Do Private Equity Firms Pay for Synergies?**

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Abstract

Stylized facts suggest that strategic acquirers can pay for synergies, while private equity (PE) firms cannot because of the missing operating fit with the portfolio company. However, if PE firms initiate buy-and-build strategies, there is potential for an operating fit between the portfolio firm and its add-on acquisitions. Thus, synergistic value could be priced in at entry. We analyze the pricing of 1,155 global PE buyouts and find strong support for a valuation effect from buy-and-build strategies. Our results indicate that PE sponsors pay a premium of up to 47% at entry when the portfolio company acquirers add-ons in the same industry within a two-year time window after the buyout. Consistent with bargaining power theory, the effect strengthens when the portfolio firm has acquisition experience, and when the PE sponsor faces pressure to invest because of unspent fund capital (referred to as "dry powder") or deal competition. These findings remain robust after addressing alternative explanations, endogenous selection, and reverse causality. They have important implications for the literature on strategic versus financial bidders in takeovers.

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1. Introduction

It is a commonly accepted view that strategic acquirers incorporate synergistic value into their bids for targets, while private equity (PE) funds presumably do not because they lack operating similarities with the portfolio firm. Empirical evidence provides some support for this view (Bargeron et al., 2008; Dittmar et al., 2012; Gorbenko & Malenko, 2014; Fidrmuc et al., 2012).

However, prior literature is limited to PE bids in so-called public-to-private buyouts (P2Ps) which account for only 7% of the overall buyout market (Strömberg, 2008). A typical P2P is furthermore motivated by undervaluation, tax benefits, and incentive realignment rather than by growth opportunities (Renneboog et al., 2007; Weir et al., 2005). It is thus not surprising that extant literature concludes that PE firms can at best incorporate future value from restructuring and access to favorable debt financing into their bids for public targets (Gorbenko & Malenko, 2014).[1]

The so-called buy-and-build (B&B) value creation strategy is unusual for P2Ps (Hammer et al., 2017), and thus not covered by prior studies on PE bidding. The strategic intent of the B&B strategy is to use the initial buyout firm as a platform for one or several smaller add-on acquisitions during the holding period (Wright et al., 2001). Hammer et al. (2017) document that B&B strategies have increased in importance over time. Their sample suggests that approximately 39% of all deals exited in 2012 used B&B strategies, versus only 19% in 2000. Consulting firms such as Bain & Company believe this number will increase even further in the future. This is because B&B strategies are particularly useful for deploying record amounts of committed capital and for levering PE firms' core advantages in deal execution.[2]

[1] This is also consistent with economic theory that suggests firms go public in order to benefit from the market for corporate control and to realize growth opportunities (Brau & Fawcett, 2006; Lowry, 2003). Thus, at the time of an intended P2P buyout, it is likely that most of the growth potential has already been exploited. In line with this notion, Boucly et al. (2011) find that P2Ps do not tend to spur growth.

[2] See the 2018 edition of the "Global Private Equity Report," available online.

Note that the sources of value creation in B&B strategies are no different from those that strategic acquirers incorporate into their valuations when bidding for related companies. Smit (2001) argues that the integration of operations between the platform and its add-on acquisitions leads to cost efficiencies and improved market power, i.e., operating synergies. These synergies, in turn, are the primary motivation for "regular" mergers (Mukherjee et al., 2004), and are typically associated with a price premium for the target shareholders (e.g., Nielsen & Melicher, 1973; Jensen & Ruback, 1983; Bradley et al., 1988). This raises the question of whether similar premiums for synergies are observable in buyouts with B&B strategies. We address this question using a sample of 1,155 global PE transactions that, next to P2Ps, also cover all other relevant entry channels such as private-to-private, secondary (SBO), and divisional buyouts.

We conjecture that B&B strategies will be associated with a price premium because they allow the general partner (GP) to incorporate expected synergistic value from add-ons, besides the usual PE value creation measures, into target valuations. As a result, more value is subject to the purchase price negotiation for platform companies.[3] The target likely knows about future add-on acquisitions because PE firms actively communicate their investment approaches.[4] Even when such information is unknown ex ante, the target will learn about the B&B strategy during the due diligence/negotiation process. Rational sellers may then try to capture part of the synergistic value by demanding a price premium. We expect this to hold especially true in a B&B context, because viable platforms are rare, they share a distinct set of characteristics, and they provide significant

[3] Anecdotal evidence supports this notion. For example, consider the PE fund Cinven, which, in competition with the PE fund EQT and a strategic investor Unilabs (owned by Apax and Nordic Capital), was bidding a relatively high EBITDA multiple of 12 for the platform company Synlab in the fragmented European laboratory industry (see https://uk.reuters.com/article/us-cinven-m-a-idUKKBN0P51TZ20150625).

[4] For example, using the PE firm web sites Factiva and Bloomberg, we find that information about the use of add-on acquisitions is available for about 90% of all PE firms that engage in a B&B strategy. And 75% explicitly communicate on their websites that they regularly realize M&A-based strategies for their portfolio firms.

real option value to buyers.[5] This likely enables management to use a platform's strategic importance as a bargaining chip in price negotiations.

Testing for our main hypothesis implies two identification issues. First, we need to find a proxy for the operating synergy potential of a B&B strategy. This task is not trivial given the opaque PE context in which both the platform and its add-on acquisition are non-listed entities. Because information availability is scarce, we cannot use the synergy proxies that are available for public firms, such as measures of individual and combined market valuations of the target and acquirer (e.g., Ahern et al., 2015; Maquieira et al., 1998), long-term abnormal operating performance (e.g., Healy et al., 1992; Maksimovic & Phillips, 2001), or present values of cash flow forecasts (Devos et al., 2009). Instead, we assume that synergy potential is in place if the portfolio firm acquires add-ons in the same industry (the "industry restriction"). This is consistent with Devos et al. (2009), who find that operating synergies are greatest in focused mergers that involve firms with the same industry classification code.

Second, we need to distinguish between add-ons that are an ex ante part of the deal strategy, and those that are ex post determined during the holding period. Whereas the first group gives rise to pricing effects at entry, the second group may be endogenously determined by the observed deal performance. Following Acharya et al. (2013), we expect that add-ons that are realized within two years after the buyout (the "time restriction") are unlikely to be the result of adaptive behavior.

[5] Smit (2001) argues that B&B strategies aim to consolidate fragmented industries in order to benefit from economies of scale and market power. This requires a sizable market leader with a scalable competitive advantage, as well as sufficient capacity, resources, and skill to integrate future add-ons. Once the PE firm owns such a platform, it can build on it and acquire smaller competitors, of which several will generally be available in fragmented industries. Thus, the initial platform investment creates the potential for industry consolidation, and also opens up further investment opportunities. Smit and Moraitis (2010) argue that this growth option value is significantly greater than that for add-on acquisitions, because the platform allows for pre-emptive acquisitions that make it more difficult for competitors to replicate the consolidation strategy. This demonstrates clearly that the platform acquisition is a critical component of the B&B strategy.

This leads us to expect that buyouts in which the portfolio firm makes add-on acquisitions in the same industry within the first two years of the holding period will exhibit a price premium at entry.

Our results provide strong support for our main hypothesis. In our baseline regressions, we find that PE firms pay a sizable enterprise value to sales (EV/Sales) premium of 15% to 20% when add-ons are realized in the platform's industry within two years after the buyout. This premium cannot be explained by unobserved time-invariant PE firm characteristics. Note that it also holds when controlling for a variety of determinants of buyout pricing discussed in the literature, e.g., PE firm characteristics (fund size, "dry powder", experience, institutional affiliation), deal characteristics (entry channel, syndication, management participation), portfolio firm characteristics (size, M&A experience), as well as investment conditions (financing conditions at the time of the buyout and time-varying competition for targets across industries). Furthermore, and consistent with our identification strategy, we find that economic and statistical significance of the B&B price premium decline when add-ons are realized outside the platform's industry and/or later than two years after entry.

Next, we carry out several additional analyses to address endogeneity concerns and alternative explanations. First, we explore the sensitivity of our results to alternative model specifications with various combinations of fixed effects. Second, we use a counterfactual research design to estimate treatment effects based on propensity score matching (PSM). Third, we test whether measurement error drives our results by re-estimating matching models with alternative time and industry restrictions for our B&B indicator. Fourth, we use two-stage endogenous treatment regressions that incorporate exogenous variations in the suitability of B&B strategies across markets and years as an instrument. Fifth, we explicitly address reverse causality and sample selection bias by running regressions on subsamples that exclude overpriced deals and underrepresented countries. Finally, we test the EV/EBITDA multiple and its log as alternative dependent variables. Our main result

remains intact across all these estimations. The size of the B&B price premium varies somewhat, and shows that our baseline estimates may actually be conservative. For example, the PSM estimates suggest an entry EV/Sales premium from B&B of up to 47%.

Finally, because prices paid in PE buyouts are the result of a negotiation process between the management of the buyout target and the GP, we explore bargaining power as a channel for the size of the B&B premium. Ahlers et al. (2016) identify competition, time pressure, and expertise as key antecedents of perceived negotiation power in buyout transactions. Perceived negotiation power, in turn, should affect the price upon which the portfolio firm and the PE investor eventually agree. We thus model these three determinants and test whether our estimates are sensitive to the inclusion of various interaction terms with our B&B indicator.

We find that the B&B premium increases when the PE sponsor faces higher competition for deals in the portfolio firm's industry. This is because the target will be less inclined to make concessions during the negotiation when there is a substantial number of outside alternatives. We also find a significantly greater B&B premium if the PE sponsor has "dry powder," as this coincides with relative investment pressure and thus with a weaker bargaining position. Finally, the B&B premium is greater when the portfolio firm has M&A experience at entry. This finding is consistent with the idea that platform targets can counter GP's negotiation power and capture a greater part of the synergistic value from B&B when they have comparable M&A expertise.

This paper contributes to several strands of literature, most importantly to prior studies on strategic versus financial buyers in takeover processes (Bargeron et al., 2008; Dittmar et al., 2012; Fidrmuc et al., 2012; Gorbenko & Malenko, 2014). We depart from these studies by investigating a sample of PE activity that is not limited to P2Ps. This allows us to contrast the notion of segmented bidding, because our findings indicate that targets with growth opportunities may similarly appeal to financial investors. Beyond that, we present novel evidence that financial

investors can incorporate synergistic value from add-on acquisitions into their bids. This may enable them to outbid strategic acquirers in auctions, which may help PE firms capture a larger share of the M&A market.

Moreover, our findings have important implications for the literature on buyout pricing (Achleitner et al., 2011; Arcot et al., 2015; Axelson et al., 2013; Cumming & Dai, 2011; Demiroglu & James, 2010; Gompers & Lerner, 2000; Wang, 2012). To the best of our knowledge, this paper is the first to show that it is necessary to control for B&B strategies, and thus the intended source of value creation, when estimating buyout prices. Furthermore, our results indicate that operating value creation potential from synergies can at least partially explain rising prices in the PE industry.

We also add to the growing literature on B&B strategies in PE (Acharya et al., 2013; Hammer et al., 2017; Nikoskelainen & Wright, 2007; Smit, 2001; Smit & Moraitis, 2010; Valkama et al., 2013; Wright et al., 2001). In contrast to the aforementioned studies, this paper relates B&B to entry pricing rather than to IRR. Moreover, it studies determinants of the documented price premium rather than determinants of add-on acquisitions themselves. Our approach allows us to provide empirical evidence for the theoretical framework of Smit (2001) and Smit & Moraitis (2010). That is, we show that platforms command a price premium because they have strategic importance for B&B strategies. We also document that the extent to which platforms can capitalize on this strategic importance depends on their relative bargaining power.

Finally, we contribute to prior literature on bargaining power and contracting in buyouts (Ahlers et al., 2016; Cumming & Johan, 2008; Cuny & Talmor, 2007; Ljungqvist et al., 2008). The novelty of this aspect lies in the introduction of empirical proxies for the qualitative bargaining power determinants that Ahlers et al. (2016) identify in their survey of 176 PE professionals.

The remainder of this paper proceeds as follows. Section 2 discusses related literature in more detail. Section 3 is devoted to hypothesis development. In section 4, we discuss the sample

selection, distribution, and construction details for all variables used in the regression models. Section 5 presents our empirical results. Section 6 concludes.

2. Related Literature

The first relevant strand of literature that we discuss is on strategic versus financial buyers in takeover processes. Bargeron et al. (2008) find that target shareholders attain 55% higher premiums if the acquirer is a public firm, and they attribute this premium increase to differences in managerial incentives. Gorbenko & Malenko (2014) estimate willingness to pay in takeover auctions, and find that the market is segmented, i.e., different targets appeal to different groups of buyers. Their results indicate that financial bidders prefer investments in mature underperforming targets, and they are more affected by aggregate economic conditions. Fidrmuc et al. (2012) investigate the selling processes of firms acquired by PE versus strategic acquirers. They find that targets with low market to book values, high cash levels, and redeployable assets are acquired by PE buyers more frequently. They posit this is because their restructuring abilities mean they can add more value to these firms.

A second relevant strand of literature is on buyout pricing. Gompers & Lerner (2000) document a strong positive relationship between buyout valuations and capital inflows into the private equity industry. Cumming & Dai (2011) find a convex relationship between fund size and portfolio company valuations, while Wang (2012) shows that secondary buyouts are priced at a premium that cannot be explained by target firm characteristics. Moreover, Arcot et al. (2015) document that pressured buyers who are close to the end of their investment periods tend to pay more in secondary buyouts. Axelson et al. (2013) find that economywide credit conditions influence leverage and transaction prices, and suggest that private equity funds overpay when access to credit is easily available. Achleitner et al. (2011) provide evidence that PE firm experience is vital for buyout

pricing. And Demiroglu & James (2010) find that buyout leverage is positively related to pricing, while GP reputation is not.

A third strand of literature addresses B&B strategies in PE. Wright et al. (2001) introduce B&B as an entrepreneurial strategy that creates growth opportunities. They contrast it with the classic "organizational efficiency" view of buyouts. Nikoskelainen & Wright (2007), as well as Valkama et al. (2013), find that deals with add-on acquisitions outperform those without in terms of their internal rates of return (IRR). Acharya et al. (2013) find that GPs with investment banking backgrounds generate higher deal-level abnormal performance when pursuing an inorganic growth strategy than those with operational backgrounds. Smit (2001) and Smit & Moraitis (2010) provide a conceptual background by describing the real option characteristics of platform acquisitions in B&B strategies. Hammer et al. (2017) analyze the determinants of add-on acquisition probability, productivity, and speed along various dimensions. They also investigate firm-level determinants of cross-border and industry-diversifying inorganic growth strategies, as well as the relationship between add-ons and the exit channel.

Finally, this paper is related to the literature on bargaining power and contracting in PE. Ahlers et al. (2016) use survey data to explore perceived power in buyout negotiations and the moderating role of PE firm specialization. They find that competition, expertise, and time pressure are important determinants of perceived bargaining power, and that size specialization matters for GPs. Cuny & Talmor (2007) theoretically model the purchase price as a function of bargaining power for PE turnarounds, while Ljungqvist et al. (2008) relate the timing of a PE fund's drawdowns to the manager's bargaining power relative to that of its target shareholders. They find that funds invest more when their bargaining power is higher. Finally, Cumming & Johan (2008) examine investor versus investee bargaining power in the allocation of cash flow and control rights in a VC

context. Their results indicate that control rights are weaker when the VC lacks bargaining power relative to the entrepreneur.

3. Hypothesis Development

3.1 B&B and Entry Pricing

As discussed previously, in a B&B strategy, the portfolio company serves as a platform for add-on acquisitions during the holding period (Wright et al., 2001). These acquisitions are motivated by the PE firm's aim to benefit from a positive difference between the market value of the merged entity and the sum of the stand-alone market values of the platform and its add-on acquisitions. The valuation difference typically stems from the operating synergies. Smit (2001) argues that B&B strategies serve to consolidate fragmented industries, with the aim of transforming several companies into a more efficient large-scale network. In particular, as operations become integrated, economies of scale and scope may create cost efficiencies. Add-ons also serve to rapidly increase market share, and thus benefit from market power.

Note that the platform company and its add-on acquisitions typically have different characteristics. Smit (2001) describes an ideal platform target as a sizable and respected market leader with a scalable competitive advantage, as well as sufficient capacity, resources, and skill to integrate add-on acquisitions. Add-ons, in contrast, are usually small, undercapitalized, face management problems, or lack a unique market position.

These differences have several implications. First, the characteristics of a platform company are relatively rare. Thus, when acquiring such a platform, PE firms may face the problems inherent in a seller's market. Second, platforms provide a foothold in a particular market, and their skills can be leveraged to expand geographic outreach, product offerings, or the customer base through inorganic growth (Smit & Moraitis, 2010). Because platforms open up opportunities for add-on investments, they are crucial for industry consolidation (Smit, 2001). Platform targets thus have

significant growth option value. Platforms may also be of strategic importance because they allow for pre-emptive acquisitions, i.e., those that prevent competitors from replicating the consolidation strategy (Smit & Moraitis, 2010; Akdogu, 2011). Because of these arguments, Smit (2001) suggests that the acquisition of a platform company may require paying a substantial premium.[6]

Note that PE firms determine the deal strategy and the intended sources of value creation before the buyout (Gompers et al., 2016). Therefore, they know about the synergistic potential from future add-on acquisitions and can incorporate it into their valuation of the platform. This means that more value is subject to negotiation in comparison to an otherwise similar target for which no add-on acquisitions are planned. It is also reasonable to assume that the seller knows about possible add-on acquisitions ex ante, or learns about them during the due diligence/negotiation process. This is because most PE firms actively communicate their investment approach. Even when the seller faces uncertainty about the PE firm's deal strategy ex ante, it seems inevitable that the B&B intention is revealed during negotiations as both contracting parties determine the purchase price in an iterative process where they discuss underlying business cases (Ahlers et al., 2016). Thus, a rational seller who wants to secure maximum benefits from the transaction will try to capture part of the PE firm's value from the B&B strategy and demand a price premium. This may lead to a higher deal enterprise value at entry.

A priori, the extent to which entry prices reflect a B&B premium should depend on how much additional value add-on acquisitions create, i.e., on how strong the synergies are. Existing literature on public mergers proxies for the amount of synergies using measures of individual and combined market valuations of the target and acquirer (e.g., Ahern et al., 2015; Maquieira et al., 1998), long-term abnormal operating performance (e.g., Healy et al., 1992; Maksimovic & Phillips, 2001), or

[6] Note, however, that the real option value of the platform is contingent on operating similarities to the add-on acquisitions, i.e., the operating synergy potential is the underlying for the real option. This implies that the strategic importance of the target and the synergy potential with add-ons cannot be detached from each other.

present values of cash flow forecasts (Devos et al., 2009). However, such measures are insufficiently available when the acquirer and its target are non-listed, as is the case for a PE-backed portfolio firm and its add-on acquisition. We therefore must rely on an alternative proxy for synergy potential.

The fact that B&B strategies aim to create operating (not financial) synergies should be particularly helpful in finding such a proxy. Devos et al. (2009) point out that operating synergies are the result of enhanced productive efficiencies, such as savings from reductions in investments. They find that operating synergies are greatest in focused mergers that involve firms with similar industrial classification codes. Operating synergies can also result from economies of scale and market power, especially when the acquisition reduces competition because the target operates in the same business (e.g., Kim & Singal, 1993; Sapienza, 2002). Thus, we expect that synergy potential, whether driven by productive efficiencies, market power, or both, will be greatest when the platform company of the B&B strategy acquires add-ons in the same industry.[7]

Furthermore, any pricing effect from B&B strategies depends on whether acquisition events are part of the PE firm's deal strategy at entry, or result from adaptive behavior during the holding period. Acharya et al. (2013) argue that late M&A events during the holding period could be endogenously determined by the observed performance of the deal. That is, when PE managers recognize bad deal performance, they may revise their original deal strategy, and turn to add-on acquisitions to improve operations and signal growth prospects to a potential buyer.

[7] Survey results by Gompers et al. (2016) indicate that add-on acquisitions frequently originate from proprietary sources. However, we note that this is not even necessary for our expectation to hold true. The industrial logic of B&B strategies rests on consolidating fragmented industries, which offer a large number of add-on targets that serve equally to increase the platform's market power. This should allow the PE sponsor to incorporate synergistic effects from add-on acquisitions even when there is uncertainty about which of the potential add-on targets will agree to a merger. This is also in line with Smit (2001), who argues that a platform company in a B&B strategy entails general flexibility value, because it opens up further investment opportunities in fragmented industries independent of a concrete add-on target.

Following Acharya et al. (2013), we expect that all add-ons conducted two or more years after a buyout are prone to such adaptive behavior, and will thus not be systematically associated with an entry price premium. Earlier add-ons, in contrast, are unlikely to be adaptive given the time needed to recognize bad deal performance and complete add-on acquisitions. In particular, Acharya et al. (2013) assume that GP adaption requires at least one year of observation of the deal performance, and at least one more year of searching for targets and negotiating. Results reported by Hammer et al. (2017) indicate that the two-year assumption holds even when GPs recognize bad deal performance in less than one year. The average time to add-on completion in their sample is 1.56 years.

Combining this two-year assumption with our industry-related explanation for the size of synergies, we formulate the following hypothesis:

H1 *Buyouts in which the portfolio firm makes add-on acquisitions in the same industry within the first two years of the holding period exhibit a price premium at entry.*

3.2 Moderating Factors

Prices paid in PE buyouts are the result of a negotiation process between the management of the buyout target and the GP. They thus depend on relative bargaining power. Previous literature argues that the greater the relative bargaining power, the more value a party can capture from the transaction (Argyres & Liebeskind, 1999; Greenhalgh et al., 1985).

In our context, greater relative bargaining power may enable target's management to capture more of the synergistic potential from the intended B&B strategy and force the GP to accept a higher price (and vice versa). Hence, determinants of relative bargaining power are crucial for the extent to which entry prices reflect synergy potential from B&B.

Ahlers et al. (2016) investigate determinants of relative bargaining power and identify competition for targets, time pressure, and expertise as antecedents of power asymmetry in buyout negotiations. Following their results, it is reasonable to expect that competition, time pressure, and expertise will determine how much synergistic value a GP is presumably forced to give up in the negotiations, and thus the extent to which entry prices will reflect a premium for B&B strategies.

Buyout competition is the first factor that potentially influences relative bargaining power during buyout negotiations. Intense competition for buyout targets increases the number of available PE sponsors sellers must choose from. At the same time, it decreases the number of uncontested alternatives for the GP. Negotiation theory suggests that such a situation will benefit seller management, because it is less dependent on the outcome of a particular negotiation and could threaten to break up negotiations and move on with another PE sponsor (e.g., Bacharach & Lawler, 1980). The GP, in contrast, may be inclined to make concessions in the absence of viable alternatives. We therefore expect to observe a greater B&B premium when buyout competition is intense.

Note that this prediction is consistent with previous literature. Gompers & Lerner (2000) show that competition for a limited number of VC targets leads to rising prices. Varaiya (1987) uses the degree of competition for M&A targets as a proxy for sellers' relative bargaining strength, and finds that a higher degree of competition is associated with higher premiums. Aktas et al. (2010) provide evidence that merger bids increase in the presence of latent competition, i.e., when there is a risk of losing the target to a competitor in case negotiations fail. Taken together, these arguments lead to our second empirical prediction:

H2 *The B&B price premium increases when PE sponsors face more intense competition for buyout targets.*

The second potential determinant of relative bargaining power is time pressure. In general, when a negotiating party needs to close a deal quickly, it may be tempted to accept unfavorable terms. It is thus associated with weaker bargaining power (e.g., Pruitt & Drews, 1969). In our context, this may lead to lower/higher buyout prices depending on which negotiating party is under greater time pressure.

Several previous studies indicate that time pressure is particularly critical for GPs due to the institutional features of a PE fund (e.g., Arcot et al., 2015; Axelson et al., 2009). The lifetime of a PE fund is restricted to typically ten years, where the first five years serve as the investment period (also called "commitment period"), i.e., the period where GPs call committed capital to acquire portfolio companies. The rather short time span that GPs have to deploy all fund capital can be problematic, because PE fundraising is cyclical and characterized by high aggregate fund inflows during "boom phases" (Kaplan & Strömberg, 2009). As a result, targets will frequently be lost to competition, which can lead to unusually high amounts of unspent fund capital ("dry powder") and adverse incentives to engage in unfavorable deals or accept high prices (Arcot et al., 2015). Thus, in the case of B&B strategies, GPs with substantial amounts of dry powder are likely to give away more of the synergy potential from add-ons and accept a higher B&B premium.

H3 *The B&B price premium increases when PE sponsors have relatively higher amounts of "dry powder."*

The final determinant of relative bargaining power is expertise. Negotiation theory suggests that superior expertise allows for better informational sense making, which is associated with greater persuasiveness and greater ability to shape counterparty assumptions, beliefs, and choices favorably (e.g., Lewicki et al., 2010; Pfeffer, 1981). Ahlers et al. (2016) argue that experience is a necessary prerequisite for expertise, because it allows for learning through repeated reflection of negotiation outcomes. Mohite (2016) provides empirical support for this. He finds that premiums

received by target shareholders in M&A deals are positively related to the target's deal-making experience, suggesting that, as deal-making skills improve, a negotiating party can secure more benefits at the expense of the acquirer.

When experience is decisive for the negotiation outcome, PE firms may have an advantage, because they constantly acquire and sell portfolio companies. The resulting bargaining power asymmetry could be critical in the context of a buyout because of the complexity of negotiations, which typically involve various financial, tax, and legal issues (Cumming & Johan, 2009).

However, experienced buyout targets that have completed a substantial number of prior M&A deals themselves could mitigate informational disadvantages and counter GP's bargaining power (Ahlers et al., 2016). This may enable them to capture more of the synergistic value and enforce a higher price compared to a buyout target without similar M&A experience.

In addition, buyout targets with track records of prior acquisitions should be of particular attractiveness to a PE sponsor when engaging in a B&B strategy, as they can acquire and integrate add-ons faster and need less advice from the GP (Hammer et al., 2017). This, in turn, is important given the GP's holding period constraints (e.g., Cumming et al., 2005).

Experienced buyout targets may be aware of the value they bring to a B&B strategy and consequently demand a price premium. At the same time, GPs may be willing to accept a higher price if it comes at the advantage of quicker B&B execution and shorter holding periods. Overall, these arguments lead to our final hypothesis:

H4 *The B&B price premium increases if buyout targets have prior M&A experience at entry.*

4. Data

4.1 Sample Construction and Distribution

We follow prior literature on PE buyouts (e.g., Hammer et al., 2017; Rigamonti et al., 2016; Tykvová & Borell, 2012; Wang, 2012) and base our sample on Bureau van Dijk's (BvD) Zephyr database, which is known to have good coverage of private firm acquisitions (Erel et al., 2015). We select all institutional buyouts, PE-backed management buyouts, management buy-ins, and buy-in management buyouts completed between 1 January 1997 and 31 December 2010, where financing is labelled as "private equity" or "leveraged buyout." We exclude corporate acquisitions and VC deals that are mistakenly classified as late-stage buyouts, and deals that were announced but never completed. This leaves us with 9,548 global PE transactions.[8]

Next, we complement our data with the comprehensive add-on acquisitions sample of Hammer et al. (2017), which includes 4,937 acquisition events between 1997 and 2012 sourced from Zephyr, LexisNexis, and official company websites. The sample contains detailed information about timing and industrial classification of all add-ons. To construct a measure of entry valuation, we follow Arcot et al. (2015), and use EV/Sales multiples. We thus collect information about deal enterprise values from Zephyr and about portfolio firm sales figures in the year of the buyout from BvD's Orbis database. After excluding deals with missing deal values or accounting information, our final sample consists of 1,155 buyouts.[9]

Table 1 presents the sample distribution along various dimensions. Next to the overall sample distribution, and following our major hypotheses, we report distributions for the subsample of deals with at least one add-on in the portfolio firm's industry (industry restriction "IR") within a two-

[8] The sampling strategy is similar to Hammer et al. (2017), who present a detailed benchmarking of the representativeness of these 9,548 buyouts in comparison to the samples of Strömberg (2008) and Axelson et al. (2013).
[9] The sample is comparable in size to that of Arcot et al. (2015), who draw upon 1,373 entry EV/Sales multiples for a sample of U.S. and European buyouts between 1980 and 2010 from Capital IQ.

year window after the buyout (time restriction "TR") (*B&B [IR+TR]*), as well as for the subsample of deals without add-ons or with add-ons that occur outside of the portfolio firm's industry and/or later than two years after the buyout (*Non-B&B [IR+TR]*).

— Insert Table 1 about here —

Table 1, panel A, shows that the majority of the sample falls in the 2003-2007 period. The time series indicates a first rise of buyout activity until 2000, a slight drop thereafter, a second rise until 2007, and a subsequent drop during the global financial crisis. These trends mimic the overall development of the buyout market as reported by several other studies (e.g., Degeorge et al., 2016; Strömberg, 2008; Wilson et al., 2012). Deals in the *B&B [IR+TR]* and *Non-B&B [IR+TR]* subsamples exhibit relatively similar clustering of observations.

Table 1, panel B, reports the sample distribution across countries. We cover a total of forty countries and a broad range of geographies. Most observations originate from Europe, especially the U.K., because it is the most important non-U.S. buyout market and disclosure regulations require all private companies to submit annual financial reports (Wang, 2012). The distribution of observations across European countries is representative of the European buyout market and in line with other studies (e.g., Achleitner et al., 2011; Lopez-de-Silanes et al., 2015). Arguably, non-European deals seem underrepresented in our sample. We therefore address the sensitivity of our results to an exclusion of these deals in the robustness section. With respect to the cross-section of B&B, we observe relatively similar distributions for the *B&B [IR+TR]* and *Non-B&B [IR+TR]* subsamples.

Table 1, panel C, presents our coverage across industries. Overall, the sample is well distributed over all industries, with "business services," at 11.8%, representing the largest cluster of observations. The fact that most deals occur in "business services" is not surprising, because service

industries tend to be more fragmented (Brown et al., 2005). Fragmented industries are generally more attractive to PE firms (Kaplan & Strömberg, 2004). Thus, other PE studies have also reported a relatively high share of services deals (e.g., Bernstein et al., 2017). The *B&B [IR+TR]* subsample records somewhat more deals in "recreation" and in "restaurants, hotels, motels," and fewer deals in "retail." But, overall, there is no indication of any undue clustering.

4.2 Variables and Summary Statistics

In Table 2, we present definitions of the variables that we use in our regression models, including details on the variable constructions and sources. In the following, we discuss the rationale for choosing these variables, as well as the construction details and summary statistics.

— Insert Table 2 about here —

4.2.1 Dependent and Major Explanatory Variables

We use the EV/Sales multiples at entry, winsorized at the 1% level, as our major dependent variable. Relying on EV/Sales multiples, rather than on enterprise value to EBIT or EBITDA multiples, has the advantage that we do not lose observations when firms have negative profitability figures. We can therefore draw upon more observations in our regressions, which increases the efficiency of our estimates. Note, however, that our results are robust to using EV/EBITDA multiples (as discussed in section 5). Table 3 presents the summary statistics. The mean (median) EV/Sales multiple in our sample amounts to 1.96 (1.11).

— Insert Table 3 about here —

Our major explanatory variable is a B&B indicator with both industry ("IR") and time restrictions ("TR"). The indicator is equal to 1 if the portfolio firm conducts all add-on acquisitions within its industrial classification code using a version of Fama and French's scheme as depicted in Table 1, and the first add-on within a two-year time window after the buyout. We also construct

indicators where we sequentially relax the time and/or industry restrictions, i.e., *B&B [IR]*, *B&B [TR]*, and *B&B.*

As Table 3 shows, approximately 11% of buyouts acquire add-ons in the same industry within two years. This number increases to 15% (20%) when relaxing the time (industry) restriction. 28% of buyouts use any kind of add-on acquisition during the holding period, which is in line with Hammer et al. (2017), who report 26% for a global sample of 9,548 buyouts. Table 3 also presents the summary statistics for several control variables, which can be clustered into three groups: PE firm characteristics, portfolio firm and deal characteristics, as well as investment conditions.

4.2.2 PE Firm Characteristics

Previous literature highlights the importance of controlling for fund size as a determinant of buyout pricing. Cumming & Dai (2011) find that, if funds become unreasonably large, GPs may suffer from adverse monetary incentives[10] and diluted attention, which increases the probability of inflationary pricing (see also Humphery-Jenner, 2013). We therefore collect data on fund sizes from Thomson One, and include *LN (fund size)* as a control variable in the regressions. The average (median) fund in the sample has a volume of $1,550 million ($501 million), which compares to $938 million ($456 million) in Jenkinson & Sousa (2015), and $1,420 million ($700 million)[11] in Harris et al. (2014).

Experience is likely to be another important control variable at the PE firm level. Gompers (1996) documents the grandstanding phenomenon for young PE firms, which relates to incentives to quickly realize deals at the expense of lengthy negotiations and attractive prices. Young PE firms, moreover, tend to be inexperienced and lack reputation, which should coincide with a lack

[10] Adverse monetary incentives can arise if funds grow to levels where the fixed management fee creates sufficient financial remuneration so that GPs may be tempted to conduct riskier investments.
[11] Harris et al. (2014) report these numbers for the 2000s, which represent the vast majority of vintage years in our sample.

of negotiation skill and power (Achleitner et al., 2011). To account for these arguments, we construct an indicator variable, *Novice*, that is equal to 1 if PE firm age is less than six years at the time of the buyout.[12] Data about the foundation years of PE firms comes from Bloomberg Businessweek's private company database, Thomson One, and official PE firm websites.

We also control for relative investment pressure due to dry powder (unspent fund capital). Our indicator variable, *dry powder*, controls for these effects by comparing a fund's investment behavior to peers. We first complement our dataset with information about fund vintage years from Thomson One and cluster funds according to vintage year and size using three size segments. We then set the *dry powder* indicator to 1 if the total number of a fund's investments at buyout entry is less than 75% of the average number of investments of funds from the same cluster. The rationale is that funds of similar size class will have comparable capital endowments, and will, on average, target investments of similar size.[13] Thus, trailing behind the average number of realized investments of peers with similar vintage year and size will indicate unusually high amounts of unspent capital.

Finally, we follow previous literature (e.g., Arcot et al., 2015; Cressy et al., 2007; Scellato & Ughetto, 2013), and control for differing institutional backgrounds of PE firms. The indicator variable *affiliation* equals 1 if the PE sponsor is related to a bank, insurance company, pension fund, family office, governmental institution, or industrial corporation, and 0 otherwise. Affiliation with these institutions may imply that PE managers are pursuing goals aside from pure IRR maximization, e.g., stimulating regional private equity activity in case of affiliation with the

[12] The six-year definition ensures that the PE firm is still in the investment period of its first fund.

[13] Humphery-Jenner (2012) provides empirical and theoretical justifications for this assumption. He finds that large funds are significantly more likely to invest in large portfolio companies and vice versa. For example, the findings indicate that, when clustering funds according to size, only 1.16% of funds in the bottom 25% exhibit average investment sizes that range in the top 25% of deal values. The explanation for this rests on the notion that large funds can only use their competitive advantage when they invest in large firms, and they suffer from diseconomies of scale otherwise.

government (Cumming et al., 2017), or establishing lending relationships in case of affiliation with a bank (Fang et al., 2013). Thus, it is likely that PE managers of affiliated funds are less sensitive to pricing and more willing to accept higher entry valuations.

4.2.3 Portfolio Firm and Deal Characteristics

At the portfolio firm level, we control for M&A experience at entry. Hammer et al. (2017) find that B&B strategies are significantly more likely to occur if the portfolio company draws on a track record of prior acquisitions. Failing to control for such a track record may lead to an omitted variables bias if it is simultaneously correlated with entry pricing. This, in turn, may be the case because repetitive acquirers gain experience and improve deal-making skills, so that they frequently force their counterparty to accept higher prices (Mohite, 2016). We thus control for *LN (previous net acquisition experience)* in our regression models, where *previous net acquisition experience* indicates the portfolio firm's total number of acquisitions before the buyout, as in BvD Zephyr, net of all acquisitions from a previous buyout if there is one (we control for these acquisitions separately).

We also need to control for the size of the portfolio firm as an additional determinant of entry pricing. Achleitner et al. (2011) provide evidence that larger firms are associated with higher entry valuations. This is also consistent with the idea that larger firms obtain more leverage, which is positively correlated with buyout pricing (Axelson et al., 2013; Demiroglu & James, 2010). We therefore cluster portfolio firms according to their deal enterprise value, and we include dummy variables for *small cap, mid cap,* and *large cap* buyouts in all our regression models. As Table 3 indicates, and in line with prior literature (e.g., L'Her et al., 2016; Hammer et al., 2017; Phalippou, 2014), the vast majority of deals (86%) is from the small and mid-cap segment.

Furthermore, we include a control variable at the deal level that indicates *management participation*. The dummy variable is equal to 1 if the buyout is labelled as a management buyout

(MBO), buy-in (MBI), or buy-in management buyout (BIMBO) in BvD Zephyr. Controlling for management participation is important because of the "underpricing hypothesis" (Lowenstein, 1985; Kaplan, 1989), which suggests that managers have private information about the company and may thus be able to enforce lower prices.

We also control for syndicates, i.e., deals where several PE sponsors jointly acquire the portfolio firm, because previous literature suggests that this is important. For example, Officer et al. (2010) find that PE sponsors pay significant discounts when joining forces in public-to-private club deals.

A final set of control variables at the deal level comprises different entry channels. The respective dummy variables indicate whether the vendor is a publicly listed entity (*public-to-private*), a larger corporation spinning off a business unit (*divisional*), or another PE firm (*financial*). Following Hammer et al. (2017), we further distinguish between PE firms that did not rely on a B&B strategy in the previous buyout (*financial organic*), and those that did (*financial inorganic*).

Previous literature suggests that pricing could be contingent on these different entry routes. Achleitner & Figge (2014) argue that financial buyouts are overpriced because the selling PE sponsor will exercise market timing and negotiation skills. This may especially hold true in the presence of leftover value creation potential from B&B strategies that a subsequent PE owner can extract (Hammer et al., 2017). Officer (2007) reports price discounts for the acquisition of corporate subsidiaries due to liquidity constraints of the corporate parent. The findings of Renneboog et al. (2007) suggest it is important to control for public-to-private buyouts, as they may be motivated by undervaluations.

4.2.4 Investment Conditions

In terms of investment conditions, we control for the PE firm's competitive pressure at buyout entry. Gompers & Lerner (2000) provide evidence that competition for targets leads to increasing valuations and rising prices. To account for this, we first compute industry market shares for each country and entry year as well as their year-on-year variations. We then construct an indicator variable, *competitive pressure*, that equals 1 if the market share of the portfolio company's industry increased by more than 50% in the year before the buyout.

Finally, we control for financing conditions at buyout entry. Axelson et al. (2013) provide evidence that economywide credit conditions affect leverage in buyouts, and that acquirers pay higher prices when access to credit is easier (see also Cao, 2011). Achleitner et al. (2011) and Demiroglu & James (2010) find similar results. We therefore include the log of the option-adjusted *high yield spread* from BofA Merrill Lynch, measured on a monthly basis, as an additional control for our regression models.

5. Results

5.1 Baseline Results

In Table 4, we present univariate comparisons of mean and median entry EV/Sales multiples across different B&B definitions.

— Insert Table 4 about here —

Panel A of Table 4 documents that the mean (median) entry EV/Sales multiple for *B&B [IR + TR]* deals is 35% (38%) higher than for *Non-B&B [IR + TR]* deals. The difference is statistically significant at the 1% (5%) level. Panels B, C, and D of Table 4 show that the magnitude of the difference decreases when we relax either the industry *[IR]* and/or time restriction *[TR]*. Thus, the univariate results are consistent with our prediction in H1.

To formally address the relationship between B&B strategies and entry pricing in a multivariate setting, we specify the following two regression models:

$$Y_i = \alpha + \beta_1 \, x \, B\&B_i[IR + TR] + SPONSOR + IND + COUNTRY + YEAR + \epsilon_i, \quad (1)$$

$$Y_i = \alpha + \beta_1 \, x \, B\&B_i[IR + TR] + \beta_2 \, x \, \overrightarrow{CONTROLS_k} + IND + COUNTRY + YEAR + \epsilon_i, \quad (2)$$

where Y_i is the entry EV/Sales multiple of buyout *i* winsorized at the 1% level, and $B\&B_i[IR + TR]$ is an indicator variable equal to 1 if buyout *i* exhibits an add-on acquisition in the portfolio firm's industry within the first two years of the holding period, and 0 otherwise. $\overrightarrow{CONTROLS_k}$ is a vector of control variables as described in section 4.2.2, including various measures of PE firm, portfolio firm, and deal characteristics, as well as investment conditions. $SPONSOR$, IND, $COUNTRY$, and $YEAR$ represent PE sponsor, industry, country, and entry year fixed effects, respectively. We also present versions of these specifications where we sequentially replace $B\&B\ [IR + TR]$ with $B\&B\ [IR]$, $B\&B\ [TR]$, and $B\&B$.[14] Table 5 presents OLS estimates for our empirical models with standard errors clustered by world regions.

The results in columns (1) and (2)—strictest form of our buy-and-built definition—provide strong empirical support for H1. We find that coefficient estimates of the *B&B [IR+TR]* indicators are positive and statistically significant at the 1% level across both regression models. The magnitude of the estimated coefficients is also economically large, and indicates that entry EV/Sales multiples of *B&B [IR+TR]* deals exceed other PE multiples by 0.28 to 0.38 depending on the model specification. Using the predicted non-*B&B [IR+TR]* entry multiple as a benchmark, these estimates suggest a 15% to 20% B&B premium, respectively.

[14] We also test models where we include all B&B dummies at the same time but find that variance inflation factors exceed the critical values. Thus, there is evidence of multicollinearity in these models, which makes coefficient estimates unreliable.

Note that PE sponsor fixed effects in regression model (1) absorb all time-invariant PE firm characteristics. Thus, because these results are in line with regression model (2), there is no indication that unobserved factors at the PE firm level are driving our results. To account for the possibility that latent factors on other levels may bias our estimates, we address endogeneity concerns in more detail in the next section.

Columns (3) to (8) document that statistical and economic significance of the B&B coefficients reduce, or completely vanish, when relaxing the time and/or industry restrictions. This is consistent with our hypothesis that add-on acquisitions being realized outside the portfolio firm's industry and/or later than two years after the buyout have less priceable synergy potential.[15] In particular, statistical significance turns out to be less robust to the different model specifications, and coefficients are significant at the 5% level at best. Coefficient sizes drop by approximately 25% to 35% (40% to 65%) when relaxing the time (industry) restriction, and by approximately 60% to 100% when relaxing both restrictions, while all control variables are unaffected.

Note that coefficient estimates for our control variables are as expected. We detect a positive and statistically significant relationship between fund size and entry prices. The same holds true for the portfolio firm size indicators. Novice funds, and those with significant amounts of dry powder, tend to pay higher entry multiples, while deals with management participation are associated with lower entry valuations. There is also a positive and statistically significant relationship between financial, i.e., secondary/tertiary/quaternary, buyouts and entry multiples when the previous PE owner already initiated a B&B strategy.

[15] Note that results in columns (3) to (8) can be interpreted as a placebo test. If factors other than synergy potential were to systematically explain our results from the baseline regressions, we would expect that the observed premium is not sensitive to the degree of industry relatedness between the platform and its add-on and thus to relaxing the industry restriction for our explanatory variable.

Other coefficients are statistically insignificant, but the signs and magnitudes are consistent with the literature. The only exception is the positive coefficient on *syndicate*, which is in contrast to the finding in Officer et al. (2010). However, our sample is not limited to P2P buyouts, and thus it may not be directly comparable.

— Insert Table 5 about here —

5.2 Extensions and Endogeneity Tests

In this section, we carry out several additional analyses to test for the robustness of our baseline estimates regarding H1, our main hypothesis.

First, we use alternative model specifications, where we include various combinations of fixed effects following Acharya et al. (2018) and Goetz et al. (2013). The rationale here is to address the possibility of spurious results due to time-varying shocks to a country and/or industry, or unobserved time-invariant characteristics that pertain to an industry in a specific geographic context. Thus, we sequentially add country x industry FE, country x entry year FE, industry x entry year FE, and country x industry x entry year FE to both regression models (1) and (2). Table 6 depicts the results. Despite losing many degrees of freedom, statistical significance remains largely unaffected. The size of the *B&B [IR+TR]* coefficients is furthermore comparable to our previous estimates, and implies a 17%-25% B&B premium.

— Insert Table 6 about here —

Next, we use a counterfactual research design and a propensity score matching (PSM) estimator to address the concern that observable characteristics in the sample are jointly correlated with the implementation of a B&B strategy and the entry multiple. We model treatment assignment (here: the implementation of a B&B strategy) using a probit regression with the vector of control variables and fixed effects as in regression model (2). Conditional on these results, the PSM estimator then

imputes the missing potential outcome (here: the counterfactual entry multiple, i.e., the entry multiple had the portfolio firm not realized a B&B strategy) using similar observations, the so-called "nearest neighbors," that did not pursue a B&B strategy. The result is that, if any significant treatment effect is evident, it cannot be explained by the observable characteristics used in the treatment assignment model.

Table 7 presents the results of the PSM estimation. The matching diagnostics in panel A indicate that our treatment assignment model performs well in explaining cross-sectional variation in B&B probability before matching. Several variables significantly discriminate between the two levels of the *B&B [IR+TR]* indicator, including *novice, affiliated*, *financial inorganic, competitive pressure,* and *LN (high yield spread).* After matching, none of the coefficients on these variables is statistically significant. The model's McFadden Pseudo R^2 drops by roughly 50%, from 15.7% pre-match to 7.7% post-match, and p-values for the Wald test statistic increase from 0.0036 to 0.5297, respectively. Thus, diagnostics indicate that the covariates are sufficiently balanced after the matching, which is a necessary precondition for finding unconfounded nearest neighbors.

Next, in panel B, we present the average treatment effects on the treated (ATET)[16] using robust Abadie-Imbens standard errors and a varying number of matches per observation. We find that the estimated ATET is statistically significant at the 5% or 1% level, and the coefficients suggest that implementing a *B&B [IR+TR]* strategy is associated with a 0.58 to 0.85 greater EV/Sales multiple at entry. Using the average of the imputed counterfactual EV/Sales multiples as a benchmark, this corresponds to a 26% to 47% B&B premium. This is somewhat higher than in the baseline OLS regressions, but nevertheless in the range of the univariate mean difference (35%) as shown in Table 4.

[16] We focus on the ATET rather than on the average treatment effect (ATE), because it requires fewer identifying assumptions.

— Insert Table 7 about here —

In Table 8, we present ATET estimates for non-parametric nearest neighbor matching using alternative definitions of our major explanatory variable. The purpose is twofold. First, we want to explore the robustness of our matching estimates to using regression model (1), which includes PE sponsor fixed effects and uses the full sample of 1,155 observations.[17] Second, we want to investigate possible measurement errors of our major explanatory variable. We thus create versions of the *B&B [IR+TR]* indicator with alternative time and industry restrictions.

With respect to the time restriction ("TR"), we require the first add-on to be realized within twelve, eighteen, thirty, or thirty-six months after the buyout, rather than within twenty-four months as in the baseline definition. We also vary the industry restriction ("IR") for the add-on acquisitions using Fama & French's (FF) five, seventeen, thirty-eight, and forty-eight industry classification schemes. The latter is especially important because, when using industry classification codes to identify operating ties and synergy potential, there is a trade-off between comprehensiveness and precision.

For example, when using a rather aggregated scheme such as FF5, the portfolio firm's classification code will likely capture all industries that provide at least some degree of synergy potential. However, the result may also lack precision, because unrelated industries without synergy potential are also inevitably captured. A very detailed classification scheme such as FF48 leads to the opposite result, i.e., having a more precise measure of operating fit at the expense of not capturing less related firms with minor synergy potential.

[17] Note that this comes with using the non-parametric version of the matching estimator that identifies nearest neighbors on the basis of the Mahalanobis distance. For the previously used PSM estimator, we have estimation problems in STATA due to the large number of fixed effects in the probit model. Thus, as a side benefit, we can test for sensitivity to an alternative matching method. Following King et al. (2011), this is advisable, because PSM can at times degrade inferences. Reporting single matching solutions with PSM may thus be misleading.

Note that our baseline classification scheme lies in between these two extremes, and should therefore provide the best solution to this trade-off. However, we acknowledge that it is informative to also estimate the sensitivity of our results to these extreme cases, and to provide treatment effects for various combinations of time windows and industry classification schemes, as in Table 8.

Not surprisingly, we find that coefficient sizes vary depending on the combination of *IR* and *TR* that we apply, although it is noteworthy that all coefficients are in the range of our previously discussed coefficients for *B&B [IR+TR]*. The estimations furthermore confirm the positive and statistically significant relationship to buyout pricing, with significance being evident at (at least) the 10% level for all ATETs.

— Insert Table 8 about here —

The presented treatment effects from the matching estimators are consistent estimates for the B&B premium as long as correlation occurs on the basis of observable attributes. However, we could still have an endogeneity problem if unobserved factors are jointly correlated with *B&B [IR+TR]* and the entry EV/Sales multiple. Considering the typical platform company in a B&B strategy, management's "ability" may be a candidate for such an unobserved factor.

Smit (2001) describes platforms of B&B strategies as sizable market leaders with strong competitive advantages. Therefore, one may suspect these firms have achieved a relative competitive advantage because of their managerial talent, which may similarly enable them to achieve higher buyout prices when negotiating with PE bidders.

To ensure such self-selection does not bias our estimates, we utilize exogenous variations in the suitability of B&B strategies across markets and years. The idea is that B&B strategies are not equally attractive in all industries, country contexts, or years, because they depend on an industry's degree of fragmentation, competitive environment, and consolidation pressure (Hammer et al.,

2017; Smit, 2001). However, these factors are exogenous to both the portfolio firm and the PE sponsor, and thus the possibility of self-selection of firms with high ability managers to B&B strategies is restricted to target firms located in B&B-friendly markets.

To construct such a measure of B&B suitability, we first define local market indicators using the interaction of the buyout's entry year, target firm country, and target firm's industrial classification code. For each indicator, we then calculate the share of *B&B [IR + TR]* deals[18], and use the variable *local market B&B share* as an instrument in the first stage of an endogenous treatment regression model. We believe the instrument satisfies both the relevance and exclusion conditions. On the one hand, it is likely that B&B probability correlates with the B&B friendliness of the local market. On the other hand, there is no obvious reason why the distribution of aggregated B&B market shares should affect deal pricing, which is, in addition, more related to idiosyncratic factors at the deal or firm level (see discussion of control variables in section 3.2.2).

Note that the idea of our instrument is not new, and it has various applications in the literature. Ozmel & Guler (2015) use the availability of VCs in a venture's local geographic market as an instrumental variable to address the non-randomness of the match between VCs and their ventures. Brander et al. (2015) use local market averages of government-sponsored VC funding to instrument for backing from a government-sponsored VC firm. Bottazzi et al. (2008) use average local market business experience to instrument for a VC's business experience, while Hammer et al. (2017) apply a similar instrument in the PE context. Hellmann et al. (2008) use geographic and temporal market shares of bank VC firms to instrument for bank VC backing. Siming (2014) uses the number of financial advisors in a local market to instrument for a PE firm manager's previous employment with a financial advisor.

[18] Basis for the local market share calculations are all institutional buyouts between 1997 and 2010 in BvD Zephyr where deal financing is labelled as "leveraged buyout" or "private equity" (9,548 global buyouts).

Table 9 presents second stage OLS estimates using regression model (2) as the basis and treating *B&B [IR + TR]* as an endogenous variable. It also presents first stage probit estimates where we include our instrument *local market B&B share* as an additional explanatory variable to predict the probability of implementing a B&B strategy. The results of the first stage regression provide strong support for instrument validity both in terms of economic and statistical significance. Tests of instrument strength do not point to a weak instrument problem.[19]

The second stage regression shows that the *B&B [IR + TR]* indicator remains positive and highly statistically significant. The size of the *B&B [IR + TR]* coefficient is furthermore comparable to our baseline estimates. Note that the null of uncorrelated error terms between the first and second stage regressions cannot be rejected (p-value 0.4847), which indicates that our previous results are not subject to endogeneity.

— Insert Table 9 about here —

Endogenous treatment regressions are powerful econometric tools. However, their consistency depends on the non-testable exclusion restriction, so it is worth addressing some alternative explanations for our results in more detail (besides measurement error, which we have discussed previously). We investigate simultaneity and sample selection bias in Table 10 using two subsample regressions.

In the first regression, we exclude overpriced deals because relatively high entry valuations could incentivize PE managers to engage in B&B strategies for opportunistic reasons. That is, when PE managers overpay in the initial buyout, they may use add-on acquisitions, which are typically

[19] We are unaware of a formal weak instruments test in an endogenous treatment regression framework where the first stage is a non-linear probit model. So we run a 2SLS IV regression as an approximation, ignoring the binary nature of the B&B indicator (results are not reported here for brevity). The test statistics show that our model easily passes the critical values suggested by Stock & Yogo (2005), with a F-statistic of 514.76. Both the Durbin and the Wu-Hausman diagnostics indicate that the null hypothesis of exogeneity cannot be rejected.

smaller than the platform, less contested, and thus available at relatively lower prices, to bring down the average deal multiple (Achleitner et al., 2011). This would imply that our predicted relationship is reversed, so that high multiples lead to B&B strategies, rather than vice versa. From an empirical perspective, if the B&B premium can be explained by overpayment at entry, then any statistically significant effect should disappear once we exclude buyouts with comparatively high entry multiples. To implement this idea, we first compute average buyout entry multiples in the portfolio firm's industry within yearly clusters around the entry date.[20] We then exclude the upper thirtieth percentile of all observations, and re-estimate regression model (2) on the subsample of 409 buyouts. As it turns out, sign, size, and significance of the *B&B [IR + TR]* coefficient are similar to our baseline estimates.

In the second subsample regression, we exclude all non-European deals. These deals are underrepresented in our sample, so bias could arise from their selected (non-random) observability. As Table 9 shows, coefficient estimates of *B&B [IR + TR]* are robust in terms of sign and size. Statistical significance is reduced to the 10% level for the presented regression model, which includes control variables. However, when using regression model (1) with PE sponsor fixed effects, statistical significance remains evident at the 1% level (not depicted for brevity). We therefore conclude that neither reverse causality nor sample selection bias drives our main results.

— Insert Table 10 about here —

Finally, in Table 11, we explore the sensitivity of our results to alternative dependent variables. We re-estimate regression model (2) using the EV/EBITDA multiple as well as the log of the EV/EBITDA multiple as alternative dependent variables. Confirming our previous estimates, we

[20] The clusters are pre-dot-com (1997-1999), post-dot-com (2000-2002), pre-global financial crisis (2003-2006), and global financial crisis/post-global financial crisis (2007-2010).

detect a positive and statistically significant relationship between *B&B [IR + TR]* and deal pricing. The results suggest that deals with *B&B [IR + TR]* strategy pay, on average, a 15% premium, which is at the lower end of the estimated economic effects for the EV/Sales multiple. Note, however, that the EV/EBITDA regressions are based on a smaller sample, and are thus not directly comparable.

— Insert Table 11 about here —

5.3 Channels

In the hypothesis section, we discussed three economic channels that likely increase the size of the B&B premium: competitive pressure for targets (H2), relatively large amounts of unspent fund capital, also called "dry powder" (H3), and the M&A experience of the portfolio firm at entry of the PE sponsor (H4). To explore whether these predictions hold, we augment regression model (2) with three separate interaction terms *B&B [IR + TR]* x *Competitive pressure*, *B&B [IR + TR]* x *Dry powder*, and *B&B [IR + TR]* x *LN (Net acquisition experience)*.

Table 12 presents the results which support H2-H4. We find that the stand-alone coefficients of *B&B [IR+TR]* remain positive and statistically significant at the 5% level across all three regression models. This implies that deals with the *B&B [IR+TR]* strategy exhibit a price premium even when there is no competitive pressure, no dry powder, and when the portfolio firm does not have any M&A experience at entry. However, when these three factors come into play, they significantly add to the premium, and the magnitude of these effects is also sizable. For example, when funds have dry powder, they pay a 0.899 greater EV/Sales multiple, which adds 68pp to the 17% premium that B&B deals without dry powder already pay. Competitive pressure adds 53pp to a similar premium. Furthermore, when PE firms initiate B&B strategies with synergy potential, a 1% increase of the portfolio firm's prior M&A experience is associated with a 0.00553 greater EV/Sales multiple. For example, this means that a *B&B [IR+TR]* target with a history of two

completed M&A deals will be able to negotiate a 0.553 greater EV/Sales multiple compared to a *B&B [IR+TR]* target with experience from just a single acquisition. These results suggest that the three variables we use to proxy for asymmetries in bargaining power during buyout negotiations are indeed decisive for the B&B pricing premium at entry.

— Insert Table 12 about here —

6. Conclusion

In this paper, we challenge the common perception that PE funds do not incorporate synergetic value when bidding for companies, because the PE fund and the target company are not "merged" and thus there are no synergies to be leveraged for value creation. While this notion holds for many PE strategies focusing on different levers, B&B strategies built to some extend on creating synergetic value through the acquisition of a platform company, which is merged with portfolio companies in the same industry. Therefore, it seems plausible that PE funds planning to follow a B&B strategy with the purchase of a portfolio company, incorporate to some extend the expected synergies in their bid, because they compete with strategic investors.

Our paper is the first to show robust empirical evidence that PE funds are willing to pay a significant premium of up to about 50% when implementing a B&B strategy with synergy potential. The stastistical significance of the premium paid holds for a large spectrum of robustness checks, including alternative model specifications with various combinations of fixed effects, estimation of treatment effects based on PSM, and different proxies for the dependent variable. We also run a two-stage endogenous treatment regressions to address endogeneity concerns, check for potential sample selection bias, and reverse causality. In sum, we find that our main result of a sizable premium is not altered for any of the various robustness checks and different research designs.

Finally, we test for the influence of three key aspects (competition, time pressure, and expertise) of the negotiation process between the GPs of PE fund and the platform company's management on the B&B premium. We find, in line with theory, that all three aspects have a significant and sizable impact on the premium. In sum, we show that a fiercer competition for platform companies, higher investment pressure by the PE fund as measured by "dry powder," and greater M&A experience of the management of platform companies positively correlate with a higher premium.

These findings have important implications for the literature on strategic versus financial bidders as well as on bargaining power and contracting in buyouts. They highlight the importance to control for B&B strategies and details of the negotiation process when explaining or estimating buyout prices. Building on our results, future research could address the question whether PE firms potentially outbid strategic buyers in private auctions because of synergistic value generated from future add-on acquisitions. We also leave it to future research to investigate the pricing of add-on acquisitions. Following Masulis & Nahata (2011), one could suspect that acquisition prices of PE-backed platforms are lower due to a certification effect of the PE owner.

References

Acharya, V., Eisert, T., Eufinger, C., & Hirsch, C. (2018). Real effects of the sovereign debt crisis in Europe: Evidence from syndicated loans. *Review of Financial Studies, forthcoming*.

Acharya, V., Gottschalg, O., Hahn, M., & Kehoe, C. (2013). Corporate governance and value creation: Evidence from private equity. *Review of Financial Studies, 26(2),* 368-402.

Achleitner, A.-K., & Figge, C. (2014). Private equity lemons? Evidence on value creation in secondary buyouts. *European Financial Management, 20(2),* 406-433.

Achleitner, A.-K., Braun, R., & Engel, N. (2011). Value creation and pricing in buyouts: Empirical evidence from Europe and North America. *Review of Financial Economics, 20(4),* 146-161.

Ahern, K., Daminelli, D., & Fracassi, C. (2015). Lost in translation? The effect of cultural values on mergers around the world. *Journal of Financial Economics, 117(1),* 165-189.

Ahlers, O., Hack, A., Kellermanns, F., & Wright, M. (2016). Opening the black box: Power in buyout negotiations and the moderating role of private equity specialization. *Journal of Small Business Management 54(4),* 1171-1192.

Akdogu, E. (2011). Value-maximizing managers, value-increasing mergers, and overbidding. *Journal of Financial & Quantitative Analysis, 46(1),* 83-110.

Aktas, N., de Bodt, E., & Roll, R. (2010). Negotiations under the threat of an auction. *Journal of Financial Economics, 98(2),* 241-255.

Arcot, S., Fluck, Z., Gaspar, J., & Hege, U. (2015). Fund managers under pressure: Rationale and determinants of secondary buyouts. *Journal of Financial Economics, 115(1),* 102-135.

Argyres, N., & Liebeskind, J. (1999). Contractual commitments, bargaining power, and governance inseparability: Incorporating history into transaction cost theory. *Academy of Management Review, 24(1),* 49-63.

Axelson, U., Jenkinson, T., Strömberg, P., & Weisbach, M. (2013). Borrow cheap, buy high? The determinants of leverage and pricing in buyouts. *Journal of Finance, 68(6),* 2223-2267.

Axelson, U., Strömberg, P., & Weisbach, M. (2009). Why are buyouts levered? The financial structure of private equity funds. *Journal of Finance, 64(4),* 1549-1582.

Bacharach, S. B., & Lawler, E. J. (1980). *Power and politics in organizations: The social psychology of conflict, coalitions, and bargaining.* San Francisco: Jossey-Bass.

Bargeron, L., Schlingemann, F., Stulz, R., & Zutter, C. (2008). Why do private acquirers pay so little compared to public acquirers? *Journal of Financial Economics, 89(3),* 375-390.

Bernstein, S., Lerner, J., Sorensen, M., & Strömberg, P. (2017). Private equity and industry performance. *Management Science, 63(4),* 1198-1213.

Bottazzi, L., DaRin, M., & Hellmann, T. (2008). Who are the active investors? Evidence from venture capital. *Journal of Financial Economics, 89(3),* 488-512.

Boucly, Q., Sraer, D., & Thesmar, D. (2011). Growth LBOs. *Journal of Financial Economics, 102(2),* 432-453.

Bradley, M., Desai, A., & Kim, E. (1988). Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firms. *Journal of Financial Economics, 21(1),* 3-40.

Brander, J., Du, Q., & Hellmann, T. (2015). The effects of government-sponsored venture capital: International evidence. *Review of Finance, 19(2),* 571-618.

Brau, J., & Fawcett, S. (2006). Initial public offerings: An analysis of theory and practice. *Journal of Finance, 61(1),* 399-436.

Brown, K., Dittmar, A., & Servaes, H. (2005). Corporate governance, incentives, and industry consolidations. *Review of Financial Studies, 18(1),* 241-270.

Cao, J. (2011). IPO timing, buyout sponsors' exit strategies, and firm performance of RLBOs. *Journal of Financial & Quantitative Analysis, 46(4),* 1001-1024.

Cressy, R., Munari, F., & Malipiero, A. (2007). Playing to their strengths? Evidence that specialization in the private equity industry confers competitive advantage. *Journal of Corporate Finance, 13(4),* 647-669.

Cumming, D., & Dai, N. (2011). Fund size, limited attention and valuation of venture capital backed firms. *Journal of Empirical Finance, 18(1),* 2-15.

Cumming, D., & Johan, S. (2008). Preplanned exit strategies in venture capital. *European Economic Review, 52(7),* 1209-1241.

Cumming, D., & Johan, S. (2009). *Venture capital and private equity contracting: An international perspective.* Malden, MA: Academic Press.

Cumming, D., Fleming, G., & Suchard, J.-A. (2005). Venture capitalist value-added activities, fundraising and drawdowns. *Journal of Banking & Finance, 29(2),* 295-331.

Cumming, D., Grilli, L., & Murtinu, S. (2017). Governmental and independent venture capital investments in Europe: A firm-level performance analysis. *Journal of Corporate Finance, 42,* 439-459.

Cuny, C., & Talmor, E. (2007). A theory of private equity turnarounds. *Journal of Corporate Finance, 13*, 629-646.

Degeorge, F., Martin, J., & Phalippou, L. (2016). On secondary buyouts. *Journal of Financial Economics, 120(1)*, 124-145.

Demiroglu, C., & James, C. (2010). The role of private equity group reputation in LBO financing. *Journal of Financial Economics, 96(2)*, 306-330.

Devos, E., Kadapakkam, P.-R., & Krishnamurthy, S. (2009). How do mergers create value? A comparison of taxes, market power, and efficiency improvements as explanations for synergies. *Review of Financial Studies, 22(3)*, 1179-1211.

Dittmar, A., Li, D., & Nain, A. (2012). It pays to follow the leader: Acquiring targets picked by private equity. *Journal of Financial & Quantitative Analysis, 47(5)*, 901-931.

Erel, I., Jang, Y., & Weisbach, M. (2015). Do acquisitions relieve target firms' financial constraints? *Journal of Finance, 70(1)*, 289-328.

Fang, L., Ivashina, V., & Lerner, J. (2013). Combining banking with private equity investing. *Review of Financial Studies, 26(9)*, 2139-2173.

Fidrmuc, J., Roosenboom, P., Paap, R., & Teunissen, T. (2012). One size does not fit all: Selling firms to private equity versus strategic acquirers. *Journal of Corporate Finance, 18(4)*, 828-848.

Goetz, M., Laeven, L., & Levine, R. (2013). Identifying the valuation effects and agency costs of corporate diversification: Evidence from the geographic diversification of U.S. banks. *Review of Financial Studies, (26)7*, 1787-1823.

Gompers, P. (1996). Grandstanding in the venture capital industry. *Journal of Financial Economics, 42(1)*, 133-156.

Gompers, P., & Lerner, J. (2000). Money chasing deals? The impact of fund inflows on private equity valuation. *Journal of Financial Economics, 55(2)*, 281-325.

Gompers, P., Kaplan, S., & Mukharlyamov, V. (2016). What do private equity firms say they do? *Journal of Financial Economics, 121(3)*, 449-476.

Gorbenko, A., & Malenko, A. (2014). Strategic and financial bidders in takeover auctions. *Journal of Finance, 69(6)*, 2513-2555.

Greenhalgh, L., Neslin, S., & Gilkey, R. (1985). The effects of negotiator preferences, situational power, and negotiator personality on outcomes of business negotiations. *Academy of Management Journal, 28(1)*, 9-33.

Hammer, B., Knauer, A., Pflücke, M., & Schwetzler, B. (2017). Inorganic growth strategies and the evolution of the private equity business model. *Journal of Corporate Finance, 45(1),* 31-63.

Harris, R., Jenkinson, T., & Kaplan, S. (2014). Private equity performance: What do we know? *Journal of Finance, 69(5),* 1851-1882.

Healy, P., Palepu, K., & Ruback, R. (1992). Does corporate performance improve after mergers? *Journal of Financial Economics, 31(2),* 135-175.

Hellmann, T., Lindsey, L., & Puri, M. (2008). Building relationships early: Banks in venture capital. *Review of Financial Studies. 21(2),* 513-541.

Humphery-Jenner, M. (2012). Private equity fund size, investment size, and value creation. *Review of Finance, 16(3),* 799-835.

Humphery-Jenner, M. (2013). Diversification in private equity funds: On knowledge sharing, risk aversion, and limited attention. *Journal of Financial & Quantitative Analysis, 48(5),* 1545-1572.

Jenkinson, T., & Sousa, M. (2015). What determines the exit decision for leveraged buyouts? *Journal of Banking & Finance, 59,* 399-408.

Jensen, M., & Ruback, R. (1983). The market for corporate control: The scientific evidence. *Journal of Financial Economics, 11(1-4),* 5-50.

Kaplan, S. (1989). The effects of management buyouts on operating performance and value. *Journal of Financial Economics, 24(2),* 217-254.

Kaplan, S. N., & Strömberg, P. (2009). Levered buyouts and private equity. *Journal of Economic Perspectives, 23(1),* 121-146.

Kaplan, S., & Strömberg, P. (2004). Characteristics, contracts, and actions: Evidence from venture capitalist analyses. *Journal of Finance, 59(5),* 2177-2210.

Kim, E., & Singal, V. (1993). Mergers and market power: Evidence from the airline industry. *American Economic Review, 83(3),* 549-569.

King, G., Nielsen, R., Coberley, C., & Pope, J. (2011). Comparative effectiveness of matching methods for causal inference. *Working paper, Harvard University, Cambridge, MA.*

Lewicki, R. J., Saunders, D. M., & Barry, B. (2010). *Essentials of negotiation.* New York: McGraw Hill.

L'Her, J., Stoyanova, R., Shaw, K., Scott, W., & Lai, C. (2016). A bottom-up approach to the risk-adjusted performance of the buyout fund market. *Financial Analysts Journal, 72(4),* 36-48.

Ljungqvist, A., Richardson, M., & Wolfenzon, D. (2008). The investment behavior of buyout funds: Theory and evidence. *NBER Working Paper No. 14180*.

Lopez-de-Silanes, F., Phalippou, L., & Gottschalg, O. (2015). Giants at the gate: Investment returns and diseconomies of scale in private equity. *Journal of Financial & Quantitative Analysis, 50(3),* 377-411.

Lowenstein, L. (1985). Management buyouts. *Columbia Law Review, 85(4),* 730-784.

Lowry, M. (2003). Why does IPO volume fluctuate so much? *Journal of Financial Economics, 67(1),* 3-40.

Maksimovic, V., & Phillips, G. (2001). The market for corporate assets: Who engages in mergers and asset sales and are there efficiency gains? *Journal of Finance, 56(6),* 2019-2065.

Maquieira, C., Megginson, W., & Nail, L. (1998). Wealth creation versus wealth redistributions in pure stock-for-stock mergers. *Journal of Financial Economics, 48(1),* 3-33.

Masulis, R., & Nahata, R. (2011). Venture capital conflicts of interest: Evidence from acquisitions of venture-backed firms. *Journal of Financial & Quantitative Analysis, 46(2),* 395-430.

Mohite, I. (2016). The value of target's acquisition experience in M&A. *European Journal of Finance, 23(13),* 1238-1266.

Mukherjee, T., Kiymaz, H., & Baker, H. (2004). Merger motives and target valuation: A survey of evidence from CFOs. *Journal of Applied Corporate Finance, 14(2),* 7-24.

Nielsen, J., & Melicher, R. (1973). A financial analysis of acquisition and merger premiums. *Journal of Financial & Quantitative Analysis, 8(2),* 139-148.

Nikoskelainen, E., & Wright, M. (2007). The impact of corporate governance mechanisms on value increase in leveraged buyouts. *Journal of Corporate Finance, 13(4),* 511-537.

Officer, M. (2007). The price of corporate liquidity: Acquisition discounts for unlisted targets. *Journal of Financial Economics, 83(3),* 571-598.

Officer, M. S., Ozbas, O., & Sensoy, B. A. (2010). Club deals in leveraged buyouts. *Journal of Financial Economics, 98(2),* 214-240.

Ozmel, U., & Guler, I. (2015). Small fish, big fish: The performance effects of the relative standing in partners' affiliate portfolios. *Strategic Management Journal, 36(13),* 2039-2057.

Pfeffer, J. (1981). *Power in organizations.* Boston: Pitman.

Phalippou, L. (2014). Performance of buyout funds revisited? *Review of Finance, 18(1),* 189-218.

Pruitt, D. G., & Drews, J. L. (1969). The effect of time pressure, time elapsed, and the opponent's concession rate on behavior in negotiations. *Journal of Experimental Social Psychology, 5*, 43-60.

Renneboog, L., Simons, T., & Wright, M. (2007). Why do public firms go private in the UK? The impact of private equity investors, incentive realignment and undervaluation. *Journal of Corporate Finance, 13(4)*, 591-628.

Rigamonti, D., Cefis, E., Meoli, M., & Vismara, S. (2016). The effects of the specialization of private equity firms on their exit strategy. *Journal of Business Finance & Accounting, 43*, 1420-1443.

Sapienza, P. (2002). The effects of banking mergers on loan contracts. *Journal of Finance, 57(1)*, 329-367.

Scellato, G., & Ughetto, E. (2013). Real effects of private equity investments: Evidence from European buyouts. *Journal of Business Research, 66(12)*, 2642-2649.

Sheen, A. (2014). The real product market impact of mergers. *Journal of Finance, 69(6)*, 2651-2688.

Siming, L. (2014). Your former employees matter: Private equity firms and their financial advisors. *Review of Finance, 18(1)*, 109-146.

Smit, H. (2001). Acquisition strategies as option games. *Journal of Applied Corporate Finance 14(2)*, 79-89.

Smit, H., & Moraitis, T. (2010). Serial acquisition options. *Long Range Planning, 43(1)*, 85-103.

Stock, J., & Yogo, M. (2005). Testing for weak instruments in linear IV regression: Essays in honor of Thomas Rothenberg. In D. Andrews, & J. Stock, *Identification and inference for econometric models* (pp. 80-108). New York: Cambridge University Press.

Strömberg, P. (2008). The new demography of private equity. In A. Gurung, & J. Lerner, *The Globalization of Alternative Investments Working Papers Volume 1: The Global Economic Impact of Private Equity Report 2008* (pp. 3-26). World Economic Forum.

Tykvová, T., & Borell, M. (2012). Do private equity owners increase risk of financial distress and bankruptcy? *Journal of Corporate Finance, 18(1)*, 138-150.

Valkama, P., Maula, M., Nikoskelainen, E., & Wright, M. (2013). Drivers of holding period firm-level returns in private equity-backed buyouts. *Journal of Banking & Finance, 37(7)*, 2378-2391.

Varaiya, N. (1987). Determinants of premiums in acquisition transactions. *Managerial and Decision Economics, 8(3)*, 175-184.

Wang, Y. (2012). Secondary buyouts: Why buy and at what price? *Journal of Corporate Finance, 18(5)*, 1306-1325.

Weir, C., Laing, D., & Wright, M. (2005). Incentive effects, monitoring mechanisms and the market for corporate control: An analysis of the factors affecting public to private transactions in the UK. *Journal of Business Finance & Accounting, 32(5-6)*, 909-943.

Wilson, N., Wright, M., Siegel, D., & Scholes, L. (2012). Private equity portfolio company performance during the global recession. *Journal of Corporate Finance, 18(1)*, 193-205.

Wright, M., Hoskisson, R., & Busenitz, L. (2001). Firm rebirth: Buyouts as facilitators of strategic growth and entrepreneurship. *Academy of Management Executive, 15(1)*, 111-125.

Zhou, Y. (2011). Synergy, coordination costs, and diversification choices. *Strategic Management Journal, 32(6)*, 624-639.

Table 1: Sample Distribution

This table presents the sample distribution along various dimensions: Panel A across buyout entry years, panel B across countries of origin of the portfolio company, and panel C across industries.

Panel A: Distribution by entry year

	Total sample		B&B [IR+TR]		Non-B&B [IR+TR]	
Entry year	N	%	N	%	N	%
1997	17	1.5	2	1.6	15	1.5
1998	39	3.4	6	4.7	33	3.2
1999	63	5.5	4	3.1	59	5.7
2000	67	5.8	11	8.6	56	5.5
2001	64	5.5	5	3.9	59	5.7
2002	57	4.9	7	5.5	50	4.9
2003	98	8.5	7	5.5	91	8.9
2004	108	9.4	15	11.7	93	9.1
2005	69	6.0	9	7.0	60	5.8
2006	152	13.2	23	18.0	129	12.6
2007	180	15.6	16	12.5	164	16.0
2008	108	9.4	7	5.5	101	9.8
2009	61	5.3	6	4.7	55	5.4
2010	72	6.2	10	7.8	62	6.0
Total	1,155	100.0	128	100.0	1,027	100.0

Table 1: Sample Distribution—*continued*

Panel B: Distribution by country

	Total sample		B&B [IR+TR]		Non-B&B [IR+TR]	
Country	N	%	N	%	N	%
Austria	9	0.8	1	0.8	8	0.8
Australia	5	0.4	0	0.0	5	0.5
Belgium	23	2.0	2	1.6	21	2.0
Bulgaria	4	0.3	1	0.8	3	0.3
Canada	8	0.7	0	0.0	8	0.8
China	2	0.2	0	0.0	2	0.2
Czech Republic	10	0.9	1	0.8	9	0.9
Germany	50	4.3	6	4.7	44	4.3
Denmark	2	0.2	0	0.0	2	0.2
Estonia	2	0.2	1	0.8	1	0.1
Egypt	3	0.3	0	0.0	3	0.3
Spain	55	4.8	7	5.5	48	4.7
Finland	8	0.7	1	0.8	7	0.7
France	172	14.9	18	14.1	154	15.0
United Kingdom	562	48.7	70	54.7	492	47.9
Israel	5	0.4	0	0.0	5	0.5
India	4	0.3	0	0.0	4	0.4
Italy	53	4.6	5	3.9	48	4.7
Japan	7	0.6	0	0.0	7	0.7
Korea, Republic Of	3	0.3	0	0.0	3	0.3
Lithuania	6	0.5	0	0.0	6	0.6
Luxembourg	2	0.2	0	0.0	2	0.2
Malaysia	3	0.3	0	0.0	3	0.3
Netherlands	24	2.1	3	2.3	21	2.0
Norway	12	1.0	1	0.8	11	1.1
Poland	8	0.7	0	0.0	8	0.8
Portugal	5	0.4	0	0.0	5	0.5
Romania	9	0.8	0	0.0	9	0.9
Sweden	41	3.5	6	4.7	35	3.4
Thailand	2	0.2	0	0.0	2	0.2
United States	47	4.1	5	3.9	42	4.1
Rest of world	9	0.8	0	0.0	9	0.9
Total	1,155	100.0	128	100.0	1,027	100.0

Table 1: Sample Distribution—*continued*

Panel C: Distribution by industry

	Total sample		B&B [IR+TR]		Non-B&B [IR+TR]	
Industry	N	%	N	%	N	%
Food Products	41	3.5	8	6.3	33	3.2
Beer & Liquor	8	0.7	1	0.8	7	0.7
Recreation	41	3.5	13	10.2	28	2.7
Printing and Publishing	39	3.4	3	2.3	36	3.5
Consumer Goods	34	2.9	1	0.8	33	3.2
Apparel	11	1.0	0	0.0	11	1.1
Healthcare, Medical Equipment, Pharmaceutical Prod.	48	4.2	4	3.1	44	4.3
Chemicals	22	1.9	4	3.1	18	1.8
Textiles	10	0.9	0	0.0	10	1.0
Construction and Construction Materials	89	7.7	5	3.9	84	8.2
Steel Works etc.	14	1.2	1	0.8	13	1.3
Fabricated Products and Machinery	38	3.3	1	0.8	37	3.6
Electrical Equipment	20	1.7	1	0.8	19	1.9
Automobiles and Trucks	18	1.6	0	0.0	18	1.8
Aircraft, ships, and railroad equipment	8	0.7	1	0.8	7	0.7
Mining, Oil & Gas Extraction, Nonmetallic Minerals	8	0.7	1	0.8	7	0.7
Utilities	16	1.4	1	0.8	15	1.5
Communication	52	4.5	8	6.3	44	4.3
Business Equipment	46	4.0	3	2.3	43	4.2
Business Supplies and Shipping Containers	25	2.2	1	0.8	24	2.3
Transportation	52	4.5	10	7.8	42	4.1
Wholesale	67	5.8	7	5.5	60	5.8
Retail	99	8.6	2	1.6	97	9.4
Restaurants, Hotels, Motels	36	3.1	10	7.8	26	2.5
Banking, Insurance, Real Estate, Trading	37	3.2	6	4.7	31	3.0
Personal Services	50	4.3	9	7.0	41	4.0
Business Services	136	11.8	18	14.1	118	11.5
Computer Software	60	5.2	6	4.7	54	5.3
Everything Else	30	2.6	3	2.3	27	2.6
Total	1,155	100.0	128	100.0	1,027	100.0

Table 2: Variable Definitions

This table describes the construction and sources of the dependent and independent variables used in this paper.

Category	Variable	Description
Entry pricing	EV/Sales	Disclosed deal enterprise value divided by sales in the year of the buyout. Sources: BvD Zephyr; BvD Orbis
	EV/EBITDA	Disclosed deal enterprise value divided by EBITDA in the year of the buyout. Sources: BvD Zephyr; BvD Orbis
	LN(EV/EBITDA)	Natural logarithm of the disclosed deal enterprise value divided by EBITDA in the year of the buyout. Sources: BvD Zephyr; BvD Orbis
B&B	B&B [IR+TR]	Indicator variable that equals 1 if the portfolio firm conducts all add-on acquisitions within the same Fama & French industry classification code and the first add-on acquisition within two years after the buyout entry date, and 0 otherwise. Source: BvD Zephyr
	B&B [IR]	Indicator variable that equals 1 if the portfolio firm performs all add-on acquisitions within the same Fama & French industry classification code and 0 otherwise. Source: BvD Zephyr
	B&B [TR]	Indicator variable that equals 1 if the portfolio firm conducts the first add-on acquisition within two years after the buyout entry date, and 0 otherwise. Source: BvD Zephyr
	B&B	Indicator variable that equals 1 if the portfolio firm conducts at least one add-on acquisition, and 0 otherwise. Source: BvD Zephyr
PE firm characteristics	LN (fund size)	Natural logarithm of fund volume (USD million) of the sponsoring PE firm. The variable is averaged in case of a syndicate. Source: Thomson One
	Novice	Indicator variable that equals 1 if PE firm age is less than six years at the time of the buyout, and 0 otherwise. Sources: Bloomberg, Thomson One, PE firm websites
	Dry powder	Indicator variable that equals 1 if, at buyout entry, a PE fund completed less than 75% of the number of deals that PE funds of similar size and vintage year (based on three size clusters) have completed since fund inception, and 0 otherwise. Sources: BvD Zephyr, Thomson One
	Affiliated	Indicator variable that equals 1 if the PE firm is affiliated with a bank, insurance company, pension fund, family office, governmental institution, or any other financial or non-financial corporation, and 0 otherwise. Sources: Bloomberg, Thomson One
Portfolio firm and buyout characteristics	LN (prev. net acq. exp.)	Natural logarithm of 1 plus the number of acquisitions made by the portfolio firm prior to the buyout. For financial buyouts, this variable is net of the add-on acquisitions from the previous buyout. Source: BvD Zephyr
	Small-cap	Indicator variable that equals 1 if the disclosed deal enterprise value is less than 25 million USD and 0 otherwise. Source: BvD Zephyr
	Mid-cap	Indicator variable that equals 1 if the disclosed deal enterprise value is equal to or larger than 25 million USD or less than 600 million USD, and 0 otherwise. Source: BvD Zephyr
	Large-cap	Indicator variable that equals 1 if the disclosed deal enterprise value is equal to or larger than 600 million USD, and 0 otherwise. Source: BvD Zephyr
	Management participation	Indicator variable that equals 1 if the buyout is labelled as “management buyout,” “management buy-in,” or “buy-in management buyout” in Zephyr. Note: Deals with management participation are only included if a PE investor is involved, i.e., pure management buyouts without PE involvement are excluded. Source: BvD Zephyr

Table 2: Variable Definitions—*continued*

Panel B: Independent variables

Category	Variable	Description
	Syndicate	Indicator variable that equals 1 if more than one PE sponsor backs the portfolio firm, and 0 otherwise. Source: BvD Zephyr
	Public-to-private	Indicator variable that equals 1 if the portfolio firm's vendor at entry is a publicly listed entity, and 0 otherwise. Source: BvD Zephyr
	Divisional	Indicator variable that equals 1 if the portfolio firm has been a corporate division or subsidiary before the buyout event, and 0 otherwise. Source: BvD Zephyr
	Financial organic	Indicator variable that equals 1 if the portfolio firm's vendor at entry is another PE firm and if the portfolio company did not conduct add-on acquisitions in the previous buyout, and 0 otherwise. Source: BvD Zephyr
	Financial inorganic	Indicator variable that equals 1 if the portfolio firm's vendor at entry is another PE firm and if the portfolio company conducted at least one add-on acquisition in the previous buyout, and 0 otherwise. Source: BvD Zephyr
Investment conditions	Competitive pressure	Indicator variable that equals 1 if the PE market share of the portfolio firm's industry in a respective country increased by more than 50% in the year before the buyout, and 0 otherwise. Source: BvD Zephyr
	LN (high-yield spread)	Natural logarithm of the BofA Merrill Lynch option-adjusted high-yield spread at buyout entry on a monthly basis. Source: BofA Merrill Lynch Global Research

Table 3: Summary statistics

This table gives summary statistics for the dependent and independent variables used in this paper.

	N	Mean	S.D.	Q1	Median	Q3
EV/Sales	1,155	1.96	2.46	0.57	1.11	2.34
EV/EBITDA	858	9.93	6.73	5.26	7.96	12.95
B&B [IR+TR]	1,155	0.11	0.31	0.00	0.00	0.00
B&B [IR]	1,155	0.15	0.36	0.00	0.00	0.00
B&B [TR]	1,155	0.20	0.40	0.00	0.00	0.00
B&B	1,155	0.28	0.45	0.00	0.00	1.00
Fund size (USD million)	686	1550.47	3184.01	177.05	501.83	1484.74
Novice	1,005	0.16	0.37	0.00	0.00	0.00
Dry powder	1,155	0.03	0.18	0.00	0.00	0.00
Affiliated	1,084	0.28	0.45	0.00	0.00	1.00
Previous net acquisition experience (# of acq.)	1,155	2.20	7.88	1.00	1.00	1.00
Small-cap	1,155	0.25	0.44	0.00	0.00	1.00
Mid-cap	1,155	0.61	0.49	0.00	1.00	1.00
Large-cap	1,155	0.13	0.34	0.00	0.00	0.00
Management participation	1,155	0.26	0.44	0.00	0.00	1.00
Syndicate	1,153	0.18	0.38	0.00	0.00	0.00
Public-to-private	1,155	0.14	0.34	0.00	0.00	0.00
Divisional	1,155	0.29	0.45	0.00	0.00	1.00
Financial organic	1,155	0.17	0.37	0.00	0.00	0.00
Financial inorganic	1,155	0.08	0.27	0.00	0.00	0.00
Competitive pressure	1,155	0.08	0.28	0.00	0.00	0.00
High-yield spread (bps)	1,138	559.96	278.90	333.80	485.00	719.95

Table 4: Univariate Difference Tests

This table presents univariate comparisons of means and medians of the EV/Sales multiple for different B&B definitions. In panel A, we base our B&B definition on a time (first add-on within two years of entry) and industry restriction (all add-ons have the same industry classification code as the platform). In panel B, we only keep the industry restriction [IR]. In panel C, we only keep the time restriction [TR]. In panel D, we relax both restrictions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Time and industry restrictions

	B&B [IR + TR]	Non-B&B [IR + TR]	Diff.
Mean	2.53	1.88	0.65***
Median	1.48	1.07	0.41**
N	128	1,027	1,155

Panel B: Industry restriction

	B&B [IR]	Non-B&B [IR]	Diff.
Mean	2.36	1.88	0.48***
Median	1.38	1.07	0.31**
N	179	976	1,155

Panel C: Time restriction

	B&B [TR]	Non-B&B [TR]	Diff.
Mean	2.27	1.88	0.39**
Median	1.35	1.06	0.29***
N	229	926	1,155

Panel D: No restriction

	B&B	Non-B&B	Diff.
Mean	2.15	1.88	0.26*
Median	1.27	1.06	0.21**
N	327	828	1,155

Table 5: Multivariate Baseline Results

This table presents OLS regressions where the dependent variable is the entry EV/Sales multiple winsorized at the 1% level. All variables are defined in Table 2. Omitted categories are private-to-private for the entry channels, and small-cap for the portfolio firm size measures. The constant is included. Standard errors are clustered by world regions and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: EV/Sales							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
B&B [IR + TR]	0.280***	0.383***						
	(0.02)	(0.10)						
B&B [IR]			0.208	0.242**				
			(0.11)	(0.08)				
B&B [TR]					0.168**	0.131		
					(0.06)	(0.14)		
B&B							0.108**	-0.045
							(0.04)	(0.20)
LN (fund size)		0.119***		0.123***		0.121***		0.122***
		(0.03)		(0.03)		(0.03)		(0.03)
Novice		0.534**		0.541**		0.547**		0.558**
		(0.18)		(0.19)		(0.18)		(0.20)
Dry powder		0.557*		0.563*		0.559*		0.535**
		(0.28)		(0.25)		(0.26)		(0.21)
Affiliated		0.296		0.309		0.313		0.320
		(0.26)		(0.26)		(0.26)		(0.25)
LN (prev. net acq. exp.)		0.570		0.573		0.572		0.578
		(0.48)		(0.48)		(0.47)		(0.49)
Mid cap		0.900***		0.897***		0.915***		0.924***
		(0.14)		(0.15)		(0.16)		(0.18)
Large cap		1.330***		1.321***		1.359***		1.363***
		(0.37)		(0.36)		(0.35)		(0.34)
Management participation		-0.247*		-0.245*		-0.247*		-0.252*
		(0.12)		(0.12)		(0.12)		(0.13)
Syndicate		0.201		0.212		0.201		0.204
		(0.21)		(0.21)		(0.21)		(0.22)
Public-to-private		-0.413		-0.411		-0.425		-0.429
		(0.25)		(0.26)		(0.25)		(0.27)
Divisional		-0.003		-0.004		-0.007		-0.003
		(0.15)		(0.15)		(0.15)		(0.15)
Financial organic		0.173		0.172		0.165		0.144
		(0.17)		(0.17)		(0.17)		(0.22)
Financial inorganic		0.189*		0.194**		0.219**		0.289***
		(0.08)		(0.06)		(0.08)		(0.08)
Competitive pressure		0.452		0.429		0.432		0.422
		(0.25)		(0.24)		(0.25)		(0.24)
LN (High-yield spread)		-0.139		-0.140		-0.142		-0.179
		(0.20)		(0.21)		(0.20)		(0.25)
Sponsor FE	Yes	No	Yes	No	Yes	No	Yes	No
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entry year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,155	629	1,155	629	1,155	629	1,155	629

Table 6: Alternative Model Specifications

This table presents OLS regressions where the dependent variable is the entry EV/Sales multiple winsorized at the 1% level. Specifications where controls are included use the set of control variables as in regression model (2). The constant is included. Standard errors are clustered by world regions and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: EV/Sales							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
B&B [IR + TR]	0.347***	0.352***	0.456***	0.367*	0.462***	0.491**	0.446**	0.329***
	(0.07)	(0.08)	(0.11)	(0.17)	(0.11)	(0.17)	(0.13)	(0.09)
Controls included	No	No	No	No	Yes	Yes	Yes	Yes
Sponsor FE	Yes	Yes	Yes	Yes	No	No	No	No
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entry year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Entry year FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Industry x Entry year FE	No	No	Yes	Yes	No	No	Yes	Yes
Country x Industry x Entry year FE	No	No	No	Yes	No	No	No	Yes
N	1,155	1,155	1,155	1,155	629	629	629	629

Table 7: Matching Diagnostics and Estimators

This table presents probit regressions on the unmatched and matched sample in panel A, as well as the average treatment effect on the treated (ATET) for propensity score matching (PSM) estimators in panel B with varying numbers of nearest neighbors (NN). In panel A, the dependent variable is the B&B [IR + TR] indicator. Omitted categories are private-to-private for the entry channels and small-cap for the portfolio firm size measures. The constant is included. Robust standard errors are reported in parentheses. In panel B, the dependent variable is the EV/Sales multiple winsorized at the 1% level. Robust Abadie-Imbens standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Matching diagnostics

	Dependent variable: B&B [IR + TR]	
	Before matching	After matching
LN (fund size)	0.062	-0.009
	(0.07)	(0.09)
Novice	0.443**	0.018
	(0.18)	(0.22)
Dry powder	-0.126	-0.527
	(0.33)	(0.38)
Affiliated	0.319*	0.108
	(0.17)	(0.22)
LN (prev. net acq. exp.)	0.121	-0.019
	(0.13)	(0.17)
Mid cap	0.240	0.092
	(0.23)	(0.26)
Large cap	0.172	-0.081
	(0.37)	(0.41)
Management participation	0.005	-0.337
	(0.19)	(0.24)
Syndicate	0.032	-0.029
	(0.19)	(0.24)
Public-to-private	-0.219	-0.098
	(0.29)	(0.33)
Division	0.044	0.107
	(0.17)	(0.22)
Financial organic	-0.257	0.148
	(0.24)	(0.26)
Financial inorganic	0.888***	0.119
	(0.24)	(0.28)
Competitive pressure	-0.589**	-0.299
	(0.28)	(0.32)
LN (High-yield spread)	-0.617*	-0.328
	(0.36)	(0.41)
Country FE	Yes	Yes
Industry FE	Yes	Yes
Entry year FE	Yes	Yes
N	629	629

Table 7: Matching Diagnostics and Estimators—*continued*

Panel B: Treatment effects

	Dependent Variable: EV/Sales
ATET with NN = 1	0.852**
	(0.35)
ATET with NN = 2	0.793**
	(0.31)
ATET with NN = 3	0.839***
	(0.32)
ATET with NN = 4	0.744**
	(0.31)
ATET with NN = 5	0.758**
	(0.30)
ATET with NN = 10	0.707**
	(0.30)
ATET with NN = 15	0.633**
	(0.30)
ATET with NN = 25	0.582**
	(0.29)

Table 8: Alternative Industry and Time Restrictions

This table presents estimates of the average treatment effect on the treated (ATET) from nearest neighbor matching using varying time [TR] and industry restrictions [IR] for the B&B [IR + TR] indicator. The outcome variable is the EV/Sales multiple winsorized at the 1% level. Baseline IR requires the first add-on acquisition to have the same industry classification code as the platform company, according to the classification scheme in Table 1. Baseline TR requires the first add-on acquisition to be executed within twenty-four months after entry of the PE sponsor. Versions of these restrictions are presented using Fama & French's five, seventeen, thirty-eight, and forty-eight classification schemes, as well as with twelve-, eighteen-, thirty-, and thirty-six-month time windows. Nearest neighbors are determined on the basis of the Mahalanobis distance using the covariate set from regression model (1). All estimations draw upon the full sample of 1,155 observations, and impute potential outcome means using ten matches per observation. Bias-corrected Abadie-Imbens standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

		Varying industry restrictions [IR]				
		FF5	FF17	Baseline	FF38	FF48
Varying time restriction [TR]	36 months	0.453*	0.598**	0.704**	0.549*	0.659**
		(0.26)	(0.28)	(0.31)	(0.29)	(0.31)
	30 months	0.443*	0.588**	0.692**	0.546*	0.650**
		(0.27)	(0.28)	(0.31)	(0.29)	(0.31)
	Baseline	0.549*	0.645**	0.785**	0.653**	0.752**
		(0.29)	(0.30)	(0.34)	(0.31)	(0.33)
	18 months	0.456*	0.518*	0.559*	0.521*	0.535*
		(0.27)	(0.27)	(0.31)	(0.29)	(0.30)
	12 months	0.760**	0.792**	0.852**	0.808**	0.805**
		(0.33)	(0.33)	(0.39)	(0.35)	(0.38)

Table 9: Endogenous Treatment Regression

This table gives estimates of a linear regression with endogenous treatment. In this first stage, we run a probit regression on the *B&B [IR + TR]* indicator, where we include *local market B&B share* as an instrument. The second stage is an OLS regression on the EV/Sales multiple winsorized at the 1% level. Controls are as specified in regression model (2). The constant is included. Standard errors are clustered by world regions and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable 1st stage: B&B [IR + TR]	Dependent variable 2nd stage EV/Sales
Local market B&B share	8.075***	
	(0.15)	
B&B [IR + TR]		0.344***
		(0.04)
Rho		0.023
		(0.03)
Controls	Yes	Yes
Country FE	Yes	Yes
Industry FE	Yes	Yes
Entry year FE	Yes	Yes
N	629	629

Table 10: Subsample Regressions

This table gives OLS regressions on subsamples where we subsequently exclude overpriced and non-European deals. The dependent variable is the EV/Sales multiple winsorized at the 1% level. Controls are as specified in regression model (2). The constant is included. Standard errors are clustered by world regions and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: EV/Sales	
	No overpriced deals	No non-European deals
B&B [IR + TR]	0.300***	0.318*
	(0.04)	(0.08)
Controls included	Yes	Yes
Country FE	Yes	Yes
Industry FE	Yes	Yes
Entry year FE	Yes	Yes
N	409	587

Table 11: Alternative Dependent Variables

This table presents OLS regressions on the entry EV/EBITDA multiple winsorized at the 1% level and on the log of the entry EV/EBITDA multiple. Controls are as specified in regression model (2). The constant is included. Standard errors are clustered by world regions and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	EV/EBITDA	LN(EV/EBITDA)
B&B [IR + TR]	0.951**	0.153***
	(0.36)	(0.39)
Controls included	Yes	Yes
Country FE	Yes	Yes
Industry FE	Yes	Yes
Entry year FE	Yes	Yes
N	477	477

Table 12: Interaction Effects

This table shows OLS regressions using various interaction terms. The dependent variable is the EV/Sales multiple winsorized at the 1% level. Controls are as specified in regression model (2). The constant is included. Standard errors are clustered by world regions and reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: EV/Sales		
	(1)	(2)	(4)
B&B [IR + TR]	0.344**	0.344**	0.174**
	(0.11)	(0.13)	(0.06)
x Competitive pressure	0.638**		
	(0.26)		
x Dry powder		0.899**	
		(0.26)	
x LN (Net acquisition experience)			0.553***
			(0.12)
Interacted variable stand-alone	Yes	Yes	Yes
Other controls	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Entry year FE	Yes	Yes	Yes
N	629	629	629