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## Article

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Article

# Can Entrepreneurs Who Experienced Business Closure Bring Their New Start-Up to a Successful M&A?

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**Abstract:** Numerous technology start-ups end up shutting down their operations. The present study aims to answer the following research questions: can entrepreneurs who closed their previous ventures bring their new venture to a successful exit through M&A and to what extent does this positive outcome correspond to whether investors funded their start-up? We examine 9723 technology start-ups established by 19,458 entrepreneurs. About half of the start-ups were funded, and 3463 of them had entrepreneurs with closure or with M&A experience. We find that entrepreneurs with closure experience are negatively associated with the probability of M&A as a main effect, in line with the theory that indicates imprinting. Nevertheless, entrepreneurs with closure experience are positively associated with the probability of M&A when their co-founders have M&A experience. We suggest that entrepreneurs with closure experience can compensate for their lack of M&A experience by learning from their peers who possess this experience. We discuss implications for theory, investors, and entrepreneurs.



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**Keywords:** entrepreneurs; closure experience; M&A; funding

## 1. Introduction

Numerous technology start-ups end up shutting down their operations, and this closure affects employees, investors, and the entrepreneurs. Research regarding the implications of business closure for entrepreneurs is quite rich (e.g., [Gottschalk et al. 2017](#); [Nyström 2020](#); [Stam and Schutjens 2006](#)). A popular belief is that entrepreneurs learn from their mistakes ([Prince 2018](#); [Stokes and Blackburn 2002](#)). This concept implies that entrepreneurs who have founded start-ups in the past possess the experience to enable them to do better in their future start-ups, regardless of whether their previous start-ups succeeded or were shut down. However, it is unclear whether the popular belief—that closure is likely to lead to learning and subsequent positive outcomes—is true and, if so, under what circumstances the positive outcomes are realized. If entrepreneurs who led start-ups in their past possess the experience to enable them to do well in their future start-ups, then other entrepreneurs may aspire to co-found their new start-up with these experienced entrepreneurs. Likewise, potential investors (firms or individuals who invest in technology start-ups) can benefit from investing in the future start-ups of these experienced entrepreneurs.

The present study aims to answer the following research questions: under what circumstances, if any, can entrepreneurs who closed their previous ventures bring their new venture to a successful exit through M&A and to what extent does this positive outcome correspond to whether investors invested in their start-up?

We follow the expanding literature that treats the exit of start-ups through M&A as a successful business outcome ([Bernstein et al. 2016](#); [Ahluwalia and Kasscieh 2021](#); [Kato et al. 2022](#)). Whereas investors have different preferences and aspirations for the firms they invest in, it is evident from the literature that investors consider their ability to convert their

investment into cash with a good return through M&A as a positive outcome (Ahluwalia and Kassiech 2021; Cefis et al. 2021; Nahata et al. 2014). Prior research defined a successful M&A as one with a value of over \$5 M (Kerr et al. 2014). Taking a more conservative approach, we define a successful M&A as one with a value of over \$10 M. The cutoff of \$10 M fits the context of the start-up industry in the present study.<sup>1</sup> We also conduct a sensitivity analysis for this cutoff point in our modeling estimation.

Following previous research (Gimmon and Levie 2010; Hoenig and Henkel 2015; Ucbasaran et al. 2010), we define closure experience as entrepreneurs who closed their previous start-up due to bankruptcy or liquidation, and we define an M&A experience as entrepreneurs who made a successful exit through M&A with a previous start-up. The experience of entrepreneurs and the way it contributes to business performance has occupied scholars for several decades (e.g., Hashai and Zahra 2022; Kato et al. 2015). We contribute to this literature by (1) taking a closer look specifically at entrepreneurs who experienced the closure of their previous venture and (2) examining which circumstances of a new start-up—in terms of the experience of co-founders—increase the probability of their new start-up undergoing a successful M&A. We supplement this examination by (3) observing the extent to which investors funded start-ups led by entrepreneurs with closure experience, as such an investment would suggest that investors identify closure experience as valuable.

We examine 9723 technology start-ups in Israel, established by more than 19,000 entrepreneurs. The technology start-up industry in Israel is one of the largest outside the United States (Bahar 2018; Deloitte 2021). Israel is ranked first in R&D intensity, fifth in high-tech density, and seventh on the global *Bloomberg Innovation Index* (2021). Thus, the present study's context is a considerable global technology start-up market, which provides an appropriate setting for entrepreneurship-related research.

## 2. Theory and Hypotheses

### 2.1. *Entrepreneurs with Closure Experience*

Entrepreneurs undergo an extensive learning process, which starts even before entering the market; in fact, pre-entry learning shapes subsequent performance (Bennett and Chatterji 2019; Chen et al. 2018). After entry, entrepreneurs learn about the capabilities of their start-up with regards to the industry that it operates in, and this learning is connected to the outcomes of either growth or decline (Jovanovic 1982). Like the learning that occurs before and during the entrepreneurial endeavor, learning occurs during and after closing. Entrepreneurs who closed their firm are also viewed as ones that can learn from the process and use their experience in other business settings (Atsan 2016; Stokes and Blackburn 2002; Bates and Khasawneh 2005). Entrepreneurs claim that they learn from their mistakes (e.g., Minniti and Bygrave 2001; Sitkin 1992), and studies indicate a potential increase in their ability to identify business opportunities (McGrath 1999). A business closure can motivate entrepreneurs to take different and new actions that are distinct from the ones they had previously taken (Minniti and Bygrave 2001). Broadly speaking, the closure experience may allow entrepreneurs to reflect upon their views, strengths, weaknesses, and the areas in which they could benefit from further development (Cope 2005, 2011).

### 2.2. *The Association between Entrepreneurs' Closure Experience, the Probability of Funding, and the Likelihood of Future M&A*

When making investment decisions, investors are influenced by the experience of the entrepreneurs of the firms they invest in (Bollazzi et al. 2019; Elitzur and Solodoha 2021). An important question, however, is whether investors consider the outcome of the previous ventures of the entrepreneurs. If entrepreneurs were successful in their previous entrepreneurial endeavors, they likely bring their know-how and capabilities to the new start-up (Boso et al. 2019; Zhao et al. 2013). Specifically, when entrepreneurs become more experienced with a certain activity, such as M&A, they may become more sensitive to changes or new opportunities in their external environments (Starbuck and Milliken

1988) and to efficiently acquire and assess information about the external environment (Bingham et al. 2007). Previous research demonstrated that entrepreneurs with a track record of success were more likely to demonstrate further down-the-road success than their peers (Gompers et al. 2010). As a result, entrepreneurs who successfully exited with their previous start-ups are likely to attract investors to invest in their new venture.

The question remains, however, whether entrepreneurs who have closed their previous firms attract or deter investors from investing in their new ventures. One could argue that the closure of one's previous venture is not a promising sign. However, the entrepreneurship literature suggests that, in the case of start-ups, this may not necessarily be the case and that there is considerable variation in the responses of individuals to the experience of failure (if failure was indeed the reason for closure) (Jenkins et al. 2014).

A prominent stream of studies emphasizes the importance of "learning by doing" (e.g., Gompers et al. 2010). Learning by doing highlights learning from one's activity, whether this activity led to a positive or less-positive outcome. The literature on entrepreneurial failure suggests that business closure can trigger entrepreneurs' learning about the business and about themselves (Cope 2011; Mueller and Shepherd 2016). Entrepreneurship experiences shape how entrepreneurs perceive certain cues from their environment, interpret them, and take action to pursue market opportunities (Maitlis 2005; Tripsas and Gavetti 2017). As a result, investors may perceive entrepreneurs as able to identify and exploit opportunities that could be missed or misunderstood by less-experienced entrepreneurs. Therefore, because experience—as a whole—provides knowledge and skills in the entrepreneurship arena (Cope and Watts 2000), investors may perceive closure experience as a source of learning that may contribute to the outcome of new projects.

One should ask, however, whether entrepreneurs indeed learn from their closure experience in a way that would increase their probability of an exit through M&A. While a business closure clearly presents rich learning opportunities (Cope 2011; Politis and Gabrielsson 2009; Ucbasaran et al. 2013), the ability to harness that learning effectively entails both understanding the closure process and accurately attributing the causes of the closure (Shepherd 2003). Learning from closure is difficult, especially if it is associated with failure. For example, the ability to learn from the process can be interfered because of one's negative emotional response (Cannon and Edmondson 2001), the blow to one's self-efficacy (Yamakawa et al. 2010), feelings of grief (Jenkins et al. 2014), and harsh financial consequences (Ma et al. 2021). Inefficient learning from closure can lead entrepreneurs to avoid potentially viable opportunities (Denrell and March 2001; Eggers 2012; Ucbasaran et al. 2009).

Another aspect of entrepreneurs' closure experience is the extent to which they can detach their future actions from their previous ones, thereby taking new paths that differ from the ones that led them to business closure. Studies have demonstrated that entrepreneurs tend to replicate decisions because their experience creates influential knowledge structures that are hard to escape (Kim and Longest 2014). For example, De Figueiredo et al. (2013) find that the early career experience of hedge fund entrepreneurs is a powerful determinant of the performance of their new hedge funds. Fern et al. (2012) argue that the experience of entrepreneurs strongly constrains their strategic decisions in their new venture and that entrepreneurs replicate strategies they have used in the past. In fact, Kim and Longest (2014) find that the knowledge that entrepreneurs gained in their past is strongly connected to their newly ventured firms, which greatly resemble the firms they left behind in terms of workstyle. Hsu and Lim (2014) find that the way entrepreneurs treat knowledge at the birth of their venture has a strong and long-term imprinting effect on how their firm treats knowledge down the road. Similarly, Beckman and Burton (2008) find that the experience entrepreneurs bring to their ventures has a long-lasting organizational imprint.

To summarize, we expect that investors will tend to invest in start-ups with entrepreneurs who have closed their previous start-ups, perhaps because investors believe in the ability of these entrepreneurs to learn from their mistakes. At the same time, these entrepreneurs are less likely to bring their new start-ups to a successful exit through M&A

because of imprinting: it is hard for them to act differently than what they were used to. Formally hypothesized, and despite investors' expectations,

**Hypothesis 1 (H1).** *Entrepreneurs with closure experience are negatively associated with the probability of performing M&A.*

### *2.3. The Association between Entrepreneurs' Closure Experience and the Probability of M&A When Co-Founding with Entrepreneurs with Exit Experience*

One should ask what could disrupt the potential imprint of previous actions and lead entrepreneurs who closed their previous start-ups to different outcomes in their new ventures. The literature suggests that this may occur if entrepreneurs expand their search for new business possibilities and opportunities (McGrath 1999; Shepherd et al. 2009).

We argue that the ability of entrepreneurs who closed their previous ventures to undergo M&A in their new start-up has a meaningful connection with joining forces with entrepreneurs who performed M&As in their own previous ventures. Prior literature argues that experiencing negative outcomes exposes gaps in the entrepreneurs' knowledge and motivates them to question their knowledge and search for new knowledge to supplement their own (Madsen and Desai 2010). Entrepreneurs with closure experience know that their previous actions had negative implications but might not know what actions will have positive implications. Having a co-founder with the appropriate experience will drive them to compensate for their deficiency by learning from their partner. Indeed, it is typical for entrepreneurs to compensate for a shortage in resources by using other available resources (Baker and Nelson 2005), especially through social transactions (Starr and MacMillan 1990). Such a compensation mechanism increases learning and has considerable long-term benefits (Rosenzweig and Grinstein 2016). Indeed, research highlights the importance of optimally using the human capital resources available to the top management team (Huy and Zott 2019). Consequently, when an entrepreneur who experienced closure co-founds a start-up with an entrepreneur who experienced M&A, the former will use the opportunity to learn and translate this learning into a successful outcome. We therefore hypothesize:

**Hypothesis 2 (H2).** *Entrepreneurs with closure experience are positively associated with the probability of performing M&A when co-founding with entrepreneurs with M&A experience.*

## **3. Method**

### *3.1. Data*

To test our hypotheses, we use the Israel Venture Capital (IVC) database. This is a comprehensive dataset that includes unique information on virtually the entire population of technology start-ups in Israel. The IVC is a privately owned research firm that provides information and serves as a mediator between start-up firms and potential investors. Formal institutions use these data, including the Israeli Central Bureau of Statistics and the Israel Innovation Authority, in their formal publications on the VC and start-up industries in Israel (CBS 2012, 2016; Israel Innovation Authority 2021, 2022). A research team continuously updates the dataset using public information validated with the entrepreneurs and investors of each start-up. The IVC database is a dual market: start-ups are highly motivated to be listed on it because it exposes them to potential funding opportunities, mergers and acquisitions, business and academic alliances, international alliances and funding, and so on. Similarly, investors are highly motivated to be listed in the database because it introduces them to potential investment opportunities, prospective social ties, and the associated social capital. Thus, inclusion in the database provides considerable benefits to start-ups and potential investors with no monetary cost, thereby limiting—although not eliminating—the possibility of start-ups not being listed in the data.

We retrieved the data on firms established between 1990 and 2014 and examined if they underwent a successful exit through M&A by 2019. If a start-up firm changed its name and, as a result, was listed in two separate entries, we merged them into a single entry.

We excluded start-ups where information critical for our analysis was missing. Our final sample included 9723 start-ups.

To account for entrepreneurs’ experience, we had to identify serial entrepreneurs, as well as the outcome of their previous start-up. We individually identified each entrepreneur using their first and last name and the industries that these entrepreneurs were active in. To complement the data in cases of uncertainty or missing information, we employed additional sources of information, such as the start-up’s website, Facebook, LinkedIn, and CrunchBase. The main advantage of such personal identification is that entrepreneurs cannot hide their past business closures because they cannot remove their names from the IVC database.

### 3.2. Measures

Our dependent variable is whether the start-up exited through M&A with a value of at least \$10 M (yes/no). Ten million dollars is a conservative take on prior research, which defined a value of \$5 M as a successful M&A (Kerr et al. 2014). To validate our cutoff, we conducted sensitivity analyses on M&A amounts of \$5 M–\$35 M, as reported below. We also tested a dependent variable with three outcomes: firms that underwent M&A, those that were closed, and those that remained active.

Our independent variables relate to the experience of the start-ups’ entrepreneurs: closure experience is the number of firms that the entrepreneurs led in their past that were closed, and M&A experience is the number of firms that the entrepreneurs led in their past that underwent M&A.

We control for the number of entrepreneurs and for whether the entrepreneurs have a PhD or MD (yes/no), because entrepreneurs’ educational background may be associated with outcomes (Kato et al. 2015). We also account for whether the start-up was funded (yes/no), because financial conditions are associated with start-ups’ exit routes (Honjo and Kato 2019). We also include industry dummy variables to control for one of seven industries: information technology (IT) and software, communication, life sciences, semiconductors, clean-tech, Internet, and miscellaneous technologies. Next, we control for start-up maturity, using both start-up age in years and start-up stage (seed, R&D, initial revenue, or revenue-growth stage), as these are associated with firms’ growth and outcomes (Jovanovic 1982). Finally, we control for “hot” or “cold” markets using the start-up’s year of establishment fixed effects (Gompers and Lerner 2000).

### 3.3. Modeling Approach

We use a logit model to test the probability of a start-up undergoing M&A:

$$M\&A_i = \beta_0 + \beta_1 Closure\ Experience_{ii} + \beta_2 M\&A\ Experience_i + \beta_3 Closure\ Experience \times M\&A\ Experience_i + \sum_{l=4}^L \beta_l P_{il-3} + \epsilon_i \tag{1}$$

where  $i$  is the subscript for start-up, and  $P$  are control variables that may affect the probability of the start-up undergoing M&A. To establish robustness, we also test a multinomial model, which we describe later.

In addition, because we wish to observe whether investors invest in start-ups led by entrepreneurs with closure and M&A experience, we similarly use a logit model to test the probability of the start-up to be funded:

$$Funding_i = \delta_0 + \delta_1 Closure\ Experience_{ii} + \delta_2 M\&A\ Experience_i + \delta_3 Closure\ Experience \times M\&A\ Experience_i + \sum_{l=4}^L \delta_l C_{il-3} + \epsilon_i \tag{2}$$

where  $i$  is the subscript for start-up, and  $C$  are control variables that may affect the probability of the start-up to be funded.

### 4. Results

#### 4.1. Descriptive Findings

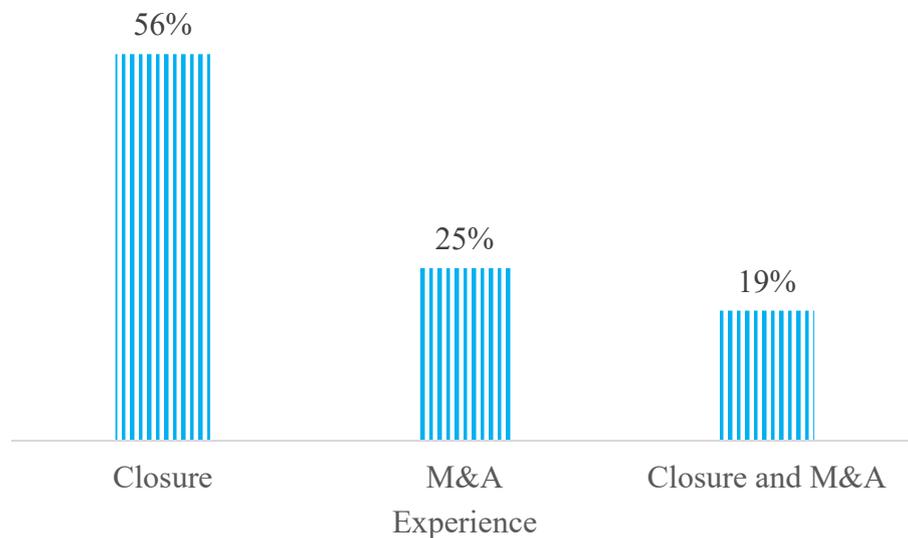
Of the 9723 technology start-ups in our analysis, 631 start-ups performed an exit through M&A, 3325 start-ups closed, and 5767 were still active when we harvested the data. The start-ups were established by 19,458 entrepreneurs. About half of the start-ups were funded (52.5%), and 3463 of them had entrepreneurs with closure or M&A experience.

Table 1 presents the means, standard deviations, and correlation matrix of the main variables. Figures 1 and 2 focus only on the start-ups of entrepreneurs with prior experience. Figure 1 examines only those start-ups that were funded. It shows that investors are undeterred by closure experience: 56% of the funded start-ups are of entrepreneurs with closure experience. Only 19% of the funded start-ups are of entrepreneurs with both types of experience. Figure 2 describes start-ups that underwent M&A. Only 9% of the start-ups of entrepreneurs with only closure experience exited through a successful M&A, compared with 19% of start-ups that involved entrepreneurs with both closure and M&A experience.

**Table 1.** Means, standard deviations, and correlation matrix of main variables.

	M	SD	1	2	3	4	5	6	7
1. Exited through successful M&A	0.081	0.273	-						
2. Closure experience	0.336	0.806	-0.026 *	-					
3. M&A experience	0.192	0.662	0.078 **	0.191 **	-				
4. Number of entrepreneurs	1.895	0.982	0.101 **	0.154 **	0.177 **	-			
5. PhD or MD (yes/no)	0.274	0.596	0.040 **	0.060 **	0.077 **	0.193 **	-		
6. Start-up age	5.584	4.577	0.101 **	-0.081 **	0.026 *	0.014	0.191 **	-	
7. Funded (yes/no)	0.525	0.499	0.156 **	0.023 *	0.108 **	0.185 **	0.207 **	0.244 **	-

\*\*  $p < 0.001$ , \*  $p < 0.05$ .



**Figure 1.** The share of funded start-ups of experienced entrepreneurs by entrepreneurs' type of experience.

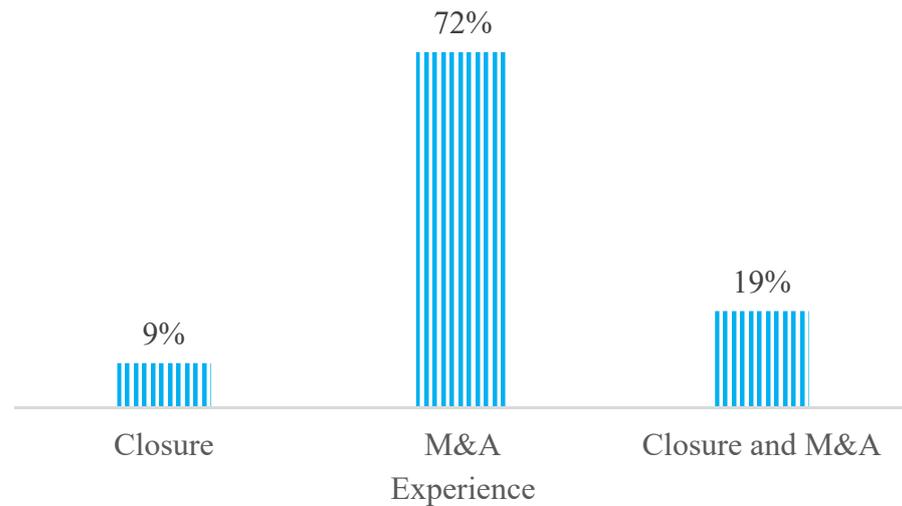


Figure 2. The share of types of experience among start-ups that underwent M&A.

4.2. Hypotheses Testing

H1 posits that entrepreneurs with closure experience are negatively associated with the probability of M&A. Model 1 (Table 2) shows the logit model estimation testing the association between entrepreneurs’ closure and M&A experience and the probability of M&A. We find that closure experience is negatively associated with performing M&A ( $\beta = -0.139, p < 0.05$ ), in support of H1. As expected, M&A experience is positively associated with performing M&A ( $\beta = 0.178, p < 0.001$ ).

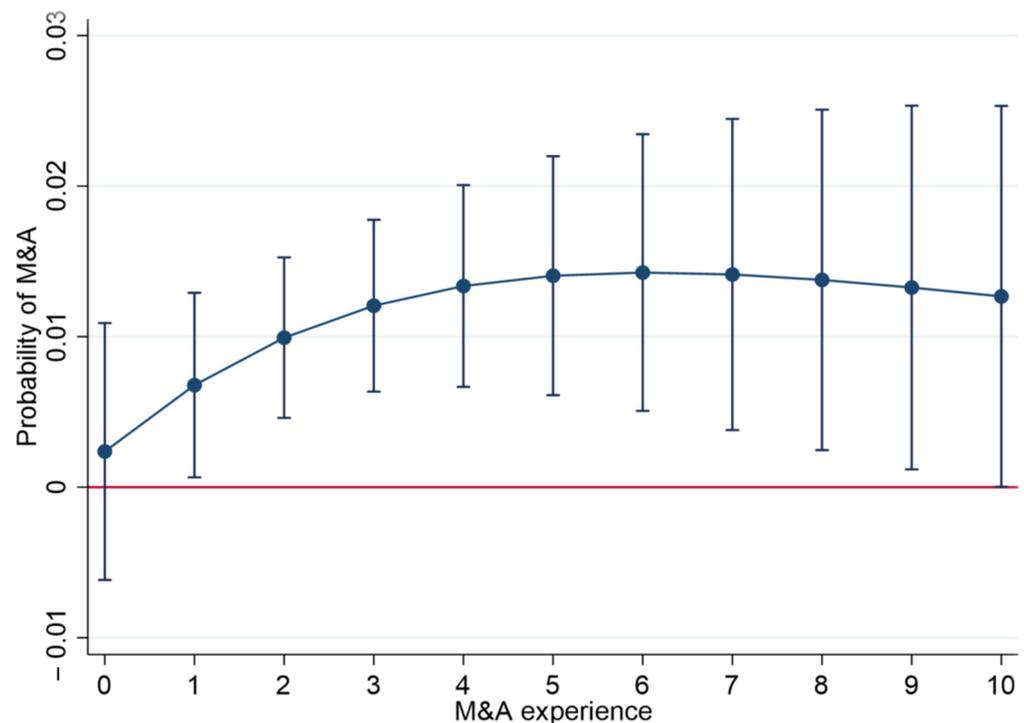
Table 2. The effect of entrepreneurs’ experience on the probability of M&A.

	Model 1		Model 2	
	$\beta$	SE	$\beta$	SE
Closure experience	-0.139 *	0.031	-0.227 **	0.075
M&A experience	0.178 **	0.064	0.042	0.077
Closure experience X M&A experience			0.097 **	0.034
Number of entrepreneurs	0.106 *	0.043	0.117 **	0.042
PhD or MD (yes/no)	0.517 **	0.115	0.538 **	0.115
Funded	0.904 **	0.112	0.910 **	0.113
Start-up age	-0.096 **	0.011	-0.098 **	0.011
Industry				
Clean-tech				
Communications	1.441 **	0.307	1.436 **	0.306
IT and software	1.712 **	0.302	1.717 **	0.302
Internet	0.992 **	0.310	1.003 **	0.310
Life sciences	1.100 **	0.315	1.096 **	0.315
Misc. technologies	1.148 **	0.342	1.145 **	0.342
Semiconductors	1.991 **	0.341	1.988 **	0.341
Start-up stage				
Seed				
R&D	-1.246 **	0.113	-1.262 **	0.113
Initial revenues	1.381 **	0.128	1.393 **	0.128
Revenue growth	-2.747 **	0.230	-2.774 **	0.231
Year of establishment fixed effects		√		√
Constant	-3.646 **	0.323	-3.624 **	0.322
Observations		9723		9723
Pseudo R <sup>2</sup>		0.197		0.198
Log-likelihood		-1920.339		-1916.574

\*\*  $p < 0.001, * p < 0.05$ .

H2 posits that entrepreneurs with closure experience are positively associated with the probability of M&A when co-founding with entrepreneurs with M&A experience. Model 2

(Table 2) includes the interaction between closure experience and M&A experience. Closure experience is negatively associated with performing M&A ( $\beta = -0.227, p < 0.001$ ), but the interaction is positively associated with performing M&A ( $\beta = 0.097, p < 0.001$ ). Because the logit model is not linear, it is challenging to interpret the interaction effects. Thus, we follow Gruber et al. (2013) and offer a graphical analysis of this interaction, based on a prediction of the interaction values wherein we keep the other variables constrained to their means. Figure 3 demonstrates that the interaction is significant almost across the entire range of values: for the probability of M&A to be positive and significant, entrepreneurs with closure experience should have at least one entrepreneur with M&A experience on the team. These findings are in support of H2.



**Figure 3.** A graphical analysis of the interaction effect: predicted probability and confidence intervals (95%) of start-up M&A as a function of entrepreneurs with closure experience and the number of entrepreneurs with M&A experience.

Observing the probability of funding according to the experience of the entrepreneurs, Model 3 (Table 3) shows that closure experience and M&A experience are both positively associated with the probability of funding ( $\delta = 0.083$  and  $\delta = 0.343$ , respectively,  $p < 0.001$ ). However, when accounting for the interaction between closure experience and M&A experience (Model 4, Table 3), the interaction is insignificant ( $\delta = -0.025, p = 0.375$ ). These findings suggest that investors are undeterred by closure experience; however, having entrepreneurs with diverse experience, of both M&A and closure, does not lead them to value the start-up as a better investment opportunity.

**Table 3.** The effect of entrepreneurs’ experience on the probability of funding.

		Model 3		Model 4	
		Probability of Funding		Probability of Funding	
		$\beta$	SE	$\beta$	SE
<b>Closure experience</b>		<b>0.083 **</b>	<b>0.031</b>	<b>0.095 **</b>	<b>0.035</b>
<b>M&amp;A experience</b>		<b>0.343 **</b>	<b>0.060</b>	<b>0.374 **</b>	<b>0.073</b>
<b>Closure experience X M&amp;A experience</b>				<b>−0.025</b>	<b>0.029</b>
Number of entrepreneurs		0.450 **	0.027	0.448 **	0.027
Ph.D. or MD (yes/no)		0.512 **	0.071	0.509 **	0.071
Start-up age		−0.032 *	0.008	−0.031 *	0.008
Industry	Clean-tech				
	Communications	−0.612 **	0.111	−0.613 **	0.111
	IT and software	−0.815 **	0.110	−0.817 **	0.110
	Internet	−0.648 **	0.108	−0.650 **	0.108
	Life sciences	0.182	0.114	0.182	0.114
	Misc. technologies	−0.387 **	0.130	−0.388 **	0.130
	Semiconductors	−0.090	0.175	−0.091	0.175
	Seed				
Start-up stage	R&D	0.207 **	0.062	0.208 **	0.062
	Initial revenues	1.126 **	0.137	1.124 **	0.137
	Revenue growth	−1.652 **	0.078	−1.650 **	0.078
Year of establishment fixed effects			√		√
Constant		−0.321	0.380	−0.320	0.380
Observations			9723		9723
Pseudo R <sup>2</sup>			0.192		0.192
Log-likelihood			−5435.192		−5434.872

\*\*  $p < 0.001$ , \*  $p < 0.05$ .

#### 4.3. Robustness Tests

We conduct the following tests. First, we follow the logic presented in prior studies and the start-up market in Israel to determine a cutoff of \$10 M as a successful exit through M&A. Nevertheless, we examine the sensitivity of the models to this exit value. Table 4 presents a sensitivity analysis that tests our main models for M&A values ranging from \$5 M to \$35\$, with all control variables, as in our main model estimations (Models 1–2). Our findings remain consistent across these estimations. Specifically, closure experience is negatively associated with the probability of M&A across all model estimations. In estimations including the interaction, there is no significant association between M&A experience and the probability of M&A, but the interaction between closure experience and M&A experience is positively associated with the probability of M&A across all model estimations. This sensitivity analysis indicates the robustness of our findings along a continuum of M&A values.

**Table 4.** Sensitivity analysis: the effect of entrepreneurs’ experience on the probability of M&A with different values.

	M&A > \$5 M		M&A > \$5 M		M&A > \$15 M		M&A > \$15 M		M&A > \$25 M		M&A > \$25 M		M&A > \$35 M		M&A > \$35 M	
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE
Closure experience	−0.143 *	0.065	−0.223 **	−0.071	−0.132 *	0.070	−0.212 **	0.077	−0.102 *	0.071	−0.185 *	0.078	−0.098 *	0.073	−0.184 *	0.081
M&A experience	0.190 **	0.061	0.066	0.074	0.172 *	0.066	0.046	0.079	0.165 *	0.067	0.031	0.082	0.188 *	0.073	0.050	0.083
Closure experience X M&A experience			0.090 **	0.033			0.089 *	0.035			0.092 **	0.035			0.092 **	0.035
Control variables included	✓		✓		✓		✓		✓		✓		✓		✓	
Observations	9831		9831		9658		9658		9593		9593		9552		9552	
Pseudo R <sup>2</sup>	0.202		0.203		0.193		0.194		0.186		0.187		0.182		0.183	
Log-likelihood	−2062.847		−2059.461		−1802.765		−1799.770		−1691.043		−1687.983		−1611.766		−1608.697	

\*\*  $p < 0.001$ , \*  $p < 0.05$ .

Second, we separated our dependent variable into three possibilities: (1) firms that exited through M&A with a value of more than \$10 M, (2) firms that closed down their operations or exited through M&A with a value of less than \$10 M (i.e., could be viewed as a failure), and (3) firms that are still active. We use a multinomial logit regression model based on Islam et al. (2018):

$$Pr(Z_i = K) = \frac{\sum_{k=1}^{K-1} e^{\partial}}{1 + \sum_{k=1}^{K-1} e^{\partial}} \tag{3}$$

where  $i$  is the start-up and  $K$  represents the outcomes:

$$Z_i \begin{cases} -1 & \text{if the start-up closed or exited through M\&A} < \$10 \text{ M} \\ 0 & \text{if the start-up is active} \\ 1 & \text{if the start-up exited through a successful M\&A} > \$10 \text{ M} \end{cases}$$

and

$$\partial = \gamma_0 + \gamma_1 \text{Closure Experience}_i + \gamma_2 \text{M\&A Experience}_i + \gamma_3 \text{Closure Experience} \times \text{M\&A Experience}_i + \sum_{k=4}^K \gamma_k D_{ik-3} + \varepsilon_i \tag{4}$$

where  $D$  are control variables.

Table 5 presents the model estimations, where the probability of closure and of M&A is compared with the probability of the start-up being active ( $Z_i = 0$ ). Model 5 shows that there is no significant association between either closure experience or M&A experience and the probability of start-up closure ( $\beta = -0.038$  and  $\beta = -0.064$ , respectively,  $p > 0.1$ ). However, consistent with our main analysis, closure experience is negatively associated with M&A ( $\beta = -0.131$ ,  $p < 0.05$ ) and M&A experience is positively associated with M&A ( $\beta = 0.184$ ,  $p < 0.05$ ). In Model 6, we include the interaction between closure experience and M&A experience. The interaction demonstrates no significant association with closure ( $\beta = 0.016$ ,  $p > 0.1$ ), but is positively associated with M&A ( $\beta = 0.086$ ,  $p < 0.001$ ). These results indicate that the presence of both types of experience has little to do with the probability of closure. At the same time, and consistent with our main findings, their presence relates to the probability of M&A, wherein a combination of both types of experience correlates with a positive outcome.

**Table 5.** The effect of entrepreneurs’ experience on the probability of closure and M&A (compared with the firm remaining active).

		Model 5				Model 6			
		Probability of Closure		Probability of M&A		Probability of Closure		Probability of M&A	
		β	SE	β	SE	β	SE	β	SE
Closure experience		−0.038	0.028	−0.131 *	0.066	−0.047	0.031	−0.210 **	0.074
M&A experience		−0.064	0.050	0.184 *	0.063	−0.087	0.060	0.062	0.078
Closure experience X M&A experience						0.016	0.027	0.086 **	0.035
Number of entrepreneurs		−0.099 **	0.025	0.066	0.043	−0.098 **	0.025	0.075	0.043
PhD or MD (yes/no)		0.537 **	0.067	0.670 **	0.120	0.539 **	0.067	0.699 **	0.120
Funded		0.127 *	0.051	0.892 **	0.113	0.127 *	0.051	0.897 **	0.114
Start-up age		−0.113 **	0.007	−0.115 **	0.012	−0.113 **	0.007	−0.117 **	0.012
Industry	Clean-tech								
	Communications	−0.220 *	0.105	1.214 **	0.299	−0.220 *	0.105	1.210 **	0.299
	IT and software	0.157	0.103	1.675 **	0.294	0.158	0.103	1.679 **	0.294
	Internet	−0.061	0.099	0.918 **	0.302	−0.060	0.099	0.928 **	0.301
	Life sciences	−0.038	0.102	0.962 **	0.305	−0.039	0.102	0.959 **	0.305
	Misc. technologies	0.497 **	0.123	1.268 **	0.333	0.497 **	0.123	1.267 **	0.333
	Semiconductors	0.778 **	0.169	2.055 **	0.343	0.777 **	0.168	2.050 **	0.342
Start-up stage	Seed								
	R&D	0.213 **	0.066	−1.069 **	0.113	0.212 **	0.066	−1.082 **	0.114
	Initial revenues	−0.988 **	0.197	0.997 **	0.134	−0.985 **	0.197	1.007 **	0.134
	Revenue growth	0.708 **	0.075	−2.350 **	0.232	0.706 **	0.075	−2.374 **	0.233
Year of establishment fixed effects			✓		✓		✓		✓
Constant		−0.219 *	0.126	−3.053 **	0.320	−0.216 *	0.126	−3.034 **	0.320
Observations				9723				9723	
Pseudo R <sup>2</sup>				0.106				0.106	
Log-likelihood				−7436.520				−7433.569	

\*\*  $p < 0.001$ , \*  $p < 0.05$ .

### 5. Discussion

The present study is part of the body of research examining entrepreneurs who closed their businesses. We focus on a specific aspect of business closure experience: the probability of start-ups led by such entrepreneurs to undergo a successful exit through M&A in their later start-ups. We find that entrepreneurs with closure experience are negatively associated with the probability of M&A as a main effect, in line with the theory that indicates imprinting. Nevertheless, entrepreneurs with closure experience are positively associated with the probability of M&A in start-ups with co-founders who have M&A experience. We attribute this finding to the ability of these entrepreneurs to compensate for their deficiency by utilizing social capital and cooperating with co-founders who possess relevant experience.

Interestingly, to the extent that investors indicate their expectations through making investments in start-ups, it seems that investors have faith in entrepreneurs with closure experience, as evident in the fact that their start-ups are being funded. An intriguing observation is the finding that investors seem less impressed with the combination of co-founders with both closure experience and M&A experience, as the probability of these start-ups being funded is not significant.

The present research offers the following contributions. First, our research disentangles one aspect of a long debate on whether entrepreneurs who experienced business closure learn from their mistakes and subsequently do better in their new start-ups. Prior studies focused on the importance of entrepreneurs’ experience to their future endeavors (Amankwah-Amoah et al. 2018; Boso et al. 2019; Simmons et al. 2016). We add to this literature by indicating circumstances in which these entrepreneurs translate their experience into a favorable M&A: an opportunity to co-found with entrepreneurs with M&A experience, thereby compensating for their lack of relevant M&A experience.

Second, we contribute to the literature on investors. We are careful with drawing conclusions regarding investors' decisions to fund the start-ups we examine because different investors have different preferences and aspirations for the start-ups they invest in. We follow research that considers the ability of investors to convert an investment into cash as a positive outcome (Ahluwalia and Kassicieh 2021; Nahata et al. 2014). Prior research suggested that funding is closely associated with start-up growth and performance (e.g., Honjo and Kato 2019; Hyun and Lee 2022). We add to this literature by offering a case in point, wherein investors tend to fund start-ups of entrepreneurs with closure experience, but these start-ups are negatively associated with the probability of M&A. Conversely, investors tend not to fund start-ups with teams of entrepreneurs with both types of experience, even though down the road, these start-ups are positively associated with the probability of M&A. With due caution, this finding may indicate that investors overestimate closure experience but do not attribute additional value to a more diverse combination of entrepreneurs, a puzzle that deserves further research.

Third, a recent literature review stated a need to situate exits via M&A on "a continuum ranging from favorable acquisitions paid at a premium, to asset-stripping acquisitions at fire-sale prices" (Cefis et al. 2021, p. 440). The sensitivity analysis we provide in Table 4 is a first step toward situating M&As on such a continuum, because it exposes the nature of the association of entrepreneurs' experience with the probability of undergoing M&A along a continuum of valuations.

Fourth, the present study uses unique data that provide some advantages: (1) as start-ups are primarily private ventures, data on entrepreneurs and start-up performance is hard to obtain. Some studies used large datasets (Dahl and Sorenson 2012; Parker 2013). However, many researchers resort to questionnaires, resulting in relatively small samples of a few dozen and up to a few hundred firms (Beckman and Burton 2008; Colombo et al. 2004); (2) because data on start-ups that ceased their operations and closed is hard to obtain, scholars are often forced to examine only ventures that survived, resulting in potential selection and survival bias (Da Rin et al. 2013). The features of our data enable us to broaden the scope of current research and partially address survival and selection bias.

### 5.1. Implications

Our findings provide several theoretical and practical implications. Regarding theory, realizing that a combination of different types of experience of the top management team could be a source of change and a diversion from unwanted imprinting is important. For investors, it is important to understand which closure experience is likely to generate a useful learning process for entrepreneurs. Possibly, practical learning can occur only when learning overrides imprinting. To increase the probability of down-the-road M&A, investors may want to qualify investments in entrepreneurs with closure experience only to cases where other entrepreneurs are on the founding team or to closely monitor and mentor entrepreneurs with closure experience.

For entrepreneurs, expanding the set of capabilities at hand is a critical task. Our findings indicate that actively seeking co-founders with M&A experience is likely to prove useful, especially for entrepreneurs who experienced closure in their past. However, because coordination costs increase with multiple co-founders (Wasserman 2012), entrepreneurs should carefully weigh the pros and cons of increasing the number of co-founders and thoroughly consider their team members.

It would also be valuable for entrepreneurs to realize that they tend to replicate previous strategic choices and decisions, even when these no longer match their new business environment. Such awareness of imprinting can become a useful tool in changing one's undesirable performance. Entrepreneurs with closure experience should be optimistic because investors seem to support them despite their past, and investments are associated with the probability of down-the-road exit.

## 5.2. Limitations and Future Research

Whereas our study contributes to the entrepreneurship literature and practice, it is not without limitations, which can serve as opportunities for future research. First, the present study focuses on a specific set of entrepreneurial experiences and one specific start-up outcome. Future research can investigate other forms of experience, such as experience within or outside the industry, as well as other down-the-road performance outcomes, such as the number and quality of patents that a start-up has been granted.

Second, we did not examine the approach of different types of investors to experience. Future research could examine this point. For example, private investors may view the experience of entrepreneurs differently than venture capitalists or government funds; the latter might consider previous business closures as a red flag. Grants from public sources could be critical for the start-ups because public funding is associated with innovation and potential revenues (Hottenrott and Richstein 2020; Srhoj et al. 2021). Finally, future research can offer policymakers some practical implications. For example, future research can test the benefits of government incentives for start-ups with heterogeneous experience of entrepreneurs or the benefits of training programs and mentoring for entrepreneurs with closure experience, so that they avoid a potentially harmful imprinting.

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## Note

- <sup>1</sup> For an M&A to be considered a positive outcome for investors, the value of the M&A should exceed the amount of money invested in the start-up. The context of the present study is the start-up industry in Israel. During the studied period, the average capital raised by funded start-ups in Israel ranged between \$4.9 M and \$7.5 M (IVC Research Center 2021). Therefore, a \$10 M value for M&As seems to be an adequate, yet conservative, cutoff for a positive outcome for start-ups in Israel.

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