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Serial acquirers and decreasing returns: Do bidders' acquisition patterns matter?

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Abstract

This paper examines the phenomenon of declining announcement returns of serial acquirers. Using a classification of acquirers based on their patterns of acquisition, I find that decreasing returns occur mostly within "blocks" of acquisitions. This trend is driven by bidders who acquire targets quickly in chunks. In contrast, I find no evidence of any such decline in returns for the most active acquirers in the market of corporate control. I test several theories proposed by the prior literature to explain declining returns and find evidence consistent with temporary overvaluation, agency costs, and bidder learning as likely drivers.

KEYWORDS
acquirer returns, decreasing returns, mergers and acquisitions, serial acquirers

JEL CLASSIFICATION
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1 | INTRODUCTION

The takeover market is of great interest to researchers as mergers and acquisitions (M&As) are among the most economically significant events in corporate finance. Bidders acquiring multiple targets during a specified time window are referred to as "serial acquirers." These actors have received lots of attention lately, especially the most active among them that acquire dozens, or even sometimes hundreds of targets. Indeed, although 35% of all bidders qualify as serial acquirers, they conduct roughly 80% of the deals for an average reported value of $329 million.[1]

Fuller, Netter, and Stegemoller (2002) is the first study to investigate the performance of serial acquirers in the market for corporate control. They find evidence that serial acquirers experience a pattern of declining returns over successive acquisitions. Consistent with this finding, Moeller, Schlingemann, and Stulz (2005) find that serial

[1] The average deal value is calculated based on the deals for which the value is available (50.1% of the sample).

acquirers often experience value-destroying deals after a sequence of value-increasing deals. More recently, Karolyi and Taboada (2015) confirm that this pattern of shrinking announcement returns applies to serial acquirers around the world.

Despite this consensus about the occurrence of decreasing returns, there is much less agreement regarding the factors driving this phenomenon and we have little understanding of how this process occurs. Moreover, despite serial acquirers' prevalence in the takeover market, few papers have paid attention to their patterns of acquisition. In one such study, Macias, Rau, and Stouraitis (2016) propose to stratify bidders based on their acquisition patterns. The authors find significant differences across bidder categories and observe that a firm's ex-ante characteristics allow to predict the type of acquirer it will eventually become, providing a framework for acquirer classification.

In this study, I investigate whether bidders' acquisition patterns impact the phenomenon of declining returns. I augment Macias et al. (2016)'s classification system to define acquirers as one of five types: *loners*, *occasional acquirers*, *joggers*, *sprinters*, and *marathoners*. I add the *jogger* category to capture differences in acquirer behavior by differentiating bidders that are selective (joggers), from bidders that acquire targets in chunks (sprinters), from bidders that absorb targets virtually continuously (marathoners). My empirical evidence suggests that joggers are distinct from the other four groups. The purpose of this paper is not to improve upon Macias et al., although I build on their foundation; rather, its focus is to provide evidence about the pattern of declining returns in M&As.

The idea behind this classification is to differentiate acquirers based on their degree of selectivity and the frequency at which they conclude deals.[2] Past studies have identified overvaluation, hubris, management learning, agency problems, and relative deal size as potential channels for decreasing returns. However, it seems unlikely each channel impacts all acquirers equally. For example, if a temporary mechanism drives the decline in returns (e.g., overvaluation), it seems logical that acquirers completing several deals quickly reap more benefits. Similarly, mechanisms driven by experience (e.g., learning) should be more prominent for frequent acquirers and lead to stronger decreasing patterns. Results are consistent with this intuition, suggesting these channels do not impact all bidders equally. I discuss each channel in depth in the hypothesis section.

The literature on serial acquirers suffers from two specific weaknesses. As pointed out by Macias et al. (2016), the first weakness is that there is no clear and established definition of what it means to be a serial acquirer. At what point does a bidder become a serial acquirer? Moreover, if serial bidders experience ever-decreasing returns, it is unclear why the most active bidders keep on acquiring dozens, sometimes hundreds of targets.

The second weakness of the literature is the lack of consensus regarding how to measure and quantify declining returns. Past studies have used different methods to analyze returns, sometimes by comparing single acquirers to multiple acquirers (Billett & Qian, 2008; Ismail, 2008), and sometimes by taking a point in the distribution of acquisitions to observe returns before and after a selected cutoff point (Fuller et al., 2002; Karolyi and Taboada, 2015). Moreover, not all bidders are equally active, and they use different acquisition strategies. Do acquisition patterns play a role in the phenomenon of declining return?

To address this question, in this paper I introduce two new variables designed to capture the impact of bidder acquisition patterns as well as the timeliness of their bids on value creation. On the one hand, the relative position (*RP*) of an acquisition captures the global "trend" of an acquirer's returns over time with each successive acquisition. On the other hand, the relative position of an acquisition within a "block" of acquisitions (*RPWB*)[3] captures the impact of bidder acquisition patterns on value creation, allowing us to disentangle the effect of time from that of strategy.

I find evidence that serial bidders' announcement returns follow a sequential sawtooth pattern (though decreasing), as opposed to a monotonic decrease as some previous studies suggest. I report that returns decline in concomitance with "blocks" of acquisitions, indicating that firms acquiring several targets in a short period drive the phenomenon of

[2] See Appendix B.1 in the Supporting Information for a graphical display of the classification system along dimensions of interest. This appendix is available in the supporting materials section online.

[3] I follow Macias, Rau, and Stouraitis (2016) and define a "block" of acquisitions as acquisitions completed by the bidder within a certain window (see Section 2).

declining returns. The decrease is progressive, and the rate at which returns decline increases with each successive acquisition in a block. Moreover, this phenomenon is driven by one specific type of acquirers, the sprinters, which tend to acquire targets in short bursts. Conversely, marathoners, which are the most active actors in the market for corporate control, do not exhibit decreasing returns.

This paper advances two strands of the M&A literature. First, this paper adds to the literature on M&A returns, and more specifically to the discussion about the phenomenon of the declining returns experienced by serial acquirers. I introduce two new variables (*RP* and *RPWB*) that allow me to gain additional insight on serial acquirers' behavior and its consequences on value creation. To my knowledge, no study has considered the timeliness of acquisitions in conjunction with the possible sequential nature of these declining returns. Considering both factors reveal the subtleties of the notion of declining returns, showing that if returns do indeed decline, they do not do so mechanically over time but rather over blocks of acquisitions, and that this decline is driven by one specific group of acquirers (the sprinters) while other groups do not experience any such decrease.

Second, this paper contributes to the discussion on the causes of declining returns. Specifically, the overvaluation hypothesis, the learning hypothesis, and the agency hypothesis are channels consistent with a decline through blocks of acquisitions. Moreover, the fact that a small group of very active acquirers (the marathoners) does not experience any decline explains the apparent dichotomy between decreasing returns and prolonged bidding activity.

2 | SAMPLE AND METHODS

2.1 | Sample selection

I gather M&A data from the Securities Data Company (SDC), including all completed deals from 1979 to 2016. Following Fuller et al. (2002), Moeller, Schlingemann, and Stulz (2004), and Macias et al. (2016), I apply the following filters that are common to most studies investigating acquirer returns.[4]

1. Acquiring firms are U.S. publicly listed firms on the NYSE, AMEX, or NASDAQ, for which CRSP and COMPUSTAT data are available.
2. Targets include both U.S. and cross-border firms of any type including public, private, subsidiary, government, or mutual firms.
3. The bidder is acquiring at least 50% of the target firm.
4. The acquisition must be completed within the time window of reference (1979–2016).

To alleviate truncation concerns, I require that (1) bidders do not conduct any acquisition in the first 3 years of the sample (1979–1982) and (2) that bidders complete their first acquisition before 2011. These restrictions yield a final sample of 10,169 unique acquirers completing a total of 60,817 bids (see Panel A of Table 1).

2.2 | Serial acquirers

The past literature uses several methods to classify serial acquirers. Fuller et al. (2002) define "repeat" acquirers as firms completing more than five acquisitions within a 3-year window. Ismail (2008) considers "multiple" acquirers as bidders taking over more than one target in their entire sample. Billet and Qian (2008) define "serial" acquirers as

[4] For example, Fuller, Netter, and Stegemoller (2002), Moeller, Schlingemann, and Stulz (2005), and Macias et al. (2016) apply similar filters. Results are qualitatively similar when considering only deals worth more than 1% of the bidder's market cap, or when excluding utilities and financial firms (see Appendix F in the Supporting Information). Following Macias et al. (2016), I keep these deals in the base sample to have the most comprehensive idea of serial acquirers' acquisition patterns.

TABLE 1 Sample filters and categories of acquirers

Panel A: Sample and filters			
N	60,817		
Unique acquirers	10,169		
Target type	Public, private, subsidiary, government, mutual, JV		
Cross-border target	Yes		
Window of observation	1979–2016		
Panel B: Categories of acquirers			
Category of acquirer	**No. of acquisitions (#A)**	**Block intensity (BI)**	**Type of acquirer**
Loner	1		Single acquirer
Occasional	$2 \leq \#A \leq 4$		Single acquirer
Jogger	$5 \leq \#A \leq 29$	$BI \leq 2$	Serial acquirer
Sprinter	$5 \leq \#A \leq 29$	$BI \geq 3$	Serial acquirer
Marathoner	$\#A \geq 30$		Serial acquirer

Note. Panel A reports the various filters I applied to obtain the sample used in this paper. *N* reports the number of deals considered in the sample. The variable *Unique acquirers* reports the number of acquirers making at least one acquisition. *Target type* reports the type of targets considered in the sample. *Cross-border targets* report whether cross-border targets are included in each sample. Panel B summarizes the rules followed to create the five categories of acquirers.

bidders acquiring more than two targets during the entire window of the sample, while Karolyi and Taboada (2015) use a threshold of five targets during the window of their sample. As Macias et al. (2016) point out, there is currently no consensus about the definition of a "serial acquirer."

One reason for this lack of consensus is that multiple types of acquirers with different acquisition patterns exist. To address this issue, Macias et al. (2016) stratify acquirers based on three dimensions: a bidder's total number of acquisitions, the timeliness of these acquisitions (the number of "blocks" of acquisitions, see thereafter), and their intensity (which I define here as the number of acquisitions within an acquisition block). To better suit my empirical setting and capture the different existing acquisition patterns, I build on their framework and augment their classification by adding the *jogger* category to the initial four: *loner*, *occasional acquirer*, *sprinter*, and *marathoner*.[5]

The objective of this classification system is to capture differences in bidder acquisition patterns. While some bidders are very selective in their target selection (joggers), others complete deals in chunks (sprinters), or simply acquire targets continuously over long periods of time (marathoners). These streaks of deals are referred to as "blocks" of acquisitions. A block is defined by the number of bids occurring within 365 days of one another.[6] In other words, a deal announced within 365 days of the previous deal's announcement is part of the same block (see Figure 1).

Following Macias et al. (2016), I define *loners* as bidders making only one acquisition during the sample period. *Loners* are the "one and done" acquirers that are commonly thought of as single acquirers. *Occasional acquirers* are firms completing between two and four acquisitions. This category is important because past studies have used the threshold of five acquisitions as the cutoff point to distinguish "single" acquirers from "serial" acquirers. As such, loners and occasional acquirers constitute the "single" acquirers group.

[5] Macias et al. (2016) classify bidders into four categories based on a *k*-median cluster analysis. I use a set of mathematical rules as thresholds to separate the categories so as to capture differences in acquirers' patterns of acquisitions. The addition of the jogger category allows me to capture differences in acquirer behavior by differentiating bidders that are selective (joggers) from bidders that acquire targets in chunks (sprinters) which fall under the same category in the original classification system.

[6] There is on average 398 days between two successive acquisitions. In the absence of clear-cut threshold, I define the base length of a block as a year (see Appendix B.2 in the Supporting Information for a graphical representation of a block). The reader should note that results are robust to a wide range of windows to define a "block," as shown in the robustness section. I provide more information on block length and time between blocks in Appendix B.3 in the Supporting Information.

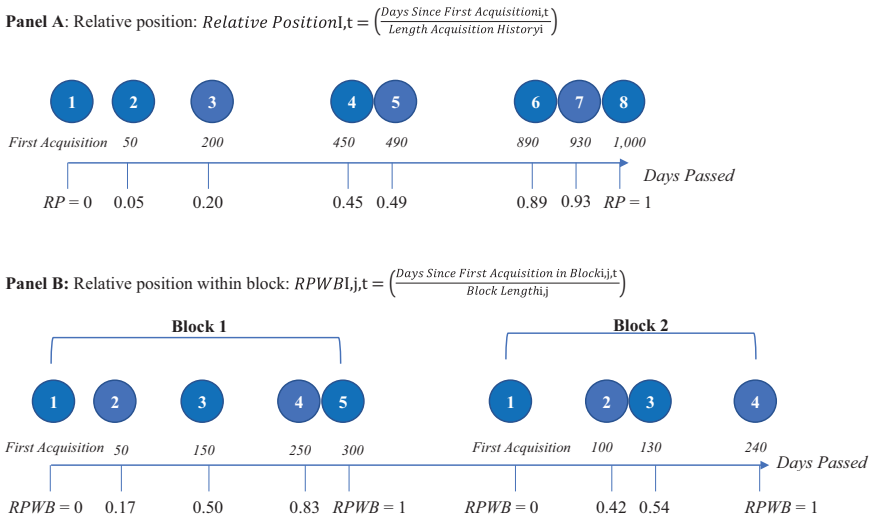

FIGURE 1 M&A timeline—the relative position of a bid

As opposed to single acquirers, the serial acquirers group includes *marathoners*, *sprinters*, and *joggers*. I augment the initial classification system by adding the jogger category that I define as firms completing five or more successful bids, but that never acquire more than two firms within the same block. This category captures acquirers that are active but selective, never acquiring targets in chunks. Sprinters are defined as firms acquiring five or more targets, but that have at least one block with three or more acquisitions. This category identifies bidders that tend to acquire targets quickly in chunks. Finally, I define marathoners as firms acquiring more than 30 targets over the length of the sample.[7] This category comprises the most active participants in the market for corporate control: bidders that acquire targets almost continuously. Panel B of Table 1 summarizes the set of rules I use to distinguish each group.

Table 2 breaks down the composition of the sample across the five categories of acquirers. It reports the number and the percentage of unique acquirers in every category (second and third column), as well as the number and the percentage of the total number of deals they complete (last two columns). For example, *Microsoft* accounts for one unique acquirer (a marathoner) for a total 161 deals completed.[8] Although serial acquirers collectively account for a third of the sample, they complete about 80% of the total number of acquisitions (Appendix B.1 in the Supporting Information).[9]

Panel A of Table 3 presents summary statistics for the sample at the acquisition level.[10] Nine percent of the targets of the sample are public, while 58% are private, 32% are subsidiaries, and 1% are governmental entities, mutual or joint ventures. Eight percent of the transactions are known to be paid for exclusively with stock, while 15% are known to be paid for exclusively with cash. Roughly a third of the deals are horizontal at the 4-digit SIC level (32%).[11] The average deal involves an acquirer with $14 billion worth of assets, a market-to-book ratio of 2.86, a 0.27 debt-to-assets ratio,

[7] Results are robust to cutoffs of 20, 25, 35, or 40 acquisitions to define marathoners (Appendices E.5–E.8 in the Supporting Information).

[8] See Appendix A in the Supporting Information for a breakdown of the most active acquirers (by industry in Appendix C in the Supporting Information).

[9] Schipper and Thompson (1983) suggest the returns of an acquisition program might be capitalized in the announcement of the first acquisition. If blocks are interpreted as signaling an acquisition program, then the first acquisition in a block might drive the decline in return. I show that results are robust to this possibility in Appendix F.4 in the Supporting Information.

[10] Variables are winsorized at the 1% and 99% percentiles. I also report summary statistics at the unique acquirer level in Appendix B.3 in the Supporting Information.

[11] This number climbs up to 57% of the deals if I compute horizontal deals at the 2-digit SIC code level. These numbers are in line with the past literature and overall results are robust to the use of both methods of computation.

TABLE 2 Types of acquirers: dimensions and blocks

Acquiring firm	No. of acquirers (%)	Variable	Min	Mean	Max	No of acquisitions (%)
(1) Loner	2,957 (29.08)	No. of acquisitions	1	1	1	2,957 (4.86)
		No. of blocks	1	1	1	
		Block intensity	1	1	1	
(2) Occasional	3,578 (35.19)	No. of acquisitions	2	2.76	4	9,581 (15.75)
		No. of blocks	1	1.87	4	
		Block intensity	1	1.47	4	
(3) Joggers	623 (6.13)	No. of acquisitions	5	6.99	16	3,933 (6.47)
		No. of blocks	2	4.65	14	
		Block intensity	1	1.32	2	
(4) Sprinter	2,661 (26.17)	No. of acquisitions	5	12.45	29	28,573 (46.98)
		No. of blocks	1	3.63	16	
		Block intensity	1	4.31	29	
(5) Marathoner	350 (3.44)	No. of acquisitions	30	50.07	363	15,773 (25.94)
		No. of blocks	1	6.29	15	
		Block intensity	1	7.97	362	
Total Serial (3 +4+5)	3,634 (35.74)	No. of acquisitions	5	14.32	363	48,279 (79.38)
		No. of blocks	1	4.22	16	
		Block intensity	1	3.4	362	
Total (1+2+3+4+5)	10,169 (100)	No. of acquisitions	1	6.38	363	60,817 (100)
		No. of blocks	1	2.46	16	
		Block intensity	1	2.6	362	

This table breaks down the composition of the sample into five types of acquirers, according to my classification system. *Loners* are bidders making only one acquisition during the sample period. *Occasional acquirers* are firms making between two and four acquisitions within two to four blocks. *Joggers* are firms making five or more successful bids, but that never acquire more than two firms within the same block. *Sprinters* are firms acquiring five or more targets, but that have at least one block with three or more acquisitions. *Marathoners* are firms acquiring 30 or more targets over the length of the sample. The table reports the minimum, maximum, and average *number of acquisitions*, *number of blocks*, and *block intensity* by acquirer type. *No. of acquisitions* is the total number of acquisitions, independently of the number of blocks. *No. of blocks* is the number of blocks of acquisitions. *Block intensity* is the total number of acquisitions in a block. *Total Serial* reports results for *serial acquirers*, which combines the *joggers*, *sprinter*, and *marathoner* categories.

and a ROA of −0.01. Finally, the average bidder cumulative announcement return (CAR) is 0.77%. These figures are consistent with those reported by Betton, Eckbo, and Thorburn (2008) and other similar studies.

Panel B of Table 3 presents the same summary statistics decomposed by acquirer category. I find patterns similar to those reported by Macias et al. (2016), including a monotonic increase in the size of the acquirer from left to right, from loners to marathoner. I observe similar increases in sales volume and profitability. In contrast, average CARs decrease from loners to marathoners (from 2.35% to 0.20%), which is consistent with multiple acquirer having lower returns than single acquirers as reported by Ismail (2008).

TABLE 3 Summary statistics

Panel A: Global sample						
	N	Mean	*SD*	25th	Median	75th
Deal level variables						
Public target	60,817	0.09	0.29	0	0	0
Private target	60,817	0.58	0.49	0	1	1
Subsidiary target	60,817	0.32	0.47	0	0	1
Other target	60,817	0.01	0.08	0	0	0
Days since last acquisition	50,648	398	672	54	161	434
All stock	60,817	0.08	0.28	0	0	0
All cash	60,817	0.15	0.36	0	0	0
Horizontal merger	60,817	0.32	0.47	0	0	1
Merger	60,817	0.25	0.43	0	0	0
Hostile	60,817	0.01	0.10	0	0	0
Tender	60,817	0.02	0.14	0	0	0
Intrastate	60,817	0.21	0.41	0	0	0
Cross-border	60,817	0.17	0.38	0	0	0
Relative deal size	30,503	0.11	0.18	0.02	0.05	0.13
Firm-level variables						
Total assets	60,817	13,928	89,421	261	1,061	4,398
Sales	60,817	4,928	16,159	168	648	2,574
Market-to-book	60,817	2.86	2.76	1.33	2.05	3.29
Debt-to-assets	60,817	0.27	0.21	0.10	0.24	0.40
Operating cash flows	60,817	0.10	0.13	0.05	0.11	0.16
Capital expenditure	60,817	0.05	0.06	0.01	0.03	0.06
ROA	60,817	−0.01	0.19	0.00	0.03	0.07
Percentage cumulative announcement returns (CARs) [−1; 1]	60,817	0.77	8.32	−1.96	0.16	2.70

Panel B: Summary statistics by acquirer type										
	Loner		Occasional		Jogger		Sprinter		Marathoner	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Deal-level variables										
Public target	0.13	0.34	0.10	0.30	0.12	0.32	0.09	0.28	0.08	0.27
Private target	0.54	0.50	0.57	0.50	0.53	0.50	0.58	0.49	0.62	0.48
Subsidiary target	0.32	0.47	0.33	0.47	0.34	0.48	0.32	0.47	0.29	0.45
Other target	0.01	0.09	0.01	0.08	0.01	0.08	0.01	0.09	0.01	0.08
Days since last acquisition	.	.	797	1,086	768	872	333	537	173	296
All stock	0.13	0.33	0.11	0.31	0.09	0.29	0.08	0.28	0.05	0.23
All cash	0.12	0.32	0.16	0.36	0.17	0.38	0.16	0.36	0.14	0.34

(Continues)

TABLE 3 (Continued)

Panel B: Summary statistics by acquirer type										
	Loner		Occasional		Jogger		Sprinter		Marathoner	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Horizontal merger	0.37	0.48	0.33	0.47	0.34	0.47	0.32	0.47	0.30	0.46
Hostile	0.03	0.16	0.01	0.12	0.01	0.10	0.01	0.10	0.01	0.10
Tender	0.36	0.48	0.31	0.46	0.30	0.46	0.24	0.42	0.18	0.39
Merger	0.03	0.16	0.02	0.14	0.02	0.14	0.02	0.13	0.02	0.14
Intrastate	0.34	0.48	0.28	0.45	0.24	0.43	0.20	0.40	0.14	0.35
Cross-border	0.12	0.33	0.14	0.34	0.17	0.37	0.17	0.37	0.22	0.41
Relative deal size	0.23	0.28	0.17	0.24	0.14	0.18	0.09	0.15	0.07	0.10
Firm-level variables										
Total assets	1,337	16,956	2,032	10,385	3,778	13,572	9,512	59,984	33,213	151,032
Sales	567	3,413	894	4,576	2,062	9,121	3,361	14,308	11,268	22,986
Market-to-book	2.57	3.19	2.66	3.06	2.60	2.55	2.75	2.71	3.27	2.66
Debt-to-assets	0.27	0.25	0.27	0.24	0.24	0.20	0.29	0.21	0.26	0.18
Operating cash flows	−0.01	0.22	0.04	0.18	0.10	0.11	0.10	0.11	0.13	0.07
Capital expenditure	0.06	0.07	0.06	0.07	0.05	0.06	0.05	0.06	0.04	0.04
ROA	−0.15	0.34	−0.08	0.28	0.00	0.15	0.00	0.17	0.04	0.10
CARs [−1;1]	2.35	17.07	1.55	11.49	0.97	10.29	0.60	6.39	0.20	4.09

Panel A reports the summary statistics of the sample at the deal level. Panel B reports the summary statistics by acquirer type at the deal level. All variables are defined in Appendix A the Supporting Information.

2.3 | Relative position of an acquisition

The literature has proposed several methods to investigate the returns of serial bidders. Most papers compare serial acquirers' CARs before and after their 5th acquisition. Aktas, Bodt, and Roll (2013) look at the deal order number (DON), which refers to the number of acquisitions already completed before a given acquisition. Macias et al. (2016) and Macias Rau, and Stouraitis (2020) propose the acquisition index number (AIN) which reflects the order in which an acquisition occurs within a block.[12] All these measures have merit and are well suited to the empirical needs of their respective studies. Since the goal of this paper is to understand how declining returns occur and whether a bidder's acquisition pattern plays a role in that decline, I need a measure that captures not only the order of occurrence of an acquisition, but also its timeliness in the context of a bidder's acquisition pattern. Moreover, to compare acquirers across the board, I need a measure that normalizes the length of bidders' respective streaks of acquisitions. To this end, I introduce two new variables. The first variable is the *relative position* (*RP*) of an acquisition:

$$RP_{i,t} = \left(\frac{Days\ Since\ First\ Acquisition_{i,t}}{Length\ Acquisition\ History_i} \right) \tag{1a}$$

[12] As a robustness test, I replicate my main tests using DON and AIN in Appendices G.1 – G.3 in the Supporting Information.

This measure yields a value comprised between 0 and 1 where each acquisition is separated by an interval reflecting the time separating two acquisitions (0 being the first acquisition and 1 the last acquisition, independently of the length of a block, see Panel A of Figure 1). Higher values represent acquisitions occurring later in the bidder's sequence of acquisitions. Consequently, the coefficient on *RP* will be negative if declining returns occur monotonically over time.

The second variable is the *relative position within block* (*RPWB*) of an acquisition. *RPWB* is computed following a method analogous to that of *RP*, but looking at sequences of acquisitions within a block (see Panel B of Figure 1):

$$RPWB_{i,j,t} = \left(\frac{Days \text{ Since } First\ Acquisition\ in\ Block_{i,j,t}}{Block\ Length_{i,j}} \right) \quad (1b)$$

This variable captures an important nuance, as a negative coefficient means that the decrease in returns occurs within a block of acquisition, but not necessarily beyond. In other words, *RPWB* captures the effect of acquiring several targets bunched together on announcement returns. Consequently, if the pattern of declining returns is sequential and conditioned by the grouping of acquisitions, the coefficient of *RPWB* will be negative while the coefficient of *RP* will not.

3 | HYPOTHESES DEVELOPMENT AND EMPIRICAL PREDICTIONS

3.1 | Declining returns and their cause

The past literature has found that serial acquirers' returns tend to decline over successive acquisitions, both in the domestic market (Fuller et al., 2002) as well as in the international market for corporate control (Karolyi and Taboada, 2015). More recently, Golubov, Yawson, and Zhang (2015) show that some repeat acquirers are consistently better at acquiring firms than others. This finding raises the question of the universality of declining returns: for example, marathoners acquire targets sometimes at a frenetic rate,[13] and as such it seems unlikely they would maintain such a pace while experiencing systematically declining returns.

Furthermore, the timing of series of acquisitions has received little attention, yet it seems likely to be a factor. On the one hand, it is unclear why multiple acquisitions, sometimes several years apart would lead to a systematic decrease in returns. On the other hand, it is intuitive to think of acquisitions within a block as comparable and potentially subject to such a decrease. As a consequence, I argue that decreasing returns occur sequentially within a block of acquisition rather than over the entire history of acquisition of a bidder.

Hypothesis 1: *The phenomenon of declining returns occurs within blocks of acquisitions as opposed to over the entire acquisition history of a bidder.*

If returns do indeed decrease this way, then acquisition patterns (proxied by bidder category) likely impact whether acquirers experience such a decrease. Independently of the mechanism(s) driving decreasing returns (I investigate theories proposed by the literature in Hypothesis 7), the degree of selectivity of a bidder and the frequency of its bids likely impact market reaction. In fact, I argue that bidders acquiring targets frequently and quickly drive the phenomenon of declining returns. If declining returns are driven by temporary opportunities fading over time, then quick, frequent bidders should capture most of the gains and thus see market returns fade along with additional bids. If returns diminish as managers gain experience and price their offer better, bidders concluding the most deals should drive the associated decline in returns. If managers target more profitable bids first and then progressively move to lower NPV projects, conclude deals for egotistic reasons, or decide to act on excess cash flows, the market impounds the information on announcement and the same declining pattern ensues. Consequently, I posit that while selective

[13] See Appendix A.1 in the Supporting Information for a breakdown of the most active *marathoners* in the sample.

acquirers are intuitively less likely to capitalize on any of these potential drivers, on the other hand less selective, more frequent acquirers are very likely to, leading to declining returns. Particularly, sprinters who concentrate their target acquisitions in short spans should drive the phenomenon.

Hypothesis 2: *Not all acquirers experience decreasing returns similarly. Bidders that are less selective and acquire target frequently in quick succession are likely driving the phenomenon.*

To test these first two hypotheses, I use the following base model:

$$CAR_{i,t} = \beta_0 + \beta_1\, RP_{i,t} + \beta_2\, RPWB_{i,j,t} + \gamma_1\, Acquirer - level\ controls_{i,t-1} + \gamma_2 Deal - level\ controls_{i,t} + f_i + \delta_{nt}, \quad (2)$$

where *CAR* is the cumulative announcement returns over a 3-day window centered around the announcement of a deal, *RP* and *RPWB* are the two measures of the timeliness of acquisitions defined earlier. I expect the coefficient of β_1 to be insignificant and the coefficient of β_2 to be negative, as higher values of *RPWB* (i.e., acquisitions occurring later in a block) would have lower returns on average.

Acquirer-level controls is a vector of variables that the past literature has shown to influence abnormal returns, such as the size of the acquirer (Moeller et al., 2004; Palepu, 1986), its market-to-book ratio (Rhodes–Kropf, Robinson, & Viswanathan, 2005), the ratio of long-term debt to total assets (Bruner, 1988; Maloney, McCormick, & Mitchell, 1993), and ROA (Owen & Yawson, 2010). All the acquirer-level controls are measured in year $t - 1$. *Deal-level controls* is a vector of variables capturing the ownership status of the target (Fuller et al., 2002), the method of payment (Martin, 1996), whether the deal is a horizontal acquisition (Graham, Lemmon, & Wolf, 2002), hostile (Franks & Mayer, 1996), a merger or an acquisition of assets, cross-border or domestic (Erel, Liao, & Weisbach, 2012). I include firm fixed effects (f_i) to control for time-invariant unobserved heterogeneity and industry-year fixed effects (δ_{nt}) to address industry-wide effects. Thus, identification comes from within firm variation over time.

Next, I investigate the nature of declining returns. Is the decline sequential or abrupt following a bad acquisition? As explained above, independently of the channel considered, the likelihood of experiencing lower abnormal returns than on the previous deal should increase with each acquisition in a block (yet not necessarily over the history of a bidder).

Hypothesis 3: *The likelihood of experiencing lower CARs than on the previous acquisition increases with each acquisition in a block.*

To test for this possibility, I use the following linear probability model where the dependent variable *lower CAR* is an indicator variable equal to 1 if the abnormal returns for the acquisition at hand are lower than that of the previous acquisition:[14]

$$Lower\ CAR_{i,\Delta t,\, t-1} = \beta_0 + \beta_1 RP_{i,t} + \beta_2\, RPWB_{i,j,t} + \gamma_1 Acquirer{-}level\ controls_{i,t-1} + \gamma_2\, Deal{-}level\ controls_{i,t} + f_i + \delta_{nt} \quad (3)$$

In a similar fashion, I posit that the rate of decline in abnormal returns should increase with successive acquisition (i.e., returns become more negative with each acquisition within a block), as marginal gains decrease with each acquisition.

[14] Results are robust to the use of a logit model using Equation (3) as the empirical specification.

Hypothesis 4: *The rate of decline of returns increases with each acquisition in a block.*

To test for this possibility, I run an OLS model analogous to (3) where the dependent variable ΔCAR is the difference in abnormal returns between two successive acquisitions:

$$\Delta CAR_{i,t-t-1} = \beta_0 + \beta_1 RP_{i,t} + \beta_2\ RPWB_{i,j,t} + \gamma_1\ Acquirer{-}level\ controls_{i,t-1} + \gamma_2\ Deal{-}level\ controls_{i,t} + f_i + \delta_{nt} \quad (4)$$

To confirm my findings, I look at changes from one block to the next. If returns do decrease within blocks of acquisitions, then the observed patterns should reverse when comparing the first acquisition of a block with the last acquisition of the previous block.

Hypothesis 5: *As returns primarily decrease within blocks of acquisition, the likelihood of having lower CARs than on the previous acquisition is lower for the first acquisition in a block, and the change in returns becomes positive.*

To test that hypothesis, I use an empirical specification analogous to Equations (3) and (4), using the dummy *first in block*, an indicator variable equal to 1 if the observation is the first acquisition in a block as the primary right-hand side variable.

Another question of interest is whether returns become more negative with each successive acquisition. It makes sense for managers to keep on acquiring targets as long as the net present value of the project is positive. As such, they might keep on acquiring targets even as returns decrease, as long as they are still positive. Consistent with previous conjectures, I expect returns to be more likely to be negative with each successive acquisition within block, especially for sprinters. However, I posit that returns will not be increasingly negative over the bidder's history, especially for marathoners, explaining why these very active bidders keep on acquiring despite the perception of decreasing returns.

Hypothesis 6: *The likelihood of negative CARs increases with successive acquisitions within blocks, especially for sprinters. On the other hand, returns are not likely to be more negative over the bidder's acquisition history, at least for marathoners.*

To test for this possibility, I use the following linear probability model:

$$Negative\ \ CARi,t = \beta_0 + \beta_1 RP_{i,t} + \beta_2\ RPWB_{i,j,t} + \gamma_1\ Acquirer{-}level\ \ controls_{i,t-1} + \gamma_2\ Deal{-}level\ controls_{i,t} + f_i + \delta_{nt} \quad (5)$$

The literature proposes various theories to explain declining returns over successive bids. As suggested by Macias et al. (2016), some established theories might help explain declining returns. If returns decline within blocks, then it is likely these theories might not impact all bidders equally. Proxies used to test each theory should be correlated (directionality depends on the case) with *RPWB* to be consistent with decreasing returns. I detail each theory below:

Rhodes–Kropf et al. (2005) and Klasa et al. (2007) suggest that bidders tend to acquire targets when they (the acquirers) are overvalued. I refer to this theory as the *overvaluation hypothesis*. Overvalued firms look to take advantage of their temporarily inflated stock to conclude deals. However, overvaluation is temporary and declines over time as the market becomes more efficient. Sprinters are likely able to capitalize the most on temporary opportunities, as they rush to make acquisitions, experiencing decreasing returns as the market adjust. Joggers might implement a similar strategy, but they are more selective and with at most two acquisitions per block, they are less likely to

experience a notable intrablock decrease. Finally, since marathoners acquire targets virtually continuously and overvaluation is unlikely to persist over long periods, they are less prone to experience significant intrablock decreases as well.

Roll (1986) suggests that managers' hubris leads them to overestimate synergies. Malmendier and Tate (2008) find elements consistent with that theory, showing that overconfident CEOs are more likely to engage in M&As and to overpay providing they have enough internal resources. Moreover, hubristic CEOs are also more likely to overestimate synergies when rushing to complete a deal. As such, I expect frequent acquirers to conclude more hubristic acquisitions than selective acquirers. Sprinters should be particularly more likely to make hubristic acquisitions as they are larger firms with more internal resources that jump from deal to deal quickly. Joggers are more selective and do not rush acquisitions. As such, they are less likely to experience the negative effects of hubristic deals. I refer to CEOs' overestimation of synergies as the *hubris hypothesis*.

Aktas, Bodt, and Roll (2011) suggest that CEOs first undertake projects with very high potential and then, as they become increasingly able to value targets, they engage in projects with lower (but still positive) NPV, leading to decreasing returns. I refer to this theory as the *learning hypothesis*. They argue that in sprees of acquisitions, the time between deals (*TBD*) decreases as managers learn to price their offer better, explaining decreasing returns. CEOs overseeing rapid and extensive acquisition streaks will logically gain experience and should thus display a stronger declining return pattern. As such I expect this channel to primarily impact frequent acquirers such as marathoners and sprinters. Shorter *TBD* leading to more gains according to the theory, it is logical to posit this channel should be especially strong for sprinters who conclude deals quickly within blocks. Conversely, Aktas et al. argue that if too much time passes between acquisitions, CEOs experience "memory loss." Consequently, selective acquirers such as the joggers should not experience declining returns.

Another possibility is that managers engage in empire building and knowingly undertake M&As that benefit themselves rather than shareholders (Jensen, 1986). I refer to this possibility as the *agency hypothesis*. I expect this effect to be particularly strong for sprinters as managers would likely bid on targets most likely to generate growth first, with empire-related acquisitions occurring later in blocks with more selfish motives. Although marathoners might also undertake acquisitions for similar reasons, they conclude deals virtually all the time and as such, there is no reason to think empire-building acquisitions would occur in any particular order within block. Joggers are selective and thus less likely to conclude deals for agency-related reasons in a specific order.

Finally, Ahern (2008) suggests that relative target size affects how returns decline. Although smaller targets come at a lower cost of integration, they do not provide enough value to offset the costs associated with M&As. Over time, bidders acquire larger firms of smaller relative size leading to decreasing returns. I refer to this theory as the *relative size* hypothesis. I expect sprinters and marathoners to be particularly impacted as they are large firms conducting lengthy blocks of bids, thus resulting in the acquisition of ever smaller targets in terms of relative size.

Hypothesis 7: *The mechanisms put forth by existing theories on decreasing returns of serial bids will have various degrees of validity depending on the type of the acquirer*.

$$RPWB_{i,j,t} = \beta_0 + \beta_1\ Hypothesis\ specific\ variable_{i,t} + \gamma_1\ Acquirer{-}level\ controls_{i,t-1} + \gamma_2 Deal{-}level\ \ controls_{i,t} + f_i + \delta_{nt}, \quad (6)$$

where the expected sign of β_1 depends on the theory tested (see above).

4 | RESULTS

4.1 | How do returns decrease?

I begin by verifying that the phenomenon of the declining returns of serial acquirers holds within my sample. I use the empirical specification in Equation (2) and regress the 3-day cumulative abnormal returns around announcement on a classic indicator variable *Post 5*th that contrasts the returns of an acquirer before and after its fifth bid. Column 1 of Table 4 reports the results of this regression. As expected, the coefficient of −0.36 on *Post 5*th is on par with past studies[15] and confirms the occurrence of declining returns as traditionally measured.

Next, columns 2 and 3 report the results of similar regressions using independently *RP* and *RPWB* as variables of interest. The coefficient of *RP* suggests a decline of 0.91% in announcement returns on average over a bidder's entire acquisition history, while the coefficient on *RPWB* indicates a decrease of 0.43% in announcement returns from the first acquisition within a block to the last.

The fact that all three measures point in the same direction further confirms the idea of a negative trend in announcement returns with successive acquisitions. However, one of the objectives of this study is to better understand how these returns occur and at this point we can only confirm the directionality of the trend. In column 4, I run a last regression with the two relative position variables together (*RP* and *RPWB*).[16] Only *RPWB* is significant with a magnitude comparable to that described earlier. It appears to subsume at least some of the variation captured by *RP*. This result suggests that most of the decline in return occurs within blocks of acquisition, that is, when acquiring targets in a quick succession. The coefficient of −0.31 suggests that bidders' announcement returns diminishes by 31 basis point on average from the first acquisition in a block to the last.[17] This is an economically significant finding as it represents a decrease of nearly $24 million for the average acquirer.[18] The magnitude of these results is comparable to that of Macias et al. (2020)'s unadjusted CAR findings. In their study, the authors attribute the declining pattern of returns to the anticipation of subsequent acquisitions based on prior acquisition activity. Independently of the mechanism driving the phenomenon, the finding of both studies suggests that multiple deals do not necessarily hurt value creation per se, reinforcing the need to understand the mechanism driving the decrease in returns when several acquisitions are made in a short span.

The rest of the control variables are consistent with the past literature. Bidder CARs tend to be lower when the target is public, when the deal is paid for with stock only, and when the deal is cross-border (Betton et al., 2008; Erel et al., 2012; Fu, Lin, & Officer, 2013; Fuller et al., 2002). In contrast, bidder CARs tend to be higher when the target is paid for with cash only, when the merger is horizontal, when the bidder makes a tender offer, and when the acquirer is more profitable.

To conclude, this first set of results confirms that the returns of serial bidders indeed appear to be declining, but that the observed decline occurs mostly within blocks of acquisitions and not necessarily over the entire history of acquisition of a bidder. Although we cannot reach definitive conclusions at this point, this first salvo of results suggest that it is not merely the order in which acquisitions occur that drive the phenomenon of decreasing returns, but rather the fact that deals occurring successively within short periods of time tend to have increasingly lower benefits. This

[15] Fuller et al. (2002) report coefficients of −0.20 for subsidiaries, −0.19 for private targets, and −0.13 for public targets. My setting does not distinguish target types.

[16] *RP* and *RPWB* are the same when bidders acquire all their targets in one block only. A total of 509 firms match that description (less than 5% of the sample, results are robust to the exclusion of such firms). Variance Inflation Factor (VIF) tests ensure that multicollinearity is not a problem (all coefficients are below 2.8).

[17] These results remain qualitatively similar when I take into account the span separating blocks of acquisitions (See Appendix D.1 in the Supporting Information). The time between two blocks does not affect results significantly, and the coefficient *RPWB* itself does not depend upon the distance from the previous block.

[18] The average acquirer in the sample has a market value of $7.7 billion. Therefore, a decrease of 0.31% in CARs represents a loss of $23.8million.

TABLE 4 Evidence on declining returns

	(1)		(2)		(3)		(4)	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Post 5th	−0.36***	<0.01						
RP			−0.91***	<0.01			−0.47	0.17
RPWB					−0.43***	<0.01	−0.31**	0.02
Multiple announcement	−0.04	0.80	−0.07	0.69	−0.05	0.78	−0.05	0.79
Public target	−1.42***	<0.01	−1.43***	<0.01	−1.45***	<0.01	−1.45***	<0.01
Private target	0.04	0.92	0.02	0.95	0.01	0.98	0.00	1.00
All cash	0.44***	<0.01	0.43***	<0.01	0.43***	<0.01	0.46***	<0.01
All stock	−0.44*	0.07	−0.44*	0.06	−0.43*	0.07	−0.43*	0.09
Horizontal merger	0.19**	0.03	0.19**	0.03	0.19**	0.03	0.23**	0.01
Hostile	0.42	0.29	0.41	0.30	0.42	0.29	0.66	0.15
Tender	0.57*	0.05	0.57*	0.05*	0.56*	0.05	0.57*	0.06
Merger	0.46***	<0.01	0.47***	<0.01	0.47***	<0.01	0.43***	<0.01
Intrastate	−0.03	0.84	−0.03	0.79	−0.03	0.82	−0.01	0.96
Cross-border	−0.18**	0.04	−0.18**	0.04	−0.18**	0.03	−0.15*	0.10
Ln Total Assets	0.11	0.63	0.07	0.77	0.10	0.64	−0.02	0.94
Market-to-Book	0.05**	0.05	0.04*	0.09	0.05*	0.07	0.07**	0.01
Debt to Assets	0.42	0.42	0.50	0.33	0.47	0.36	0.15	0.78
Capital expenditure	−3.19*	0.07	−3.22*	0.07	−3.15*	0.08	−2.55	0.15
ROA	1.55**	0.05	1.50*	0.06	1.51*	0.06	1.99**	0.02
Firm-FE	Yes		Yes		Yes		Yes	
Industry-year FE	Yes		Yes		Yes		Yes	
N	60,817		60,817		60,817		60,817	
R^2	14.31%		14.31%		14.34%		14.34%	

Note: This table reports the results of an OLS regression using the model specified in Equation (2):

$$CAR_{i,t}[-1;1] = \beta_0 + \beta_1 RP_{i,t} + \beta_2 RPWB_{i,j,t} + \gamma_1\, Acquirer - level\ controls_{i,t-1} + \gamma_2\, Deal - level\ controls_{i,t} + f_i + \delta_{nt},$$

where *CAR* is the cumulative announcement returns of a 3-day window centered around the announcement of a deal. Post 5th is an indicator equal to 1 if the observation occurs after the fifth acquisition of a bidder, 0 otherwise. *RP* is the ratio of the number of days passed since a bidder's first acquisition divided by the length (in days) of a bidder's acquisition history. *RPWB* is the ratio of the number of days passed since a bidder's first acquisition in the current block divided by the block's length (in days). I include firm fixed effects (f_i) and industry-year fixed effects (δ_t). For readability, all coefficients are expressed in percent. All control variables are defined in Appendix A the Supporting Information. *, **, and *** denote significance of coefficients at the 10%, 5%, and 1% levels, respectively, computed using robust (Rogers, 1993) firm-clustered standard errors. FE = Fixed Effects.

distinction is important as the prior literature traditionally concludes that returns are simply declining over time. Are all acquirers impacted equally?

Table 5 reports the results of my regressions by acquirer category. The main takeaway of this test is that the phenomenon of declining returns appears to be driven by sprinters. Indeed, sprinter is the only category for which *RPWB* is significant (a decrease of 0.46% on average within a block of acquisitions, which amounts to $35.4 million for the average bidder). This finding is important because sprinters represent only 26% of the acquirers (47% of the total number of acquisitions), yet they experience decreasing returns more so than any other category.

TABLE 5 Declining returns by type of acquirer

	Loner		*Occasional*		*Jogger*		*Sprinter*		*Marathoner*	
	Coeff.	*p*-value	Coeff.	*p*-value	Coeff.	*p*-value	Coeff.	*p*-value	Coeff.	*p*-value
RP			−2.75	0.30	0.19	0.83	−0.51	0.23	−0.40	0.39
RPWB			1.20	0.45	−0.42	0.16	−0.46***	<0.01	−0.18	0.28
Multiple announcements			−0.36	0.94	0.44	0.62	0.18	0.47	−0.19	0.29
Public target	4.42	0.45	−0.09	0.98	−2.59***	<0.01	−2.04***	<0.01	−0.93***	<0.01
Private target	5.54	0.34	1.09	0.76	−0.54	0.17	−0.35	0.11	−0.16	0.17
All cash	−1.21	0.32	0.44	0.64	0.65*	0.05	0.37***	<0.01	0.43***	<0.01
All stock	1.31	0.31	−0.42	0.80	−0.02	0.97	−0.66**	0.03	−0.32	0.19
Horizontal merger	−0.71	0.40	0.16	0.84	0.71**	0.02	0.24*	0.07	0.04	0.61
Hostile	7.13**	0.03	3.97	0.34	−0.47	0.68	0.41	0.41	0.23	0.55
Tender	−0.05	0.99	1.93	0.39	0.90	0.41	0.94**	0.03	0.18	0.58
Merger	0.58	0.57	0.09	0.92	0.36	0.32	0.54***	<0.01	0.26*	0.08
Intrastate	0.01	0.99	0.48	0.55	0.32	0.37	−0.01	0.95	0.00	1.00
Cross-border	1.29	0.26	0.91	0.41	−0.46	0.18	−0.17	0.27	0.00	0.97
Ln Total Assets	−0.50	0.37	−0.27	0.89	−0.24	0.54	−0.23	0.15	0.02	0.90
Market-to-Book	−0.05	0.67	0.24	0.24	0.07	0.37	0.05	0.23	0.03	0.34
Debt to Assets	4.08*	0.06	−1.52	0.72	4.11***	<0.01	0.06	0.94	−0.25	0.69
Capital expenditure	−7.23	0.29	7.32	0.46	−0.13	0.98	−3.37	0.18	−5.66**	0.01
ROA	4.25*	0.09	3.35	0.50	4.18**	0.02	0.97	0.31	1.65***	<0.01
Firm-FE	No		Yes		Yes		Yes		Yes	
Industry-year FE	Yes		Yes		Yes		Yes		Yes	

(Continues)

TABLE 5 (Continued)

	Loner		*Occasional*		*Jogger*		*Sprinter*		*Marathoner*	
	Coeff.	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**
N	2,959		9,581		3,933		28,573		15,773	
R^2	2.62%		1.70%		16.38%		27.34%		12.16%	

Note: This table reports the results of an OLS regression using the model specified in Equation (2):

$$CAR_{i,t}[-1;\ 1] = \beta_0 + \beta_1 RP_{i,t} + \beta_2 RPWB_{i,j,t} + \gamma_1 Acquirer - level\ controls_{i,t-1} + \gamma_2 Deal - level\ controls_{i,t} + f_i + \delta_{nt},$$

where *CAR* is the cumulative announcement returns of a 3-day window centered around the announcement of a deal. *RP* is the ratio of the number of days passed since a bidder's first acquisition divided by the length (in days) of a bidder's acquisition history. *RPWB* is the ratio of the number of days passed since a bidder's first acquisition in the current block divided by the block's length (in days). I include firm fixed effects (f_i) and industry-year fixed effects (δ_t). For readability, all coefficients are expressed in percent. All control variables are defined in Appendix A the Supporting Information. *, **, and *** denote significance of coefficients at the 10%, 5%, and 1% levels, respectively, computed using robust (Rogers, 1993) firm-clustered standard errors.

In contrast, marathoners do not appear to experience any such decrease. The idea that some firms might undertake acquisitions at a frenetic pace while experiencing a constant decline in returns is counterintuitive (e.g.„ *Arthur J. Gallagher & Co.* is the most active bidder of the sample acquiring 363 targets during the window of observation), yet the literature has not provided any explanation. Decomposing bidder activity in blocks sheds light on this phenomenon by showing that not all types of serial acquirers experience declining returns.

4.2 | Likelihood of lower returns and rate of decline

We know very few things about the way this decline in returns occur. Is the decrease brutal or does it occur with each successive acquisition? Do returns decline linearly, or does each acquisition suffer a sharper drop-off? To answer these questions, I tweak my original setting by focusing on changes in market reaction from an acquisition to the next.

First, I investigate how likely a bidder is to experience lower returns on an acquisition compared to the previous one. *Lower CAR* is an indicator variable equal to 1 if the bidder's CARs for acquisition *i* is lower than that of acquisition $I-1$, and 0 otherwise. By using *Lower CAR* as the dependent variable in a linear probability model (see Equation 3), I calculate the likelihood for the market's reaction to an acquisition to be worse than it was for the previous acquisition by the same bidder. I expect to see a negative *RPWB* coefficient if returns decline progressively with each successive acquisition in a block (as opposed to rare but abrupt declines).

The first column in Panel A of Table 6 reports the results of a regression pooling all serial acquirers together. The main takeaway is that *RP* and *RPWB* now point in two different directions. The positive coefficient on *RPWB* indicates that a given acquisition is indeed more likely to have lower CARs than the previous one with each successive acquisition in a block (the higher the *RPWB* index is, the higher the likelihood of having a lower CAR than on the previous acquisition). This result means that in any given block, each subsequent acquisition has a higher likelihood of having a decreasing market response as a spree of acquisition goes on, which is consistent with the notion that returns decline progressively. The coefficient on *RPWB* on the first column indicates that an acquisition occurring at the end of a block is 12% more likely to have a lower CAR than the previous bid compared to an acquisition occurring at the beginning of a block.

Contrariwise, the coefficient on *RP* is negative indicating that the likelihood of having a lower CAR than on the previous acquisition becomes significantly lower over the acquisition history of a bidder, which is key in differentiating the influences behind the phenomenon of declining returns. This result implies that (1) returns do decrease within block, which is consistent with a previous test and (2) returns do not necessarily decrease monotonically over the long term. In fact, this result suggests that if anything, the mechanism might slow down over the long term. Moreover, since *Lower CAR* captures the likelihood of having lower CAR on the very next acquisition, it confirms that returns tend to decline progressively as opposed to abruptly.

Columns 2–4 report the results of the same specification split across acquirer type. Again, sprinters appear to be the driving category. On the other hand, marathoners do not appear to experience a significant increase, which is consistent with the last battery of tests. Note that in every specification, the coefficient on *RPWB* is not impacted much by the inclusion of *RP*.

Next, I investigate the rate of decline of announcement returns. Is the rate of decline constant or does it accelerate with every additional acquisition? To answer this question, I introduce the dependent variable ΔCAR, defined as the difference in CARs between acquisition *i* and acquisition $i-1$. As such, for acquisitions that have a lower (higher) CAR than the previous acquisition by the same bidder, ΔCAR is negative (positive). Regressing ΔCAR on *RP* and *RPWB* allows us to have a sense of the rate of decline of announcement returns (see Equation 4).

In Panel B of Table 6, the first column reports the results of the regression for all serial acquirers. As hypothesized, the negative and significant coefficient on *RPWB* suggests that the rate of decrease in CARs accelerates with each additional acquisition within a block (returns decrease at an ever-increasing pace within a block). For example, in a block of 10 equally spaced acquisitions, the decrease in CAR between acquisitions 9 and 10 is 0.54% (0.6% × (1 −

TABLE 6 Likelihood of lower returns and change in abnormal returns

Panel A: Lower CAR								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
RP		−0.22** (0.02)		−0.29** (0.03)		−0.25*** (< 0.01)		−0.22 (0.18)
RPWB	0.12** (0.05)	0.12*** (< 0.01)	0.04 (0.25)	0.06 (0.37)	0.08* (0.06)	0.10** (0.01)	0.02 (0.25)	0.09 (0.23)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	44,645	44,645	3,310	3,310	25,912	25,912	15,423	15,423
R^2	6.84%	6.84%	40.21%	40.25%	10.02%	10.04%	6.24%	6.24%
Panel B: ΔCAR								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
RP		0.94** (0.03)		−1.69 (0.50)		1.58** (0.03)		−0.51 (0.25)
RPWB	−0.38*** (< 0.01)	−0.60*** (< 0.01)	−1.61 (0.25)	−1.49** (0.03)	−0.36* (0.07)	−0.58** (0.04)	−0.17 (0.35)	−0.15 (0.40)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	44,645	44,645	3,310	3,310	25,912	25,912	15,423	15,423
R^2	12.22%	12.23%	38.76%	38.78%	16.80%	16.81%	4.82%	4.82%

Note: Panel A (B) reports the results of an LPM (OLS) regression ran using the model displayed in Equation 3 (4):

$$Lower\ CAR_{i,t}(\Delta CAR_{i,t}) = \beta_0 + \beta_1\ RP_{i,t} + \beta_2\ RPWB_{i,j,t} + \gamma_1\ Acquirer - level\ controls_{i,t-1} + \gamma_2 Deal - level\ controls_{i,t} + f_i + \delta_{nt}.$$

where *Lower CAR* is an indicator variable equal to 1 if the acquisition's *CAR* is lower than the *CAR* of the bidder's last acquisition. Δ*CAR* is the difference between a bidder's *CAR* for acquisition: the acquisition at hand minus the returns on the bidder's last acquisition. *RP* is the ratio of the number of days passed since a bidder's first acquisition divided by the length (in days) of a bidder's acquisition history. *RPWB* is the ratio of the number of days passed since a bidder's first acquisition in the current block divided by the block's length (in days). I include firm fixed effects (f_i) and industry-year fixed effects (δ_t). For readability, coefficients in Panel B are expressed in percent. Control variables are the same as in the base model and are defined in Appendix A the Supporting Information. *, **, and *** denote significance of coefficients at the 10%, 5%, and 1% levels, respectively, computed using robust (Rogers, 1993) firm-clustered standard errors.

0.1)) higher than the decrease in CAR from the first to the second acquisition. To put it in perspective, a decrease of this magnitude would translate to a loss in announcement returns of roughly $42 million for the average bidder in the sample.

In columns 2–4, I split acquirers by category. Once again, sprinters (and to a certain degree joggers) appear to be driving the trend. More importantly, sprinter is the only category exhibiting coefficients on *RP* and *RPWB* going in different directions. This additional evidence implies that the decline in returns accelerates within block, but ultimately appears to reverse over the long term. This result suggests that returns follow a sawtooth pattern, declining with each successive acquisition within a block, then increase (or revert to higher levels) at the start of a new block. Marathoners do not appear to be affected by this trend.

4.3 | Are serial acquirers maximizing their opportunities or destroying value?

If bidder returns decline with successive acquisitions, do serial acquirers stop bidding before destroying value? Declining returns should not prevent managers from bidding for additional targets as long as these acquisitions are positive NPV projects. To answer this question, in Table 7 I look at whether bidder returns become more negative over time.

Consistent with previous results, I find that sprinters are more likely to record negative announcement returns later in blocks of acquisitions, suggesting that their returns are more likely to fall into a negative territory after a flurry of acquisitions. Consistent with my findings in previous tests, sprinters drive the trend while marathoners do not experience increasingly negative CARs.

The lack of significance of every test involving marathoners is a key takeaway of this study. It provides an explanation to the counterintuitive idea that some bidders experience an adverse market reaction, but yet keep on acquiring dozens, sometimes hundreds of firms.

4.4 | The edge of blocks

Thus far, results suggest that declining announcement returns occur within blocks of acquisition and is mainly driven by sprinters. Some readers might still be skeptical about the setting used and argue that a "block effect" is hard to disentangle from the effects of other sources of variation. Is acquiring a flurry of firms in a quick succession value destroying in essence?

To tackle this possibility, I look at the "edge of blocks." If returns do decline with each successive acquisition in a block, we should see on average a sharp and significant difference between the first acquisition of a new block and the last acquisition of an old block. Moreover, we should observe a reversal of the trend observed within block. To test this hypothesis, I look at the behavior of my market reaction proxies around the first acquisition of new blocks.

Panel A of Table 8 reports the results of a regression using an empirical setting analogous to Equation (3) that includes the dummy *first in block* as its primary right-hand side variable in lieu of the relative position measures. For sprinters, the negative coefficient on the specification with *RPWB* alone indicates they are significantly less likely to experience lower returns when the acquisition is the first in a block, which drives results for serial acquirers as a whole (column 1). To examine the impact of the span between two acquisition blocks, in each test I include a specification with an indicator variable equal to 1 if the span separating the current block from the last block is *above the median* as well as its interaction with the *first in block* variable. For sprinters, the negative coefficient on the interaction variable suggests that the longer the inactivity period between two blocks is, the less likely a sprinter is to experience lower CARs on the first acquisition of its next block.[19]

[19] The cutoff for the average (median) span between two blocks is 1,164 (839) days for joggers, 960 (675) days for sprinters, and 843 (586) days for marathoners. Results are robust to the use of either the mean or median number of days between blocks.

TABLE 7 Likelihood of negative CAR

	Serial		Jogger		Sprinter		Marathoner	
RP		0.04 (0.35)		0.24 (0.46)		0.07 (0.30)		−0.07 (0.76)
RPWB	0.32** (0.05)	0.27** (0.01)	0.25 (0.92)	0.03 (0.79)	0.42* (0.09)	0.34** (0.03)	0.20 (0.14)	0.09 (0.33)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	48,279	48,279	3,933	3,933	28,573	28,573	15,773	15,773
R^2	12.42%	12.44%	44.22%	44.26%	16.63%	16.68%	10.59%	10.59%

Note: This table reports the results of an LPM regression ran using the model displayed in Equation (5):

$$Negative\ CAR_{i,t} = \beta_0 + \beta_1 RP_{i,t} + \beta_2 RPWB_{i,j,t} + \gamma_1 Acquirer - level\ controls_{i,t-1} + \gamma_2 Deal - level\ controls_{i,t} + f_i + \delta_{nt},$$

where *Negative CAR* is an indicator variable equal to 1 if the CAR on the acquisition at hand is negative, and 0 otherwise. *RP* is the ratio of the number of days passed since a bidder's first acquisition divided by the length (in days) of a bidder's acquisition history. *RPWB* is the ratio of the number of days passed since a bidder's first acquisition in the current block divided by the block's length (in days). I include firm fixed effects (f_i) and industry-year fixed effects (δ_t). Control variables are the same as in the base model and are defined in Appendix A in the Supporting Information. *, **, and *** denote significance of coefficients at the 10%, 5%, and 1% levels, respectively, computed using robust (Rogers, 1993) firm-clustered standard errors.

TABLE 8 Likelihood of lower returns and change in abnormal returns—first acquisition in a block

Panel A: Lower CAR								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
First in block	−0.08** (0.01)	−0.09** (0.03)	0.02 (0.61)	−0.01 (0.85)	−0.42*** (< 0.01)	−0.36** (0.04)	0.17 (0.41)	−0.01 (0.90)
DPB above median		0.10 (0.17)		0.00 (0.99)		0.22 (0.24)		−0.05 (0.65)
First in block × DPB above median		−0.14 (0.27)		0.02 (0.68)		−0.11** (0.04)		0.18 (0.30)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	44,645	44,645	3,310	3,019	25,912	25,912	15,423	15,423
R^2	4.71%	4.74%	20.61%	20.64%	28.74%	28.85%	2.19%	2.93%
Panel B: ΔCAR								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
First in block	0.47*** (< 0.01)	1.11* 0.08)	0.14*** (< 0.01)	0.86 (0.27)	0.21** (0.01)	0.39* (0.09)	0.42* (0.07)	−0.03 (0.04)
DPB above median		−0.27 (0.91)		−0.24 (0.84)		−0.06 (0.48)		−0.07 (0.70)
First in block × DPB above median		0.17 (0.19)		−0.33 (0.68)		0.04 (0.19)		0.46 (0.19)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	44,645	44,645	3,310	3,310	25,912	25,912	15,423	15,423
R^2	1.92%	2.94%	1.34%	1.85%	2.01%	6.17%	0.39%	1.99%

Note: Panel A (Panel B) reports the results of an OLS (LPM) regression ran using the model displayed in Equation 3 (4):

$$Lower\ CAR_{i,t}(\Delta CAR_{i,t}) = \beta_0 + \beta_1\ First\ in\ block_{i,t} + \beta_2\ DPB_{i,j,t} + \beta_3 First\ in\ block_{i,j,t} * DPB_{i,j,t} + \gamma_1\ Acquirer - level\ controls_{i,t-1} + \gamma_2 Deal - level\ controls_{i,t} + f_i + \delta_{nt},$$

where *Lower CAR* is an indicator variable equal to one if the acquisition's CAR is lower than the CAR of the bidder's last acquisition. Δ*CAR* is the difference between a bidder's CAR for acquisition: the acquisition at hand minus the returns on the bidder's last acquisition. *DPB* above median is a variable equal to 1 if the span (in days) between the last block of acquisition is greater than the median, 0 otherwise. I include firm fixed effects (f_i) and industry-year fixed effects (δ_t). For readability, all coefficients in Panel B are expressed in percent. Control variables are the same as the base model and are defined in Appendix A in the Supporting Information. *, **, and *** denote significance of coefficients at the 10%, 5%, and 1% levels, respectively, computed using robust (Rogers, 1993) firm-clustered standard errors.

Panel B of Table 8 provides additional evidence by looking at the effect of *first in block* on *ΔCAR*. In the base model, *First in block* is positive for every category of bidder providing evidence that on average, the first acquisition in a block tends to perform much better than the last of the previous block. However, when taking into account the impact of the span between two acquisition blocks, only the effect for sprinters remains significant. Overall, these results are consistent with the view that returns exhibit a sawtooth pattern concomitant with blocks of acquisitions and should reinforce the credibility of the acquisition block based approach to serial acquirers.

4.5 | The channels of decreasing returns

Using the features of blocks of acquisitions, I test several theories suggested by the past literature as potential drivers of declining returns. I use the empirical setting depicted in Equation (6) and regress select variables of interest (each relevant to a specific theory) on *RPBW* to see if the variable at hand behaves in a way that is consistent with decreasing returns within block.

I report the results of the associated regressions in Table 9. Tests in Panel B, C, and D are conducted at the CEO level rather than at the firm level as traits may not persist from one executive to the next.[20] As such, the number of observations used and the power of the tests vary depending on the hypothesis tested and the proxy used. In Panel A, I test the overvaluation hypothesis that states that firms engage in streaks of M&As when overvalued. As they keep on acquiring, their stock eventually reverts to its true value, thus leading to decreasing returns. Following Macias et al. (2016)'s methodology, I look at bidders' market-adjusted returns over the past quarter to proxy for overvaluation.[21] I find evidence consistent with the overvaluation hypothesis as higher market-adjusted returns are associated with low values of *RPWB* for all acquirers except joggers.

I test the hubris hypothesis in Panel B. Following Ahern (2008), I use the magnitude of the premium paid as a measure of hubris. The evidence does not support the hubris hypothesis as *premium paid* is not significant for any type of acquirer. An important caveat here is that *premium paid* is available only for public targets, which lowers the number of observations available.

In Panel C, I test the learning hypothesis. Bidders learn over time, which allows them to better price their offer with every subsequent acquisition (in the sense that they can price it closer to a zero CAR). Following Aktas et al. (2013), I use the *TBD* to proxy for the learning phenomenon.[22] Results are significant for sprinters and marathoners alike suggesting a strong learning effect associated with additional acquisitions.

In Panel D, I test the *agency hypothesis*. Lang and Stulz (1994) observe that diversifying mergers and performance appear to be negatively related. As such, I use the number of diversifying mergers as a proxy for empire building. Results are significant for sprinters only, suggesting that acquisitions on the back-end of their short bursts blocks are likely to be empire building related which is consistent with their strong decreasing returns pattern.

Finally, I test the *relative size hypothesis* in Panel E. This hypothesis stipulates that bidders pick targets with a gradually smaller relative size, implying ever smaller gains over subsequent acquisitions. Results are not consistent with the relative size view as coefficients are insignificant in every regression. Again, this result must be interpreted with caution as the data necessary to compute the relative size of a target are not always available, truncating the sample.

[20] I gather the CEO-level data from Boardex to test the *hubris*, *management learning*, and *agency cost* hypotheses.

[21] Bidder market-adjusted returns are computed as returns over the quarter before the acquisition takes place so as not to contaminate the period of reference in case of multiple acquisitions. As such, this measure is constant for all deals within a given quarter. Note that results are qualitatively similar using a window of (−120 ; −30) or the firm-error component (Rhodes–Kropf, Robinson, & Viswanathan, 2005; see Appendix D.8 in the Supporting Information). All specifications exclude all-cash acquisitions.

[22] To avoid skewing the results, I take away the first observation of each block (the first observation in a new block by definition will have a higher *TBD*). Joggers are excluded since they complete at most two deals per block. Results are qualitatively similar when including the first observation of each block (see Appendix D.5 in the Supporting Information).

TABLE 9 Channels of decreasing returns

Panel A: Overvaluation hypothesis (no all-cash deals)								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
	Coeff.	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**
Market-adjusted returns $q-1$	−0.06***	<0.01	−0.01	0.66	−0.08***	<0.01	−0.09***	<0.01
Controls	Yes		Yes		Yes		Yes	
Firm and industry-year FE	Yes		Yes		Yes		Yes	
N	40,931		3,251		24,076		13,604	
R^2	14.04%		9.37%		11.46%		29.76%	
Panel B: Hubris hypothesis								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
	Coeff.	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**
Premium paid	−0.07	0.16	−0.06	0.34	−0.05	0.55	−0.09	0.33
Controls	Yes		Yes		Yes		Yes	
CEO FE and industry-year FE	Yes		Yes		Yes		Yes	
N	2,505		270		1,373		862	
R^2	20.48%		64.11%		20.92%		8.26%	
Panel C: Learning hypothesis								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
	Coeff.	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**
TBD	−0.05***	<0.01	–	–	−0.04***	<0.01	−0.02***	<0.01
Controls	Yes		–		Yes		Yes	
CEO FE and industry year FE	Yes		–		Yes		Yes	
N	24,132		–		11,414		12,718	
R^2	14.04%		–		48.51%		51.55%	
Panel D: Agency hypothesis								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
	Coeff.	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**
Diversifying acquisition	0.05**	0.02	0.02	0.36	0.03***	<0.01	0.02	0.12
Controls	Yes		Yes		Yes		Yes	
CEO FE and industry-year FE	Yes		Yes		Yes		Yes	
N	34,155		2,415		17,124		14,616	
R^2	50.51%		40.09%		29.55%		40.07%	

(Continues)

TABLE 9 (Continued)

Panel E: Efficiency hypothesis								
	Serial		**Jogger**		**Sprinter**		**Marathoner**	
	Coeff.	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**	**Coeff.**	***p*-value**
Relative value	0.00	0.71	−0.01	0.85	0.01	0.63	−0.01	0.77
Controls	Yes		Yes		Yes		Yes	
Firm FE and industry-year FE	Yes		Yes		Yes		Yes	
N	18,091		2,115		11,967		4,009	
R^2	15.20%		8.99%		15.41%		30.96%	

Note: This table reports the results of a series of regressions of relative position within block on several variables of interest. I use the following model as displayed in Equation (6):

$$RPWB_{i,t} = \beta_0 + \beta_1\ Variable\ of\ interest_{i,t} + \gamma_1 Acquirer - level\ variables_{i,t-1} + \gamma_2 Deal - level\ variables_{i,t} + f_i + \delta_t,$$

where *RPWB* is the ratio of the number of days since the first acquisition in the block divided by the total block length. In panel A and E, f_i represent firm-level fixed effects, while in panel B, C, and D it represents CEO fixed effects as observations are at the CEO level. Control variables are the same as in the base model and are defined in Appendix A in the Supporting Information. Panel A reports the results of a regression using market-adjusted returns over the previous quarter as the variable of interest to test the overvaluation hypothesis (all-cash deals excluded). Panel B reports the results of a regression using the premium paid as the variable of interest to test the hubris hypothesis. Panel C reports the results of a regression using the log of time between deals (TBD, see Aktas et al., 2013) as the variable of interest to test the learning hypothesis. Panel D reports the results of a regression using diversifying acquisition as the variable of interest to test the agency hypothesis. Panel E reports the results of a regression using relative size as the variable of interest to test the efficiency hypothesis. *, **, and *** denote significance of coefficients at the 10%, 5%, and 1% levels, respectively, computed using robust (Rogers, 1993) firm-clustered standard errors in Panels A and E and CEO-clustered standard errors in Panels B, C, and D.

4.6 | Robustness

In Sections D.1 through G.4 of Appendix in the Supporting Information, I report the results of a battery of robustness tests. Results are robust to alternative measures of performance such as a 5-day CAR window, equal-weighted and value-weighted market-adjusted returns, and to the impact of block distance (Section D). Another issue I address is the possible dependence of my results to the definition of a "block" of acquisitions. In the main tests, I use a full year (365 days) as the cutoff for a block, but results are robust to alternatives block lengths of 150, 250, 450, and 550 days. In a similar fashion, results are robust to alternative cutoffs for the marathoner category such as completing 20, 25, 35, or 40 acquisitions (Section E). Results are also robust to additional sample filters such as the exclusion of utilities and financial firms. Moreover, controlling for the impact of relative deal size further confirms my findings (although I acknowledge that deal size is not available for all observations which weakens test power, see Section F). To control for the possibility that investors perceive blocks as acquisition programs and capitalize on the first announcement, I show that results are robust to the removal of the first acquisition of every block (Section F). Finally, using alternative existing measures to capture returns such as DON or AIN confirms my conclusions (Section G).

5 | CONCLUSION

The prior literature has documented declining returns for bidders undertaking multiple acquisitions. To measure these declining returns accurately, I classify acquirers based on their patterns of acquisition and I look at bidders' streaks of

acquisition by grouping them into "blocks." I propose a new measure capturing bidders' acquisition patterns and the timeliness of their acquisitions, the *RPWB*, which provides new insights on the phenomenon of declining returns.

I confirm that returns do decline for bidders engaging in multiple acquisitions, but I show that this decline occurs within blocks of acquisitions as opposed to linearly over time as was previously thought. Furthermore, I find that one specific type of acquirer is driving the results (sprinters), while the most active actors in the market for corporate control (marathoners) appear to be immune to the pattern of declining returns. As such, marathoners appear to be the only serial bidders not to be affected by this phenomenon. This corroborates Golubov et al. (2015)'s finding that some acquirers simply outperform others on a regular basis. It appears likely that marathoners reach their preeminence precisely because they have greater capability to process and integrate targets.

These results suggest that undertaking a new acquisition is not necessarily value destroying even when the bidder has a lengthy history. Rather, it suggests that M&As tend to be value destroying when bidders make a flurry of bids over short periods of time. Finally, I investigate the channels through which declining returns occur and I find evidence consistent with temporary overvaluation, management learning, and empire building.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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