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# How does acquisition experience create value? Evidence from a regulatory change affecting the information environment

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## ABSTRACT

We argue that acquisition experience translates more readily into learning to select than into learning to restructure. The acquisition selection stage is less causally ambiguous than the subsequent restructuring stage—because its web of activities is less complex and its outcome less delayed—and causal ambiguity undermines learning from experience. Therefore, we hypothesize that more-experienced acquirers will perform particularly well when the information environment is less transparent and thus the ability to select targets (versus to restructure them) is more important. Relying on a unique database of 1388 acquisitions realized by private equity firms in the United States between 1975 and 2005, and exploiting a regulatory change affecting the information environment faced by acquirers when selecting their targets, we find results largely consistent with our theory.

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## 1. Introduction

The goal of understanding how accumulated acquisition experience affects future acquisition performance has taken center stage in the discourse between organizational and strategy scholars. A considerable literature has pointed out that learning from acquisition experience is quite difficult; acquisitions are complex strategic decisions prone to causal ambiguity—which undermines learning from experience, because it obscures the causal link between how a certain acquisition was conducted and its final outcome (Heimeriks, Duysters, & Vanhaverbeke, 2007; March & Olsen, 1975; Mosakowski, 1997; Zollo, 2009).

However, past research has generally neglected that acquisitions are decisions composed of multiple stages and that these stages might differ in their level of causal ambiguity, such that past acquisition experience might translate into learning to perform some stages more than others. In particular, based on extant literature, we may separate the acquisition process into at least two distinct stages (Barkema & Schijven, 2008b; Puranam, Powell, & Singh, 2006), each of which contributes to final financial performance. The first is the selection stage, during which an acquiring

firm strives to reduce information asymmetry between itself and a potential target so that it can more accurately assess the target firm's value (Capron & Shen, 2007; Puranam et al., 2006). The second is the restructuring stage, during which an acquiring firm endeavors to build up an acquisition's actual value using corporate restructuring (Barkema & Schijven, 2008b; Heimeriks, Schijven, & Gates, 2012).

We argue that acquisition experience mainly teaches firms to select targets rather than to restructure them, since causal ambiguity will be higher during the restructuring stage than during the selection stage. This will be true for at least two reasons. First, the restructuring stage will be relatively more complex because it includes more activities and those activities are more interrelated (King, 2007). Second, after the restructuring stage ends, feedback about its outcome will be more delayed (King, 2007) than feedback from the selection stage. Experiential learning suffers when causal ambiguity increases (March & Olsen, 1975; Mulotte, Dussauge, & Mitchell, 2013). Thus, we can expect that firms engaging in acquisitions are likely to learn more about how to properly execute the selection stage (where causal ambiguity is lower) than about how to properly implement the restructuring stage (where causal ambiguity is higher). If this is true, we should observe that firms with a longer history of acquisitions perform particularly well in cases where the external environment in which the target is evaluated is “opaque” and thus the ability to select (versus the ability to restructure) becomes more crucial.

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We apply our conceptual arguments to a context that is well suited to testing our theory: acquisitions—also called buyouts—performed by private equity (PE) firms (Castellaneta & Zollo, 2015). Different from acquisitions realized by strategic acquirers—whose performance is typically difficult to assess because acquired firms are not left (and resold) as separate entities—acquisitions realized by PE firms offer a relatively clean measure of overall performance using the internal rate of return (IRR). Drawing on a private database of 1388 buyouts realized in the United States between 1975 and 2005, and exploiting an arguably exogenous regulatory shock influencing the transparency of the information environment, we find results largely consistent with the notion that acquisition experience enhances performance when an acquirer's capacity to select target companies is more relevant.

## 2. Theory background and hypotheses

### 2.1. *Experiential learning to select versus add value*

Previous studies have consistently theorized and shown that performance increases as organizations gain production experience in operational settings, a phenomenon known as the “experience curve effect” (Andress, 1954; Hirschmann, 1964; Wright, 1936). This relationship has been documented in production settings for aircraft (Benkard, 2000), ships (Rapping, 1965), trucks (Argote & Epple, 1990), and semiconductors (Hatch & Mowery, 1998), among others. However, findings about learning from experience in strategic contexts have been decidedly less consistent (see Barkema & Schijven, 2008a). In particular, studies about acquisitions found positive relationships between experience and performance (Barkema, Bell, & Pennings, 1996; Bruton, Oviatt, & White, 1994; Fowler & Schmidt, 1989), while others reported finding the relationship to be non-significant (Hayward, 2002; Wright, Kroll, Lado, & Van Ness, 2002; Zollo & Singh, 2004) or U-shaped (Haleblian & Finkelstein, 1999; Porrini, 2004).

To explain why experience might have a different impact on performance in operational and strategic contexts, previous research has pointed to differences in causal ambiguity. Causal ambiguity refers to the difficulty of determining the exact causal relationship between a certain task (or decision) and its outcome (Mosakowski, 1997). Quite simply, if a task is causally ambiguous—and so it is difficult to understand the link between how the task is executed and its outcome—it is less likely that the repetition of a task over time leads to some learning and therefore to improved performance. As the previous literature shows, where decision makers' bounded rationality (Simon, 1947) is assumed, causal ambiguity depends mainly on two characteristics of the decision at hand: its complexity and its temporal distance from the outcome (i.e., the time span between the execution of a decision execution and the observation of its associated outcome).

A decision's complexity is relevant because complexity can obscure the cause–effect linkages between a decision and its outcomes. Complexity is determined by the number of activities involved in a decision and the degree of their interdependence (Zollo & Winter 2002)—which in turn is highest when activities are reciprocal, such that the input of one activity constitutes the output of the other activity, and vice versa (Puranam & Goetting, 2011; Thompson, 1967). These two factors are in fact the key parameters of complexity as defined in the NK models (Gavetti & Levinthal, 2000).

Further, the time span between the execution of a decision and the observation of the associated outcome might influence causal ambiguity. As King (2007, p. 170) explained, “a long time interval between a competency execution and its outcome limits

opportunities for performance assessment. In addition, longer time gaps may raise decision makers' propensity to engage in self-serving attributions that can distort more-accurate assessments of competency–performance relationships.”

We suggest that the degree of causal ambiguity likely differs not only across decisions (i.e., operational vs. strategic) but also across different stages of the same decision. As noted above, acquisitions entail two different stages: selection and restructuring (Barkema & Schijven, 2008b; Puranam et al., 2006). The selection stage consists mainly of engaging in a systematic search for and collection of information about a range of potential targets, elaborating on that information in order to decide which target to pursue, and bidding a convenient offer (Makadok & Barney, 2001; Puranam et al., 2006). Extracting value during an acquisition's selection stage is therefore derived from the acquiring firm's superior (i.e., more precise) assessment of the target company's current value relative to the assessments made by other potential acquirers (Capron & Shen, 2007; Reuer & Ragozzino, 2008). In contrast, extracting value during an acquisition's restructuring stage is accomplished through careful reorganization of a target firm after it is acquired. An acquiring firm can create value in this stage by creating synergies (when the target firm is integrated) and/or by improving the acquisition's stand-alone value (when it is not integrated)—for example, by redefining some key strategic variable, such as which market or markets the target firm serves (Quah & Young, 2005; Wright, Hoskisson, & Busenitz, 2001; Wright, Hoskisson, Busenitz, & Dial, 2001).

We can expect the restructuring stage of a strategic decision to be more causally ambiguous than the selection stage. First, a restructuring stage is typically more complex than a selection stage (Bruton et al., 1994). Indeed, it is usually composed of a high number of activities that are also quite interdependent. “from the conversion of the information system, to the integration of supply and distribution chain, from the selection, retention and motivation of human resources to the restructuring and reorganization of the new product development” (Zollo, 2000, p. 206). The resulting confusion and lack of clarity can make it quite difficult for a newly combined entity to isolate the performance effect of any single activity (Cording, Christmann, & King, 2008). Previous research has shown that, due to the complexity of the restructuring phase, past acquisition experience per se does not enhance the performance of the restructuring phase, which instead increases only if that experience is articulated in codified knowledge (Zollo & Singh, 2004). By contrast, the selection phase consists of a relatively limited and well-defined set of activities (mainly target search, evaluation, and bidding), which makes the overall process not only easier to execute than the restructuring stage (Barkema and Schijven, 2008b) but also simpler to evaluate ex post—which implies that the tacit accumulation of past acquisition experience might be a valid guide for selecting new targets.

Second, usually—even if certainly not always—the span of time that passes between the end of a selection stage and the observation of its associated outcome is also quite short, since reliable feedback on the value that a selection generates is relatively immediate. Once a target firm has been acquired, for instance, almost any information missing at the selection stage can be obtained by the acquiring firm, allowing the acquirer to evaluate whether its ex ante assessment of the target's value was accurate and whether the price paid reflects the firm's value (Puranam et al., 2006). By contrast, after the restructuring is terminated, it usually takes at least three years to recognize the actual economic impact of changes implemented in the target company's business (Cording et al., 2008). Any short-term indicator of performance during the restructuring phase might be a poor (or even bad) predictor of the real value that a restructuring creates. For example, a post-

acquisition cost-cutting program might seem beneficial in the short term, but it may also negatively (and unexpectedly) impact retention of a target company's top employees, thereby driving down performance in the long term (Zollo & Meier, 2008).

## 2.2. *Experiential learning and the role of the information environment*

Overall, the selection stage should therefore be less causally ambiguous than the restructuring stage. Since experience more effectively translates into learning when an action or decision is less causally ambiguous (March & Olsen, 1975; Zollo, 2009), past experience with acquisitions is more likely to teach firms how to select undervalued targets *ex ante*, rather than how to restructure firms *ex post*. Accordingly, even if the direct effect of acquisition experience on acquisition performance cannot be predicted based on extant literature, we can expect its effect to be substantially *more positive* in any scenario where the acquisition's potential performance (i.e., the overall value that could be created) depends more heavily on proper implementation at the selection stage (rather than on proper implementation during the subsequent restructuring stage)—that is, where the acquisition is more selection-oriented (rather than more restructuring-oriented).

In particular, the extent to which information about a target firm is publicly available to all potential buyers (as opposed to being private) will have a large influence on the potential for acquirers to create value using selection. If, as we argue, acquisition experience mainly generates learning about how to select targets undervalued by other acquirers, then its positive effect on deal performance should be weaker in environments where information about target companies is mainly public and thus easily available. In such a scenario, all potential acquirers would have similar (and unbiased) assessments of a target's current value. Hence, there would be little to no chance of acquiring a target for less than its current value, and the primary method for creating value would be to restructure the target *ex post*. Stated differently, a more-transparent information environment should make *all* potential acquisitions less selection-oriented.

In a sense, markets for acquiring corporate control of firms function in the same way as markets for other strategic resources. In these “strategic factor markets” (Barney, 1986), one crucial mechanism for superior economic performance is having more-accurate expectations about a resource's future value than other market actors have. Firms that can assess such future value more accurately can avoid economic losses due to overestimation and will also be better able to exploit valuable resources that other companies underestimate (Barney, 1986; Denrell, Fang, & Winter, 2003; Dierickx & Cool, 1989; Makadok & Barney, 2001). This informational advantage can only arise and be sustained in environments where information is unevenly distributed across firms, such that firms have different expectations about the value of a strategic resource—in other words, in information environments that are less transparent. Instead, with more transparency, firms will use readily available information to estimate resources similarly, such that the competition for acquiring them would drive economic profits down towards zero (Barney, 1986).

The previous reasoning will hold for any context in which acquiring firms compete for the same targets. In principle, more-experienced firms enjoy informational advantages over less-experienced firms; they have probably learned over time to collect information about a target more effectively. But if the information environment becomes more transparent—for instance, if a regulatory change obliges or incentivizes target companies to disclose more or better-quality information about their assets (Armstrong, Balakrishnan, & Cohen, 2012)—the potential

acquisition value that can be created through selection will decrease. It follows that the advantage enjoyed by more-experienced firms at the selection stage would be less substantive. We therefore formulate the following hypothesis:

**Hypothesis.** *The higher the transparency of the information environment (i.e., as more information about the target company becomes publicly available), the lower the positive relation between acquisition experience and focal acquisition performance.*

Furthermore, if the overall effect of acquisition experience on the focal acquisition performance decreases by more than half when the information environment improves, we can also conclude that experience enhances performance mainly by nurturing the ability to select rather than the ability to restructure.

## 3. Research design

### 3.1. *The empirical context: acquisitions by private equity firms*

Acquisitions performed by PE firms—often called buyouts—involve purchasing a controlling stake in a company (or a division) from its owners, usually with a limited time horizon (Gilligan & Wright, 2012). The major difference between an acquisition and a PE buyout is that whereas the former is often aimed at complementing an existing company through the creation of synergies, the latter is typically aimed at running the acquired business independently and then selling it at a profit (Landau & Bock, 2013). For this reason, in the PE context, selection tends to be largely independent from value addition in that PE firms do not select targets that can create value through synergies with existing businesses. Consistently, Achleitner, Braun, Engel, and Figge (2010) find that only four percent of the value created in a buyout is driven by a combination effect between value creation and selection.

Applying our main theoretical argument in the context of acquisitions performed by PE firms, we argue that acquisition experience—the number of buyouts a PE firm bought and sold before the focal acquisition—translates more into learning to select than into learning to restructure (which takes place after a target firm is acquired). If our argument is true, we should observe that acquisition experience has a more positive impact on buyout performance whenever a focal buyout's potential performance depends more on selection (or, equivalently, depends less on restructuring).

We chose the PE industry as our empirical context for two reasons. The first is that companies acquired during buyouts tend to remain in a PE firm's portfolio for a limited period only. They also generally remain separate legal and financial entities, operating (and eventually resold) as stand-alone firms (Landau & Bock, 2013). This makes it possible to measure the performance of each single acquisition independently from the performance of other companies in the portfolio—in other words, without confounding factors.

Second, the PE context is particularly well suited to our purposes because PE firms tend to use two distinct approaches to generate value. On one hand, PE firms may be good “scouts” that create value by identifying and selecting currently undervalued companies—that is, by pursuing hands-off, selection-oriented buyouts (Chan, 1983; Shepherd, Ettenson, & Crouch, 2000). On the other hand, they may be particularly good “coaches” that make profits from ensuring that the firms they invest in are well managed and therefore gain value—that is, by pursuing hands-on, restructuring-oriented buyouts (Hellmann & Puri, 2002; Wright, Hoskisson & Busenitz, 2001; Wright, Hoskisson, Busenitz et al., 2001).

To determine the extent to which a buyout's potential performance depends more on proper execution at the selection stage than on proper execution at the restructuring stage, we assess the

transparency of the information environment of the U.S. state where the target is incorporated. Transparency will govern the extent to which information about the target firm is homogenous and available to all potential acquirers, which in turn affects the potential for acquirers to extract value using a (selection-oriented) “buy low, sell high” strategy.

### 3.2. Data

We rely on a dataset of 1388 PE buyouts of U.S. target firms realized by 100 PE firms between 1975 and 2005. We assembled these data by collecting PE firms' fund-raising prospectuses, usually referred to as Private Placement Memoranda, which contain performance indicators and other characteristics of a PE firm's prior buyouts. From among these we retained only those for which we were able to identify the U.S. state in which the target firm was incorporated, because in order to measure the transparency of the target companies' information environments, we needed to document longitudinal changes in local antitakeover regulations, which have an important impact on the amount and quality of information disclosed by public companies (Armstrong et al., 2012). We also excluded any PE firm for which we could not discover key pieces of information (e.g., industry, buyout year, performance). Unlike commercially available data on PE firms, which provide complete performance measures only at the fund level, our dataset allows us to measure the performance of each individual buyout realized by a PE firm, independent of the performance of other buyouts in the PE firm's portfolio. Moreover, our dataset contains the complete track record of each firm's past buyouts, which eliminates the problem of self-reported biases that arise in survey-based samples of privately held companies.

### 3.3. Variables

#### 3.3.1. Dependent variable

**3.3.1.1. Acquisition performance (IRR).** To measure the performance of each buyout, we used the gross IRR, which measures the gross return earned by investors from the acquisition of the company until it is sold. IRR is calculated as the annually compounded discount rate that would make the net present value (NPV) of all cash flows  $c_n$  related to a given buyout equal to 0. That is,

$$NPV = \sum_{n=0}^N \frac{c_n}{(1 + IRR)^n} = 0$$

The gross IRR is calculated using monthly gross cash inflows (i.e., capital calls from the investor in the PE fund) and outflows (i.e., capital distributions to the investor in the PE fund) for each investment. Similar to previous studies (e.g., Castellaneta & Zollo, 2015; Lopez-de-Silanes et al. 2015), we compute the gross IRR, that is, the IRR gross of expenses, fees, carried interests, and management fees. Consistent with prior literature (e.g., Castellaneta, Conti, & Kacperczyk, forthcoming; Castellaneta & Gottschalg, 2016; Castellaneta & Zollo, 2015; Lopez de Silanes, Phalippou, & Gottschalg, 2015), we censor the distribution to account for the outliers (defined as observations three standard deviations above and below the mean).

#### 3.3.2. Independent variables

**3.3.2.1. Acquisition experience.** Similarly to the M&A literature (Collins, Holcomb, Certo, Hitt, & Lester, 2009; Moatti, 2009), we measure a PE firm's stock of acquisition experience as the number of the PE firm's buyouts completed (i.e., sold) before the focal target firm was acquired. Thus, this measure takes into account only those deals where the PE firm completed the entire buyout process, from

the initial acquisition up to the point when the acquired company was resold, so that it could learn by observing the outcome of the full buyout–resale process.

**3.3.2.2. Transparency of local information environment.** A good proxy for a change in the transparency of the target firm's information environment is the enactment of business combination laws in the state where the target is incorporated. Such laws are meant to prevent potential acquirers from taking over a public company during a specified period of time without the explicit permission of the target's board (e.g., Bertrand & Mullainathan, 2003). However, as Armstrong et al. (2012) have shown, the enactment of these laws has a significant effect on the wider information environment in a state, such that public firms supply higher-quality information. This mainly occurs because managers of public companies, when they are more protected from the threat of takeover, become less concerned about disclosing truthful data on their company's performance. It also occurs because, since the passage of the antitakeover laws results in less managerial monitoring, the managers might want to voluntarily improve their financial reporting quality to allow for better monitoring and thus to signal the quality of their firms.

Making high-quality information about public companies more accessible is likely to influence the quality of information available about all the firms located in the same state. Indeed, the usual way of estimating the value of a company is to compare it to the values of “comparables”, that is, similar public companies affected by the same local environmental conditions (Bowman & Bush, 2007). Hence, the availability of better financial data about the “comparables” provides the basis for more-reliable and less-biased estimates of the value of companies in the same state. Accordingly, we expect that the enactment of antitakeover laws has made the information environment more transparent for companies (public or private) based in states where such laws have been passed. Bertrand and Mullainathan (2003) list the years in which U.S. states passed antitakeover regulation (see Appendix Table A).

A key issue is whether the enactment of antitakeover legislation constitutes an exogenous event with respect to PE firms. Extant literature suggests that the passage of such laws should be uncorrelated with PE firm characteristics, so that they offer an ideal context for a quasi-natural experiment. For example, Romano (1987) analyzes the political context that characterized the passage of antitakeover laws in various U.S. states and concludes that they are nearly always promoted by specific companies—those under threat of takeover—rather than the result of organized efforts by firms in general (including PE firms). Thus, for most companies, the enactment of antitakeover regulation appears to be an exogenous event.

#### 3.3.3. Control variables

The first set of controls relates to the characteristics of the PE firm acquiring the target. *PE fund size* measures the total equity raised by the fund that acquired a focal company. *PE firm age* measures the number of years between its foundation and the entry year of the focal buyout. Finally, we included *PE firm fixed effects* to control for any time-invariant, unobservable PE firm characteristics (Castellaneta & Gottschalg, 2016).

The second set of controls accounts for the various characteristics of the focal buyout: *investment size*, measured as the equity invested in the buyout (expressed in millions of 2006 US\$); *duration* of the focal investment, measured as the length of time (in years) between the start of the buyout and the completion of the resale (e.g., a PE firm that buys a company in 2000 and resells it in 2002 earns a duration value of 2); *IPO*, which takes a value of 1 when the investment is exited through an initial public offering;

and entry-year fixed effects.

Finally, we included the *target-firm incorporation state and industry fixed effects*—considering the 48-industry Fama–French classification (Fama & French, 1997)—to control for unobserved state and industry heterogeneity, respectively.<sup>1</sup>

### 3.4. Empirical strategy

Our analysis refers to the single buyout level. To test our hypothesis, we have to assess the interaction effect between PE firm experience and the transparency of local information environment on IRR. Following similar studies (e.g., Armstrong et al., 2012; Bertrand & Mullainathan, 2003), we adopt a typical difference-in-difference (diff-in-diff) strategy (Bertrand, Duflo, & Mullainathan, 2004), through which we compare buyouts in states that experience an increase in the transparency of the information environment with buyouts in states that did not experience this increase. We used a panel-data regression model to estimate the coefficients.<sup>2</sup> The dependent variable is the performance of the buyout of a certain target company  $i$  by a PE firm  $j$ . We estimate the following equation:

$$\begin{aligned} IRR_{i,j} = & \alpha * Experience_{j,tbuy} \\ & + \beta * Transparency\_info\_environment_{i,tbuy} \\ & + \gamma * Experience_{j,tbuy} * Transparency\_info\_environment_{i,tbuy} \\ & + \delta Z + e_{i,j} \end{aligned} \quad (1)$$

$Transparency\_info\_environment_{i,tbuy}$  is a variable equal to 1 if the state where target company  $i$  is incorporated has enacted anti-takeover business combination laws before the focal company is acquired—rendering its information environment more transparent relative to states without such regulations—and 0 otherwise. We expect  $\gamma$  to be negative and significant. Table 1 describes all variables used in the analysis.

### 3.5. Results

Tables 2 and 3 present the descriptive statistics and the pairwise correlations between variables, respectively.

Table 4 presents the result of the model used to estimate equation (1). The stand-alone impact of experience is significant in all specifications. Building on the consideration that when analyzing the impact of experience in strategic contexts “important contingencies are at play and, thus, researchers need to dig deeper” (Barkema & Schijven 2008a, p. 595), in our main hypothesis we proposed that the impact of acquisition experience on the performance of a focal buyout should be less (more) positive when the information environment improves (deteriorates). Consistently, we find that the coefficient of the interaction between acquisition experience and an information environment’s transparency is negative and significant ( $\beta = -0.011$ ,  $p < 0.05$ ) (Table 4, column 3). In particular, after the state enactment of a business combination law (our proxy to measure transparency), a one standard deviation increase in experience (i.e., 15.33) decreases the IRR by about 17 percentage points. Thus, our hypothesis is supported by our

findings that indicate that acquisition experience becomes quite less valuable in more transparent environment.

More than that, we can conclude that the main path through which past acquisition experience creates value is by enhancing the firm ability to select rather than the ability to restructure. In particular, based on Model 3 in Table 4, we find that any additional unit of experience increases IRR of 0.017, that is, 1.7 percentage points. However, when the information environment is more transparent, any additional unit of experience increases IRR of only 0.6 percentage point (i.e., 0.017 minus 0.011, which is the coefficient of the interaction between experience and transparency): this number is in fact an (upper bound) estimate of the value of the experiential learning to restructure in transparent environments where creating value through selecting undervalued target is very difficult.<sup>3</sup> Overall, this implies that about two thirds of the overall value determined by a greater experience derives from the ability to select vs. the ability to restructure. That is, of the overall value created by experience (1.7 percentage points), 0.6 percentage points – at most – derives from the ability to restructure and the remaining 1.1 percentage points from the ability to select.

We also perform additional empirical analysis to address some issues possibly affecting our findings. A first concern involves the proxy we used for measuring improvement in the information environment, that is, the enactment of state-level business combination laws. Even if this event is plausibly exogenous, a criticism could be that business combination laws affect the acquisition process of public companies by changing the “rules of the game” for acquiring such companies, rather than by improving the information environment directly. Given that more-experienced PE firms will have developed more abilities for acquiring public companies before the regulatory change, they may suffer greater losses, relative to less-experienced PE firms, after the regulatory change. However, even if this explanation could theoretically account for our results, we believe it is inappropriate for our sample, which is mainly (about 90%) composed of buyouts of private companies. Arguably, the only way that business combination laws could affect the acquisition of private companies in our sample is by changing the overall local information environment, by inducing public companies (which are used as “comparables” to assess the value of focal target private companies) to disclose more and higher-quality information. Nevertheless, to ensure that our results are not due to the presence of public companies in our sample, we replicated the analysis including only private companies. The results (presented in Table 4, columns 4–6) remain completely consistent with our theory.

Furthermore, previous studies have accounted for the possibility that experience depreciates over time (e.g., Ingram & Baum, 1997). Even if buyouts are rare strategic events (Zollo, 2009) and therefore unlikely to depreciate over time (e.g., Argote, Beckman, & Epple, 1990; Haleblan & Finkelstein, 1999; Ingram & Baum, 1997), we analyze whether our results are robust to the use of discounting rates for experience. More specifically, based on previous literature (e.g., Haleblan & Finkelstein, 1999; Hayward, 2002; Vermeulen & Barkema, 2001), we use three different discounts of experience. First, we measure experience as the number of PE firm buyouts completed in the 10-year period prior to the focal buyout. This variable is called *Experience (10 years)*. Second, we discount experience at a rate of 5 percent. This implies, for instance, that buyouts exited at time  $t-1$  are multiplied by a factor of 100 percent and buyouts exited at time  $t-2$  are multiplied by a factor of 95 percent,

<sup>1</sup> We also check whether our results are robust to the inclusion of other control variables used in similar studies (e.g., Castellaneta & Zollo, 2015). Results (available upon request) are robust to the inclusion of these controls, both when using the full sample and when excluding public firms.

<sup>2</sup> Results presented in Tables 4 and 5 are robust to clustering standard errors by PE firms.

<sup>3</sup> This is an upper bound estimate given that the information environment is possibly not completely transparent after our shock, such that some value still depends on selection.

**Table 1**  
Operationalization of variables.

Variable	Operationalization
<b>Dependent variable</b>	
Acquisition performance (IRR)	The internal rate of return of the PE firm buyout into the target company, winsorized at 3 standard deviations. <i>Source: proprietary database.</i>
<b>Independent variables</b>	
Acquisition experience	The number of buyouts already realized by the PE firm up to the focal buyout. <i>Source: proprietary database.</i>
Transparency	Equal to 1 if the state where the target firm is incorporated did enact the antitakeover regulation. <i>Source: (Bertrand &amp; Mullainathan, 2003).</i>
<b>Control variables</b>	
Investment size	The overall amount of equity invested by the PE firm, in 2006 \$US. <i>Source: proprietary database.</i>
Fund size	The amount of money collected by the fund, in 2006 \$US. <i>Source: proprietary database.</i>
Firm age	The number of years since the foundation of the PE firm with respect to the entry year of the focal buyout. <i>Source: proprietary database.</i>
IPO	Equal to 1 when the investment is exited through an IPO. <i>Source: proprietary database.</i>
Duration	The difference between the year when the target company was bought by the PE firm, and the year when it was sold. <i>Source: proprietary database.</i>
Entry-year FE	Equal to 1 in the entry year of the focal buyout. <i>Source: proprietary database.</i>
Target-firm incorporation state FE	Equal to 1 for the state of incorporation of the target company. <i>Source: proprietary database.</i>
PE firm FE	Equal to 1 for each PE firm. <i>Source: proprietary database.</i>
Industry FE	Equal to 1 for the industry where the target company operates. <i>Source: proprietary database.</i>

Note: IPO, initial public offering; IRR, internal rate of return; PE, private equity.

**Table 2**  
Descriptive statistics.

	Count	Mean	SD	Min	Max
IRR	1388	0.420497	1.438032	–1	16.30348
Experience	1388	15.32925	20.28593	0	151
Transparency	1388	0.5230548	0.4996482	0	1
PE firm age (years)	1388	8.23379	5.957594	0	28.08333
Fund size (ml)	1388	929.4181	1257.305	5	6450
Duration (years)	1388	5.428674	3.804329	0	28
IPO	1388	0.1930836	0.3948603	0	1
Investment size (ml)	1388	68.08484	192.8881	0.1004291	6143.15
Experience (10 years)	1388	11.11527	14.50186	0	110
Experience (5%)	1388	10.33778	13.39169	0	94.23293
Experience (discount age)	1388	8.397786	10.65512	0	73.48453

Note: IPO, initial public offering; IRR, internal rate of return; PE, private equity.

**Table 3**  
Correlations.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. IRR	1.000										
2. Experience	0.046	1.000									
3. Transparency	–0.100	0.166	1.000								
4. PE firm age	–0.060	0.718	0.190	1.000							
5. Fund size	–0.043	0.533	0.068	0.438	1.000						
6. Duration	–0.040	–0.116	–0.128	–0.115	–0.046	1.000					
7. IPO	0.135	–0.013	–0.023	–0.017	0.021	0.115	1.000				
8. Investment size	–0.054	0.126	0.008	0.143	0.355	0.094	0.040	1.000			
9. Experience (10 years)	0.049	0.974	0.178	0.668	0.490	–0.107	–0.009	0.129	1.000		
10. Experience (5%)	0.042	0.984	0.176	0.703	0.514	–0.111	–0.013	0.135	0.993	1.000	
11. Experience (discount age)	0.042	0.982	0.176	0.697	0.514	–0.109	–0.012	0.135	0.992	0.999	1.000

Note: IPO, initial public offering; IRR, internal rate of return; PE, private equity.

and so on. This variable is called *Experience (5%)*. Third, we discount experience by experience age. More specifically, we discount experience by the cubic root of experience age to take into account that, for rare strategic events such as acquisitions, experience decays slowly (Hayward, 2002). This variable is called *Experience*

(*discount age*). As shown in Table 5, columns 1 through 3, our results are completely robust to the use of discounts for experience. Moreover, we repeat our analysis excluding public companies. The results—Table 5, columns 4 through 6—remain completely consistent with our theory.

**Table 4**

The impact of experience on acquisition performance (IRR).

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	IRR	IRR	IRR	IRR	IRR	IRR
Experience		0.009*	0.017***		0.013**	0.021***
		(0.005)	(0.006)		(0.005)	(0.006)
Experience × Transparency			-0.011***			-0.013***
			(0.004)			(0.005)
Transparency	-0.154	-0.162	0.028	-0.149	-0.165	0.038
	(0.223)	(0.223)	(0.233)	(0.254)	(0.254)	(0.264)
PE firm age	0.130	0.094	0.087	0.138	0.091	0.087
	(0.146)	(0.147)	(0.147)	(0.160)	(0.161)	(0.161)
Fund size	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Duration	-0.077***	-0.073***	-0.073***	-0.080***	-0.075***	-0.076***
	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)	(0.019)
IPO	0.572***	0.582***	0.577***	0.542***	0.561***	0.554***
	(0.105)	(0.105)	(0.105)	(0.119)	(0.119)	(0.118)
Investment size	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	2.338	1.929	1.935	1.934	1.365	1.361
	(2.641)	(2.646)	(2.639)	(2.877)	(2.882)	(2.873)
Entry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Target-firm incorporation state FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
PE firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1388	1388	1388	1247	1247	1247
R-squared	0.212	0.215	0.220	0.229	0.233	0.239
Adj. R-squared	0.059	0.061	0.066	0.060	0.064	0.070

Note: FE, fixed effects; IPO, initial public offering; IRR, internal rate of return; PE, private equity. Standard errors in parentheses.

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .**Table 5**

The impact of experience on acquisition performance (IRR): experience discounted.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	IRR	IRR	IRR	IRR	IRR	IRR
Experience (10 years)	0.022***			0.025***		
	(0.008)			(0.008)		
Experience (10 years) × Transparency	-0.015**			-0.017***		
	(0.006)			(0.007)		
Experience (5%)		0.024***			0.029***	
		(0.009)			(0.010)	
Experience (5%) × Transparency		-0.017**			-0.019***	
		(0.007)			(0.007)	
Experience (discount age)			0.029**			0.034***
			(0.011)			(0.012)
Experience (discount age) × Transparency			-0.021**			-0.024***
			(0.008)			(0.009)
Transparency	0.019	0.026	0.029	0.035	0.041	0.047
	(0.234)	(0.234)	(0.235)	(0.265)	(0.265)	(0.265)
PE firm age	0.122	0.119	0.121	0.131	0.128	0.130
	(0.146)	(0.146)	(0.146)	(0.160)	(0.160)	(0.160)
Fund size	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Duration	-0.076***	-0.075***	-0.076***	-0.079***	-0.079***	-0.079***
	(0.017)	(0.017)	(0.018)	(0.019)	(0.019)	(0.019)
IPO	0.577***	0.578***	0.578***	0.552***	0.556***	0.555***
	(0.105)	(0.105)	(0.105)	(0.118)	(0.119)	(0.119)
Investment size	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	2.381	2.380	2.397	1.934	1.936	1.954
	(2.633)	(2.633)	(2.633)	(2.866)	(2.865)	(2.866)
Entry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Target-firm incorporation state FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
PE firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1388	1388	1388	1247	1247	1247
R-squared	0.219	0.219	0.218	0.237	0.237	0.237
Adj. R-squared	0.065	0.065	0.064	0.068	0.068	0.067

Note: FE, fixed effects; IPO, initial public offering; IRR, internal rate of return; PE, private equity. Standard errors in parentheses.

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

#### 4. Conclusions

We found that, in the PE context, acquisition experience translates more into learning to select than into learning to restructure, which leads more-experienced firms to perform worse as the information environment becomes more transparent. Accordingly, our study offers several key contributions to prior literature.

First, it suggests that the degree of causal ambiguity varies not only across decisions (i.e., operational vs. strategic) but also across different stages of the same strategic decision, that is, in the selection stage versus the restructuring stage. More specifically, we suggest that the likelihood of incurring problems of causal ambiguity is higher during the restructuring stage than during the selection stage. Looking beyond our empirical context of acquisitions in PE, we believe our findings may be relevant for acquisitions generally and also for alliances—that is, in settings where value is created both *ex ante* (e.g., by selecting the right alliance partner) and *ex post* (e.g., by coordinating effectively with that partner).

Second, this paper contributes to the stream of literature on the influence of experience in the context of strategic decisions. Prior research has mainly addressed whether experience impacts decision performance (Barkema & Schijven, 2008a), but we still have limited insights into *how* (that is, via which mechanisms) this happens (Haleblian, Devers, McNamara, Carpenter, & Davison, 2009). By disentangling the selection stage from the restructuring stage, we offer new evidence on how experience actually creates value for firms engaging in acquisitions.

Third, we contribute to the debate on whether PE firms, in particular, create value mainly in the selection stage or the restructuring stage. This discussion has focused previously on young startups (e.g., Baum & Silverman, 2004), but we extend it to the study of PE investments in mature businesses. This issue has received surprisingly scant attention in the literature, notwithstanding PE firms' importance in the strategic renewal of established businesses. By showing that accumulating experience impacts performance based on selection more strongly than it impacts performance based on restructuring, we offer new evidence on the levers of value creation in PE firm buyouts.

Some limitations of this study are worth noting, as well. First, private-equity backed buyouts represent a significant portion of the global M&A volume, arriving to represent more than 20 percent of the total M&A volume before the financial crisis of 2008 (Dobbs, Goedhart, & Suonio, 2007). However, private-equity backed buyouts do not represent the general case, that is, when the acquirer is a corporation. Therefore, more data should be collected to confirm that our results still hold in more general cases – and also when considering a longer time period. Second, the number of past acquisitions is the most common measure of acquisition experience used in the organizational learning literature so far (e.g., Barkema & Schijven, 2008a), it would of course be interesting to take a more nuanced measure of experience into account, such as one accounting for experience homogeneity and the pacing of sequential experiences. Third, we also have no direct measures of potential and actual value creation at the selection stage and the restructuring stage; future surveys could find ways to better estimate these two stages and build direct measures for them. Finally, while we can show that acquisition experience is positively correlated with better performance in those situations where the selection stage is more relevant for total value creation, we cannot prove that experience alone accounts for that performance increase; other unobserved variables may confound its impact. Future studies could cope with this causality question by, for example, relying on experimental methods that estimate the effect of experience on performance net of confounding variables. At the same time, qualitative studies could help uncover the process through which

acquisition experience translates into learning to select and/or to add value.

Despite these limitations, we believe this study provides important insights for managers and policymakers. On one hand, the issue of whether PE firms profit more often through selection or through restructuring—an issue that remains under debate (Kosman, 2009)—has important implications for policymakers. This paper demonstrated that accumulated experience translates more into a capacity to select than into a capacity to restructure. Hence, policymakers might want to target their efforts to recruiting experienced or inexperienced PE firms—by using different taxation rates or enacting laws to change the information environment, for example—according to whether they want to encourage the identification and revaluation of undervalued firms or the strategic renewal of potential local targets.

Our study also has relevance for practitioners. More-experienced PE firms are likely to have competitive advantages in contexts characterized by higher levels of information asymmetry, so these PE firms should choose to operate in such contexts as emerging markets, where they can probably leverage their superior capacity to select. Whether experienced PE firms can effectively achieve competitive advantages in such markets is an interesting topic that we leave for future research.

#### Appendix

**Table A**  
Antitakeover laws by state.

State	Year	State	Year
Arizona	1987	Nebraska	1988
Connecticut	1989	Nevada	1991
Delaware	1988	New Jersey	1986
Georgia	1988	New York	1985
Idaho	1988	Oklahoma	1991
Illinois	1989	Ohio	1990
Indiana	1986	Pennsylvania	1989
Kansas	1989	Rhode Island	1990
Kentucky	1987	South Carolina	1988
Maine	1988	South Dakota	1990
Maryland	1989	Tennessee	1988
Massachusetts	1989	Virginia	1988
Michigan	1989	Washington	1987
Minnesota	1987	Wisconsin	1987
Missouri	1986	Wyoming	1989

Source: Bertrand & Mullainathan, 2003.

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