Secondary Buyout Waves

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Abstract

We develop a dynamic model of the private equity market in which a wave in secondary buyouts emerges endogenously as the financial sponsors respond to past returns and herd into the market. The model shows that investment volumes and returns to sponsors increase with higher leverage and lower market interest rates, even when operating performance of the targets is constant. We confirm the model implications using a unique hand-collected dataset of 101 secondary buyouts completed between 1999 and 2008 with target companies in the United Kingdom. Tracing the entire holding period, from the time of a buyout to exit, we find evidence that these transactions generate statistically significant returns for their sponsors. In contrast, operating performance for the target companies does not seem to improve or even worsens, depending on the measure. Firm pre-buyout performance, improved governance, and, to a smaller degree, higher leverage and monitoring by private equity owners play a role in explaining the cross sectional variation in the post-SBO target performance over the life of the deal.

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1 Introduction

A secondary buyout (SBO) is a private leveraged buyout (LBO) transaction where both the buyer and seller are private equity (PE) firms. In any type of LBO, a PE firm uses a relatively small part of equity and relatively large part of debt capital to acquire a controlling equity interest in the target company. Over the last ten years, SBOs have emerged as an important, yet controversial phenomenon. After LBOs first emerged in the 1980s, the private equity segment has grown substantially over the years. In turn, the SBO sub-market has grown from 2% in the 1980's to 26% in the last four years as a fraction of all buyouts (Kaplan and Strömberg, 2009). Today, one in four private equity deals in Europe is a SBO.[1] Surprisingly, there is a gap in theoretical literature describing the characteristics of and dynamics in private equity markets observed in the recent years. We contribute to this discussion by presenting a dynamic model of the private equity market and then providing empirical support to its implications using the data from the recent wave of secondary buyouts in the United Kingdom, which is the second-largest PE market after the United States.

Researchers and practitioners are skeptical about this SBO trend for three reasons. First, the operating performance potential of SBOs may be limited because the previous owner was a PE firm that had likely implemented improvements with the largest impact on operating performance (Cumming and MacIntosh, 2003). Second, growth in the number of SBO deals coincides with the growth of liquidity in debt markets during the last boom period from 2005 to mid-2007, and is not driven by operating performance potential of the targets. Third, SBOs seem to be overpriced because PE fund inflows inflate PE valuations in a phenomenon known as "money chasing deals" (Gompers and Lerner, 2000).[2] In contrast to these views, some argue that SBOs could provide an interesting investment opportunity when the original PE firm is forced to sell a part of its portfolio early due to structural, opportunistic, or cash flow smoothing motivations (Strömberg, 2008), or when the PE firm needs to present a track record while raising new funds (Sousa, 2010). In addition, various PE firms often have different value-creation strategies because of different skills (Wang, 2012) or realize synergies in their specialized investment portfolios. Finally, compared to public companies private targets offer benefits of tax shields and better control due to the smaller number of owners and the resulting incentive structure. Therefore, SBOs may be motivated by the residual value potential.

To reconcile these conflicting views we present a stylized model of the market for private equity. In our

[1] According to the Centre of Management Buy-Out Research press release for 04 April 2011.

[2] This should affect all PE deals, but there are specific reasons why SBOs are overpriced. According to Achleitner and Figge (2012), SBOs are more expensive than other buyouts because the acquiring PE firm is purchasing the asset from a seller with similar market timing and negotiation skills.

model, the equilibrium depends on the demand for private equity financing by firms or entrepreneurs and on the supply of capital that has other potential uses by financial sponsors.[3] A distinguishing feature of our model the source of the private equity waves. They do not necessary depend on the general health of the economy and the net expected benefit of PE investment (the demand factors) but mostly are driven by the expected return on alternative investments, the commitment levels of PE firms, and the leverage that banks are willing to fund (the supply factors). Intuitively, when the supply side of funds—either through leverage by banks or capital allocation decisions by limited partners such as pension funds and other institutional investors—is based on past returns a decline in interest rates may cause a self-reinforcing process of PE investment. This self-reinforcing process emerges when an increase in supply of funds associated with higher commitment levels and higher leverage generates an increase in exit buyout prices, which in turn boost the returns in private equity market relative to alternative investments further fuelling the process. A cascade of acquisitions may result, where private equity funds face "musical chairs" during a period of increased leverage and low interest rates; exit prices continue to rise until the music stops (as in Toxvaerd, 2008). At the extreme, a cascade or a "wave" of acquisitions may result in exceedingly high prices and very low net present value transactions.[4]

The model delivers several testable implications about SBOs. First, the investment waves in secondary buyouts do not necessarily depend on the conditions of the economy or operating performance but are mostly driven by increasing leverage, expansion of supply of capital, and declining interest rates. Second, the returns to sponsors increase with higher leverage (debt/EBITDA) and lower market interest rates, even when operating performance of the targets (EBITDA/capital) is constant.

To test the model implications, we use a unique dataset of 101 secondary buyouts completed between 1999 and 2008 with target companies in the United Kingdom. Finally, we focus on *all* identifiable SBOs with sufficient financial information from one year before the deal until the exit. Our dataset is hand-collected using eight different datasets and company-specific news and contains information on key financial

[3] A financial sponsor is a common term to refer to the PE firms, particularly those PE firms that invest equity in leveraged buyout transactions. Debt providers co-invest in the form of bank loans, high-yield debt, and mezzanine capital. In this paper the term "financial sponsors" refers to the debt and equity providers.

[4] The recent wave of byouts from end-1990s to 2008 is not a new phenomenon. For instance, the high returns of buyout in the early 1980s can be attributed to information advantages of the early general partners, who "invented" leveraged buyouts as a vehicle to restructure inefficient and over-diversified businesses. It is plausible that commitment and investment levels of partnerships were triggered by positive signals and returns in previous periods and reached unprecedented levels. In particular, when supply of new capital, for example, though junk bond markets, was partially driven by past returns it tended to overwhelm the available opportunities when negative externalities arose. Negative externalities in demand and competition for a limited number of deals ended these waves. By 1991–1992 the private equity market in the United States had dried up. What is new about the recent wave is the dominance of secondary buyouts.

variables of the target companies, deal statistics (such as deal value and management equity participation), exit strategies (for example, sales to a strategic buyer or initial public offering), and market statistics (such as industry peer group financial performance and market returns). The UK provides the best data availability because private companies are required to submit annual financial reports. More importantly, according to TheCityUK (2011), the UK is the second most active buyout market in the world, after the US, in terms of invested and raised funds, with the presence of the largest global PE firms involved in cross-border acquisitions (see Appendix B for the list of the largest PE firms in our sample). Still, relatively little is known about SBOs outside of the United States. Empirically, we investigate i) What are the leverage and price characteristics of SBOs? Are they consistent with the model of PE waves? ii) Do SBOs create value (in terms of nominal and market and risk-adjusted return) for financial sponsors over the entire holding period?[5] and iii) Do SBOs improve the operating performance of target companies over the entire holding period?

Consistent with our model, we observe a wave of SBO transactions in the UK, both in terms of the number and the dollar value of the deals, from 1999 to the peak in 2006–07 with a visible collapse in 2008. The SBO transactions are characterized by a high leverage (post-buyout debt to capital is 72%), which is in line with the theory and earlier research on LBOs and SBOs (see Guo et al., 2011; Kaplan, 1989a). The post-buyout debt to capital or to EBITDA grows almost two-fold for a typical deal. Compared to first-time LBOs, these deals are more expensive (consistent with Achleitner and Figge, 2012) and have a shorter holding period (3.8 years for a typical deal). With respect to over time changes, the transactions become more levered and more expensive from the beginning to the end of the wave.

According to our estimates, the SBO financial sponsors receive large and statistically significant returns to invested debt and equity capital over the period from buyout completion to their subsequent exit or the end of our time period. The estimated median nominal and market and risk-adjusted returns are positive and significant (44% and 42%, correspondingly), and have the order of magnitude found for LBOs by Guo et al. (2011). Interestingly, potential operating performance improvements of target companies over the life of the buyout do not materialize on average. In most cases, we observe *negative* operating results. In this respect, SBOs are not different from any other LBO transaction in the recent wave: Guo et al. (2011) finds substantially smaller gains in operating performance in LBOs concluded in the US between 1990 and 2006 compared to deals of the 1980s. The data from UK thus confirms the prediction of our model that investment

[5]The holding period is the time from buyout completion until subsequent exit by the PE firm.

and returns to sponsors of secondary buyouts may increase even when operating performance of targets is constant or even declines.

To dig into this issue deeper, we exploit a large cross-sectional variation in operating performance within our sample and conduct a regression analysis to establish what factors are empirically associated with observed operating performance. We find strong and robust evidence of improvement in operating performance by companies that replaced management within one year after buyout completion. While our results for SBOs are consistent with the studies of first-time LBOs (Guo et al., 2011; Kaplan, 1989a), this finding is somewhat unexpected and remarkable because this measure is the easiest to implement following the first-time buyout and, in principle, the subsequent management change should not be as effective. In contrast to what has been reported in the literature for LBOs, we find only a modest role for the Jensen's (1986) disciplining effect of higher debt, probably because the targets of a SBO are already highly-leveraged companies and the benefits from further debt infusion might be muted. We also observe a positive correlation of performance with the proxy of direct monitoring by PE firms; however, this effect is somewhat weak. Monitoring by other investors (banks), the alignment of incentives of management and shareholders through management equity participation, the PE sponsor's reputation, and the length of the holding period do not seem empirically important. Finally, firm pre-buyout performance is empirically important, which is consistent with the idea that PE firms are able to pick the better-performing targets for SBO, and further enhance their profitability and return on assets.

We contribute to the current literature on SBOs in several ways. Our model is the first to provide the explanation for the existence and value creation characteristics of the waves of SBOs. The novelty is to explain the occurrence of the SBO waves due to supply side of the market for private equity. Our analysis also contributes to empirical literature on SBOs (for example, Achleitner and Figge, 2012; Bonini, 2012; Sousa, 2010; Wang, 2012) by characterizing a conclusive pricing, return, and operating performance profile of SBOs using the entire life of the SBO deal, rather than focusing on one of the aspects or looking at a narrow time window around the SBO deal.[6]

The paper is organized as follows. Section 2 describes the current state of knowledge about SBOs and introduces a model of the market for private equity. Section 3 presents the methodology and the data. Section 4 documents the results for volume, pricing, return, and operating performance profile of the recent SBO wave in the UK. Section 5 concludes.

[6]Compiling a comprehensive hand-collected dataset of SBOs with targets in the UK is an independent contribution of this paper, given the scarcity of information on SBOs compared to other PE transactions and mergers and acquisitions in general.

2 Model of market for private equity

2.1 What do we know about secondary buyouts?

Given the fact that SBOs are a relatively recent phenomenon, we have to rely on the theoretical and empirical literature on LBOs in search for their motivation and theoretical sources of value.[7] Because a SBO is a second LBO, a secondary transaction and a first-time PE deal should have similar value drivers. Specifically, Kaplan and Strömberg (2009) identify the following drivers of value in LBOs: improvements in operating performance, leverage effect, and buyout pricing.

Improvements in operating performance of LBO targets include improvements in cash flow, which, in turn, result from the growth of sales, financial restructuring, and optimization of working capital (Kaplan, 1989a). Kaplan and Strömberg (2009) state that reasons for these operating performance gains include improved incentive alignment between shareholders and managers of the target company; access to knowledge and operational engineering by buyout executives; and active monitoring of operations by investors, debt providers, and board members. The improved incentive alignment is achieved through management equity participation (Muscarella and Vetsuypens, 1990) and through smaller agency costs associated with increased leverage, as predicted by Jensen's (1986) Free Cash Flow hypothesis. High financial leverage and management equity participation prevent managers from investing for private benefit or short-term rather than long-term value (Jensen, 1989). Furthermore, PE firms increasingly try to specialize in operational expertise and specific industry sectors to optimize their portfolio companies' operating performance (Sousa, 2010). Finally, improved reporting procedures and active ownership by investors guarantees effective monitoring of management decisions and strategies (Acharya et al., 2013).[8]

The use of *leverage* is the second potential driver of value. In addition to the disciplining effect of debt mentioned by Jensen (1986), the use of leverage increases company's value directly through the tax

[7] Cumming et al., 2007 and Kaplan and Strömberg, 2009 provide extensive surveys of the empirical literature examining the LBO transactions of PE investors and the performance of target companies.

[8] Earlier literature on LBOs generally find improvements in operating performance of targets achieved through restructuring activities, increased management holdings, higher rates of new product development, and an increase in operating productivity (**?**). Research on the most recent wave of buyout transactions draws more mixed conclusions. Harris et al. (2005) show that PE-backed target companies show a significant outperformance and a substantial increase in plant productivity after the buyout, relative to comparable firms. Desbrières and Schatt (2002) use a French sample of MBOs to provide evidence for a significant decrease in return on investment, return on equity, and margin ratios in the years following the buyout. Leslie and Oyer (2008) show that PE-backed firms use stronger incentive alignments for management executives than do similar public companies. However, they do not identify significant differences in operating performance. Acharya et al. (2013) study a sample of UK transactions and show a significant increase in profit margins compared to industry peers that result from an active monitoring by buyout professionals and improved corporate governance. Results of Guo et al. (2011) on outperformance of PE companies, compared to industry peers, is mixed.

shield (higher interest tax deductions), which works by increasing cash flows that is available to equity holders because the financial structure of a post-buyout firm involves more leverage relative to the pre-buyout financial structure (Kaplan, 1989b).[9] Leverage also helps boost equity returns by increasing the risk of a buyout transaction.

The third potential source of value, *pricing of buyouts*, is primarily explained by market timing skills, also known as a buy low and sell high strategy. Negotiation skills of PE firms, as positioning skills in terms of industry and geography, are important factors. These PE firm characteristics are combined with high leverage strategies to multiply returns to equity after paying down debt commitments with cash flow generated by the target's operations. These are important elements in the price determination of a target company (Achleitner et al., 2011).[10]

The recent growth in number and volume of SBO transactions is hard to explain by value-creation theories alone. In fact, under the hypothesis that first PE investors have effectively improved the target firm's fundamentals, it is unclear how a subsequent PE investor can further create value by improving operating performance with similar (financing) methods and regulations (Wright et al., 2009). Jensen (1993) argues that, in such cases, real operating growth can only be achieved with the implementation of new investments and strategies, such as industry consolidation, international expansion, change in business strategy, or a new management team with different skill sets (Wang, 2012). Furthermore, in several situations, PE firms may be forced to sell a portfolio company early because of structural and opportunistic motivations, a limited lifetime (Kaplan and Schoar, 2005), or to present a track record when raising new funds, or to provide limited partners with a stable cash flow profile (Strömberg, 2008).[11] This could create an interesting investment opportunity for subsequent PE investors. Nevertheless, in the absence of a far-reaching opportunity, there should be no or very limited motivation for a PE firm to invest in a SBO. Because residual growth should be priced in the transaction, this will heavily reduce the profitability of the subsequent PE investor.

The the casual observation points out to other reasons for recent SBOs. The growth in SBO deals coincides with the growth of liquidity in debt markets during the last boom period from 2005 to mid-

[9] Kaplan (1989b) estimates tax benefits arising during leveraged buyouts for a range of assumptions on the marginal tax rate and finds evidence on the tax shield hypothesis in the U.S. for the 1980s. Guo et al. (2011) also find evidence regarding the effect of tax benefits on realized returns to capital in the U.S. from 1990 to 2006.

[10] Guo et al. (2011) show that industry or market-related changes in multiples account for, an average, 12.0% of the returns on the capital invested in the buyout. Phalippou and Zollo (2005) provide evidence that PE fund performance correlates positively with market and business cycles, which suggests that a substantial share of returns and price is due to market-wide conditions.

[11] Limited partner is a common term in private equity industry and refers to large investors that provide capital to the PE firms. The examples include public pension funds, insurance companies, foundations, and funds-of-funds.

2007. This suggests that SBOs are mainly an attractive option when the second PE firm increases the financial risk of the transaction by exploiting attractive debt market conditions. With higher risks, one can anticipate lower operating performance potential. The increase in the number of SBOs coincides with a peak in the fundraising activities of PE; PE fund inflows inflate PE valuations in a phenomenon known as "money chasing deals" (Gompers and Lerner, 2000). In contrast to global public capital markets, private equity market can deviate from the equilibrium due to sticky short-term supply.[12] Supply of capital may then overshoot demand when private equity investors incorrectly infer the size of the pool of investment opportunities or do not consider the costly adjustments associated with the total growth in their activities.

Given that SBO is a relatively recent phenomenon, the empirical literature on value-creation theories and motives for SBOs is scarce. Nikoskelainen and Wright (2007) analyze LBO transactions and provide evidence that returns with a SBO exit are lower than with Initial Public Offerings (IPOs) or sales to a strategic buyer. Bonini (2012) focuses on the operating performance of target companies in SBOs and LBOs. Analyzing a sample of 111 deals in Western Europe from 1998–2008, he finds that LBOs create significant industry-adjusted operating improvements. In contrast, for SBOs there are no meaningful operating performance improvements compared to industry benchmarks. The value creation in SBOs seems mainly driven by leverage as PE firms take advantage of excess liquidity in financial markets. Achleitner and Figge (2012) use a subset of databases compiled by three European funds-of-funds (limited partners) to compare equity returns and operating performance of SBOs compared to LBOs. Based on 910 realized buyouts (115 SBOs) from 1985–2006, mostly in Europe and the US, they find a higher leverage for SBOs at time of the transaction, even controlled for debt market conditions, and some evidence that SBOs are more expensive compared to other buyouts. In contrast to Bonini (2012) they found no robust evidence that SBOs have lower equity returns or offer less potential for operating performance improvements than do other buyouts suggesting that debate is going on. Sousa (2010) examines motives of an SBO exit by analyzing 1,627 PE deals in Europe between 2000 and 2007. The results of his study indicate that PE firms use an SBO exit to take advantage of favorable debt market conditions, while avoiding longer holding periods, thus, benefiting from a quick exit in terms of internal rate of return. Wang (2012) uses a sample of 465 LBOs and 140 SBOs in the UK from 1997–2008 to compare their pricing and study the motives that drive the SBO market. She shows that unfavorable equity market conditions (measured as industry IPO volume) and favorable debt

[12] Supply in the market has to adapt to exogenous shocks, but it takes 12 to 18 months before additional funds are raised. Exogenous shocks may cause fluctuations in private equity investments and fundraising. Most fluctuations in private equity fundraising are attributed to changes in the demand for private equity (Gompers and Lerner, 1998; Poterba, 1989).

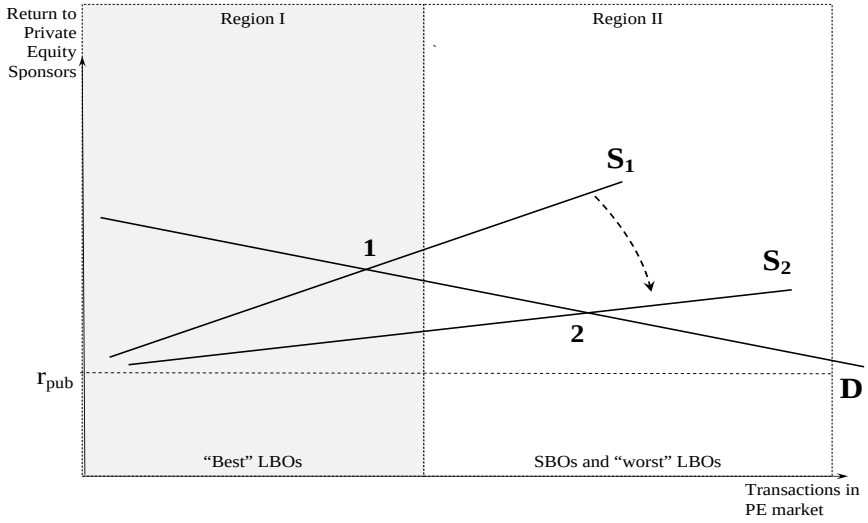
market conditions increase the likelihood of a SBO. She finds that SBOs are priced at a premium of 15% of enterprize multiple, compared to first-time buyouts; but this premium cannot be explained by the target's characteristics or the acquirer's abilities to borrow. Wang also finds mixed results for efficiency gains.

In order to reconcile the seemingly bleak value creation potential of SBOs with the recent stark growth of the SBO market we present a stylized model of a market for private equity which provides some testable implications for analyzing the SBOs in the recent decade. Later we bring these implications to the data.

2.2 Model environment and implications

Consider a market for a certain category of private equity, e.g., LBOs.[13] Figure 1 presents a simple illustration of equilibrium in this market.

Figure 1: Market for Private Equity



Notes: The diagram presents the developments in the market for private equity. The demand curve D for a certain category of private equity targets is determined by the pool of available targets in a given economy, seeking private investment. The supply curve S comes from the private equity sponsors willing to participate in a particular type of private equity transaction. The (continuous) increase in leverage of PE transactions and/or number of PE sponsors in the market increases the liquidity of the market and flattens the supply curve from S_1 to S_2. With the fixed pool of PE targets N the market evolves from the Region I (the typical deal involves the highest-return "best" LBOs) to the Region II (with some LBOs but SBOs dominating). The equilibrium return to a PE transaction (marginal and required return) declines, while the price of a typical transaction goes up due to increased leverage and fixed targets supply.

The aggregate *demand* for private equity at time t is determined by the pool of available targets of the private equity firms, each with different resources to deliver a particular expected return. The demand curve

[13] The basic elements of a static version of our model are similar to illustration in Gompers and Lerner (1998).

D, written in terms of returns, is given by

$$r_t^D = \theta - \kappa\, Q_t \tag{1}$$

where θ represents the net premium of private equity over public equity return and $Q_t = \sum_{\tau=0}^{t} Q_\tau$ denotes the total number of transactions in the market as of time t. We stress that the number of target companies N_t may be lower than the number of *transactions* Q_t in the market as of time t because each firm can be bought and sold a number of times. The return promised by later investment opportunities decreases at a rate κ. The demand curve has the usual negative slope because as private equity investors demand more targets (Q_t increases) fewer "good" high-return targets are available for buyout, the same companies may be bought and sold multiple times, and, as a consequence, deliver lower net benefits for investors. Because the first-time LBOs are already realized, it is plausible that the net benefits of secondary or even tertiary buyouts (Region II) is lower than that of first-time buyouts (Region I).[14]

The aggregate *supply* of private equity investment in our model comes from the private equity sponsors willing to participate in a particular type of private equity transaction. We assume that each agent invests an amount I that can be leveraged at ratio δ; in other words $I = E + D = E(1 + \delta)$ where E is the amount of equity supplied by the financial sponsors and D is borrowed from banks and other debt holders (e.g., junk bonds). The supply curve **S** (without segmentation and regulations) is likely to be very elastic. If perfect substitutes for PE targets existed, the market supply curve would be flat. However, the suppliers of funding to private companies have to accept illiquidity and a good deal of idiosyncratic risk. Hence, the supply curve is likely to be sloping slightly upward and, written in terms of expected returns, is given by

$$r_t^S = r_{\text{pub}} + \lambda Q_t. \tag{2}$$

where the intercept is equilibrium rate of return in the global capital market r_{pub} because the PE transactions should at least match the return of an alternative use with a similar risk in financial markets; in other words, the net present value must be at least zero.[15] The slope λ reflects the liquidity premium demanded

[14] From the prospective of targets, the demand curve ranks the firms according to the net benefit from private financing, such as reduced agency cost due to the disciplinary effect of debt, operating and financial efficiencies, tax shields, and other sources of value associated with an LBO. Thus, highly inefficient firms with a lot of gain from being purchased in a private transaction are at the upper-left of demand curve, while highly-levered, efficient companies, with less to gain from an LBO, are on the lower-right of demand curve.

[15] We drop the time subscript of r_{pub} for clarity of exposition

by investors. We assume that $\lambda = \lambda_{\mathrm{E}}/\delta$ where the λ_{E} is the liquidity premium required by long-term financiers such as institutional investors, while the leverage parameter δ enters in the denominator because the existence of bank debt (leverage) increases the overall market liquidity (see Brunnermeier and Pedersen, 2009; Gromb and Vayanos, 2010). Finally, the larger number of investors (entry) in the market increases the overall market liquidity, thus reducing λ_{E} directly.

In a competitive environment entrepreneurs are able to finance their firm at a cost equal to the required market return and to capture the excess value or surplus of the firm by retaining part of the equity capital. The most competitive providers of capital expect to earn a return at least equal to the return in the global capital market with the same risk characteristics plus a liquidity premium. Private investment opportunities in the economy are financed until the private equity market is in equilibrium and expected net benefit from the marginal private investment is the same as the required return including a liquidity premium. In equilibrium the marginal return r^D equals the required return r^S and the equilibrium amount of buyouts is given by:

$$Q_t^* = \frac{\theta - r_{\text{pub}}}{\kappa + \lambda_{\mathrm{E}}/\delta} \tag{3}$$

and the equilibrium return is given by

$$\begin{aligned} r_t^* &= \left(1 - \frac{\kappa}{\kappa + \lambda_{\mathrm{E}}/\delta}\right)\theta + \left(\frac{\kappa}{\kappa + \lambda_{\mathrm{E}}/\delta}\right) r_{\text{pub}} \\ &= (1-\omega)\theta + \omega r_{\text{pub}} \end{aligned} \tag{4}$$

where $\frac{\kappa}{\kappa+\lambda_{\mathrm{E}}/\delta} \equiv \omega \leq 1$ is the weight depending on relative slopes of supply function (2) and demand function (1), or return elasticities with respect to quantity, for PE. Notice that the equilibrium required return r^* is a weighed average of lowest-possible and highest possible return in the market for private equity.

Observation 1. *The equilibrium number of deals in the market for private equity Q^* increases with the following demand factors: i) the higher net benefit of the available targets over public equity θ and ii) slower speed of decline in the pool of good targets κ, and the following supply factors: i) lower interest rates r_{pub}, ii) higher leverage δ, and iii) lower liquidity premium demanded by PE sponsors λ_E.*

Observation 2. *The equilibrium required return to all sponsors in the market for private equity r^* increases with the following demand factors: i) the higher net benefit of the available targets over public equity (θ) and ii) slower speed of decline in the pool of good targets (κ), and the following supply factors: i) higher*

interest rates (r_{pub}), ii) lower leverage δ, and iii) higher liquidity premium demanded by PE sponsors λ_E.

We extend the static analysis to create an environment when the herding in private equity market creates a wave of PE investments and can lead to a situation where "too much money is chasing too few deals" as in Gompers and Lerner (2000) and low marginal benefit SBOs are undertaken.

Suppose banks are willing to finance PE deals and sponsors are willing to increase commitment levels when they expect a period of increasing buyout prices because when buyout matures the equity holders are more likely to repay the remaining debt. Such behavior may also be motivated by the multiple arbitrage (also referred to as "multiple expansion" or "market timing") strategies. Multiple arbitrage in the PE market happens when the exit multiple is larger than the entry multiple. This may happen when required returns in PE market decline, even when operating performance remains constant, and, thus, PE firms may generate positive returns without implementing changes in operating performance. We formalize this behavior in terms of our model parameters as follows:

Assumption 1. *The acceptable level of leverage set by banks for the next period depends on today's expected required returns in PE market as $\delta_{t+1} = \alpha / E_t[r_{t+1}]$ where α is a constant positive parameter and $E_t[.]$ denotes the mathematical expectation operator conditional on information at time t.*

If we interpret α as a measure correlated with operating cash flows or profits of the targets, it becomes intuitive why leverage increases with higher valuation multiples. When banks and financial sponsors base their financing decisions in part on multiple arbitrage considerations the debt-to-EBITDA ratios increase because the financial sponsors expect debt to grow proportionally to company values.

Following the Assumption 1 and the intuition of the static analysis above the following property of the private equity waves holds.

Proposition 1. *The private equity (secondaries) waves do not necessary depend on the evolution of the economy or company operating performance (the demand for capital) but mostly are driven by the leverage, investors entry, and low interest rates (the supply factors).*

Informal Proof. An exogenous shock in period t, for example, due to decline in market interest rate r_{pub}, lowers the required returns in the market for private equity $r_t^* < r_{t-1}^*$, as in Observation 2, but simultaneously raises the prices of PE targets, holding operating performance parameter α constant.

Banks observe higher prices of targets at time t, form an expectation of the continuing trend in falling expected returns (or rising target prices) in the future $E_t[r_{t+1}] = r_t^*$, and become willing to finance more

deals by increasing leverage in the following period $\delta_{t+1} > \delta_t$ (Assumption 1).[16] Similarly, the financial sponsors are willing to finance in expectation of increased value of buyouts. From Observation 2, this increase in leverage results in further decline in equilibrium required return in the following period $t + 1$: $r^*_{t+1} < r^*_t$. As long as banks don't take into account that higher leverage lowers the equilibrium required return they continue to exploit multiple arbitrage and, therefore, further increase the leverage.

In this self-reinforcing process of multiple arbitrage the supply of capital increases due to entry E or higher leverage ratio δ, the equilibrium return declines (and valuation multiples increase), further amplifying the leverage. The private equity wave emerges where even buyouts with low net benefits, such as secondaries, are undertaken. Of note, prices in the wave continue to rise due to supply of capital instead of changes in operating performance α.

In the extreme, this process ends when buyouts are (almost) fully financed by debt and the supply schedule in Figure 1 becomes almost flat with the marginal liquidity premium of the financial sponsors (the slope of the supply curve) converging to zero plus a default premium. The private equity wave stops. □

The dynamic analysis of the market for private equity delivers the following testable implications.

Hypothesis 1. *Over the course of the buyout wave, leverage (the entry debt-to-EBITDA ratio) of a typical transaction increases, increasing valuation multiples (the capital-to-EBITDA ratio), resulting in a larger number of SBOs executed in the market.*

Hypothesis 2. *Returns to financial sponsors of SBOs over the period from buyout completion to their subsequent exit depend on supply-side in the market for private equity and not on changes in operating performance of the targets. Targets of SBOs experience increase in debt-to-EBITDA ratios and capital-to-EBITDA multiples and constant EBITDA/Sales and EBITDA/Total Assets over the period from buyout completion to their subsequent exit or the end of our time period.*

3 Empirical methodology and data

3.1 Methodology

To measure the value creation for financial sponsors of SBOs, we focus on nominal and market-and risk-adjusted returns following Kaplan (1989a,b) and Guo et al. (2011). The nominal return to capital is calcu-

[16] We make an auxiliary assumption of rational expectations by which $r_{t+k} = E_t[r_{t+k}] + u_{t+k}$ and the forecast error u_{t+k} is independent of the information at time t.

lated as follows:

$$\text{Nominal return} = \frac{\Sigma(\text{Interim payments to debt \& equity}) + \text{Terminal Value}}{\text{Capital}} - 1 \tag{5}$$

Here, *interim payments to debt* include the interim principal payments to debt and the annual interests paid during the holding period. The interim principal payment is the difference between the total of long-term debt and short-term loans in the last fiscal year before exit and the year of buyout completion. *Interim payments to equity* (including dividends) are calculated as the difference between the shareholder funds in the last fiscal year before exit and the year of buyout completion.[17] The *terminal value* is the total dollar value received at exit by debt and equity holders. Missing terminal values are estimated as a multiple of EBITDA based on an industry portfolio of companies with the same four-digit SIC code as the target firms. Similar results are obtained using revenue multiples if EBITDA multiples are not applicable. *Capital* is defined as the buyout price.

The market- and risk-adjusted return to capital are calculated as follows:

$$\text{Market- and risk-adjusted return} = \frac{1 + (\text{Nominal return})}{1 + (R_f(1 - \beta_u) + R_m\,\beta_u)} - 1 \tag{6}$$

where the term in the denominator is a CAPM discount factor calculated by the method of Gilson and Ruback (2000).[18] R_f is the risk-free rate of return, approximated by the three-month UK T-bill return, and R_m is market return, proxied by the geometric average return on the FTSE UK All-Share index over the matching period from buyout completion to post-buyout outcome for every target firm. β_u is "unlevered" beta and calculated as $\beta_u = (\beta_e\,E + \beta_d\,D)/(E + D)$. Here, β_e is the target firm's equity beta, a measure of systematic risk, E represents the market value of the firm's equity at buyout completion and D is the net debt (book value of long term debt + short term debt – cash and marketable securities). Due to data limitations preferred stocks are excluded from the unlevered beta calculations.

Because target companies are private firms, equity beta needs to be estimated. Every target company is matched to their industry peers based on the Industry Based Classification (IBC) industry code. Equity betas are calculated by regressing the specific industry portfolio returns for every target firm over 60 months prior

[17] The variable "Shareholder funds" is essentially total company equity and is defined in the source database ORBIS as issued share capital plus other shareholders funds. Other shareholder funds are all shareholders funds not linked with the issued capital such as reserve capital, undistributed profit, including minority interests, if any (see Bureau van Dijk Electronic Publishing, 2009).

[18] After rearranging, the term in the brackets in the denominator looks more familiar as $R_f + \beta_u\,(R_m - R_f)$.

to the firm's buyout completion on the FTSE UK All-Share index. We follow Cornell and Green (1991) and assume a value of debt beta of 0.25.

Operating performance calculations are based on the return on sales (ROS) and return on assets (ROA) estimated one fiscal year pre-buyout (henceforth, "year -1") and at the last fiscal year before exit (henceforth, "last year"). We define two versions of ROS, depending on a measure of company profits (Earnings Before Interest, Taxes, Depreciation and Amortization, EBITDA and Earnings Before Interest and Taxes, EBIT), as EBITDA/Sales and EBIT/Sales. ROA is defined analogously, using Total Assets in the denominator. Both numerator and denominator of these ratios are reported as of the end of the year in ORBIS. In the empirical analysis, we use changes in performance measures between year -1 and the last year. We also experiment with changes in the industry-adjusted performance measures by subtracting changes in the industry median ROS or ROA for firms with the same four-digit SIC code. For example, $\Delta\, ROS = ROS_{\text{last}}/ROS_{\text{-1}} - 1$ and ΔAdj. $ROS = (ROS_{\text{last}}/ROS_{\text{-1}} - 1) - \left(ROS^{\text{Ind.}}_{\text{last}}/ROS^{\text{Ind.}}_{\text{-1}} - 1\right)$ are unadjusted and industry-adjusted changes in operating performance based on EBITDA/Sales.

3.2 Sample selection and calculation of key variables

Data availability poses the biggest challenge for studying SBOs. To examine value creation, accounting data for private companies is needed. In the U.S., private firms without public debt are not obligated to disclose annual financial reports. Therefore, existing studies on SBOs are limited by data availability (Cressy et al., 2007). Focusing on the second largest buyout market, the UK, allows us to partially overcome such difficulty because in the UK, private companies are required to submit annual financial reports.[19] Furthermore, the UK is the second most active buyout market in the world after the U.S. and, due to cross border acquisitions, our sample also includes PE firms and sponsors from the rest of the world. Finally, by concentrating on a specific region, the effects of the differences in regulation, taxes, and macroeconomic variables are limited.

Our data selection process differs from the approaches of existing papers on SBO in that we combine the information from eight commercial databases and further enhance it with the hand-collected information on individual companies and transactions (see Appendix A for details of sample construction).[20]

We start by using Thomson One Banker's (TOB) and integrated SDC Platinum mergers section, both by

[19] UK Companies Act 2006 part 15, Accounts and Reports, 8 November 2006, Available at http://www.legislation.gov.uk/ukpga/2006/46/contents

[20] Achleitner and Figge (2012) use a small sample of the entire SBO market provided by two European funds-of-funds. Bonini (2012); Sousa (2010), and Wang (2012) use only one primary database source, namely Mergermarket, Capital IQ and Zephyr, respectively.

Thomson Reuters, and Bureau van Dijk's (BvD) Zephyr database to identify all SBOs in the UK completed between January 1999 and May 2008 with a minimum deal value of $50 million. Deal financing is hand-collected from deal synopsis in SDC and Zephyr, news from Factiva, and the loan and bond section of TOB. We use the "Rank value" in SDC as the buyout price or simply "capital," which is calculated as the transaction value plus the target's net debt minus the value of any liabilities assumed in a transaction. Net debt is straight debt plus short-term debt plus preferred equity minus cash and marketable securities as of the date of the most current financial information prior to the announcement of the transaction.[21] We chose 2008 as the last year to have a minimum of three years post-buyout performance. Zephyr has the largest coverage of UK deals, but only allows searches on a deal type "institutional buyout," which combines all the buyouts, including first-time LBOs. In contrast, in SDC, it is possible to search SBOs. Finally, the loans and bonds section of TOB provides detailed information on debt securities and debt financing based on the firm's Committee on Uniform Security Identification Procedures (CUSIP) code.[22] We cross-check all three databases to drop incorrectly categorized SBOs and obtain the most complete and comprehensive SBO sample for this time period. Our initial screening contains 126 secondary buyouts. We eliminate 25 cases where no detailed information on the deal value, deal rationale or financing structure is available from Zephyr, SDC, Factiva or company-specific merger offer documents. This produces a final sample of 101 SBOs. A total of 61 private equity (PE) firms are involved in executing a SBO, but no PE firm invests in more than seven deals (see Appendix B). Appendix C reports the industry distribution of SBO deals. The majority of acquired firms are active in retail (18% of current sample) or industrials (17% of the sample).

For the next step, we use BvD's Orbis and Amadeus databases to collect consolidated pre and post-buyout financial information for the target companies from January 1999–May 2011 to compute the return and operating performance of SBOs. Consolidated statements (with subsidiaries) must be used to compare the operating performance before and after the buyout of the target company accurately. In a typical secondary buyout, a new holding company is created on top of the former acquisition vehicle. After the buyout, all proceeds from the target firm's subsidiaries are consolidated under the new parent company. Therefore, the holding companies, both before and after the buyout, first need to be identified. Then we use the names and corresponding unique BvD identification numbers of parent companies to collect financial statements.[23]

[21] Guo et al. (2011) also include the fees paid in the transaction. We were not able to identity the fees separately in our sources, therefore, the fees paid during the transaction are not included in the "capital."

[22] TOB provides information on targets financing with, for example, senior debt, mezzanine, high yield debt, second lien, PIK, or bonds.

[23] Bureau van Dijk uses a unique identification number for every company to easily find different company records in its various

Name changes are common in SBO transactions; therefore, we also trace the parent company name changes and BvD identification number to ensure a correct matching between the parent and subsidiary. Furthermore, we collect a number of accounting variables from Amadeus and Orbis, including EBITDA, EBIT, interest paid, sales, total assets, shareholder funds, long term debt and short term loans. Financial data in year -1 are available for the full sample (101 SBOs); however, complete post-buyout information on accounting variables is missing for 12 companies, leaving us with a subsample of 89 firms with available post-buyout information.

To compute nominal returns to an SBO, we determine the terminal value of the target and interim post-buyout payments to debt and equity holders. The terminal value is the total capital received by debt and equity sponsors after exiting the company and is determined as the observed value at exit or the last available year if the company is still private. Our sources contain information on the terminal value at exit for 35 of the 38 deals with an outcome (out of 89 deals with post-buyout data). Among these 35, we assume no equity repayment and, thus, zero terminal value for four distressed firms. The terminal values for the two companies with unknown outcomes and for all the firms that are still private are estimated based on the multiple of EBITDA. We follow Guo et al. (2011) and calculate the EBITDA multiple as the industry median ratio of equity plus market value of debt to EBITDA of all firms in Compustat with the same four-digit SIC code.[24] For missing EBITDA multiples or firms with negative EBITDA we use revenue multiples. We uploaded the 89 SIC codes on Compustat Global to match the firm with their industry peers. If the four-digit SIC code provides fewer than 10 comparable firms, we use three-digit matching for industry peers. Because the estimates of returns depend substantially on the estimated terminal value, we perform a sensitivity analysis and, using a common practice of PE firms, assume the entry EBITDA multiple to be the same as the exit multiple (see Talmor and Vasvari, 2011, p.302). Following (Guo et al., 2011), we compute the interim post-buyout payments to debt and equity holders including cash interest, net debt principal paid, dividends and net equity repurchased. We use Orbis and Amadeus to obtain the values of long-term debt, short-term loans, and shareholder funds for the last full fiscal year before exit and at buyout completion. The difference between the sum of long-term debt, short-term loans, and shareholder funds post-buyout and at buyout completion, together with the yearly interest payments, constitute the net payment to investors. Our data sources do not report the dividends paid to equity sponsors separately from the shareholder funds,

databases, including Amadeus, Orbis, and Zephyr we use.

[24]We use the variables "Long term debt" and "debt in current liabilities" for debt values and "stockholders equity" for equity values.

hence, we assume that dividend payments are included in the latter accounting item.

To compute market and risk-adjusted returns and industry-adjusted operating performance, we search for information on industry peers of our targets and market performance using the Thomson Reuters Datastream. Because our sample contains UK target companies in a broad range of deal sizes (see Appendix Table A-1), we use the UK's FTSE all-share index per sector and match every target firm to the industry that corresponds to its core business using the IBC code.[25] Most buyouts are from industrials, consumer goods, and consumer services (see Appendix C for the list of industries in our sample).[26] We approximate market return by the geometric average return on the FTSE all-share index over the period from buyout completion until exit, and the risk free rate by the median yield of the UK's 3-month Treasury bills. As explained in Section 3.1, the measures of operating performance include unadjusted and industry-adjusted return on sales and assets based on EBITDA and, for robustness, on EBIT.[27] We download the data for EBITDA, EBIT, sales, and total assets from the consolidated accounts in Orbis and Amadeus to measure the change in operating performance of the targets year -1 and the last year. For industry adjustment of returns we use Compustat global and construct the median returns for industry portfolios based on the four-digit SIC code. If the four-digit SIC code provides fewer than 10 comparable companies we used three-digit matching for industry peers.

Appendix Table A-1 presents the key characteristic for the largest sample of 101 buyouts and the subsample of 89 firms with available post-buyout information. There is a great degree of variation in deal pricing and pre-buyout profitability, size, sales, or other characteristics of the targets, which makes our sample well-suited for the regression analysis. Our sample contains some of the largest multimillion PE deals, but also smaller buyouts around 100 million. Visual observation and formal testing (using a two-sample Wilcoxon (Mann-Whitney) rank-sum test of the equality of medians) suggests no significant difference between the sample with post-buyout information compared to the subsample without post-buyout information. Thus, sample selection based on availability of the post-buyout data should not affect the results of this paper. Where possible, we report the findings for both samples; however, we use the subsample of 89 companies in most of our analyses.

In addition to leverage and pricing, the type of exit is an important characteristic of a SBO. We refer to

[25]The core business of a company is determined based on the company SIC code obtained from Zephyr and TOB. Often there is a difference between the two databases, since in a SBO it is common that the name and holding companies change. If this is the case we search for most recent business description in Orbis and match the correct IBC code to the company core business.

[26]We chose to consider consumer services, retail, media, and travel & leisure sectors separately to allow for more variation in sectoral peer groups.

[27]Guo et al. (2011) and Kaplan (1989a) use net cash flow as second proxy for returns to sales and assets. Because of the lack of available data, we use EBIT as second proxy.

a number of sources (databases Zephyr, Orbis, Factiva, Amadeus, and news sources) and the definitions in Kaplan and Strömberg (2009) and identify exits through an Initial Public Offering (IPO), or a reverse LBO, when a company goes from private to public; sales to a strategic buyer (Sold) or sales to firms other than private equity companies (for example, the sale of a retail company to a competitor in the same industry); and sales to another PE company referred to as a tertiary buyout (TBO). "Distressed" is a situation where the company needs to be financially restructured; control is given to senior debt holders and there is typically no recovery for equity holders. Finally, deals with unknown status or those that are still privately held are combined in a separate group "Still private or unknown." Table A-3 lists exit types as of May 2011 for the deals *completed* in a given year. Sales to a strategic buyer and TBO are the most frequent exits. Our sample contains a small number of IPOs (2% of the largest sample) compared to Guo et al. (2011) and Achleitner and Figge (2012) who have a larger percentage of IPOs (each about 15% of their samples). A possible explanation is (equity) market conditions in this time period; specifically, higher market uncertainty limits the attractiveness of an IPO. Zephyr supports this conjecture: we observed 9 "rumors withdrawn" in the deal description for IPOs, which indicate that a lot of PE firms intend to float the company, but eventually chose another exit strategy or remained private.[28] Together with four firms in distress 42% deals in our largest sample reach an outcome (49% in the subsample with post-buyout data); there are the deals which which happened pre-2006. A large percentage of private or unknown status is natural because a large portion of deals in our sample occurred during the second phase of the wave from 2005 to mid-2007 (to be shown shortly in Table 1) and it takes several years between SBO completion and exit. As seen in the bottom of each panel in Table A-3, the median holding period of our full sample is just above 3 years, which is consistent with empirical literature and practical evidence of PE firms that try to turn their investments around quickly.[29]

[28] "Rumors withdrawn" record is added by Zephyr when "the parties involved in a rumour decide to discontinue negotiations, or state that a deal will definitely not go ahead" (Bureau van Dijk Electronic Publishing, 2009).

[29] Guo et al. (2011) find a median holding period of almost 4 years for first time buyouts. Achleitner and Figge (2012) find similar results with significant differences between the first time buyout median holding period of 4.1 year and SBOs of 3.3 years. This implies that SBOs have a shorter holding period than do first-time buyouts. Possible costs, in terms of organizational and reporting structure, do not have to take place because the previous owner was already a PE firm. This could reduce the holding period.

4 Characteristics of the SBO wave

4.1 Identifying the SBO wave

Table 1 provides details on deal pricing and characteristics of the targets over time. The table reports the buyout price (the "Capital") and pre- and post-buyout leverage for a "typical" (median) deal by year of buyout completion. Pre-buyout or entry variables are reported as of the last fiscal year before the buyout completion ("year -1"), and the post-buyout data is observed at the time of buyout.

The number of deals (column 1) and their size confirm the fast growing trend of SBOs as exit strategy by PE firms. The number of transactions grows steadily from the late 1990s, increases sharply from 2004 to mid-2007, and drops sharply after that. This pattern identifies a secondary buyout wave, also documented by Kaplan and Strömberg (2009).

Column (2) and (3) report statistics for the deal pricing in absolute dollar terms and relative to operating result (EBITDA in year -1 as a percentage of capital, as is typically done in the literature). The median deal size is $195 million (column 1), while the typical deal size executed in 2005 was 2.5 times larger. In 2005, five deals of more than $1 billion were executed. The median value of EBITDA_{-1}/capital is 9.1% (column 2).[30] Strikingly, there is increase of the typical deal price over time (lower ratio), concurrent with the number of deals, with slight reversal in 2008 when the wave came to halt.

Entry leverage of the typical target, measured as the book value of pre-buyout debt as percentage of capital or of pre-buyout EBITDA (column 4 and 5), grew over time from 20 to more than 40% of the deal value and from 2.6 to 7 times EBITDA.[31] These statistics imply that the secondary buyout wave observed in the UK over 1999–2008 was characterized by the steady growth and then reversal of deal price and the level of leverage, which is consistent with our Hypothesis 1.

Post-buyout debt—defined is the sum of newly issued debt to finance the buyout and pre-buyout debt retained—increases greatly compared to pre-buyout level. The median debt to capital of all deals completed in 1999–2008 post-buyout is 72% (column 6) against 32% pre-buyout (column 4); a median leverage growth

[30] Compared to first-time buyouts the SBOs seem to be traded at a relatively high price. Guo et al. (2011) find a median value of 11.37% for first-time buyouts completed over roughly the same period in the U.S., while Strömberg (2008) finds a median value of 11.76% for first-time buyouts in the UK between 2001 and 2007. Consistent with our finding, Achleitner and Figge (2012) document that secondary buyouts are, on average, 7% more expensive than other buyouts in their sample of examine a sample of 910 buyout transactions in Europe and North America between 1985 and 2006. Wang (2012) shows that SBOs command a premium of 15% compared to LBOs over a similar period.

[31] Appendix Table A-2 confirms that the characteristics of the wave in the largest 101-SBO sample are virtually identical in the sample with post-buyout data and that the omitted 12 deals are not different from the other SBOs.

rate (not reported) is 34%. This is expected because LBOs typically use little equity and a large amount of debt to finance a buyout. Similarly, the median entry debt to EBITDA increases from 4 (column 5) to the median post-buyout debt to EBITDA of 8 (column 7).

Comparing levels of leverage over the vintages of buyout years we observe a more nuanced pattern. We do not see any drastic changes in the post-buyout debt to capital, with the median by vintage year close to the overall median of 72%. The last column of this table reports the medians of total equity (capital minus debt) to capital at buyout completion. Here the ratio stays roughly constant regardless of the vintage year too, at around 30%.[32] Constant ratios imply that the values of both equity and debt values grow at the same rate as do deal prices. In contrast, the median post-buyout debt to EBITDA ratio in column 7 increases over time, meaning that the value of the debt associated with SBO grows faster than pre-buyout operating performance of the targets. The evidence so far is remarkably consistent with our theory and in particular with Hypothesis 1. Secondaries wave (number of deals and deal prices) is likely driven by supply-side factors (leverage) that respond to price dynamics and not by operating performance of the targets.

4.2 Do SBOs create value for financial sponsors?

Table 2 presents the estimates of nominal and market and risk-adjusted returns generated by SBOs for their financial sponsors during the holding period. Mean and median returns in the sample with complete post-buyout data are calculated for the different types of SBO exits presented in Table A-3. Overall, Table 2 demonstrates that nominal and adjusted returns are positive and highly significant. The mean (median) nominal return is 55% (44%) and mean (median) market- and risk-adjusted return is 44% (42%). Guo et al. (2011) provide similar positive and significant results for returns generated by first-time buyouts in the U.S. for a comparable period and with similar assumptions used to compute returns. They find a mean (median) nominal return of 91% (66%) and mean (median) market- and risk-adjusted return of 63% (41%), which are, on average, higher than the realized SBO returns in our sample. This evidence is consistent with the theory that the first PE firm implements the easiest improvements in a LBO, which would have the largest impact on return; therefore, for a subsequent SBO investor the return potential is smaller.

Nevertheless, SBOs in our sample create a significant value for financial sponsors, overall and for spe-

[32]The high level of post-buyout debt and small amount of equity is in line with other studies. Guo et al. (2011) find a median of nearly 70% post-buyout debt to capital and a total equity to capital of approximately 30% for first-time buyouts between 1999 and 2006. In the U.S., Kaplan (1989a) finds the percentage of nearly 90% for post-buyout debt to capital, which implies that the 1980s buyouts were financed even more aggressively.

cific exits. The exit through an IPO generates a nominal median return of 199% where the median market and risk-adjusted return is 168%; however these estimates are not statistically significant due to a low number of deals. The post-buyout outcome in case of sale to a strategic buyer ("Sold") generates a highly significant mean (median) nominal return of 76% (95%), which corresponds to an average (median) market and risk premium of 66% (76%) at a 1% significance level. The highest significant returns in our sample are for TBOs with a mean (median) nominal return of 142% (117%). Even after adjustment the mean (median) returns are high, with 117% (92%). This is an interesting result considering our finding that overall SBOs provide lower returns than do first-time LBOs, as seen in Guo et al. (2011) sample. Looking at the deals more closely, based on the Factiva database and deal synopsis in Zephyr, we find that 13 of the 18 deals are sold to PE firms with a current portfolio containing one or multiple companies within the same sector. These PE firms outbid other non-financial bidders in these 13 transactions. This could imply a buy-and-build strategy or significant synergy opportunities that result in a higher average price and, consequently, a higher return with a TBO exit.[33]. This is in line with the findings of Jensen (1993), who argues that real operating growth only can be achieved with, for example, industry consolidation or new investment strategies. Figures from 2010 show a 33% increase of buy-and-build strategies within the European private equity market (Silverfleet Capital Partners LLP, 2011). PE firms are increasingly looking for smaller companies in the same sector to build up their older companies, increase value, and speed up exits (Porter, 2010). As expected, the nominal and market and risk-adjusted returns in a distressed situation are all significantly negative.

Firms that are still private, or have an unknown status, have overall positive returns. We present the realized returns using two different ways to estimate terminal values described in Section 3. In the row titled "Industry multiple" the terminal values are estimated using the median industry EBITDA or revenue multiples. In the row titled "Constant multiple" we follow the observation by Talmor and Vasvari (2011) that the PE firms generally sell for the same exit multiple as the entry multiple. Under the assumption of the industry multiple, returns are positive, with mean (median) nominal returns of 24% (14%) and mean (median) adjusted returns of 17% (9%), most are not significantly different from zero. Next to distressed companies, these returns are the lowest in our sample. As detailed in Table A-3, most buyouts in the group "Still private or unknown" take place in 2006–2008. We conjecture that the low returns in this group,

[33]A private equity company Auctus Capital defines the "buy-and-build strategy" on is website as follows: "When a private equity company pursues a buy-and-build strategy, it buys a company within a specific industry sector as a platform and, in addition, acquires further companies within that sector. It then merges them into a larger group of companies in order to take advantage of synergies and increase the group value by reaching a larger company size". "Buy and Build Strategy"(http://www.auctus.com/en/investmentstrategy/scopeofparticipations-buy-and-build.html accessed in November 2011).

given the assumption to compute the terminal value, have something to do with the credit crisis that began in 2007, recent debt crisis, and poor equity market performance, which resulted in low median industry multiples at exit. Naturally, the owners of these companies are not selling their targets and they remain private. However, not all industries have been affected by the economic decline and PE firms often have an excellent sector knowledge, which allows them to select the most competitive and attractive companies. For this reason, using the overall industry multiple and not *transaction* multiples from PE market may paint an overly grim picture for SBOs that are still private. Assuming constant multiples, the mean (median) nominal return is 92% (61%) and the mean (median) adjusted return is 83% (50%). As expected, these returns are substantially higher than are returns obtained with the terminal value based on the industry multiple. Returns that exclude private firms, as reported in the last row, are based on observed transaction multiples. Indeed, they are positive with median nominal return of 98% and the median adjusted return of 76%, all significant at the 1% level. To sum up, regardless of the method used to compute terminal values and exit type, the overall sample provides evidence that SBOs create value for financial sponsors.

4.3 What happens to targets over the life of SBO?

The large positive nominal and market and risk-adjusted returns to invested capital (see Table 2) demonstrate that, on average, value is created for financial sponsors. One possible source of value is higher exit multiples. In Table 3 we look at what happens to valuation multiples and levels of debt over the life of the deal, from a year of entry to exit. We focus on the subsample of the deals which exited as of May 2011. For them, the terminal value is observed in our data sources and not estimated by us.[34] There is evidence that the SBO deals exit at a statistically significantly higher capital-to-EBITDA multiple and debt-to-EBITDA ratio. In other words, the transaction exit multiples in this subsample are higher than entry multiples. If these multiples are informative about the transaction multiples in overall sample (and Appendix Table A-4 shows that they are) we can expect even larger value of returns for still private firms than the ones reported in Table 2. This evidence points to higher exit multiples as one potential source of value for financial sponsors and corroborates our model's assumption of multiple arbitrage in SBO market.

One would expect that a prominent source of returns lies in changes of operating performance of companies. To see if this is the case, Table 4 reports the medians of unadjusted and industry-adjusted changes

[34] Appendix Table A-4 compares deal characteristics at entry and at exit for the samples of 35 deals with observed terminal value and for 54 deals where the value has to be estimated (they are 51 still private SBOs, 2 sold, and 1 TBO). The test of the difference in medians, reported in column 7–8, confirms that the pre- and post-buyout characteristics of these samples are similar.

in operating performance for 89 buyouts with post-buyout information that were completed by 2008. The results are grouped in vertical blocs by deal outcome (IPO, sold, tertiary buyouts, distressed, still private or unknown); in each block, the column "Δ" reports the change in a given performance measure from year -1 and the last year.

As seen in block (1), overall SBOs are not associated with significant improvements in operating performance in terms of profitability as measured by EBITDA/Sales (the change in unadjusted ROS is -3% and -18% in industry-adjusted ROS across all deals) and EBITDA/Total Assets (change of -33% and industry-adjusted of -17.90%). These results suggest that positive significant returns to financial sponsors that are established earlier do not necessarily imply improved operating performance of the target companies. However, the ranking of SBO targets by exit type shows that exits, which generate largest median returns for investors (Table 2), are also the ones that show *relatively* good operating performance (in the sense of less negative changes). As such, the deals ended with a TBO, which show the highest significant nominal and market and risk-adjusted returns, demonstrate the best results in operating performance. The unadjusted (industry-adjusted) median changes for EBITDA/Sales is 7% (-4%) and -22% (-2%) for EBITDA/Total Assets. On the opposite side of the spectrum, for distressed companies, we obtain a median unadjusted (industry-adjusted) ROS change of -67% (-63%) and ROA change of -59% (-58%); this was the only outcome that negatively affected investors financially. One would expect negative results for distressed firms; however, industry-adjusted and unadjusted median operating performance measures for "IPO," "Sold," and "Still private or unknown" show negative changes that are frequently significantly different from zero. The deals with the latter two outcomes rank in the middle in terms of returns to financial sponsors and changes in operating performance.

If profitability (ROS) does not significantly improve at the time of exit firms may still create value by increasing the productivity of their assets. For instance, a company could sell non-productive assets, which leaves their EBITDA/sales ratio unchanged, or distribute a part of the proceeds from sales of less productive assets to capital providers (see Guo et al., 2011). Interestingly, ROA shows larger declines than does ROS over the life of the SBO, overall and by exit type. This could imply that target firms do not seem to pursue efficiency gains from downsizing. Exploring these possibilities is beyond the scope of this paper.

As a robustness check we compute the changes in performance based on EBIT, rather than on EBITDA, to obtain similar patterns. Finally, in block (7), we report changes in performance for the 38 deals with an outcome, which are less sensitive to estimation of terminal values. The results are similar to those in the

largest sample, but changes in ROS are mostly insignificantly different from zero and changes in ROA are negative and significant.

4.4 Toward explaining post-buyout performance

Determinants of post-buyout performance

Having established a seemingly puzzling result that SBOs generate significant positive returns for financial sponsors, but lead to worsening operating performance of the targets, we take a step further and ask what factors, as suggested by the theory, are empirically associated with their observed operating performance. Theoretical papers suggest that post-buyout operating performance can be affected by management incentives, benefits of increased debt, improved governance and monitoring, and firm's pre-buyout characteristics. To learn what of these factors are empirically important we estimate two linear regression models:

$$\text{Performance}_{\text{Last year}} = \beta_0 \begin{pmatrix}\text{Industry-adjusted}\\ \text{Performance}\end{pmatrix}_{-1} + \beta_1 \begin{pmatrix}\text{Industry}\\ \text{Performance}\end{pmatrix}_{\text{Last year}} + \mathbf{X}\beta + \varepsilon \quad (7)$$

$$\Delta \begin{pmatrix}\text{Industry-adjusted}\\ \text{Performance}\end{pmatrix} = \beta_0 \begin{pmatrix}\text{Industry-adjusted}\\ \text{Performance}\end{pmatrix}_{-1} + \mathbf{X}\beta + \varepsilon \quad (8)$$

where the unit of observation is a target company and we omit for brevity the company superscript i, the Performance is Return (EBITDA) on Sales or Return on Total Assets. Industry Performance is the median return of firm i's peer companies matched on the four-digit SIC code as in Kaplan (1989a). The Industry-adjusted return subtracts the median return of peer companies. Δ represents the change between year -1 and the last year; and matrix $\mathbf{X}$ includes empirical proxies of factors suggested by the theory. In both regressions the Industry-adjusted Performance$_{-1}$ controls for pre-buyout performance; however, the expected signs of the coefficient β_0 depends on the specification. In Model (7) we study the correlation of explanatory variables with company performance in the last year, conditional on a benchmark in the last year. We expect positive β_0 to show further improvement of performance of the better-performing pre-buyout companies. Model (8) looks at changes in company performance relative to the *trend* in industry performance (the speed of convergence). We expect a negative significant coefficient β_0 in this model because firms with lower entry ROS or ROA might experience the fastest improvements on these indicators.[35]

In addition to the initial conditions, we follow Guo et al. (2011) to define the key group of explanatory

[35] Another difference between these equations is that Model (8) assumes one-to-one response of company performance to that of the industry while Model (7) allows this response to be estimated.

variables for comparison with existing LBO studies. However we deviate from Guo et al. (2011) in terms of some variations that are particular to SBOs and available in our sources. Table A-5 reports the descriptive statistics of our explanatory variables for the baseline sample of 89 firms with post-buyout information. For ease of presentation, the table is split into two panels: panel A reports the statistics of binary variables, expressed as the number and percentage of the deals with a given outcome; panel B reports the statistics for continuous variables.

Specifically, we draw on the ownership section in the Orbis database and measure the degree of the *alignment of incentives* of management and shareholders using the binary variable Management Equity Participation, which takes a value of 1 if the management contributes in the equity financing of the buyout and 0 otherwise. Relatively few companies in our sample have information on the percentage of total equity owned by management that is necessary to compute a continuous measure as in Guo et al. However, and in contrast to Guo et al., we can deduce the fact of some ownership participation from the deal descriptions in Zephyr, Orbis, and Factiva and, thus, include the firms whose exact ownership structure is unknown. Panel A of Table A-5 shows an equity participation in 74 of the 89 deals (83%). We expect the coefficient of this dummy variable to be positive and significant because, when managers have a "skin in the game," they share a common goal of creating value with shareholders.

Based on the deal synopsis, Factiva, and deal rationale in Zephyr, we identify the proxies of *improved governance* and *monitoring* by PE firms. For 24 deals (27%) we find a management change by PE firms in an attempt to improve returns. The binary variable Management Change takes the value of 1 if the CEO is replaced within the first year after buyout completion and 0 otherwise. We expect this variable to be positive and significant if a management change creates operating improvements. Following Guo et al. (2011), we define three proxies of monitoring by investors. We find 21 club deals (buyouts with multiple PE firms) in our sample (24%) and define a binary variable Club PE Participation to test whether a larger number of participants could reduce incentives to monitor. To reflect involvement of PE firms in active governance on the board of a portfolio firm we use a fraction of directors on the board from the corresponding PE firm (Sponsor Directors/Board Size) and expect a positive coefficient of this variable. In our sample, a typical (median) board has 6 members and PE firms hold, at most, half of the seats with an average of 13% of seats on the board of companies in which they invest. We also experiment with the fraction of bank loans in total debt at the time of buyout (variable Bank Loans/Total Debt) to proxy monitoring by bank lenders.

Following the intuition of Jensen (1986), we try to capture the *benefits of increased debt*, which stem

from disciplining management and lower agency costs, with the variable Entry Leverage, computed as the ratio of Total Debt to EBITDA at year -1.[36] We also control for Leverage Change, which is defined as the difference between total debt at buyout and at year -1 and normalized by EBITDA at year -1. The median entry leverage ratio is a high 3.6, compared to 1.9 in Guo et al. (2011) sample of first-time LBOs. This finding confirms that target firms are already highly levered one year before the second LBO. Still, leverage change has a median of 4.1, which is more than quadruple for a typical SBO deal. We expect both variables to be positive and significant.

Among *other controls*, we always include deal size (Log Capital). Demiroglu and James (2010) show that a better reputation allows PE firms to obtain better financing conditions from banks, which results in lower institutional and bank loan spreads and longer loan maturities. This could influence operating performance. We follow Wang (2012) and define a binary variable Reputation equal to 1 if the PE sponsor is listed on the Private Equity International (PEI) 50 index, which includes and ranks the world's 50 largest private equity firms, and 0 otherwise. 21 deals (24%) in our sample involve highly-reputable sponsors. We expect Reputation to have a positive effect on firm performance. Finally, we experiment with including the holding period of the buyout in years, from buyout completion to exit (the variable Duration). The typical holding period in our sample is 3.8 years (46 months). We expect duration to be positive and significant because it may take time for the SBO's positive effects to find their way into company performance measures.

Evidence

Table 5 reports the regression results with a baseline set of variables for the two measures of operating performance in the last pre-exit year (denoted ROS(ROA) Last Yr.) and changes in industry-adjusted performance between the year -1 and the last year (denoted ΔAdj.ROS(ROA)). In column 1, the last year ROS shows a significant and positive correlation with the industry-adjusted ROS in the year -1 (the "lagged return") and with the industry ROS in the last year. This finding suggests that the company's initial conditions and the contemporaneous industry performance are important covariates of company performance right before the exit of an SBO. We do not see that the larger SBO deals show, on average, the larger improvement in ROS. Leverage change is positive, as suggested by the theory on the disciplining effect of debt, and significant only at 10%. The correlation with the management change dummy is strong (positive and significant) and consistent with the argument that better governance with the replacement of the management results in

[36] As in Guo et al. we normalize debt by EBITDA and not by the capital because we also we also use the capital as a control variable.

better firm performance. The variables expected to capture incentive alignment (Management Equity Participation) or monitoring effects (sponsor director ratio, club PE participation) are not significantly correlated with performance. We also do not find evidence that sponsor's reputation, as measured by a listing on the PEI 50 index, is empirically important. In column (2) we repeat the exercise for the change of operating performance, relative to matching peers. In contrast to the level regression, the coefficient of entry ROS is negative and significant, which is consistent with the faster "catch up" by firms that are underperforming prior to buyout. Similarly to level regression, we document a significant positive coefficient of change in leverage as evidence of the disciplining effect of debt. The Management Change dummy is also robustly significant positive. The remaining variables are not significant, as before. Overall, the fit of the model for change, as measured by R^2, is worse than that for the level of ROS. In the former, explanatory variables explain 32% of variation in the dependent variable while in the latter the R^2 is almost 50%. It is possible that year-specific circumstances partially drive our results. We experiment with entry and exit year fixed effects and report the results with both fixed effects in column (3) and (4). We find, in contrast to Guo et al. (2011), that some year dummies are significant and, overall, add to R^2, which indicates above or below-average performance of all firms that are targets of SBO or exit SBO in a given year.[37] Overall, the results for level and change in ROS are robust.[38] Now the entry leverage is positive and significant at 10% while the change in leverage remains significant only for change in performance. The earlier result of the positive and significant management change dummy stays. In general, including year dummies is a more demanding specification and our results for profitability (ROS) are robust.

As previously discussed, companies can sometimes improve the productivity of their assets without changing their profitability. In our sample (see Section 4.3), the reverse is true: target ROA seems to decline more than ROS over the life of the deal. The remainder of the table reports the results for the second measure of operating performance, EBITDA/Total Assets, to verify whether correlations with the explanatory variables change with this measure of performance; entry and exit year fixed effects are included. Overall, the results for ROA are weaker. Compared to the results for the level of ROS, lagged adjusted performance

[37] These results are not reported for space considerations and available upon request. For the purposes of our study exploring the signs and significance of year dummies is of secondary importance.

[38] We test the assumption implicit in the Model 8 by checking if the coefficient of the industry ROS in last year is equal to one and fail to reject this null. Under this null, the coefficient of the lagged firm performance in level regression (column 3) should be equal to 1 + the coefficient of that variable in changes regression (column 4). In the regression from column (3) with the constraint that the contemporaneous industry ROS is equal to 1, the coefficient of the lagged ROS is 0.49, fairly close to 1 + (-0.336) from column (4). This implies that the two regressions are essentially equivalent under the null. I report both regression models as in Guo et al. (2011) for comparison and because this null may not hold in general.

lost significance, while industry performance is far from unity and is negative and weakly significant (column 5). The latter result can be interpreted as evidence of the ability by PE firms to generate high returns to capital at times when the peer companies of the targets preform poorly. In regressions for changes in ROA (column 6), lagged performance is negative and significant, as before, with point estimates larger than for changes in ROS. The regressions for ROA confirm evidence that change in management after the buyout is associated with better ex-post performance or larger improvement in performance.

Appendix Table A-6 reports the results of robustness checks of our results for ROS; all specifications include entry and exit year fixed effects. To explore possible effect of monitoring by bank lenders, we include the ratio of bank loans to total debt at the time of buyout (column 1). The variable Bank Loans/Total Debt is not significant. Longer time between buyout and exit may give the target more time to implement performance-enhancing measures. In column (2) we see that this is not generally the case; the variable Duration is positive but not significant. In column (3) we include the interaction of Management Change and Leverage Change to test whether a change in management reinforces the disciplining effect of leverage infusion. The coefficient of the interaction is negative but insignificant. While exploring the partial correlation plots we discovered an outlier company, Travelodge Hotels Ltd., which shows an abnormally high ROS and ROA in the last year. Of note, this company had no management change but exhibited performance superior to any company in the entire sample.[39] In the baseline specification without the outlier (column 4), the coefficients of the significant variables grow in absolute value relative to the regression (see column 3 of Table 5) using the full sample. Clearly, the presence of outliers distorts the picture with respect to some important variables. In column (5), we use only the 38 deals with an outcome, which are less sensitive to estimation of terminal values. We observe a positive and significant correlation of profitability with the Leverage Change, while the coefficient of Management Change loses its significance. The rest of results are robust. The right side of Appendix Table A-6 reports the results for changes in ROS. Compared to the regression reported in column 4 of Table 5, results remain robust to the inclusion of extra controls; however none is significant.

Appendix Table A-7 explores the robustness of the main results in columns (5) and (6) of Table 5 for ROA. As before, lagged industry ROA remains negative and significant in level regressions and lagged adjusted ROA is negative and significant in changes regressions. The correlations with Management Change

[39] See Figure A-1, which depicts this outlier. The figure presents the partial correlation plot from the the regression of ROA at the last year on the Management Change conditional on other controls from column (5) of Table 5. Each number represents a company. Company nr. 60 is Travelodge Hotels Ltd. The partial correlation plot for ROS in the last year looks qualitatively similar.

is positive and significant throughout; this includes the smaller sample of firms that reached an outcome. In contrast to the result for ROS, the interaction of Management Change and Leverage Change is significant for ROA in the last year, which is consistent with the idea that new managers can transform the benefits of a larger leverage into operating results, all else equal. We also see evidence of monitoring effects by PE representatives on the company board with the coefficient of Sponsor Directors/Board Size being positive and significant; that is especially the case in the sample with an outcome. However, the overall evidence of the latter two effects remains weak.

Discussion

Overall, pre-buyout characteristics (such as industry-adjusted operating performance in year -1 and, in some specifications, the lagged level of leverage) and improved governance (represented by management change) appear important in explaining the cross-sectional variation of operating performance of SBO targets. There is some beneficial role of increased debt (leverage change) for firm profitability (ROS). To a certain extent, this is explained by surges in leverage for all firms in particular years (absorbed by the year fixed effects), but not so much by firm-specific leverage change. With the caveat of small sample size in mind, we conclude that the results are similar for the sample of deals with an outcome, which is less sensitive to the estimation of terminal values.

Similarly to the studies of first-time LBOs by Kaplan (1989a) and Guo et al. (2011), we find a crucial role of better governance for economic performance. In some contrast to previous studies we find a positive correlation with the variable proxying the direct monitoring by PE firms of a target's board; however, this effect is somewhat weak. In our case, we find a stronger role of a target's initial conditions, which is sensible if one believes in the PE firm's ability to pick the better-performing SBO targets and further enhance their profitability and return on assets. Finally, we find a more modest role for firm-specific leverage change. This is probably because targets of SBOs are already highly-levered companies and the benefits from further debt infusion might be somewhat muted.

We must stress that the evidence in these regressions should not be interpreted as causal. It is possible that, for example, PE firms provide greater leverage to or pay higher price for firms with better prospects.[40] Establishing a causal relationship is an important, but difficult, task because of the difficulty in finding strong firm-level instruments or controlling for ex ante expectations of investors. The task of this analysis was more

[40]Guo et al. (2011) verify the reverse causality with respect to leverage change by instrumenting it with interest rates and find results similar to those obtained by OLS. They conclude that their result is not driven by the use of higher leverage for deals with expected better prospects.

modest and includes providing the first evidence on the relationship between improved governance and other factors the the operating performance of SBOs and then comparing the results with existing studies on first-time LBO transactions. Finding variables that are not caused by the target's performance but rather are correlated with some explanatory variables, conditional on other controls, will allow researchers to perform a convincing instrumentation strategy and come up with policy implications.

Our analysis can be extended in a number of ways. A further robustness check of our results may be implemented by finding a better match for companies without a terminal value. For example, based on a more firm-specific information such as size, pre-buyout performance, and market-to-book ratio, rather than same industry portfolios. This also concerns the calculation of industry-adjusted performance measures. Adding more deals for some exit types, such as an IPO, should become possible as the global financial and economic crisis passes and companies find it more attractive to go public. Finally, more research should be conducted to identify other value drivers of an SBO in addition to pricing and operating performance improvements of target companies. Findings such factors and establishing their causal effect on firm value would contribute to a better understanding of pricing and value creation in the fast growing market of secondary buyouts.

5 Conclusions

To be written

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Table 1: Characteristics of Secondary Buyout Wave

Annual medians for deal pricing and debt and equity levels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Subsample with complete post-buyout data, 89 deals								
				Pre-buyout characteristics		Post-buyout characteristics		
Characteristics	Number of SBOs	Deal value	Deal price	Leverage	Leverage	Leverage	Leverage	Equity
Measure		Capital ($ million)	Entry EBITDA/ capital(%)	Entry debt/capital (%)	Entry debt/EBITDA (ratio)	Post-buyout debt/capital (%)	Post-buyout debt/EBITDA (ratio)	Post-buyout total equity/ capital(%)
Year of SBO completion								
1999–2001	4	198.9	11.4	23.3	2.6	69.2	6.7	30.8
2002	7	180.0	11.9	33.2	2.9	71.9	5.5	28.1
2003	7	113.7	11.5	27.1	2.3	79.5	7.1	20.5
2004	15	195.4	9.4	25.4	2.5	68.0	6.5	32.0
2005	11	535.0	6.6	43.6	7.0	73.6	7.9	26.4
2006	23	185.4	6.5	30.8	4.1	74.0	11.0	26.0
2007	16	146.8	7.6	34.0	4.0	73.6	9.4	26.4
2008	6	210.8	8.0	38.8	5.5	66.6	8.7	33.4
1999–2008	89	195.0	9.1	32.4	3.6	72.2	7.7	27.8

Notes: This table presents the annual medians for the deal pricing and levels of leverage for the secondary buyouts with the deal value of at least $50 million completed between January 1999 and May 2008 in the United Kingdom with available post-buyout financial data. The statistics for pre-buyout (entry) variables are reported as of the last fiscal year before the buyout completion ("year -1"); the post-buyout data is observed at time of buyout. Capital is the rank deal value equal to the transaction value paid plus the target's net debt minus the value of any liabilities assumed in a transaction in millions of U.S. dollars from SDC. Net debt is straight debt plus short-term debt plus preferred equity minus cash and marketable securities as of the date of the most current financial information prior to the announcement of the transaction. Pre-buyout debt is the book value of debt in the year -1. Post-buyout debt is the sum of new issued debt to finance the buyout and pre-buyout debt retained. Post-buyout total equity to capital (%) is Capital minus post-buyout debt, expressed as percentage of Capital.

Table 2: Realized nominal and market- and risk adjusted returns

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Nominal return (%)			Market- and risk-adjusted return (%)		
SBO outcome	Terminal value	Obs.	Mean	Median	No. of positive returns	Mean	Median	No. of positive returns
1. IPO	Exit	2	199	199	2	168	168	2
2. Sold	Exit	14	76***	95***	11	66***	76***	11
3. TBO	Exit	18	142***	117***	17	117***	92**	17
4. Distressed	Exit	4	-75*	-73*	0	-87*	-75*	0
5. Still private	Industry multiple	51	24*	14	29	17	9	29
or unknown	Constant multiple	51	92***	61***	39	83***	50***	38
Total (1-5)	Industry multiple	89	55***	44***	59	44***	42***	59
	Constant multiple	89	97***	83***	69	84***	74***	68
Total (1-4)	Exit	38	98***	98***	30	79***	76***	30

Notes: This table presents the nominal and market- and risk-adjusted return to capital, computed by equation (5) and (6). The nominal return is the interim payments to debt and equity plus the terminal value of the target divided by capital, minus one. The interim payments to debt and equity are the sum of cash interest and debt principal repaid, dividends and equity repurchased, net of proceeds from new debt and equity issues. Capital is the rank deal value equal to the transaction value paid plus the target's net debt minus the value of any liabilities assumed in a transaction in millions of U.S. dollars from SDC. The target's terminal value is either available in the data sources or (for the private firms and firms with unknown outcome) is estimated by us. Column (2) "Terminal value" indicates the method to obtain the target's terminal value. "Exit" implies that the terminal value is the observed price received at exit date, obtained from Zephyr, SDC or Factiva. "Industry multiple" indicates the estimation of the the terminal values using EBITDA or revenue multiples based on the median industry multiple; "Constant multiple" assumes the (available) entry EBITDA multiple is same as the exit multiple. Total (1-5) reports the mean and median returns over all exit types under the latter two assumptions separately. Total (1-4) reports the mean and median returns for the firms with available (non-estimated) terminal value. The market- and risk-adjusted return discounts the nominal return by a CAPM discount factor based on the company's equity beta and debt beta. See Section 3.1 for more details. Significance levels are based on a two-tailed t-test for means and a Wilcoxon signed-rank test for medians; both tests verify if the statistics is significantly different from zero. ***, ** and * indicate significance at the 1%, 5% and 10%, respectively.

Table 3: Changes in valuation multiples and debt from entry to exit

	(1)	(2)
Subsample with observed terminal value, 35 deals		
Variable	Mean	Median
Entry Long-term debt/EBITDA (A)	4.2	3.0
Exit Long-term debt/EBITDA (B)	4.9	4.9
Difference (B)-(A)	0.72	1.88
p-value (B)=(A) vs. (B)>(A)	0.16	0.63
Entry EBITDA multiple (A)	10.9	10.1
Exit EBITDA multiple (B)	12.0	11.2
Difference (B)-(A)	1.14	1.12
p-value (B)=(A) vs. (B)>(A)	0.16	0.09

Notes: This table contains mean and median of the valuation multiples for the subsample of firms with the terminal value obtained directly from Zephyr, SDC or Factiva databases (as opposed to estimated by us). Entry EBITDA multiple is the transaction value paid plus the target's net debt minus the value of any liabilities assumed in a transaction in millions of U.S. dollars (the Capital) from SDC over EBITDA one fiscal year before the buyout completion ("year -1"). Exit EBITDA multiple is the total capital received by debt and equity sponsors after exiting the company (the Terminal value) over EBITDA one fiscal year before exit ("last year"). Long-term debt/EBITDA are computed for, correspondingly, year -1 and the last year. Difference (B)–(A) is the difference in means and medians between sub-samples multiple (B) and (A). P-value is the significance level from, correspondingly, the two-sample mean-comparison t-test for paired data and the Snedecor and Cochran [1989] test of the equality of medians for paired data in sub-samples (B) and (A) with alternative that (B)¿(A). ***, ** and * indicate significance at the 1%, 5% and 10%, respectively.

Table 4: Changes in operating performance of SBO targets

	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	SBO outcome													
	All deals (89)		IPO (2)		Sold (14)		TBO (18)		Distressed (4)		Still private, unknown (51)		Deals with outcome (38)	
Performance measure	Δ	Obs.> 0	Δ	Obs.> 0	Δ	Obs.> 0	Δ	Obs.> 0	Δ	Obs.> 0	Δ	Obs.> 0	Δ	Obs.> 0
						Change in EBITDA/Sales (%)								
Unadjusted	-3	42	-33	1	-5	5	7	12	-67	1	-4	23	2	19
Industry adjusted	-18 **	34	-112	0	-36 *	4	-4	8	-83 *	0	-14	22	-29 **	12
						Change in EBIT/Sales (%)								
Unadjusted	-17 ***	32	-57	0	-4 *	7	-0.2	9	-101	1	-26 **	15	-8	17
Industry adjusted	-25 **	31	-147	0	-25	6	10	9	-159 *	0	-25 **	16	-28	15
						Change in EBITDA/Total Assets (%)								
Unadjusted	-33 ***	17	-52	0	-37 ***	3	-22 *	3	-59	1	-32 ***	10	-36 ***	7
Industry adjusted	-18 **	34	-94	0	-16	5	-2	9	-58 *	0	-19 **	20	-18 **	14
						Change in EBIT/Total Assets (%)								
Unadjusted	-43 ***	22	-72	0	-36	4	-27	4	-102 *	0	-43 ***	14	-41 ***	8
Industry adjusted	-29 ***	33	-120	0	-33	5	20	10	-106 *	0	-29 **	18	-33 *	15

Notes: Under Δ this table reports the median unadjusted and industry-adjusted percentage changes in operating performance for 89 buyouts with post-buyout information completed by 2008 and by the type of exit. The operating performance changes are based on return on sales (EBITDA/Sales and EBIT/Sales) and return on assets (EBITDA/Total Assets and EBIT/Total Assets) between one fiscal year pre-buyout (the "year -1") and at the last fiscal year before exit (the "last year"). The industry-adjusted change subtracts the median percentage change in performance for firms with the same four-digit SIC code from the unadjusted percentage change of every target firm; the calculation of the "industry performance" matches the holding period of a given target. The significance levels are based on a Wilcoxon signed-rank test for medians; the test verifies if the statistics is significantly different from zero. ***, ** and * indicate significance at the 1%, 5% and 10%, respectively.

Table 5: SBO Performance and Improved Governance/Monitoring

	(1)	(2)	(3)	(4)	(5)	(6)
Firm Sample	All deals					
SBO Outcome Based on	Return on Sales (ROS)				Return on Assets (ROA)	
Dependent Variable	ROS Last Yr.	ΔAdj. ROS	ROS Last Yr.	ΔAdj. ROS	ROA Last Yr.	ΔAdj. ROA
log(Capital)	.017	.014	.017	.012	–.005	.003
	(.012)	(.012)	(.015)	(.013)	(.006)	(.009)
Adjusted ROS (ROA) at Year -1	.499***	–.335***	.478***	–.336***	.015	–.560***
	(.128)	(.089)	(.164)	(.105)	(.054)	(.113)
Industry ROS (ROA) at Last Year	.591**		.679***		–.284*	
	(.227)		(.234)		(.143)	
Entry Leverage	.007^{+}	.005	.009*	.009*	–.000	.004
	(.004)	(.004)	(.005)	(.005)	(.002)	(.003)
Leverage Change	.004*	.005**	.003	.004*	.000	–.001
	(.002)	(.002)	(.003)	(.002)	(.001)	(.002)
Management Change	.042**	.048**	.049*	.050**	.026*	.037*
	(.020)	(.021)	(.025)	(.024)	(.013)	(.019)
Management Equity Participation	.013	.011	.015	.013	–.017	–.003
	(.025)	(.028)	(.026)	(.027)	(.017)	(.032)
log(Board Size)	.036	.039	.028	.034	–.000	.003
	(.030)	(.031)	(.033)	(.035)	(.015)	(.025)
Sponsor Director/ Board Size	–.049	–.030	–.025	–.000	–.031	.081^{+}
	(.082)	(.084)	(.095)	(.093)	(.032)	(.054)
Club PE Participation	–.002	.014	–.017	.003	–.016	–.005
	(.026)	(.026)	(.031)	(.031)	(.015)	(.020)
Reputation	–.002	.007	–.022	–.015	–.006	.007
	(.023)	(.024)	(.028)	(.030)	(.014)	(.021)
Entry Year Fixed Eff.	No	No	Yes	Yes	Yes	Yes
Exit Year Fixed Eff.	No	No	Yes	Yes	Yes	Yes
Obs.	89	89	89	89	89	89
R^2	.47	.32	.56	.5	.37	.61
Adj. R^2	.39	.24	.37	.29	.092	.45

Notes: The table presents the results of the OLS regressions of the post-buyout performance and changes in performance for the sample of 89 deals with post-buyout information. Robust standard errors are in parentheses. *** , **, *, and $^{+}$ denote significance at 1%, 5%, 10% and 15% levels. "ROS (ROA) Last Yr." represents the return (EBITDA) on sales (ROS) or return on total assets (ROA) of the target in the last year. ΔAdj. ROS(ROA)" stands for the change between year -1 and the last year in a target's ROS(ROA) minus the median ROS(ROA) of the firm's peer companies matched on the four-digit SIC code. "Adjusted ROS (ROA) at Year -1" represents the corresponding industry-adjusted performance in the year -1 while the "Industry ROS (ROA) at Last Year" is the median return of the firm peer companies. Reputation is equal to 1 if the PE sponsor is listed on the Private Equity International (PEI) 50 index and 0 otherwise. The other independent variables are as defined in Table A-5.

Table A-1: Descriptive statistics of SBOs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sample	Full sample, 101 SBOs			Subsample with complete post-buyout data, 89 SBOs (1)			Subsample without post-buyout data, 12 SBOs (2)				
Variable	Mean	Median	Std Dev.	Mean	Median	Std Dev.	Mean	Median	Std Dev.	Difference (1)–(2)	p-value
Buyout price (Capital)	473.67	195.43	601.63	484.34	195.05	623.75	394.50	310.21	412.63	-115.16	0.80
Entry total debt	203.29	59.61	329.62	209.93	59.61	341.04	154.08	57.84	232.90	1.76	0.53
Other entry characteristics											
EBITDA	37.44	18.30	48.89	38.56	18.30	50.97	29.09	18.54	29.32	-0.24	0.64
EBIT	25.10	11.49	35.47	25.63	12.39	36.86	21.21	10.22	23.47	2.18	0.76
Interest paid	22.84	6.58	46.25	24.25	6.58	48.66	12.36	5.00	19.14	1.57	0.25
Sales	266.44	144.02	435.29	280.25	144.11	459.21	163.97	90.15	149.99	53.96	0.52
Total Assets	317.69	108.50	503.01	327.13	119.63	522.97	247.69	107.66	325.76	11.97	0.95
Shareholder funds	-6.80	5.67	169.5	-12.99	5.67	178.25	39.10	19.82	67.56	-14.15	0.21
Short term loans	13.04	5.97	34.28	13.73	5.97	36.29	7.94	4.99	10.62	0.97	0.35

Notes: This table presents the sample size and descriptive statistics of firm-specific variables and deal characteristics. The variables are in millions of U.S. dollars. The subsamples include the secondary buyouts identified from Zephyr and SDC with consolidated financial statements. "Full sample" includes 101 secondary buyouts with deal value of at least $50 million completed between January 1999 and May 2008 in the United Kingdom. For sub-sample of 89 deals the post-buyout data is available while the complete post-buyout information on accounting variables is missing for the remaining 12 companies. The statistics for entry (pre-buyout) variables are reported as of the fiscal year before the buyout completion ("year -1"). Difference (1)–(2) is the difference in medians between sub-samples (1) and (2). P-value is the significance level from the two-sample Wilcoxon rank-sum (Mann-Whitney) test of the equality of medians in sub-samples (1) and (2).

Table A-2: Annual medians for deal pricing and debt and equity levels

	(1)	(2)	(3)	(4)	(5)
Year of SBO completion	Number of SBOs	Capital ($ million)	Entry EBITDA to capital (%)	Entry debt to capital (%)	Entry debt to EBITDA ratio
Panel A: Annual medians for deal pricing and debt and equity levels in full sample of 101 deals					
1999–2001	4	198.9	11.4	23.3	2.6
2002	7	180.0	11.9	33.2	2.9
2003	9	157.8	12.4	27.1	2.3
2004	18	202.7	9.3	26.8	2.7
2005	12	755.3	6.5	44.3	7.6
2006	23	185.4	6.5	30.8	4.1
2007	20	146.8	7.6	32.6	4.0
2008	8	210.8	8.0	35.1	4.4
1999–2008	101	195.4	9.3	31.8	3.8
Panel B: Medians for deal pricing and debt and equity levels in sample with complete post-buyout data (89 deals) and 12 deals with missing post-buyout data, 1999–2008					
Subsample with post-buyout data (1)	89	195.0	9.1	32.4	3.6
Subsample without post-buyout data (2)	12	310.2	7.5	27.9	4.1
Difference in medians (1)–(2)		-115.2	1.6	4.6	-0.5
P-value		0.80	0.54	0.47	0.87

Notes: This table presents the annual medians for the deal pricing for the 101 secondary buyouts with deal value of at least $50 million completed between January 1999 and May 2008 in the United Kingdom. The statistics for entry (pre-buyout) variables are reported as of the fiscal year before the buyout completion ("year -1"). Capital is the rank deal value equal to the transaction value paid plus the target's net debt minus the value of any liabilities assumed in a transaction in millions of U.S. dollars from SDC. Net debt is straight debt plus short-term debt plus preferred equity minus cash and marketable securities as of the date of the most current financial information prior to the announcement of the transaction. Pre-buyout debt is the book value of debt in the year -1. Difference (1)–(2) is the difference in medians between sub-samples (1) and (2). P-value is the significance level from the two-sample Wilcoxon rank-sum (Mann-Whitney) test of the equality of medians in sub-samples (1) and (2).

Table A-3: Type of exit

	(1)	(2)	(3)	(4)	(5)	(6)
Year of SBO announcement	IPO	Sold	TBO	Distressed	Still private or unknown	Total
Panel A: Subsample with complete post-buyout data						
1999–2001	0	3	1	0	0	4
2002	1	1	2	1	2	7
2003	0	3	1	0	3	7
2004	1	2	6	2	4	15
2005	0	3	4	1	3	11
2006	0	0	1	0	22	23
2007	0	1	2	0	13	16
2008	0	1	1	0	4	6
1999–2008	2	14	18	4	51	89
Share of deals,%	2	16	20	4	57	100
Median months to exit	22.5	31	40.5	59	-	37.5
Panel B: Full sample						
1999–2001	0	3	1	0	0	4
2002	1	1	2	1	2	7
2003	0	4	1	0	4	9
2004	1	4	6	2	5	18
2005	0	3	5	1	3	12
2006	0	0	1	0	22	23
2007	0	2	2	0	16	20
2008	0	1	1	0	6	8
1999–2008	2	18	19	4	58	101
Share of deals,%	2	18	19	4	57	100
Median months to exit	22.5	29	42	59	-	37

*Notes:*This table presents post-buyout outcomes or "exits" as of May 2011 for the full sample of 101 secondary buyouts and for the subsample of 89 buyouts with post-buyout data available. The numbers represent the frequency of outcomes for each exit. Months to exit are the calculated median holding period from buyout completion until disinvestment.

Table A-4: Deal characteristics at entry and at exit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Comparison of samples with and without terminal values								
	Subsample with terminal value 35 Obs. (1)			Subsample without terminal value 54 Obs. (2)			Difference (1)-(2)	P-value
Variable	Mean	Median	Std Dev.	Mean	Median	Std Dev.		
Capital ($ million)	444.1	191.2	633.3	510.4	195.2	622.0	-4.0	0.42
Pre-buyout charactaristics ($ million)								
EBITDA	36.9	15.7	49.9	39.6	19.0	52.1	-3.3	0.79
EBIT	26.1	10.6	41.6	25.4	13.2	33.9	-2.6	0.59
Interest paid	17.0	6.0	32.1	29.0	6.7	56.7	-0.7	0.24
Sales	238.4	144.1	265.8	307.4	145.2	550.4	-1.0	0.57
Total Assets	279.5	105.4	463.4	358.0	128.3	560.3	-22.9	0.48
Shareholder funds	-1.4	5.4	159.6	-20.5	5.9	190.5	-0.5	1.00
Long term debt	211.7	53.7	393.6	208.8	72.2	306.2	-18.5	0.48
Short term loans	12.4	6.8	14.9	14.6	5.6	45.2	1.2	0.59
Charactaristics at exit ($ million)								
EBITDA	52.3	20.4	80.0	62.3	20.6	113.9	-0.2	0.78
EBIT	32.2	12.3	66.8	34.4	10.8	84.5	1.4	0.51
Interest paid	37.5	12.5	61.2	57.0	17.7	94.8	-5.1	0.40
Sales	350.6	219.3	343.7	414.1	183.4	660.2	35.9	0.24
Total Assets	540.9	180.0	885.0	661.3	226.8	1014	-46.9	0.63
Shareholder funds	52.6	0.0	267.8	-37.7	-4.8	271.7	4.8	0.18
Long term debt	272.0	81.7	544.7	528.0	161.5	782.9	-79.8**	0.04
Short term loans	39.7	5.5	142.0	19.6	4.8	63.2	0.7	0.83

*Notes:*This table contains mean, median and standard deviation of the subsample with a terminal value obtained from Zephyr, SDC or Factiva and a subsample without terminal value. Terminal value is total capital received by debt and equity sponsors after exiting the company. The pre-buyout and exit characteristics are obtained from Orbis and Amadeus. The entry (pre-buyout) variables are based on data from one fiscal year before the buyout completion and exits variables are collected from one year before exit. Difference (1)–(2) is the difference in medians between sub-samples (1) and (2). P-value is the significance level from the two-sample Wilcoxon rank-sum (Mann-Whitney) test of the equality of medians in sub-samples (1) and (2). ***, ** and * indicate significance at the 1%, 5% and 10%, respectively.

Table A-5: Summary statistics for deal characteristics

Panel A: Deals with the following characteristics (binary outcomes) as percentage of all 89 deals

	Deals	Percent
Management Equity Participation	74	83
Management Change	24	27
Club PE Participation	21	24
Listed on Pei 50	21	24

Panel B: Deal characteristics (continuous variables) for 89 deals

	mean	median	st.dev.	min	max
Entry Leverage (ratio)	4.47	3.63	3.12	0.10	13.99
Leverage Change (rate)	4.78	4.13	4.25	-3.49	28.57
Board Size (persons)	5.80	6.00	2.30	2.00	14.00
Sponsor Directors/Board Size	0.13	0.13	0.15	0.00	0.50
Bank Loans/Total Debt	0.38	0.48	0.39	0.00	1.00
Capital (mill $)	484	195	624	43.2	2,866
Duration (years)	3.90	3.84	1.52	0.80	8.02

Notes: The table presents the deal characteristics for the sample of 89 deals with post-buyout information. Management Equity Participation takes the value of 1 if the management contributes in the equity financing of the buyout and 0 otherwise. Management Change takes the value of 1 if the the CEO has replaced within the first year after the buyout completion, and 0 otherwise. Club PE participation is a dummy variable that equals one if two or more PE firms contribute equity in the secondary buyout. Listed on Pei 50 is equal to 1 if the PE sponsor is listed on the Private Equity International (PEI) 50 index and 0 otherwise. Entry Leverage is computed as the ratio of total debt to EBITDA at the year -1. Leverage Change is defined as is the difference between total debt at buyout and at year -1, normalized by EBITDA at year -1. Bank Loans/Total Debt is the fraction of bank loans in total debt at the time of buyout. Capital is the rank deal value equal to the transaction value paid plus the target's net debt minus the value of any liabilities assumed in a transaction in millions of U.S. dollars. Duration measures the holding period of the buyout, from buyout completion to exit, in years. See Section 4.4 for more details.

Table A-6: SBO Performance and Improved Governance/Monitoring - ROS - Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Firm Sample	All deals									
SBO Outcome Based on	Return on Sales (ROS)									
Dependent Variable	ROS in Last Year					ΔAdjusted ROS				
log(Capital)	.020	.018	.017	.011	–.020	.010	.013	.011	.010	–.020
	(.016)	(.015)	(.015)	(.014)	(.019)	(.015)	(.013)	(.013)	(.013)	(.018)
Adjusted ROS at Year -1	.460***	.498***	.477***	.501***	1.072***	–.326***	–.316***	–.352***	–.325***	.073
	(.171)	(.150)	(.172)	(.177)	(.240)	(.108)	(.105)	(.107)	(.109)	(.230)
Industry ROS at Last Year	.672***	.654***	.681***	.540***	1.037**					
	(.233)	(.234)	(.248)	(.185)	(.413)					
Entry Leverage	.009*	.008^{+}	.009*	.010*	.035***	.009*	.008^{+}	.009*	.009*	.035***
	(.005)	(.005)	(.005)	(.005)	(.011)	(.005)	(.005)	(.005)	(.005)	(.011)
Leverage Change	.003	.004	.003	.003	.014*	.004*	.005**	.006**	.004*	.014**
	(.003)	(.003)	(.003)	(.003)	(.006)	(.002)	(.002)	(.003)	(.002)	(.006)
Management Change	.051**	.046*	.051	.054**	.030	.048**	.047*	.053**	.053**	.031
	(.025)	(.025)	(.040)	(.025)	(.037)	(.023)	(.024)	(.023)	(.023)	(.034)
Management Equity Participation	.012	.014	.015	.006	–.037	.015	.013	.010	.010	–.036
	(.027)	(.028)	(.027)	(.024)	(.048)	(.027)	(.029)	(.028)	(.027)	(.046)
log(Board Size)	.025	.029	.028	.026	–.012	.036	.035	.031	.032	–.010
	(.034)	(.032)	(.036)	(.034)	(.069)	(.035)	(.034)	(.036)	(.035)	(.059)
Sponsor Director/ Board Size	–.020	–.022	–.024	–.033	.097	–.004	.005	.006	.000	.094
	(.095)	(.097)	(.096)	(.094)	(.183)	(.094)	(.096)	(.093)	(.092)	(.176)
Club PE Participation	–.019	–.023	–.017	–.009	–.060	.004	–.004	.002	.004	–.059
	(.032)	(.033)	(.031)	(.031)	(.059)	(.031)	(.032)	(.031)	(.031)	(.056)
Reputation	–.023	–.014	–.022	–.018	–.138*	–.014	–.006	–.012	–.012	–.138**
	(.029)	(.029)	(.029)	(.028)	(.063)	(.030)	(.032)	(.030)	(.030)	(.062)
Bank Loans/Total Debt	–.021					.012				
	(.039)					(.040)				
Duration		.038					.038			
		(.031)					(.037)			
Management Change× Leverage Change			–.000					–.005		
			(.005)					(.004)		
Entry Year Fixed Eff.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exit Year Fixed Eff.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	89	89	89	88	38	89	89	89	88	38
R^2	.56	.57	.56	.58	.89	.5	.51	.5	.48	.73
Adj. R^2	.36	.38	.36	.39	.64	.28	.29	.28	.26	.16

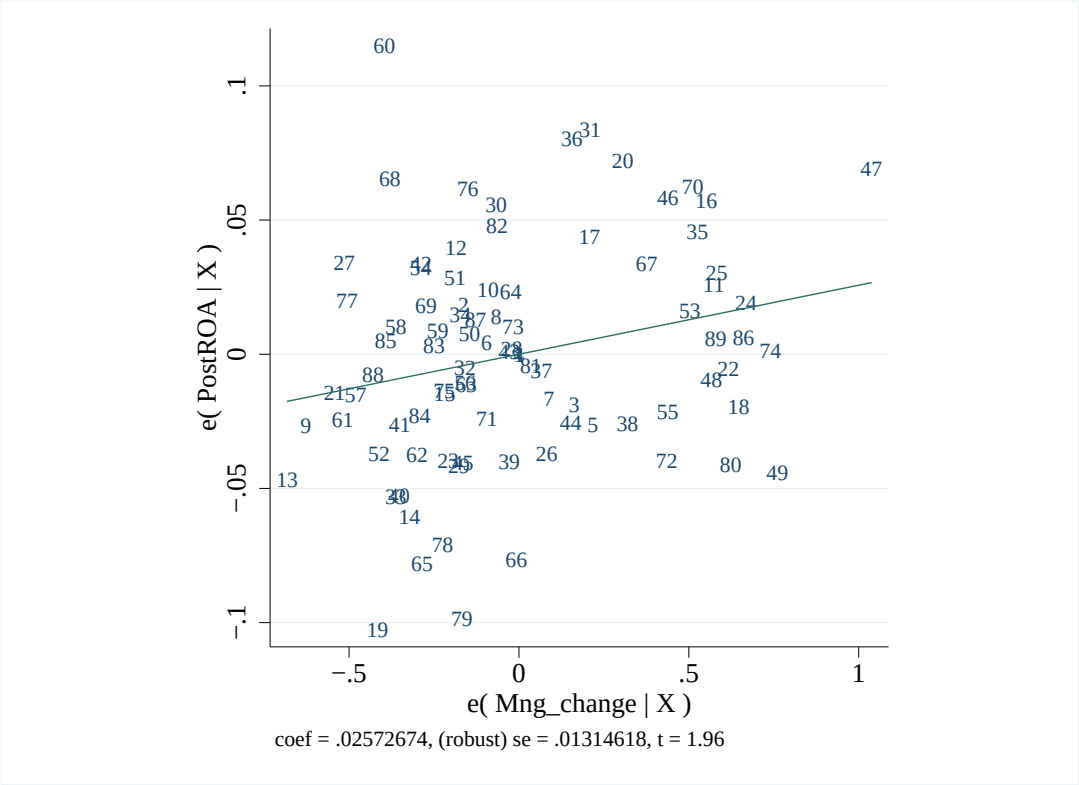
Notes: The table presents the results of the OLS regressions of the post-buyout performance and changes in performance for the sample of 89 deals with post-buyout information and for a subsample of 38 deals with an outcome. Sample in column (4) and (9) excludes an outlier, Travelodge Hotels Ltd. Robust standard errors are in parentheses. *** , **, *, and $^{+}$ denote significance at 1%, 5%, 10% and 15% levels. "ROS Last Yr." represents the return (EBITDA) on sales (ROS) of the target in the last year. ΔAdj. ROS" stands for the change between year -1 and the last year in a target's ROS minus the median ROS of the firm's peer companies matched on the four-digit SIC code. "Adjusted ROS at Year -1" represents the corresponding industry-adjusted performance in the year -1 while the "Industry ROS at Last Year" is the median return of the firm peer companies. Reputation is equal to 1 if the PE sponsor is listed on the Private Equity International (PEI) 50 index and 0 otherwise. The other independent variables are as defined in Table A-5.

Table A-7: SBO Performance and Improved Governance/Monitoring - ROA - Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Firm Sample	All deals									
SBO Outcome Based on	Return on Assets (ROA)									
Dependent Variable	ROA in Last Year					ΔAdjusted ROA				
log(Capital)	–.006	–.004	–.004	–.007	–.019**	–.002	.004	.003	.001	–.016
	(.007)	(.006)	(.006)	(.005)	(.008)	(.010)	(.009)	(.009)	(.009)	(.014)
Adjusted ROA at Year -1	.014	.024	.014	.017	–.129	–.565***	–.548***	–.559***	–.559***	–.986**
	(.055)	(.057)	(.056)	(.056)	(.193)	(.111)	(.117)	(.113)	(.116)	(.354)
Industry ROA at Last Year	–.280*	–.289**	–.327**	–.244*	–.041					
	(.145)	(.144)	(.146)	(.139)	(.153)					
Entry Leverage	–.000	–.000	–.000	–.000	.017**	.003	.004	.004	.004	.016
	(.002)	(.002)	(.002)	(.002)	(.006)	(.003)	(.003)	(.003)	(.003)	(.011)
Leverage Change	.000	.000	–.001	–.000	.013**	–.001	–.001	.000	–.001	.010
	(.001)	(.001)	(.001)	(.001)	(.004)	(.002)	(.002)	(.002)	(.002)	(.008)
Management Change	.025*	.025*	.005	.030**	.046^{+}	.032*	.036*	.039**	.040**	.076^{+}
	(.013)	(.013)	(.018)	(.012)	(.026)	(.019)	(.020)	(.019)	(.019)	(.047)
Management Equity Participation	–.016	–.016	–.016	–.018	–.061**	.002	–.002	–.005	–.005	–.063
	(.017)	(.017)	(.016)	(.016)	(.024)	(.031)	(.033)	(.032)	(.032)	(.050)
log(Board Size)	.000	–.001	.002	–.005	–.020	.006	.002	.000	–.001	–.079^{+}
	(.016)	(.015)	(.015)	(.014)	(.027)	(.025)	(.024)	(.025)	(.024)	(.051)
Sponsor Director/ Board Size	–.032	–.031	–.038	–.027	.058	.074	.082^{+}	.085^{+}	.082^{+}	.277**
	(.032)	(.033)	(.033)	(.031)	(.101)	(.053)	(.055)	(.055)	(.053)	(.114)
Club PE Participation	–.015	–.018	–.015	–.014	–.029	.000	–.007	–.005	–.003	–.036
	(.016)	(.016)	(.015)	(.015)	(.033)	(.022)	(.021)	(.020)	(.020)	(.036)
Reputation	–.006	–.005	–.008	–.004	–.074**	.009	.010	.009	.009	–.021
	(.014)	(.015)	(.015)	(.014)	(.033)	(.022)	(.023)	(.021)	(.021)	(.050)
Bank Loans/Total Debt	.005					.033				
	(.020)					(.030)				
Duration		.010					.014			
		(.019)					(.036)			
Management Change× Leverage Change			.004*					–.004		
			(.002)					(.004)		
Entry Year Fixed Eff.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exit Year Fixed Eff.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	89	89	89	88	38	89	89	89	88	38
R^2	.37	.38	.39	.42	.83	.62	.61	.62	.61	.85
Adj. R^2	.078	.085	.098	.16	.42	.45	.44	.45	.45	.54

Notes: The table presents the results of the OLS regressions of the post-buyout performance and changes in performance for the sample of 89 deals with post-buyout information and for a subsample of 38 deals with an outcome. Sample in column (4) and (9) excludes an outlier, Travelodge Hotels Ltd. Robust standard errors are in parentheses. *** , **, *, and $^{+}$ denote significance at 1%, 5%, 10% and 15% levels. "ROA Last Yr." represents the return (EBITDA) on total assets (ROA) of the target in the last year. ΔAdj. ROA" stands for the change between year -1 and the last year in a target's ROA minus the median ROA of the firm's peer companies matched on the four-digit SIC code. "Adjusted ROA at Year -1" represents the corresponding industry-adjusted performance in the year -1 while the "Industry ROA at Last Year" is the median return of the firm peer companies. Reputation is equal to 1 if the PE sponsor is listed on the Private Equity International (PEI) 50 index and 0 otherwise. The other independent variables are as defined in Table A-5.

Figure A-1: Conditional Correlation of Operating Performance (ROA) and Management Change



Notes: The figure presents the partial correlation plot from the the regression of ROA at the last year on the Management Change conditional on other controls from column (5) of Table 5. Each number represents a company. Company nr. 60 is Travelodge Hotels Ltd.

Appendix A: Sample construction

We use the databases Zephyr by Bureau van Dijk and Thomson One Banker (TOB) to identify the basic sample of SBOs. Zephyr is a database that contains merger and acquisitions, IPO and venture capital deals of any size worldwide from 1997 and is particularly extensive for European deals. As of November 2011, Zephyr had information on over 900,000 transactions. Zephyr's deal records' do not have the minimum threshold value to be included and are quite detailed: for each in each M&A, the target, the acquiring party or parties, the dates when the deal was announced and completed, and the type of the deal (e.g., Acquisition, Acquisition of 15%, Merger, Joint Venture, etc.). The Zephyr data can easily be matched with other BvD's datasets we use because a BvD company identifier is included in all databases. TOB provides a merger and acquisition module in ThomsonOne (SDC Platinum) and contains information about more than 400,000 deals worldwide since 1977. Because Zephyr has a better coverage for the recent wave of buyouts we first run a query in Zephyr and search on "Institutional Buyout" to identify all the complete buyouts in the UK from 1997 until 2008.[41] We chose 2008 as last year to have a minimum of three years post-buyout performance. In addition to the deal value we retrieve the name, the U.S. SIC code, the BvD ID number for the target, the acquirer, and the seller. This search yields 880 institutional buyouts. To isolate SBOs we filter this data based on the "banking" SIC codes of the acquirers and sellers since both the buyer and seller has to be a PE firm in a SBO. This results in a sample of 183 potential SBOs. Then we use SDC advanced search in the deal analysis section over the period 1997–2008 in the UK adding the deal type "Secondary Buyout" in the search criteria and retrieve the deal characteristics and synopsis as well as the Committee on Uniform Security Identification Procedures (CUSIP) code.[42] The CUSIP code is used as the main identifier to find additional information in other TOB sections. We identify 139 SBOs from SDC. Next we combine both Zephyr and TOB searches, read the deal synopses, and cross check the "SBO" classification and deal values based on the target names dropping incorrectly categorized SBOs, deals smaller than $50 million or SBOs with an unknown deal value. This results in a final selection of 126 SBOs.

Second, we need to identify the post-buyout outcomes (IPO, Sold, TBO, Distressed, or still private), financing structure, and the terminal values. In order to identify debt financing of the buyouts we use the deal synopses and search the SDC's bond and loans section based on the target name or CUSIP number. As

[41] In Zephyr it is not possible to search on SBOs only.

[42] The deal synopsis explains the deal rationale and often the deal financing structure. Zephyr provides similar data for every deal including related news sources.

explained in the data section, the terminal value is the total capital received by debt and equity sponsors after exiting the company and determined as the observed value at exit or the last available year if still private. Based on the target names or the BvD or CUSIP number, we search in Zephyr and SDC all the executed deals of these companies over the years and identify subsequent possible exits and terminal values of the SBOs. Furthermore, I use Factiva to find exits and cross check the deal outcomes between the different databases. In addition we make use of the Factiva database for the information about the rationale of the deal. Factiva contains business information and news from local and global newspapers such as the Financial Times and the Wall Street Journal, trade journals, magazines and newswires like Dow Jones, Reuters and the Associated Press. We find all necessary information for a sample of 101 SBOs.

Third, we search for accounting information of the 101 target firms based on the BvD ID number in Orbis and Amadeus databases to obtain financial data for one year before buyout completion until one year before exit and the yearly payments to debt and equity capital during the holding period. Orbis and Amadeus provide financial data of 79 million companies worldwide and contain extensive information on company financial performance, deals, ownership structure, annual reports and number of employees. In order to accurately compare the operating performance before and after the buyout of the target company, consolidated statements have to be used. In a typical SBO a new holding company is created on the top of the former acquisition vehicle. After the buyout, all proceeds from the target firms' subsidiaries are then consolidated under the new parent company. Therefore, holding companies both before and after the buyout need to be identified. When all holding companies are identified, we use the names and corresponding BvD IDs of the parent companies to collect financial statements. Name changes are also common in SBO transactions. Therefore, we also trace the parent companies' name changes and BvD ID to ensure a correct matching between the parent and subsidiary. We collect the values for the Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA), Earnings Before Interest and Taxes (EBIT), interest paid, and sales from the profit and loss account, and for the total assets, shareholder funds, long term debt and short term loans from the balance sheets. We find consolidated pre-buyout information for 101 target companies. Amadeus and Orbis do not provide complete post-buyout information on accounting variables for 12 companies in this sample. Hence, the post-buyout accounting variables are available for a subsample of 89 companies. Besides the accounting variables, we use the Ownership section of Orbis for the 89 target companies to identify management equity participation, management change and board size of the buyouts. The following table describes the steps we take to collect the data for a representative SBO of the company Fitness First.

Example of data construction: SBO of Fitness First

Fitness First is the largest privately owned health club group in the world with over 540 Fitness First clubs worldwide, reaching 1.4 million members across Europe, Australia, Asia, and the Middle East (as of October 2010).

Step	Source	Description of the data collection
1	TOB	We obtain the "deal value" ($1.495 billion), "US SIC Code" (7991), "CUSIP code" (33828J) and "date effective" (23/09/2005)
2	Zephyr	Search on company name (Fitness First) and it's BvD ID number (GB04699401) and identify all deals the company is involved in. Crosscheck the "deal value", "US SIC Code" and "date effective" of the SBO with the data obtained from TOB. The deal value in Zephyr is $1.489 billion. The value sometimes has a minimal difference due to exchange rate changes. The US SIC code is similar. Zephyr does not use "date effective" but has a "completion date" of 28/10/2005 and an "announcement date" of 22/09/2005. Since Zephyr explicitly provides a completion date rather than date effective (TOB), we use the date 28/10/2005 from Zephyr and it's corresponding deal value.
3	Factiva	Search for the articles in English about the company (Fitness First) with subject "Acquisitions/Mergers/Takeovers" from the last ten years to identify a possible exit. Read articles about the SBO deals and cross check "deal value". Find that Fitness First is still private (no exit). However in the years after the buyout they acquired three companies and created a start up in India. In 2011 they sold different parts of the company (Benelux, MENA, France, Spain and Italy). In 2010/2011 they also tried to float the company, however due to uncertain market conditions they postponed the IPO.
4	Zephyr	Compare the findings from Factiva to all deals for Fitness First from Zephyr (Step 2) to be certain that no exit has taken place. We conclude that Fitness First is still private and find similar results regarding the postponed IPO.
5	TOB	Based on the CUSIP code search the bonds and loan section of TOB. We find that the deal is financed using a term loan A ($133 million), term loan B ($595 million), mezzanine debt ($186 million), capital expenditure facility ($111 million) and credit facility ($36 million). A total debt financing of $1.060 billion is used (71.22% of the deal value).
6	Orbis	Search on Fitness First and it's BvD ID number (GB04699401) and identify all entities and subsidiaries. Use the consolidated financial statement of "Fitness First Holdings Limited" from the last complete fiscal year before buyout (2004). Obtain pre-buyout long-term debt ($650 million), EBITDA ($156 million), EBIT ($73 million), interest paid ($57 million), sales ($651 million), total assets ($892 million), shareholder funds ($76 million) and short-term loans ($17 million). Use the consolidated balance sheet of "Fitness First Group Limited" created by the new owners and collect the same variables as with pre-buyout, for the last available year (31/10/2010). Obtain the interest payments between 31/10/2006 and 31/10/2010.
7	Orbis	Use the Ownership module of Orbis and search on current and historic shareholders and directors, managers, contacts and advisors of "Fitness First Holdings Limited" and "Fitness First Group Limited" to identify a possible CEO change (no change), club PE participation (only 1 PE firm), management equity participation (yes), board size (8) or sponsor director in the board (no).
8	Compustat Global	Using the US SIC code (7991) of Fitness First in the period 2004 until 2010 to obtain the peer group variables from Compustat Global for all companies with the same US SIC code. Collect yearly data about EBITDA, EBIT, total assets, debt in current liabilities, long-term debt, sales, and stockholders equity.
9	Datastream	Collect information for equity and market returns. The daily returns of the FTSE all share UK index of the sector travel&leisure (IBC code 5700) of 60 months prior to the firm's buyout completion is used for equity beta calculations. The FTSE all-share index geometric average return is used as market return and the UK 3-month Treasury bill (T-bill) median yield for the risk free rate. These variables are matched to the holding period from 28/10/2005 until 31/10/10.

Appendix B: Top 50 private equity investors

Rank	PEI50	Acquirer Name	Nr. of SBO Deals
1	12	Royal Bank of Scotland	7
2	-	ABN Amro	7
3	27	Bridgepoint Capital	5
4	-	3i	3
5	-	Advent International	3
6	48	Barclays	3
7	-	Baugur	3
8	10	Blackstone	3
9	-	Candover	3
10	-	Dubai International Capital	3
11	-	Graphite Capita	3
12	-	HG capital	3
13	-	August Equity	2
14	-	Duke Street Capital	2
15	-	Lion Capital LLP	2
16	-	Lloyds TSB Development Capital.	2
17	-	Nikko Principal Investments	2
18	1	The Carlyle Group LLC	2
19	-	BC Partners	1
20	-	Phoenix Equity Partners	1
21	-	Aberdeen Murray	1
22	-	Allianz	1
23	-	Bannerbrick Ltd Bain capital	1
24	-	BC Partners Ltd	1
25	-	Challenger group	1
26	-	Change capital partners	1
27	30	Charterhouse Capital Partners	1
28	26	Cinven	1
29	-	Close Brothers Growth Capital	1
30	-	Corion	1
31	-	DC thomson	1
32	-	Dunedin Capital Partners	1
33	-	ECI capital	1
34	-	Electra partnert LLP	1
35	-	European Capital Ventures PLC	1
36	-	Exponent Private Equity LLP	1
37	-	General Atlantic Partners LLC	1
38	-	GI Partners LLP	1
39	-	gresham partners	1
40	-	hermes private equity	1
41	-	HSBC Private Equity	1
42	-	Hutton collins	1
43	-	Inflexion Private Equity	1
44	-	JP Morgan Partners LLC	1
45	-	kaupting	1
46	-	Led by management	1
47	-	Lydian Capital	1
48	-	Montagu Private Equity	1
49	-	Oakes	1
50	-	Pai partners	1

Notes: This table presents the top 50 of PE firms in my sample that acquired one or more target firms. The rank is determined based on the total number of executed deals and total deal value. Besides the deal value the Private Equity International 50 (PEI50) indicates if the firms belong to the top 50 largest PE firms worldwide.

Appendix C: Industry distribution of the SBO deals

Sample	Full sample, 101 SBOs		Subsample with complete post-buyout data, 89 SBOs	
ICB Industry Code and Name	Nr	Percentage	Nr	Percentage
0000: Oil & Gas	1	1.0	1	1.1
1000: Basic materails	5	5.0	4	4.5
2000: Industrials	17	16.8	15	16.9
3000: Consumer goods	11	10.9	11	12.4
4000: Healthcare	11	10.9	10	11.2
5000: Consumer services	14	13.9	11	12.4
5300: Retail	18	17.8	16	18.0
5500: Media	6	5.9	6	6.7
5700: Travel & Leisure	9	8.9	9	10.1
6000: Telecommunications	3	3.0	1	1.1
7000: Utilities	1	1.0	1	1.1
8000: Financials	3	3.0	2	2.2
9000: Technology	2	2.0	2	2.2
Total	101	100.0	89	100.0

Notes: This table presents the distribution of industry types. For the industry classification we used the Industry Based Classification (IBC) code developed by Dow Jones and FTSE. Because of the large difference in consumer services we have chosen to use the retail, media and travel & leisure for a more firm specific industry comparison. For every SBO the corresponding industry portfolio returns over 60 months prior to buyout completion are collected from Thomson Reuters DataStream. The industry portfolio is matched to every target firm, based on the companies SIC code.