equity in the external process has a higher cost of capital, lowering the value of payoff H and increasing the cost of buying assets in place B in (11).

Beyond this, private equity investor(s) have bargaining power in buyout price negotiations, reflected in the f term in (11), allowing part of the turnaround value to be captured from current owners. By decreasing private equity investors' bargaining power (possibly by forcing multiple private equity investors to compete in simultaneous buyout negotiations), the firm increases the attractiveness of external process.

A non-problematic manager has an incentive to increase turnaround report accuracy, providing personally costly information to avoid accidental termination through an inaccurate report. She is particularly sensitive under external process, as syndication makes an executed turnaround more likely. External process reports are generally more accurate than board process reports, which in turn are more accurate than managerial process reports, since $\theta_{XP} > \theta_{BP} > \theta_0$.

In addition to increasing report accuracy, syndication directly makes external process more attractive. For potentially promising turnaround plans, syndication provides additional information to confirm whether the opportunity is truly worthwhile. This is reflected by $\phi < 1$ in both (9) and (10).

Comparative statics on external process (private equity) attractiveness are summarized in the following corollary. Intuition for E , e and B is the same as in the simplified model (Corollary 1). Private equity investors' bargaining power f makes external process more costly to the firm, while increasing the consultant report quality ϕ makes the substitute of private equity syndication information less valuable. However, the effect of varying parameters p , q and Y is indeterminate; the relative impact on external and board process gains depends upon the relative magnitudes of f and ϕ .

Corollary 2A. *Ceteris paribus, the external process strategy is made relatively more attractive by increasing E , decreasing e , B , f , or ϕ .*

Informational roles of managerial co-operation and syndication are further highlighted by comparing how the turnaround attempt probability, success rate of attempted turnarounds, and managerial termination rate vary across the three strategies.

Corollary 2B. *The respective probabilities of attempting a turnaround under the managerial, board and external processes are $pa\phi(1-q)$, $pa\phi$, and pa . The respective success rates of attempted turnarounds are θ_0 , $q\theta_0 + (1-q)\theta_{BP}$, and $q\theta_0 + (1-q)\theta_{XP}$. The respective managerial termination rates are zero, $pqa\phi[1 - (1-q)(\theta_{BP} - \theta_0)]$, and $pqa[1 - (1-q)(\theta_{XP} - \theta_0)]$.*

Attempting turnaround is most likely to occur under external process (due to the syndication option) and least likely under managerial process (due to foregoing the managerial termination option), $pa > pa\phi > pa\phi(1-q)$. The success rate of attempted turnarounds is highest under external process and lowest under managerial process (due to relative report accuracy $\theta_{PE} > \theta_{FR} > \theta_0$). It is ambiguous whether managerial termination is more likely under external or board process: external is more likely to attempt a turnaround (possibly replacing the manager), but those turnarounds are more successful because they are less likely to misidentify a manager as problematic.

5. Corporate governance failure

Along with managerial and operational issues, the model can be extended to allow a third type of problem, failure of corporate governance. Here, the firm possesses a managerial incentive structure too flawed to generate optimal value creation. Furthermore, the current board of directors either cannot or will not make the changes necessary to incentivize the manager.¹⁸ We emphasize that this is not the primary focus of our model, and do not explicitly model the reason for corporate governance failure.

In our setting, fixing corporate governance requires board removal, which can be done expeditiously only through ownership change. Under external process, this is accomplished by a private equity buyout. Under managerial process, this is accomplished by a manager-led insider buyout, if the manager desires. This is modeled as functionally equivalent to the private equity buyout under external process: an insider buyout also has bargaining power f , cost of capital e , and the possibility of deal syndication. However, under board process, the board is unable or unwilling to recognize their own failings; in the model, a consultant concluding that corporate governance is flawed reports that turnaround is infeasible.

Assuming turnaround is feasible, there are now three turnaround types: managerial, governance and operational change, with conditional probabilities q , r , $(1-q-r)$. As before, the manager knows whether or not she is a problem. Now, upon seeing the managerial process report, she may decide to embark upon a manager-led insider buyout, in which she receives a fraction m of the buyers' gains.

Admitting the possibility of governance failure leaves the firm's expected gain under external process, (11), unchanged, as private equity naturally accommodates governance change, whether changing the board or incentive structure. In contrast, the board's inability to respond internally to governance failure makes board process less attractive, reducing the current firm owners' expected gain to:

$$\text{Gain(Board process)} = pa\phi([q\theta_0 + (1-q-r)\theta_{BP}]H - [1-r-qr(\theta_{BP} - \theta_0)]Y) - E. \quad (12)$$

¹⁸ Jensen (1989) suggests this may be due to the board holding an insufficient equity stake and having been selected by management.

Since no governance-changing turnarounds are pursued, the coefficients on both H (reflecting successful turnaround payoffs) and Y (reflecting attempted turnaround costs) are smaller in (12) than (9).

In the managerial process, when the report indicates a governance-changing turnaround and the manager knows she is not the problem, she leads an insider buyout. When the report indicates an operations-changing turnaround, it is executed internally. The current firm owners' expected gain is:

$$\begin{aligned} \text{Gain(Managerial process)} = & \text{pa}[(1 - q - r)\phi(\theta_{\text{MP}}H - [1 + q(\theta_{\text{MP}} - \theta_0)]Y) \\ & + r(1 - f)(\theta_{\text{MP}}H - (1 - q + q\theta_{\text{MP}})[eB + (1 + e)Y])/(1 + e)], \end{aligned} \quad (13)$$

where θ_{MP} is determined by

$$c'(\theta_{\text{MP}}) = m\text{parf}(H - q[eB + (1 + e)Y])/[(1 + e)(1 - q)]. \quad (14)$$

The manager has an incentive to increase the report accuracy in the managerial process, not to protect herself from termination, which is not a possibility, but to increase the value of her share of the deal in case of an insider buyout.

Proposition 3. *The current firm owners' expected gain from following the managerial, board and external processes are respectively given by (13), (12), (11). The optimal strategy is determined by which of these is largest.*

Eqs. (11), (12) and (13) are more easily compared by temporarily ignoring the effects of different report accuracies (θ 's). Gain from internal turnaround is then measured by $\text{pa}\phi(\theta H - Y)$, and buyout gain by $\text{pa}(1 - f)[(\theta H - eB)/(1 + e) - Y]$; which is larger depends upon whether the syndication effect ($\phi < 1$) outweighs private equity bargaining power (f) and cost of capital (e). External process gain (11) is just the buyout gain. Board process gain (12) is $(1 - r)$ times the internal turnaround gain, less emotional friction. Managerial process gain (13) is $(1 - q - r)$ times the internal turnaround gain plus r times the buyout gain, plus a term reflecting the manager's ability to avoid certain buyouts (when the consultant report is inaccurate, and the manager knows she is a problem). Board process foregoes turnarounds focused on governance failure (fraction r), while managerial process foregoes those focused on managerial failure (fraction q).

Let us now superimpose managerial co-operation. In the board and external processes, the non-problematic manager co-operates with the consultant to avoid accidental termination. However, in the managerial process, she co-operates to increase the value of a potential insider buyout. If this is relatively valuable to her (sufficiently high m), managerial process can become the most accurate strategy, and if r is sufficiently high, can offer the largest gain to the firm.

6. Robustness

The model's main results are robust to changing various model assumptions. The simplified model of Section 4.1 has neither information effects nor private equity bargaining power. Proposition 1 shows that emotional friction and higher private equity cost of capital are sufficient for each of the three strategies (managerial, board and external) to be optimal in some parameter region (p and q values). A similar result is also obtained by assuming only emotional friction and private equity bargaining power.

In the general model, board (relative to managerial) process has two benefits (not foregoing manager-replacing turnarounds, higher managerial co-operation) and one cost (emotional friction); in the absence of emotional friction, board dominates managerial process (although this is no longer true in the extended model of Section 5). Relative to the others, the external process has one benefit (syndication, valuable both directly and indirectly by inducing higher managerial co-operation) and two costs (bargaining power and higher private equity cost of capital). However, even in the absence of syndication, each strategy is optimal in some region. In the absence of both syndication and emotional friction, board process dominates (although not in the extended model). In the absence of both bargaining power and higher private equity cost of capital, external process dominates (but again, not in the extended model).

7. Empirical implications

The most important empirical result arising from the model is the justification for embarking on either a private equity takeover or managerial buyout before attempting an operational turnaround. The model leads to several additional empirically testable predictions and regularities. Corollary 2B predicts the success rate of attempted turnarounds is highest under private equity. Empirical testing could compare the accounting performance of private equity acquisitions¹⁹ of underperforming companies with the post-crisis performance of comparable (underperforming) quoted firms.²⁰

Corollary 2A has multiple predictions. In situations where much of the firm value consists of well-functioning assets, private equity turnarounds should be less common if the private equity firm also must own those assets. This provides a motivation for acquiring just a single division, or alternatively, an outright buyout with the intention of immediately divesting tangible assets. The former is consistent with the observation that most MBO activity in the US and UK occurs below the firm level (Harris et al., 2005). The latter is commonly observed through the divesting of corporate real estate. Corollary 2A also implies that private equity turnaround is more likely in situations with high emotional friction, where removing management in bad times becomes personally difficult. This should be the case in family-controlled firms or when the CEO also serves as the chairman of the board; in such situations, ownership change may serve as a last resort for improving performance. Weisbach (1988) finds that in outsider-dominated boards, CEO turnover is more sensitive to firm performance. More broadly, a higher proportion of outside directors is associated with better corporate governance (Hermalin and Weisbach, 2003). Lower emotional friction (and fewer private equity turnarounds) should be expected in such cases, although the effect may vary by country as board structure and composition exhibit international variation (for a summary of the evidence, see Denis and McConnell, 2003).

By Corollary 2A, private equity can be made more attractive by reducing private equity bargaining power or its cost of capital. Private equity bargaining power can be reduced by soliciting simultaneous bids and explicitly employing an auction process for the firm sale. Using leverage allows the private equity investor access to additional capital, thus reducing his cost of capital, affording a higher buyout price, and making private equity more attractive. *Ceteris*

¹⁹ Financial performance data for private companies is publicly available in the UK and in certain other European countries.

²⁰ Wright et al. (1996) find evidence of improved sales and profitability for ten years post-MBO, consistent with the extended model of Section 5.

paribus, the leverage in private equity transactions should be higher than in other (matched-pair) turnaround situations. Cumming (2005) empirically confirms that buyout transactions are generally highly levered. Interestingly, debt-like capital structure is pervasive in venture capital, making the entrepreneur's stake highly convex (for example, Bascha and Walz, 2001).

8. Conclusion

Over the last two decades, we have witnessed numerous MBOs as well as third-party buyouts that led to managerial replacement. Our paper provides a theoretical framework in which both phenomena are rationalized based on agency problems that exist in corporate governance.

An underperforming firm that may benefit from an operational turnaround has three strategies. The first (managerial process) is for current management to commission a consultant report determining feasibility of a turnaround, including an execution plan, and the value potentially created thereby. The second (board process) is for the board to commission a similar, but more-wide-ranging report, possibly suggesting replacing current management. The third (external process) begins negotiations with a private equity investor to buyout the firm; the investor then commissions a report before proceeding.

Our model focuses on the process of initiating a turnaround and associated information effects. Neither the quality of the consultant nor the available managerial talent changes when private equity is involved. Benefits and costs, both direct and information-based, for each strategy are identified. Managerial process foregoes pursuit of any turnaround plan removing current management. Board process, in allowing that current management may be a problem, generates personal frictions between management and the board, but elicits better quality information from management than managerial process, leading to more accurate turnaround decisions.

Private equity buyout (external process) has two main costs to the firm: private equity has both a higher cost of capital and bargaining power over the buyout price. These both reduce the buyout price, although using leverage tempers the first effect. Private equity has two informational benefits: deal syndication generates information about turnaround quality, which increases managerial incentives to provide information about the turnaround opportunity. When these benefits outweigh the costs, this is the most attractive strategy; turnaround is more likely to be attempted, and to be successful.

Allowing the possibility that the firm faces corporate governance failure makes managerial process relatively more attractive. This provides motivation for the insider buyout, which has costs similar to private equity, but whose existence may elicit even better turnaround information from management, who directly stands to profit.

In summary, the model sheds light on observed phenomena including private equity buyouts driven by opportunities to improve operations, their pervasive use of leverage, club deals and management buyouts.

Appendix A

Proof of Proposition 1. Assume $\theta_0 = \phi = 1$, $f = 0$, and $E < e(B+H)/(1+e)$. Syndication's advantage is in providing additional information about the successful turnaround value, and disadvantage is that the private equity investor buys only a fraction $s < 1$ of the firm when buying the firm is deemed worthwhile. Since the report reveals the turnaround value, syndication has no

advantage here. Under external process, with high value turnaround plans, the private equity investor buys the firm for price $P = B + (H - eB)/(1 + e) - Y > B$ and executes, applying Eq. (2) with $f = 0$. With low value turnaround plans, since $B + (L - eB)/(1 + e) - Y < B$, no buyout occurs. Since the probability of a high value turnaround plan is pa , this implies (5).

Under managerial and board processes, the board executes turnaround plans with high values since the gain from executing a turnaround is $H - Y = \theta_0 H - Y > e(Y + B) \geq 0$, but not those with low values since the value of executing is $L - Y \leq aH + (1 - a)L - Y < 0$. The probability of a high value turnaround plan is pa under board and $p(1 - q)a$ under managerial process. This implies (3) and, after adjusting for emotional friction E , implies (4).

By comparing (3), (4), (5), managerial is strictly preferred to board process exactly when $pq < E/[a(H - Y)]$; external is strictly preferred to managerial exactly when $q > e(B + H)/[(1 + e)(H - Y)]$; external is strictly preferred to board exactly when $p < (1 + e)E/[ae(B + H)]$.

Regions (6), (7), (8) follow from taking the appropriate pairs of these inequalities. For $q = 0$, (6) holds. For $p = 0$ and $q = 1$, (8) holds. For $p = 1$ and $q = 1$, (7) holds since $E < e(B + H)/(1 + e)$. Therefore, the three regions are non-empty. $\square$

Proof of Corollary 1. From (3), (4), (5): Gain(Managerial) decreases in q and is independent of E , e , B ; Gain(Board) decreases in E and is independent of q , e , B ; Gain(External) decreases in e , B and is independent of E , q . For $q > 0$, Gain(Managerial) and Gain(External) decrease in Y more rapidly than Gain(Managerial). Finally, all three Gains are proportional to p except for the E term in Gain(Board). $\square$

Details of Section 4.2. The probability that a feasible turnaround exists is p ; the probability that the manager is a problem is q . This gives four possibilities: feasible turnaround requiring replacing the manager, probability pq ; feasible turnaround requiring keeping the manager, probability $p(1 - q)$; no feasible turnaround and the manager is a problem, probability $(1 - p)q$; no feasible turnaround but the manager is not a problem, probability $(1 - p)(1 - q)$. Therefore, for example, if the manager is a problem, her conditional (Bayesian) probability that a feasible turnaround exists replacing her is $pq/[pq + (1 - p)q] = p$, and her conditional probability that no feasible turnaround exists is $(1 - p)q/[pq + (1 - p)q] = (1 - p)$. An accurate report reflects these probabilities, while an inaccurate report is distributed according to the four prior probabilities. Executing an accurate plan succeeds, while an inaccurate plan fails.

If the manager is a problem, and the report accuracy is θ , then the report may lead to: an accurate plan replacing her, probability θp ; an accurate claim of turnaround infeasibility, probability $\theta(1 - p)$; an inaccurate plan replacing her, probability $(1 - \theta)pq$; an inaccurate plan keeping her, probability $(1 - \theta)p(1 - q)$; an inaccurate claim of turnaround infeasibility, probability $(1 - \theta)(1 - p)$. The total probability that the report calls for replacement is $\theta p + (1 - \theta)pq$. It is shown below that a turnaround plan is only executed when the turnaround value is indicated to be high (probability ϕa), so the overall probability of termination is $[\theta p + (1 - \theta)pq]\phi a$. The maximand in (1) is then $b(1 - [\theta p + (1 - \theta)pq]\phi a) - c(\theta)$. This decreases in θ ; the optimal $\theta = \theta_0$.

Plan inaccuracy implies the consultant misunderstands the problems of the firm, so offers essentially a random diagnosis. It is possible that turnaround is infeasible, yet the report gives an inaccurate claim of turnaround infeasibility, meaning that the report has incorrect reasoning for why turnaround is infeasible. Correct reasoning, an accurate report, is required for a successful turnaround.

If the manager is not a problem, termination only occurs under an inaccurate report calling for replacement, with a high successful turnaround value, probability $(1 - \theta)pq\phi a$. The maximand in

(1) is then $b[1-(1-\theta)pq\phi a]-c(\theta)$. From the first-order condition, the optimal $\theta=\theta_{BP}>\theta_0$ satisfies $c'(\theta_{BP})=bpq\phi a$.

Suppose the report includes a turnaround plan with high successful payoff. From the board's view: with probability q , the manager is a problem, leading to report accuracy θ_0 and expected payoff $\theta_0 H$; else, report accuracy is θ_{BP} and expected payoff is $\theta_{BP} H$. Therefore, the expected payoff is $[q\theta_0+(1-q)\theta_{BP}]H\geq\theta_0 H>Y$, the expected cost; executing the turnaround plan is worthwhile. For a turnaround plan with uncertain or low successful payoff, since $[q\theta_0+(1-q)\theta_{BP}]L\leq[q\theta_0+(1-q)\theta_{BP}]\cdot[aH+(1-a)L]\leq aH+(1-a)L<Y$, turnaround will not be executed.

The probability of the report having a turnaround plan is $\theta p+(1-\theta)p=p$, independent of report accuracy. The conditional probability that the plan is successful is $\theta p/p=\theta$. The probability that the report reveals a high payoff H is ϕa , implying (9).

Details of Section 4.4. The firm is bought out and the turnaround plan executed when the buyout price P from (2) is greater than B ; equivalently, $\text{Payoff}>(1+e)Y+eB$. As external and board process reports both allow replacing the manager, the probabilities leading to the payoff calculation are similar to that of the board process, with a different managerial co-operation level. However, the possibility of syndication must be considered. Under the high payoff H , $\text{Payoff}=[q\theta_0+(1-q)\theta_{XP}]H\geq\theta_0 H>(1+e)Y+eB$; the private equity investor buys the whole firm, not just a fraction $s<1$, since this is expected to be strictly profitable to the private equity investor if $f>0$. Under the low payoff L , syndication is not worthwhile because no new information is revealed, buyout value is less than B and buyout will fail. Under the uncertain payoff, syndication is preferred. Without new information from syndication, $\text{Payoff}=aH+(1-a)L<Y<(1+e)Y+eB$, so solo investment cannot occur; if syndicate members find payoff is low, buyout will fail; if the members find payoff is high (with probability a), buyout occurs at the same price P as under the high payoff. The private equity investor gets a fraction s of this transaction, expected to be strictly profitable. Since the unconditional probability of the report having a turnaround plan is p , and the total probability of a buyout is $\phi a+(1-\phi)a=a$, the expected firm value is $(1-pa)B+paP$, which implies (11).

Now consider the manager's co-operation decision. The difference relative to board process is that a turnaround plan with uncertain payoff may lead to a syndicate buying the firm and executing the turnaround plan. Turnaround plans are executed either when the report or the syndicate find a high successful turnaround value. Therefore, if the manager is a problem, her overall termination probability is $[\theta p+(1-\theta)pq]a$. If she is not, her overall termination probability is $(1-\theta)pqa$. In the former case, the maximand in (1) is $b(1-[\theta p+(1-\theta)pq]a)-c(\theta)$, decreasing in θ ; the optimal $\theta=\theta_0$. In the latter case, the maximand in (1) is $b[1-(1-\theta)pqa]-c(\theta)$. From the first-order condition, the optimal $\theta=\theta_{XP}>\theta_{BP}>\theta_0$ satisfies $c'(\theta_{XP})=bpqa$.

Proof of Proposition 2. The proof is laid out in the details of Sections 4.2, 4.3 and 4.4, leading to Eqs. (9), (10), and (11). $\square$

Proof of Corollary 2A. External process is optimal for parameters such that (11) is larger than both (9) and (10). (9) decreases in E , while (10) and (11) are independent of E . (11) decreases in B , e and f , while (9) and (10) are independent of B , e and f . Increasing ϕ has two effects: it increases (9) and (10) directly, and also increases (9) through increasing θ_{BP} ; (11) is independent of ϕ . $\square$

Proof of Corollary 2B. The probability of board process having a turnaround plan is p ; of indicating a successful turnaround has high value is ϕa ; with both, a turnaround is attempted, probability $p\phi a$. A successful turnaround emerges from an accurate report indicating a high value,

probability $p[q\theta_0 + (1-q)\theta_{BP}]\phi a$. Dividing by the probability $p\phi a$ of attempting turnaround gives the success rate. Managerial termination arises from an accurate plan with replacement, probability $pq\theta_0 a\phi$, an inaccurate plan when the manager is a problem, probability $q(1-\theta_0)pqa\phi$, or an inaccurate plan when the manager is not a problem, probability $(1-q)(1-\theta_{BP})pqa\phi$. Summing these gives the termination rate.

Under external process, calculations are similar, with two adjustments. A successful turnaround is indicated with total probability a instead of ϕa , due to the syndicate. Report accuracy when the manager is not a problem is θ_{XP} rather than θ_{BP} .

Under managerial process, there are three adjustments. The probability of having a turnaround plan is $p(1-q)$. Report accuracy is always θ_0 . Managerial termination is ruled out. $\square$

Proof of Proposition 3. Feasible turnaround probability is p ; the problem is the manager, governance, or operations with probabilities q , r , $(1-q-r)$. Under managerial process, if governance is the problem; the manager knows she is not. For accuracy θ , the consultant reports “infeasible” with probability $\theta(1-p) + (1-\theta)(1-p+pq)$; “feasible governance turnaround” with probability $\theta p + (1-\theta)pr$, leading to insider buyout; “feasible operations turnaround” with probability $(1-\theta)p(1-q-r)$, leading to internal turnaround attempt. If operations are the problem, accuracy is still θ . The consultant reports “infeasible” with probability $\theta(1-p) + (1-\theta)(1-p+pq)$; “feasible governance turnaround” with probability $(1-\theta)pr$, leading to insider buyout; “feasible operations turnaround” with probability $\theta p + (1-\theta)p(1-q-r)$, leading to internal turnaround attempt. If manager is the problem, she knows it, so will not attempt insider buyout; accuracy is the minimal θ_0 . The consultant reports “infeasible” with probability $\theta_0 + (1-\theta_0)(1-p+pq)$; “feasible governance turnaround” with probability $(1-\theta_0)pr$, but leading to no insider buyout; “feasible operations turnaround” with probability $(1-\theta_0)p(1-q-r)$, leading to internal turnaround attempt.

The probability of the manager not being the problem is $1-q$. The conditional probability of an insider buyout is $(ar[\theta p + (1-\theta)pr] + (1-q-r)[(1-\theta)pr]) / (1-q) = pra(1-q+q\theta) / (1-q)$. The probability of such a buyout being successful is $\theta pr / [pr(1-q+q\theta)] = \theta / (1-q+q\theta)$. If the manager knows she is not the problem, her expected gain from an insider buyout less information cost is $mf [pra(1-q+q\theta) / (1-q)] (\theta H / (1-q+q\theta) - [eB + (1+e)Y]) / (1+e) - c(\theta)$. The first-order condition over θ yields $\theta = \theta_{MP}$ in (14).

The expected gain to the firm, conditional on an insider buyout, is $(1-f)(\theta_{MP}H / (1-q+q\theta_{MP}) - [eB + (1+e)Y]) / (1+e)$, using (2). Combined with the probability of an insider buyout, this generates expected gain $(1-f)pra(\theta_{MP}H - (1-q+q\theta_{MP})[eB + (1+e)Y]) / (1+e)$. The expected gain to the firm from an internal (operations-based) turnaround is $\phi a((1-q-r)p\theta_{MP}(H-Y) - [(1-\theta_{MP})p(1-q-r)(1-q-r+r) + (1-\theta_0)p(1-q-r)q]Y) = \phi ap(1-q-r)(\theta_{MP}H - [1+q(\theta_{MP}-\theta_0)]Y)$. Combining these yields (13).

Under external process, the manager is the problem with probability q , and not (i.e., either governance and operations is) with probability $(1-q)$. Effectively, these act as two states. The probability of managerial termination, turnaround attempt and success rate, managerial co-operation, and expected gain are the same as in Section 4.4.

Under board process, if the manager is a problem, for report accuracy θ , her termination probability, when the report indicates “feasible managerial turnaround” with high value, is $\phi a[\theta p + (1-\theta)pq]$. As this increases in θ , she selects minimal accuracy $\theta = \theta_0$. If she is not a problem, for report accuracy θ , the probability the report indicates “feasible managerial turnaround” with high value is $\phi a(1-\theta)pq$. Using (1), she selects $\theta = \theta_{BP}$ satisfying $c'(\theta_{BP}) = bpq\phi a$. Successful turnarounds can arise from changing the manager, probability $\phi apq\theta_0$,

or operations, probability $\phi a p(1-q-r)\theta_{BP}$. Unsuccessful ones arise from pursuing inaccurate reports claiming feasible, high value, managerial or operational turnarounds, probability $\phi a [q(1-\theta_0) + (1-q)(1-\theta_{BP})]p(1-r)$. Combining, the expected gain to the firm is $\phi a [pq\theta_0 + p(1-q-r)\theta_{BP}](H-Y) - \phi a [q(1-\theta_0) + (1-q)(1-\theta_{BP})]p(1-r)Y - E$. Collecting terms, this yields (12). $\square$

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