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Technology acquisitions and investor expectations: Reputation and expectancy violation perspectives

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Abstract

Employing the organizational reputation lens and expectancy violation theory (EVT), I examine how financial market investors (investors) affect the technology acquisition activity and the likelihood of survival of firms facing technological change. I theorize that when a firm has a growth reputation, that is, investors expect revenue growth in future periods, the likelihood of making an acquisition will increase in anticipation of a positive expectancy violation on the part of investors. In contrast, for a firm that has an income reputation, that is, investors expect shareholder returns in future periods, the likelihood of making an acquisition will decrease in avoidance of a negative expectancy violation on the part of investors. I predict a novel moderating effect of investor expectations—a firm's acquisition activity will exert a stronger positive effect on its likelihood of surviving technological change when investor expectations are growth-oriented, that is, when there is a positive expectancy violation. Using a multi-industry sample of industry convergence, a salient form of technological change, I find support for my theoretical predictions. I advance research that examines the reactions of investors to firm strategies during technological change to the domain of technology acquisitions, a salient strategic decision. I also expand the predictive utility of the reputation lens and EVT to the context of firm survival during technological change.

KEYWORDS
expectancy violation, financial market investors, firm survival, reputation, technological change, technology acquisitions

INTRODUCTION

Technology acquisitions provide several alternatives to firms to renew their resources so that they may adapt and survive technological change (Capron & Mitchell, 2004, 2009; Chaturvedi & Prescott, 2020, 2022; Graebner, Eisenhardt, & Roundy, 2010; Uhlenbruck, Hitt, & Semadeni, 2006). For instance, such acquisitions provide access to new resources and capabilities, for example, patents, knowledge, and R&D capabilities (Ahuja & Katila, 2001; Cloodt, Hagedoorn, & Van Kranenburg, 2006; Kaul, 2012; Makri, Hitt, & Lane, 2010; Wagner, 2011); innovative products (Chaturvedi & Prescott, 2020; Puranam, Singh, & Zollo, 2006; Yu, Umashankar, & Rao, 2015); entry into fast-growing markets (Almor, Tarba, & Margalit, 2014; Gaur, Malhotra, & Zhu, 2013; Tong & Li, 2011); and access to entrepreneurial startups that pioneer nascent or emerging technologies (Ozmel, Reuer, & Wu, 2017; Titus, House, & Covin, 2017; Warner, Fairbank, & Steensma, 2006).

However, concomitantly, technology acquisitions are highly visible strategic decisions that invite the scrutiny of institutional actors such as financial market investors who may respond favorably or sanction these decisions (Desyllas, Goossen, & Phelps, 2024; Gaur, Malhotra, & Zhu, 2013; Graffin, Haleblian, & Kiley, 2016; Haleblian, Pfarrer, & Kiley, 2017; Uhlenbruck, Hitt, & Semadeni, 2006). Yet, little is known about how financial market investors (hereafter, investors) affect the ability of firms to make technology acquisitions and, in doing so, how investors affect the likelihood of firms adapting and

surviving technological change. Although recent research has found that investors are likely to impact the ability of firms to make internally driven strategic decisions, for example, capital expenditure and R&D investments during technological change (Benner, 2007, 2008, 2010; Benner & Ranganathan, 2012, 2013, 2017; Hossnofsky & Junge, 2019; Tripsas, 2009), theoretical and empirical insight on how investors affect the ability of firms to make external resource-accessing decisions such as technology acquisitions is limited. Furthermore, the above studies did not examine how investors affected the likelihood of firms adapting and surviving technological change.

I propose that developing theoretical insight on this line of inquiry is important for two reasons. First, investors are an influential and salient class of institutional actors that significantly impact firms' strategic decisions, performance, and reputation (Benner & Ranganathan, 2012, 2013, 2017; Fasaei, Tempelaar, & Jansen, 2018; Graffin, Haleblian, & Kiley, 2016; Haleblian, Pfarrer, & Kiley, 2017). Thus, how investors respond to a firm's technology acquisition activity[1] may pose implications for whether the firm is likely to make technology acquisitions to adapt and survive technological change. For instance, if investors respond positively when a firm announces an intent to make an acquisition, it is likely that the firm may indeed make the said acquisition, be able to adapt, and survive. That is, investors may potentially moderate the relationship between a firm's technology acquisition activity and its likelihood of survival.

Second, firm survival is a central outcome of concern for firms facing technological change and has a long-standing intellectual heritage in prior research on firm adaptation (Christensen et al., 2018; Henderson & Clark, 1990; Klepper & Simons, 1997, 2000; Levinthal, 1992; Tripsas, 1997). Thus, how investors moderate the relationship between firms' acquisition activity and their likelihood of firm survival during technological change is a compelling line of inquiry. Developing theoretical insight on this line of inquiry may also improve our understanding of the broader topic concerning how institutional actors affect firm outcomes during environmental transformations.

In this study, I embark on a theoretical and empirical examination of how investors affect a firm's technology acquisition activity and, in doing so, how they affect the firm's likelihood of survival during technological change. Employing the organizational reputation lens (Fombrun & Shanley, 1990; Mishina, Block, & Mannor, 2012; Parker, Krause, & Devers, 2019) and expectancy violation theory (EVT) (Burgoon, 1993, 2015; Floyd, Ramirez, & Burgoon, 1999), I predict that investor expectations exert an enabling or restraining effect that respectively increases or decreases the likelihood of firms making technology acquisitions. In addition, I predict that because of this enabling or restraining effect, investor expectations moderate the relationship between acquisition activity and the likelihood of firm survival.

Prior research employing the organizational reputation lens has found that firms' reputations for creating value (or, their value creation reputations) drive heterogeneity in investors' expectations about how firms should create value in future periods (Benner, 2007; Benner & Ranganathan, 2013; Blagoeva, Kavusan, & Jansen, 2020). If a firm creates value by consistently increasing revenue (i.e., revenue growth), it develops a growth reputation, that is, investors in the firm become more growth-oriented in their expectations. That is, investors expect that the firm will continue to increase revenue in future periods (Benner, 2007; Benner & Ranganathan, 2013, 2017; Fama & French, 1998).

However, if a firm creates value by consistently generating profit and cash flow to yield dividends to shareholders, it develops an income reputation, that is, investors in the firm become more income-oriented in their expectations. That is, investors expect that the firm will continue to yield dividends in future periods (Benner, 2007; Benner & Ranganathan, 2013, 2017; Fama & French, 1998). Thus, as firms' value creation reputations (growth or income) are outcomes of pursuing different approaches to value creation (revenue growth or profit/dividends), they lead to heterogeneity in investor expectations about how the firm should create value in future periods (Pfarrer, Pollock, & Rindova, 2010).

I theorize that because of heterogeneity in expectations arising from differences in firms' value creation reputations, how investors interpret the strategic decisions (e.g., technology acquisitions) that firms take to create value are also likely to differ. That is, investors may grant some firms greater latitude to make technology acquisitions as they may interpret such acquisitions to be aligned with those firms' reputations and, hence, with their own expectations (Pfarrer, Pollock, & Rindova, 2010; Zavyalova et al., 2016).

Drawing on the EVT, I theorize that when investor expectations are growth-oriented, that is, a firm has a growth reputation, then the firm's technology acquisition activity will exceed investor expectations resulting in a positive expectancy violation. This is because investors will interpret technology acquisitions as facilitating the firm to search and leverage new growth opportunities emerging as a result of technological change to potentially increase its revenue in future periods. Prior research has established acquisitions to be a key driver of corporate growth (Almor, Tarba, & Margalit, 2014; Kim, Haleblian, & Finkelstein, 2011; Penrose, 1959; Tong & Li, 2011). Thus, I hypothesize that when investors in a firm are growth-oriented in their expectations, the firm's likelihood of making a technology acquisition will increase in anticipation of a positive expectancy violation on the part of investors. That is, investors will assume an

[1] I employ the term "technology acquisition activity" to represent instances when a firm makes one or more technology acquisitions. This term is established in per prior research on acquisitions (Collins et al., 2009; Haleblian et al., 2009; Haunschild, 1993).

"enabling" role—a firm will be more likely to make a technology acquisition as investors will interpret this decision as a positive expectancy violation.

However, when investor expectations are income-oriented, that is, a firm has an income reputation, then the firm's technology acquisition activity will fail to meet investor expectations leading to a negative expectancy violation. This is because investors will interpret technology acquisitions as risky decisions that may lead to uncertain or ambiguous outcomes that compromise the firm's ability to earn profit and cash flow and yield dividends (Benner, 2007; Benner & Ranganathan, 2013; Fasaei, Tempelaar, & Jansen, 2018). Thus, I hypothesize that when investors in a firm are income-oriented in their expectations, the likelihood of the firm making a technology acquisition will decrease in avoidance of a negative expectancy violation on the part of investors. That is, investors will assume a "constraining" role—a firm will be less likely to make a technology acquisition as investors will interpret this decision as a negative expectancy violation.

Finally, I hypothesize that investor expectations will positively moderate (strengthen) the relationship between technology acquisition activity and the likelihood of survival for a firm that has a growth reputation, that is, when investor expectations are growth-oriented. When investor expectations are growth-oriented, investors are likely to interpret the firm's technology acquisition activity as constituting a positive expectancy violation and assume an "enabling" role. Thus, such a firm is more likely to engage in technology acquisition activity in anticipation of a positive expectancy violation. As a result, such a firm may also be more likely to adapt to technological change and increase its likelihood of survival.

I found strong support for my hypotheses using a dataset of 173 firms from a multi-industry context comprising two instances of industry convergence, a salient form of technological change as per prior research—(i) convergence between the telecommunications equipment and computer networking industries (1989–2003) (Chaturvedi, Hsu, & Prescott, 2024; Lee, 2007; Puranam, Singh, & Zollo, 2006) and (ii) the emergence of the digital photography industry due to convergence between the computing, consumer electronics, and photography industries (1991–2006) (Benner, 2008, 2010; Benner & Tripsas, 2012).

My study makes three contributions. First, I advance prior research that shows how expectations of institutional actors such as financial market investors affect firms' strategic decisions during technological change. The results of my study imply that investor expectations may enable or constrain firms to engage in technology acquisition activity and exert a moderating effect on the relationship between acquisition activity and the likelihood of firm survival. Second, my study advances research on the organizational reputation lens and EVT by showing that value creation reputations and expectancy violations shape investor expectations regarding strategic decisions such as technology acquisitions and, in doing so, affect the likelihood of firm survival during technological change. Third, I extend research on industry convergence by establishing acquisitions as a crucial survival-enhancing mechanism.

THEORY AND HYPOTHESES

Technology acquisitions

Technology acquisitions yield several advantages to a firm that enable it to renew its resources to adapt and survive technological change (Almor, Tarba, & Margalit, 2014; Capron & Mitchell, 2009; Chaturvedi & Prescott, 2020, 2022; Graebner, Eisenhardt, & Roundy, 2010). Such acquisitions provide access to patents and technical knowledge that aid firms in developing absorptive capacity related to new technologies (Ahuja & Katila, 2001; Cloodt, Hagedoorn, & Van Kranenburg, 2006; Kaul, 2012; Uhlenbruck, Hitt, & Semadeni, 2006; Wagner, 2011). Hence, firms may leverage the complementarity or recombinant potential between acquired and internal resources to develop new patents and products (Chondrakis, 2016; Karim & Kaul, 2015; Makri, Hitt, & Lane, 2010).

In addition, acquisitions provide firms with R&D and product development capabilities that augment their innovation potential by enabling firms to experiment with new technologies and develop cutting-edge products (Choi & McNamara, 2018; Hunt, 2021; Puranam & Srikanth, 2007; Ranft & Lord, 2002). In other scenarios, firms may employ technology acquisitions to access a target's overall product portfolio to address continuously evolving and fast-changing customer preferences (Chaturvedi & Prescott, 2020; Karim & Mitchell, 2000; Puranam, Singh, & Zollo, 2006). Technology acquisitions may also provide firms with access to fast-growing markets by overcoming the time-compression diseconomies inherent to internal expansion (Almor, Tarba, & Margalit, 2014; Capron & Mitchell, 2004, 2009; Tong & Li, 2011).

Yet another advantage of technology acquisitions is that they grant firms foothold entries into nascent markets that may develop high growth potential in the future (Ransbotham & Mitra, 2010; Warner, Fairbank, & Steensma, 2006). By doing so, acquisitions give firms the "option" to increase or decrease resource commitment to such markets contingent on whether they may contribute to revenue growth in the future. In parallel, acquisitions involve purchasing entrepreneurial startups that pioneer nascent technologies leading to the inception of new fast-growing markets (Keyhani et al., 2022; Ozmel, Reuer, & Wu, 2017; Titus, House, & Covin, 2017). Technology acquisitions may also grant a firm access to a target's alliances and the decision rights to license out the target's technologies to earn revenue (Desyllas, Goossen, & Phelps, 2024; Klueter, Moreira, & Ofoedu, 2024).

Finally, technology acquisitions equip firms to overcome the inertia and path dependence that plague internal resources and may inhibit firms from adapting to technological change (Capron & Mitchell, 2009; Chaturvedi & Prescott, 2022; Kaul, 2012; Titus, House, & Covin, 2017). Thus, in sum, technology acquisitions augment firms' capability to adapt to technological change and increase their likelihood of survival.

Notwithstanding the above advantages, technology acquisitions are also highly visible strategic decisions that invite the scrutiny of institutional actors such as investors that may respond favorably or sanction these decisions (Desyllas, Goossen, & Phelps, 2024; Gaur, Malhotra, & Zhu, 2013; Graffin, Haleblian, & Kiley, 2016; Uhlenbruck, Hitt, & Semadeni, 2006). Yet, little is known about how financial market investors (hereafter, investors) affect the ability of firms to make technology acquisitions and, in doing so, how investors affect the likelihood of firms adapting and surviving technological change.

Next, I briefly review the organizational reputation lens and EVT and discuss how they may provide theoretical insight on this issue.

Firms' value creation reputations and investor expectations

Prior research defines reputation as "stakeholders' perceptions about whether a firm will deliver certain outcomes or perpetuate certain behaviors" (Mishina, Block, & Mannor, 2012; Parker, Gong, & Mui, 2023; Parker, Krause, & Devers, 2019). A firm develops a reputation by taking strategic decisions that enable it to consistently achieve a specific performance outcome (Basdeo et al., 2006; Fombrun & Shanley, 1990; Parker, Gong, & Mui, 2023; Parker, Krause, & Devers, 2019). As the firm establishes a reputation, stakeholders expect that the firm would continue to take decisions that lead to the same performance outcome in the future (Fasaei, Tempelaar, & Jansen, 2018; Haleblian, Pfarrer, & Kiley, 2017; Parker, Krause, & Devers, 2019). Thus, a firm's reputation derives from its prior strategic decisions and performance outcome and serves as a yardstick for stakeholders to evaluate whether decisions taken in future periods may lead to the expected performance outcome (Mishina, Block, & Mannor, 2012; Parker, Gong, & Mui, 2023; Parker, Krause, & Devers, 2019; Pfarrer, Pollock, & Rindova, 2010).

Employing these insights, I define a firm's value creation reputation as "a consistent record of achieving a specific performance outcome to create value for investors." For example, if a firm creates value by consistently increasing revenue, it develops a growth reputation and investors become more growth-oriented in their expectations, that is, they expect the firm will continue to achieve revenue growth in future periods (Benner, 2007; Benner & Ranganathan, 2013, 2017; Fama & French, 1998). If a firm creates value by consistently generating profit and cash flow to yield dividends to shareholders, it develops an income reputation and investors become more income-oriented in their expectations. That is, investors expect the firm to continue to generate profit and cash flow so that it may be able to yield dividends in future periods.

I conjecture that as value creation reputations (growth or income) arise from firms pursuing different approaches to value creation (i.e., revenue growth or profit/dividends), they may lead to heterogeneity in investor expectations regarding the type of strategic decisions (e.g., technology acquisitions) that firms need to take to create value while remaining aligned with their reputations. Below, I further elaborate on this point by reviewing the EVT and associated research on heterogeneity in investor expectations regarding firms' strategic decisions.

EVT and investor responses to technology acquisitions

The EVT states that stakeholders have expectations related to how an actor should behave in a given situation (Burgoon, 1993, 2015; Floyd, Ramirez, & Burgoon, 1999). In this context, expectancy implies an "enduring pattern of behavior" to which an actor is expected to conform (Burgoon, 1993, 2015). When an actor's behavior leads to outcomes that do not align with the expectations of stakeholders, this results in an expectancy violation (Burgoon, 1993, 2015). An expectancy violation is positive or negative when the actor's behavior may lead to outcomes that exceed or fail to meet stakeholders' expectations respectively (Burgoon, 1993; Burgoon & Le Poire, 1993; Floyd, Ramirez, & Burgoon, 1999). An actor is more likely to exhibit behavior that may lead to a positive expectancy violation as stakeholders will reward such behavior while avoiding behavior that may lead to a negative expectancy violation as stakeholders will sanction such behavior (Brown, 2001; Burgoon & Le Poire, 1993; Floyd, Ramirez, & Burgoon, 1999).

Recent research applying the EVT to firms' strategic decisions has found that because of heterogeneity in investor expectations regarding how firms should create value, investors' responses to strategic decisions that firms take to create value are likely to differ (Blagoeva, Kavusan, & Jansen, 2020; Graffin, Haleblian, & Kiley, 2016; Haleblian, Pfarrer, & Kiley, 2017). When investor expectations are growth-oriented, that is, a firm has a growth reputation, investors interpret strategic decisions that may increase revenue in future periods as positive expectancy violations and decisions that may compromise revenue growth as negative expectancy violations (Benner, 2007; Benner & Ranganathan, 2013; Blagoeva, Kavusan, & Jansen, 2020).

When investor expectations are income-oriented, that is, a firm has an income reputation, investors interpret decisions that may increase profit and cash flow in future periods as positive expectancy violations (as the firm may be more likely to yield dividends to shareholders). Alternatively, investors interpret decisions that may decrease profit and cash flow as negative expectancy violations (as the firm may not be able to yield dividends) (Benner, 2007; Benner & Ranganathan, 2013; Blagoeva, Kavusan, & Jansen, 2020).

As technology acquisitions represent a key strategic decision during technological change, they are likely to come under the purview of the above-mentioned mechanisms underpinning the organizational reputation lens and EVT. Thus, I conjecture that when technology acquisitions constitute a positive expectancy violation, investor expectations will exert an "enabling" effect, that is, the likelihood of acquisition will increase. However, when acquisitions constitute a negative expectancy violation, investor expectations will exert a "constraining" effect, that is, the likelihood of acquisition will decrease. In addition, I predict that investor expectations will exert a moderating effect on the relationship between technology acquisition activity and the likelihood of firm survival. Below, I develop these ideas in greater detail as part of my hypotheses.

Growth reputation and the likelihood of technology acquisitions

I predict that when a firm has a growth reputation, that is, investors in the firm are growth-oriented in their expectations, they are likely to interpret the firm's technology acquisition activity as a positive expectancy violation during technological change. In line with this prediction, I hypothesize that the likelihood of such a firm making a technology acquisition will increase in anticipation of a positive expectancy violation on the part of investors. I forward three rationales for this prediction.

First, when investors are growth-oriented, they expect a firm to search and leverage new growth opportunities emerging as a result of technological change so that it may develop new revenue streams and thus increase revenue in future periods (Benner, 2007; Benner & Ranganathan, 2013, 2017). To achieve this performance outcome, investors expect that the firm will employ strategic decisions that enable it to increase penetration in existing markets, enter new, fast-growing markets, explore nascent markets that promise fast growth in future periods, experiment with new technologies, and develop innovative products (Benner, 2007; Benner & Ranganathan, 2013, 2017; Blagoeva, Kavusan, & Jansen, 2020).

Technology acquisitions are an established mode of corporate growth as they aid the firm in accomplishing the above objectives to increase revenue (Almor, Tarba, & Margalit, 2014; Kim, Haleblian, & Finkelstein, 2011; Penrose, 1959; Tong & Li, 2011). As discussed, acquisitions provide access to new technological resources and capabilities (Ahuja & Katila, 2001; Cloodt, Hagedoorn, & Van Kranenburg, 2006; Kaul, 2012; Makri, Hitt, & Lane, 2010; Wagner, 2011), innovative products (Chaturvedi & Prescott, 2020; Puranam, Singh, & Zollo, 2006; Yu, Umashankar, & Rao, 2015), entry into fast-growing markets (Almor, Tarba, & Margalit, 2014; Gaur, Malhotra, & Zhu, 2013; Tong & Li, 2011), start-ups that pioneer fast-growing technologies (Keyhani et al., 2022; Ozmel, Reuer, & Wu, 2017; Titus, House, & Covin, 2017), and the option to grow via a target's alliances and licensing out its technologies (Desyllas, Goossen, & Phelps, 2024; Klueter, Moreira, & Ofoedu, 2024).

Second, acquisitions may be risky as the firm may incur significant costs due to uncertainty related to target valuation (e.g., paying high premiums) and face causal ambiguity and complexity in post-acquisition integration (Chaturvedi & Prescott, 2022; Cording, Christmann, & King, 2008; Laamanen, 2007; Puranam, Powell, & Singh, 2006; Puranam, Singh, & Zollo, 2006; Puranam & Srikanth, 2007; Reuer & Sakhartov, 2021). However, investors that are growth-oriented in their expectations may be tolerant of these risks. Investors may justify the firm incurring these risks as they interpret acquisitions to be drivers of revenue growth, a performance outcome aligned with the firm's value creation reputation that in turn derives from successful revenue growth in prior periods (Pfarrer, Pollock, & Rindova, 2010; Zavyalova et al., 2016). In addition, investors may be patient even when such risks lead to delays in the firm realizing revenue growth (Campbell, Polk, & Vuolteenaho, 2010; Souder et al., 2016; Zhang & Gimeno, 2016). This is because investors may believe that the firm will overcome the risks given its reputation, and hence, they may interpret delays in realizing revenue growth as minor setbacks rather than major disruptions (Black & Gilson, 1999; Bottazzi, Da Rin, & Hellmann, 2016; Eccles, Ioannou, & Serafeim, 2014).

Third, technological change creates environmental conditions that may be more conducive to a firm with a growth reputation (Benner, 2007; Benner & Ranganathan, 2013, 2017). For instance, there may be uncertainty related to the commercial viability of different technologies and fast-paced changes in customer demand (Adner & Kapoor, 2016; Christensen et al., 2018; Klepper & Simons, 2000; Levinthal, 1992). Such conditions emphasize the importance of a trial-and-error strategy that facilitates experimenting with new technologies, developing innovative product ideas, and commercializing ideas that address evolving customer demand and increase revenue—an imperative effectively addressed by technology acquisitions (Ahuja & Katila, 2001; Chaturvedi & Prescott, 2020; Hunt, 2021; Puranam, Singh, & Zollo, 2006; Titus, House, & Covin, 2017). A firm with a growth reputation is more

likely to be familiar with trial-and-error strategies as it is likely to have experience in searching and leveraging new growth opportunities and thus may be optimally positioned to make an acquisition. Hence, investors may interpret acquisitions as being consistent with the value creation reputation of the firm and exceeding their expectations.

In sum, when their expectations are growth-oriented, investors will anticipate that the firm will make a technology acquisition. In doing so, investors will exert an "enabling" effect that increases the likelihood that the firm will make a technology acquisition in anticipation of a positive expectancy violation. Thus, I hypothesize,

Hypothesis 1a. During technological change, growth-oriented investor expectations will positively affect the likelihood of a firm making a technology acquisition.

Income reputation and the likelihood of technology acquisitions

I predict that when a firm has an income reputation, that is, investors in the firm are income-oriented in their expectations, they are likely to interpret the firm's technology acquisition activity as a negative expectancy violation during technological change. In line with this prediction, I hypothesize that the likelihood of such a firm making a technology acquisition will decrease in avoidance of a negative expectancy violation on the part of investors.

When investors are income-oriented, they expect a firm to prioritize increasing profit and cash flow to yield dividends to shareholders consistently (Benner, 2007; Benner & Ranganathan, 2013, 2017; Fama & French, 1998). To achieve this performance outcome, investors expect that the firm will employ strategic decisions that facilitate it to improve operational efficiency and reduce costs (Benner, 2007, 2010; Benner & Ranganathan, 2013). By doing so, the firm may optimize profit and cash flow and, hence, be able to yield dividends to shareholders in future periods. In contrast, if such a firm employs strategic decisions that are costly, require significant resource commitment for implementation, and are risky in terms of bearing uncertain or ambiguous outcomes, they may undermine profit and cash flow and, hence, compromise the firm's ability to yield dividends. Thus, such strategic decisions will not be aligned with the firm's value creation reputation and, hence, will fail to meet investor expectations (Benner & Ranganathan, 2012, 2013; Fasaei, Tempelaar, & Jansen, 2018; Haleblian, Pfarrer, & Kiley, 2017).

Extending the above theoretical logic, when investors are income-oriented in their expectations, they are unlikely to interpret a firm's technology acquisition activity as being aligned with its value creation reputation and, hence, with their expectations for three reasons. First, as discussed, technology acquisitions are likely to be costly as a firm may need to pay a high premium to purchase a technology-based target due to uncertainty related in terms of the commercial viability of its resources (Laamanen, 2007; Reuer & Sakhartov, 2021). Furthermore, because of ambiguity in valuing new technologies, a firm may acquire technologies that may turn out to be commercially unviable while losing out on those that achieve viability (Chaturvedi & Prescott, 2020; Puranam, Powell, & Singh, 2006; Warner, Fairbank, & Steensma, 2006).

Second, even if a firm makes a technology acquisition, the post-acquisition integration process is likely to be highly complex and causally ambiguous (Graebner, Eisenhardt, & Roundy, 2010; Ranft & Lord, 2002). The firm may need to address the simultaneous but opposing mandates of facilitating coordination between acquirer and target resources to achieve technological synergies while granting autonomy to other resources (e.g., human capital) to avoid disrupting their innovative capabilities (Chaturvedi & Prescott, 2022; Dattée et al., 2022; Graebner, 2004; Puranam, Singh, & Zollo, 2006; Puranam & Srikanth, 2007). To address these issues, the firm may incur significant costs in designing and implementing the integration process.

Third, when integrating technology acquisitions, a firm may face risk, uncertainty, and ambiguity during integration in terms of evaluating the quality of outcomes linked to experimenting with new technologies, developing innovative products, and entering new, fast-growing markets (Cording, Christmann, & King, 2008; March, 1991; Warner, Fairbank, & Steensma, 2006). Because of this, the firm may realize tangible performance outcomes only after a significant period of time (Graebner, Eisenhardt, & Roundy, 2010; March, 1991; Ranft & Lord, 2002).

As investors with income-oriented expectations prioritize a consistent record of dividends to shareholders due to the firm's reputation that in turn derives from successfully yielding dividends in prior periods (Parker, Gong, & Mui, 2023; Parker, Krause, & Devers, 2019; Pfarrer, Pollock, & Rindova, 2010), they are unlikely to tolerate the high costs, risk, uncertainty, and ambiguity associated with technology acquisitions (Baker & Wurgler, 2004; Bushee, 2001; Hoberg & Prabhala, 2008). In addition, as investors seek dividends that are guaranteed and risk-free, they may lose patience when they realize that tangible performance outcomes from acquisitions may only be imminent in the long term (Baker & Wurgler, 2004; Cremers, Pareek, & Sautner, 2020; Polk & Sapienza, 2009). As a result, investors may view acquisitions as an unwarranted diversion of resources or an opportunity cost that may undermine the firm's ability to generate profit and cash flow to yield dividends. Thus, investors may interpret acquisitions as being inconsistent with the firm's value creation reputation and hence, failing to meet their expectations.

In sum, during technological change, when their expectations are income-oriented, investors will anticipate that the firm will abstain from making a technology acquisition. In doing so, investors will exert a "constraining" effect that decreases the likelihood that the firm will make an acquisition in avoidance of a negative expectancy violation. Thus, I hypothesize,

> **Hypothesis 1b.** During technological change, income-oriented investor expectations will negatively affect the likelihood of a firm making a technology acquisition.

Moderating effect of investor expectations on the relationship between technology acquisition activity and likelihood of firm survival

I predict that investor expectations will positively moderate (strengthen) the relationship between technology acquisition activity and the likelihood of survival when a firm has a growth reputation, that is, investor expectations are growth-oriented. I present two rationales for my prediction.

First, as discussed earlier, when investors are growth-oriented, they expect a firm to search and leverage new growth opportunities emerging as a result of technological change to consistently increase revenue in alignment with its value creation reputation. However, during technological change, a firm may also need to proactively renew its resource base by accessing new resources linked to technological change so that it may be able to search and leverage new growth opportunities more effectively (Agarwal & Helfat, 2009; Capron & Mitchell, 2009; Lavie, 2006; Sosa, 2011). This is because new resources may substitute or render obsolete the firm's legacy (pre-existing) resources and attenuate or impair their potential for revenue growth (Christensen et al., 2018; Henderson & Clark, 1990; Iansiti & Khanna, 1995). More critically, the substitution and obsolescence of legacy resources may undermine the firm's ability to adapt to technological change and imperil its likelihood of survival (Christensen et al., 2018; Klepper & Simons, 1997, 2000; Levinthal, 1992; Tripsas, 1997). Thus, if the firm remains inertial and persists with employing legacy resources for revenue growth, it may not only fail to live up to its value creation reputation and investor expectations but also be less likely to adapt and survive technological change (Benner, 2007; Chaturvedi, 2023; Tripsas, 2009).

As predicted in Hypothesis 1a, when investors have expectations that are growth-oriented, they may exert an "enabling" effect encouraging the firm to make a technology acquisition. If such a firm indeed engages in technology acquisition activity, it may be more likely to renew its resource base and succeed in searching and leveraging new growth opportunities to increase revenue in future periods. However, more crucially, acquisitions may enable the firm's managers to divert attention away from legacy resources vulnerable to substitution or obsolescence thus overcoming issues of inertia, rigidity, and persistence with strategic decisions based on legacy resources (Capron & Mitchell, 2009; Chaturvedi & Prescott, 2022; Kaul, 2012; Titus, House, & Covin, 2017). By doing so, acquisitions may improve the firm's ability to adapt to technological change and thus increase its likelihood of survival.

Second, the "enabling" effect of investor expectations may impose an "expectational" momentum on the firm, that is, the firm may face an urgent "mandate" to make frequent and multiple technology acquisitions to search and leverage new growth opportunities so that it may consistently increase revenue (Amburgey & Miner, 1992; Dobbs & Koller, 1998; Kim, Haleblian, & Finkelstein, 2011). As the firm increases its overall acquisition activity, it may develop capabilities over time that equip it to implement the overall acquisition process more effectively (Bingham et al., 2015; Heimeriks, Schijven, & Gates, 2012; Trichterborn, Zu Knyphausen-Aufseß, & Schweizer, 2016; Zollo & Singh, 2004). Such acquisition-related capabilities may empower the firm to engage in technology acquisition activity more substantially and thus realize revenue growth more consistently (Bingham et al., 2015; Chatterjee, 2009; Kim, Haleblian, & Finkelstein, 2011). As a result, the firm may remain aligned with its value creation reputation and investor expectations. However, in tandem, these capabilities may also enable the firm to renew its resources effectively so that it may adapt and survive technological change.

For instance, the firm may develop scanning capabilities to identify potential targets that are new technology pioneers or are present in market niches that show promise of high growth potential during technological change (Keyhani et al., 2022; Ozmel, Reuer, & Wu, 2017; Tong & Li, 2011). In parallel, the firm may invest in sensing capabilities to access target-specific or private information thus decreasing the due diligence time, optimizing premiums, and closing the transaction faster (Malhotra, Morgan, & Zhu, 2018; Warner, Fairbank, & Steensma, 2006; Wu & Reuer, 2021). In addition, given the firm's proclivity to search for new growth opportunities, it is likely to develop the absorptive capacity and knowledge integration capabilities to recombine different types of technological knowledge (Ahuja & Katila, 2001; Choi & McNamara, 2018; Chondrakis, 2016; Makri, Hitt, & Lane, 2010). These capabilities may facilitate experimentation and lead to innovative outcomes that not only increase the potential for revenue growth (e.g., complementary products or licensing newly developed patents) but also empower the firm to renew its technological resource base and product portfolio (Karim & Kaul, 2015; Kaul, 2012; Sosa, 2011).

In addition, such capabilities may also aid the firm's post-acquisition integration capability as managers may

become more conversant with the nuances related to assimilating new technology targets. For instance, managers may acknowledge when and why a target may require greater autonomy for its human capital, specialized incentives, and charters to preserve its innovation capabilities (Chaturvedi & Prescott, 2022; Dattée et al., 2022; Puranam, Singh, & Zollo, 2006; Puranam & Srikanth, 2007). Finally, the firm may institutionalize learning outcomes from acquisitions by establishing dedicated acquisition functions, developing deliberate learning tools, and heuristics so that learning outcomes from one acquisition may be effectively transferred to subsequent ones (Heimeriks, Schijven, & Gates, 2012; Trichterborn, Zu Knyphausen-Aufseß, & Schweizer, 2016; Vuori, Laamanen, & Zollo, 2023; Zollo & Singh, 2004). Thus, acquisition-related capabilities may not only equip the firm to live up to its value creation reputation and investor expectations but also increase its likelihood of surviving technological change as the firm may be more likely to adapt to a rapidly transforming environment.

Conversely, as per Hypothesis 1b, when investor expectations are income-oriented, they may exert a "constraining" effect that discourages the firm from making a technology acquisition. To avoid a negative expectancy violation, such a firm may be less likely to engage in technology acquisition activity. As a result, acquisitions are an unlikely alternative for such a firm for renewing its resource base or overcoming issues of inertia, rigidity, and persistence with legacy resources. Furthermore, such a firm may lack the experience or incentive to develop acquisition-related capabilities as it may employ acquisitions less frequently. Thus, such a firm may not benefit from the adaptive and survival-enhancing potential of acquisitions relative to a firm whose investors are growth-oriented.

In sum, investor expectations will positively moderate (strengthen) the relationship between technology acquisition activity and the likelihood of surviving technological change when a firm has a growth reputation, that is, investor expectations are growth-oriented. Thus, I hypothesize,

> **Hypothesis 2.** During technological change, growth-oriented investor expectations will strengthen the relationship between technology acquisition activity and the likelihood of survival of a firm.

DATA AND METHODS

I employed a multi-industry dataset comprising two contexts of industry convergence, a salient form of technological change. The first context refers to convergence between the telecommunications equipment (SICs 3661, 3663, and 3669) and data networking (SIC 3576) industries from 1989 to 2003 (Benner & Ranganathan, 2012, 2013; Chaturvedi, Hsu, & Prescott, 2024; Lee, 2007). The second context refers to convergence between the computing (SICs 3571, 3572, 3577, and 5045), consumer electronics (SICs 5064 and 5065), and photography industries (SICs 3861 and 5043) between 1991 and 2006 that led to the emergence of the mass market digital photography industry (Benner, 2008, 2010; Benner & Tripsas, 2012; Srinivasan, Haunschild, & Grewal, 2007). I provide a description of both empirical contexts in Appendix A.

Data collection and sample

I used the COMPUSTAT database to identify firms as per prior research examining the above-mentioned industries (Benner & Ranganathan, 2012, 2013; Benner & Tripsas, 2012; Chaturvedi, Hsu, & Prescott, 2024; Lee, 2007). My sample period ranged from 1989 to 2006 covering the period of industry convergence in both contexts (equipment/networking and digital photography). The first integrated voice and data product was introduced in 1989, and the first digital camera was introduced in 1991 (Benner & Tripsas, 2012; Lee, 2007). In 2003, convergence between the equipment and networking industries concluded (Lee, 2007). In 2007, the introduction of cameras in smartphones presented technological substitution implications for digital cameras, concluding the period of convergence (Benner & Tripsas, 2012; Srinivasan, Haunschild, & Grewal, 2007).

I employed the CORPTECH database to examine the product lines of equipment and networking firms obtained from COMPUSTAT (Chaturvedi, Hsu, & Prescott, 2024; Lee, 2007; Puranam, Singh, & Zollo, 2006). I included a firm only if it had a product line in either circuit switching (voice) or packet switching (data) technologies. For digital photography firms, I included a firm only if it had introduced analog or digital camera models (e.g., DSLR) (Benner & Tripsas, 2012). I collected performance and control variable data from multiple sources shown in Table 1. The initial sample comprised 288 firms, but data limitations related to various variables led to a final sample of 173 firms (92 equipment, 40 networking, seven computing, 15 consumer electronics, and 19 photography firms).

I obtained data on investor expectations from the Center for Research in Security Prices (CRSP) Survivor-Bias-Free US Mutual Fund Database (Benner & Ranganathan, 2012, 2013; Goldstein, Jiang, & Ng, 2017; Schwarz & Potter, 2016). I collected data on technology acquisitions using the Thompson Financial Securities & Data Commission (SDC) Platinum database. As per prior research, I classified an acquisition as a technology acquisition if (i) the acquirer intended to access the target's technological resources (e.g., R&D resources, knowledge, or patents) and (ii) if the acquired target had a record of patenting over a 5-year period prior to the acquisition (Ahuja & Katila, 2001; Cloodt, Hagedoorn, &

TABLE 1 Control variables[a], operationalization, and rationale for inclusion.

Control variable	Operationalization	Data source	Rationale for inclusion/alternative explanation
Firm size	Natural log of revenue	Compustat	Size influences a firm's likelihood of making acquisitions and survival as well as its value creation reputation.
Firm age	Natural log of the difference between current year and founding year	Compustat	Older firms may be less likely to make technology acquisitions and survive over time. Such firms may also be viewed as salient in terms of their value creation reputation.
Industry size	Year-on-year growth in revenue for industries in the sample (percent)	Standard and Poor industry reports	Industries with greater revenues may provide greater opportunity for technology acquisitions and firm survival.
Financial solvency	Measure of potential bankruptcy or financial distress as per Altman's Z score; coded "one" if Z score was <1.81 (i.e., firm nearing bankruptcy) and "zero" otherwise	Compustat	Bankruptcy is alternative explanation of firm exit and being closer to bankruptcy may decrease the likelihood of survival (Altman, 1968).
Corporate diversification	Natural log of the total number of four-digit SIC codes that a firm was present in	Standard and Poor reports, Mergent Online, IBIS World	Diversified firms may have access to a greater number of technology acquisitions and a higher likelihood of survival.
Extent of industry convergence	I employed the approach of Hsu & Prescott (2017) to calculate the degree of cross-industry product market diversification. I replicated this approach to calculate the extent of industry convergence for the digital photography industry.	CORPTECH, SDC Platinum, Compustat	In the digital photography industry, 1999 marked the introduction of the full dominant design of the digital camera indicating an end to the era of ferment in the industry. Convergence between all three industries increased until 1999 and decreased after this year. In the equipment/networking industries, Hsu and Prescott (2017) found that the extent of convergence increased until 1998 and decreased thereafter. I controlled for this trend to address alternative explanations that may drive the results.
New CEO appointment	I coded this variable one for the year in which a firm appointed a new CEO and zero, otherwise.		A new CEO may be more likely to pursue a strategy of technology acquisitions that increase/decrease the likelihood of survival.
Prior performance (stock price)	Average of high, low, and closing price in a year	Compustat	Prior stock price changes may change firms' strategies of making technology acquisitions.
Price earnings to growth (PEG) ratio	Measure of growth in price–earnings ratio given as the ratio of price to earnings and annual earnings per share (EPS)	Compustat	This metric is a measure of the expected growth of a company and may affect firms' strategies of technology acquisitions. They may also affect firms' value creation reputation.
Return on assets (ROA)	Natural log of (Operating profit/Total assets)	Compustat	Prior performance may increase a firm's chances of making technology acquisitions.
R&D intensity	Natural log of (R&D expenditure/Total Revenue)	Compustat	A firm's R&D intensity serves as a substitute to technology acquisitions.
Debt to equity ratio	Ratio of market value of equity to total debt (long-term + short-term liabilities + current liabilities)	Compustat	Debt to equity ratio proxy differences in capital structure and financing approaches and may affect a firm's likelihood of technology acquisitions and survival.
Capital expenditure	Natural log of capital expenditure	Compustat	Capital expenditure represents an alternative form of internal development that may be a substitute for a firm making technology acquisitions.
Unabsorbed slack	Natural log of (total assets–total liabilities)	Compustat	Firms can deploy slack resources to maintain or develop a growth orientation and for implementing growth modes to ensure their survival.
Patent stock	Natural log of all patents registered by a firm each year	USPTO	Patents may represent an alternative to technology acquisitions
Patent citations	Natural log of all citations received by each patent	USPTO	

(Continues)

TABLE 1 (Continued)

Control variable	Operationalization	Data source	Rationale for inclusion/alternative explanation
			Patent citations may lead to a firm substituting innovation via technology acquisitions or persist with a patenting strategy instead.
Prior alliance/ acquisition experience	Cumulative number of all the alliances/ acquisitions made by a firm	SDC Platinum, Lexis Nexis	Prior alliances and acquisitions may positively influence firms to make future acquisitions.
Change in analyst coverage	Difference between analyst coverage in year "*t*" and "*t* − 1"; positive values indicate an increase in coverage.	CRSP	Change in analyst coverage may affect firms' value creation reputation and represent how analysts respond to expectancy violations. They may also affect technology acquisition activity.
Ratio of buy/sell recommendations	Ratio of buy-to-sell recommendations issued by analysts covering a firm in year "*t*"	CRSP	A greater number of buy or sell recommendations may affect firms' tendency to make technology acquisitions.

[a]All control variables were lagged by 1 year.

Van Kranenburg, 2006; Uhlenbruck, Hitt, & Semadeni, 2006; Wagner, 2011). There were 608 technology acquisitions in the final sample. I give qualitative examples of my approach to classifying technology acquisitions in Appendix B.

Independent and moderator variables

To operationalize *investor expectations*, I employed the investor profile measure developed by Benner & Ranganathan (2013). I describe the operationalization procedure in Appendix C.

I operationalized the *technology acquisition activity* variable as follows. For each firm year "*t*," I measured the number of acquisitions that the firm made from the beginning of the sample period up till year "*t*" (Ahuja & Katila, 2001; Cloodt, Hagedoorn, & Van Kranenburg, 2006; Uhlenbruck, Hitt, & Semadeni, 2006; Wagner, 2011). I employed an experience depreciation approach to address the decreasing influence that acquisitions made in prior years may have in year "*t*" (Hayward, 2002; Meschi & Métais, 2015). Following prior research, I divided the count of acquisitions made in time "*t* − 1" by 1, *t* − 2 by 2 … *t* − *x* by *x* where "*x*" is the first year of the sample period (Chaturvedi & Prescott, 2020; Titus, House, & Covin, 2017). I added the obtained values to create a measure for technology acquisition activity. I lagged this variable by 1 year.

Dependent variables

I operationalized the *likelihood of technology acquisition* variable as follows. For each year, when the firm made one or more technology acquisitions, I coded this variable "one" and "zero" otherwise. I used the multidimensional conceptualization proposed by Josefy et al. (2017) to operationalize the *likelihood of firm survival* variable. For each firm year, I estimated whether a firm exited (i.e., did not survive) as per the three conditions theorized by Josefy et al. (2017). These include (i) ceasing or discontinuing operations (operations-related exit—26 firms), (ii) merger or acquisition resulting in an end to operational autonomy (ownership-related exit—37 firms), or (iii) dissolution/bankruptcy filing (solvency-related exit—11 firms). As per Josefy et al. (2017), these three conditions have been used extensively by scholars examining exit patterns for non-entrepreneurial firms. I operationalized the likelihood of survival using a categorical variable coded "one" for the year when a firm did not survive because of either of the three conditions and zero, otherwise. I used Lexis-Nexis and public sources to ascertain the year and reason behind why a firm did not survive. I found that 74 firms (43%) did not survive the sample period. I treated the remaining 99 firms as right-censored cases (Allison, 2014; Cleves, Gould, & Marchenko, 2016).

Empirical methodology

I used event history modeling to test both hypotheses as it is robust to data with the right censoring that was an issue in my dataset (Allison, 2014; Cleves, Gould, & Marchenko, 2016). I estimated the hazard rates of making a technology acquisition and firm exit as "events" for H1 and H2, respectively. I employed frailty-based event history models that accommodate firm-specific heterogeneity by controlling for firm-specific effects in the hazard function. Frailty-based models also control for any time-dependent omitted variable bias in the dataset (Cleves, Gould, & Marchenko, 2016). I used a shared frailty specification given as $h\ (t_{ij}\ |x_{ij},\ \alpha_i) = \alpha_i\ h\ (t_{ij}|x_{ij})$, where α_i denotes the frailty, that is, the unobserved, firm-specific (fixed) effect on the hazard rate, "*i*" denotes the firm (1,2 … *n*), and "*j*" is the *j*th observation for a firm (1,2 …. n_i).

In a shared frailty specification, the frailties are shared across observations implying different firm year observations may be correlated (Cleves, Gould, & Marchenko, 2016). I used this approach as a firm's decision to engage in technology acquisition activity, its value creation reputation and investor expectations related to its stock may be influenced by other factors. I chose a gamma distribution for the functional form of α_i and a proportional hazards Weibull specification for empirical analyses. A Weibull specification permits the hazard rate to take a monotonically increasing or decreasing form contingent on whether investor expectations were more or less growth-oriented (Allison, 2014). I clustered the standard errors at the firm level and employed fixed effects at the firm, industry, and year levels to account for unobserved heterogeneity and autocorrelation. I examined several goodness of fit criteria to ensure that the Weibull specification was most appropriate for analyses.

I controlled for endogeneity or self-selection in firms' decisions to make an acquisition and for investors' tendency to self-select into developing expectations based on different value creation reputations using a two-stage control function estimation approach (Terza, Basu, & Rathouz, 2008) as described in Appendix D. I also provide the first stage regression models in Appendix D.

RESULTS

Table 2 shows the descriptive statistics and correlations. Table 3 shows the empirical results. Panels (a)–(c) in Figure 1 show graphical representations of the hypotheses. In terms of interpreting the hypotheses testing results, for H1a (H1b), a positive (negative) coefficient indicated an increase (decrease) in the likelihood of making a technology acquisition, respectively. For H2, a positive (negative) coefficient indicates an increase (decrease) in the hazard rate of firm exit or a decrease (increase) in the likelihood of firm survival (Cleves, Gould, & Marchenko, 2016).

Hypothesis 1a (H1a) proposed that during technological change, growth-oriented investor expectations will positively affect the likelihood of a firm making a technology acquisition. From model 2 of Table 3, H1 was supported ($\beta = 0.23$, $p < 0.05$). As the investor profile score for a firm increased by one unit, that is, investor expectations became more growth-oriented, the hazard rate of making a technology acquisition increased by about 26% (exp. [0.23] = 0.26). Panel (a) in Figure 1 shows that the marginal effect of investor expectations on the hazard rate of making an acquisition increased as investor expectations became more growth-oriented. For instance, the hazard rate of making an acquisition increased by 26% when expectations were the least growth-oriented (when the investor profile score was "one"). However, it increased by two and a half times to about 66% when expectations were the most growth-oriented (when the score was "five").

Hypothesis 1b (H1b) proposed that during technological change, income-oriented investor expectations will negatively affect the likelihood of a firm making a technology acquisition. Model 2 of Table 3 also provides support for H1b. As the investor profile score for a firm decreased by one unit, that is, investor expectations became more income-oriented (less growth-oriented), the hazard rate of the firm making a technology acquisition decreased by about 21% (1 − (1/exp. [0.23]) = 0.21). In panel (a), the marginal effect of investor expectations on the hazard rate of making an acquisition decreased as investors became more income-oriented. The hazard rate of making an acquisition increased by about 66% when investor expectations were the most growth-oriented (when the investor profile score was "five") but this decreased by more than one and a half times to 26% when expectations were the most income-oriented or least growth-oriented (when score was "one").

Hypothesis 2 (H2) proposed that during technological change, growth-oriented investor expectations will strengthen the relationship between technology acquisition activity and the likelihood of survival of a firm. From model 4 of Table 3, H2 was supported ($\beta = -0.30$, $p < 0.05$). As a firm increased its technology acquisition activity by 100%, the hazard rate of exit decreased by about 27% (exp. [−0.30] = 0.27) for a one-unit increase in the investor profile score, that is, as investor expectations became more growth-oriented. This implies an increase in the likelihood of firm survival by about 35% (1 − (1/exp. [−0.30]) = 0.35).

Panel (b) in Figure 1 shows that when technology acquisition activity increased by 100%, the marginal effect of investor expectations on the likelihood of firm survival increased when investor expectations were more growth-oriented. For instance, the likelihood of survival increased by 35% when investor expectations were the least growth-oriented (when investor profile score was "one") but by more than thrice to more than 100% when expectations were the most growth-oriented (when score was "five").

Panel (c) in Figure 1 shows the overall interaction effect—the likelihood of survival was higher for firms with investor expectations that were more growth-oriented (solid line) relative to firms with investor expectations that were less growth-oriented (dashed line) as acquisition activity increased from zero to 100%. On examining the trend, it is observed that the difference in the likelihoods of survival between firms with more and less growth-oriented investor expectations was about three times when the increase in acquisition activity ranged from 10% to 70% and about two and a half times when acquisition activity ranged between 80% and 100%. The difference was statistically significant as shown by the 95% confidence intervals that do not include zero.

TABLE 2 Correlations[a] and descriptive statistics.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1) Firm size	1																						
2) Firm age	0.12	1																					
3) Industry size	0.04	0.00	1																				
4) Solvency	−0.05	−0.04	0.00	1																			
5) Diversification	0.14	0.12	−0.12	−0.00	1																		
6) Convergence	0.04	0.01	0.13	−0.06	0.08	1																	
7) New CEO	0.07	0.03	0.06	0.12	−0.03	−0.05	1																
8) Stock price	0.06	0.05	0.02	−0.05	−0.06	−0.03	0.14	1															
9) ROA	0.11	0.05	−0.02	−0.03	0.13	0.06	0.06	0.04	1														
10) PEG ratio	−0.08	−0.04	0.04	0.01	0.05	0.01	−0.02	0.11	0.02	1													
11) R&D intensity	0.14	0.08	−0.02	0.01	0.02	0.11	−0.01	0.05	0.02	0.10	1												
12) Debt equity	0.10	0.13	−0.05	−0.02	0.06	0.07	0.04	0.01	0.01	−0.02	0.05	1											
13) Capital exp	0.18	0.11	−0.08	0.04	0.13	0.02	0.07	−0.03	−0.04	0.04	−0.08	−0.07	1										
14) Slack	0.06	−0.06	−0.05	−0.02	0.05	0.04	0.04	0.02	0.06	0.06	0.03	−0.02	−0.02	1									
15) Patent stock	0.12	0.05	−0.08	0.02	0.02	0.01	−0.01	−0.06	0.09	0.11	0.07	−0.08	−0.01	0.08	1								
16) Patent cites	0.09	0.03	−0.07	0.07	0.01	0.05	0.03	0.04	0.00	0.07	−0.02	0.02	0.05	0.12	0.16	1							
17) Alliance exp.	0.03	0.06	−0.09	0.02	−0.02	0.04	0.08	0.05	0.05	−0.02	0.03	0.04	−0.02	0.02	0.09	0.05	1						
18) Acquisition exp.	0.05	0.03	−0.03	0.01	0.04	−0.07	0.01	0.00	0.01	0.05	−0.04	−0.02	0.08	0.00	0.02	0.02	0.03	1					
19) Investor expectations	0.02	0.00	−0.02	−0.00	0.09	−0.01	0.02	−0.02	0.00	0.13	−0.01	−0.06	0.08	0.00	0.00	0.03	0.01	0.04	1				
20) Likelihood of tech. acquisition	0.08	−0.21	0.24	−0.05	0.02	0.06	0.08	0.11	0.12	0.03	0.05	0.07	0.05	0.00	0.09	0.05	0.00	0.03	0.10	1			
21) Exit	−0.04	0.07	−0.08	−0.12	0.02	0.09	0.03	0.08	0.09	0.01	−0.04	−0.06	0.16	0.07	0.12	0.06	0.07	0.09	0.03	0.03	1		
22) Coverage changes	0.13	0.11	0.01	0.08	−0.16	0.04	−0.12	−0.16	0.03	0.03	−0.05	−0.07	−0.05	0.03	0.01	0.01	0.07	0.02	0.19	0.09	−0.06	1	
23) Buy/sell	−0.09	−0.13	0.02	0.08	−0.14	0.05	0.08	0.14	0.11	0.02	−0.06	−0.09	0.11	−0.02	0.05	0.06	0.03	0.13	0.01	−0.07	−0.08	0.09	1
Mean	2.11	1.06	0.18	0.14	0.64	0.35	0.23	0.24	0.75	0.97	0.08	0.34	0.33	2.97	26.31	32.44	1.14	0.26	2.43	0.07	0.03	7.33	0.84
SD	1.84	1.13	0.16	0.19	0.48	0.15	0.17	0.26	1.56	1.53	0.60	1.14	1.29	0.11	0.14	0.25	0.49	0.14	2.74	0.24	0.16	2.48	1.67
Minimum value	1.25	0.68	0.13	−0.17	0	0	0	−0.51	0.01	0.14	−2.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	0	0	13	2.93
Maximum value	4.48	2.72	0.52	0.85	1	0.42	0.49	1.06	1.60	4.69	7.26	1.18	2.22	126	249	1843	97	24	5	1	1	2	0.07

[a]All the correlation values (positive and negative) greater than 0.09 are significant at $p < 0.05$.

TABLE 3 Event history modeling results—Proportional hazards Weibull regression.

	Likelihood of acquisition as DV		Likelihood of exit as DV	
	Model 1 (controls)	**Model 2 (H1)**	**Model 3 (controls)**	**Model 4 (H2)**
H1: Investor expectations (main effect)		0.23* (0.09)	−0.18 (0.16)	−0.21 (0.15)
H2: Investor expectations * Technology acquisition activity				−0.30* (0.13)
Technology acquisition activity (main effect)			−0.15(0.13)	−0.17(0.19)
Firm size	0.66* (0.31)	0.61*** (0.08)	−0.46*** (0.07)	−0.47*** (0.07)
Firm age	0.61*** (0.08)	0.60*** (0.16)	0.14* (0.07)	0.15* (0.06)
Industry size	−0.63 (0.80)	−0.50 (0.32)	0.09 (0.13)	−0.07 (0.20)
Financial solvency	0.62*** (0.16)	0.41 (0.81)	−0.81*** (0.20)	−0.78** (0.23)
Corporate diversification	0.45 (0.63)	0.56 (0.63)	−0.03 (0.11)	−0.02 (0.09)
Extent of industry convergence	0.12^{+} (0.07)	0.14* (0.06)	0.12** (0.04)	0.09^{+} (0.05)
New CEO appointment	0.07 (0.08)	0.09 (0.08)	−0.49 (0.35)	−0.44 (0.36)
Prior performance (ROA)	−0.09 (0.16)	−0.10 (0.21)	−0.05** (0.01)	−0.06** (0.02)
Prior performance (stock price)	0.09 (0.21)	0.08 (0.17)	−0.05 (0.04)	−0.05 (0.04)
Price earnings to growth (PEG) ratio	0.24*** (0.03)	0.23*** (0.02)	−0.08^{+} (0.04)	0.05* (0.02)
R&D intensity	−0.08 (0.08)	−0.07 (0.09)	−0.04 (0.03)	−0.07 (0.05)
Debt equity ratio	−0.09 (0.18)	−0.15 (0.14)	0.15 (0.11)	0.18 (0.14)
Capital expenditure	−0.06 (0.05)	−0.02 (0.06)	−0.07 (0.07)	−0.09 (0.11)
Unabsorbed slack	0.24* (0.11)	0.22* (0.10)	−0.10*** (0.01)	−0.13*** (0.02)
Patent stock	−0.18*** (0.04)	−0.11^{+} (0.06)	−0.04 (0.06)	−0.03 (0.06)
Patent citations (forward)	0.12* (0.05)	0.14** (0.05)	0.01 (0.02)	0.04 (0.04)
Prior alliance experience	0.25 (0.20)	0.17 (0.20)	−0.19*** (0.02)	−0.18*** (0.03)
Prior acquisition experience	0.61*** (0.14)	0.59*** (0.14)	−0.53** (0.16)	−0.48** (0.16)
Change in analyst coverage	0.13 (0.14)	0.22 (0.19)	−0.09 (0.08)	−0.06 (0.10)
Ratio of buy-to-sell recommendations	−0.15 (0.14)	−0.11 (0.13)	−0.06 (0.07)	−0.06 (0.05)
Endogeneity residual (interest rates)	0.16 (0.19)	0.15 (0.14)	0.06 (0.04)	0.01 (0.03)
Endogeneity residual (free cash flow)	0.04 (0.09)	0.03 (0.07)	−0.09 (0.06)	−0.08 (0.05)
Endogeneity residual (growth fund dominance)	−0.05 (0.07)	−0.07 (0.07)	0.02 (0.04)	0.03 (0.04)
Year, industry, and firm fixed effects	Included	Included	Included	Included
Wald χ^2	1241.95	1266.70	230.47	256.53
Log pseudo-likelihood	−174.84	−113.62	−37.41	−21.48
Frailty model over-dispersion parameter θ	1.82	1.98	2.83	2.97
Weibull shape parameter (p)	2.46	4.17	3.65	5.03

Note: Larger bold values refer to the hypothesis results. While interpreting the results in models 3 and 4, an increase in the likelihood of firm survival is given as 1/δp (exit) with δp (exit) implying a decrease in the hazard rate of firm exit. I report the log pseudo-likelihood and Wald χ^2 statistic as event history models do not provide log-likelihood and likelihood ratio test values when robust standard errors are used.
***$p < 0.001$.
**$p < 0.01$.
*$p < 0.05$.
$^{+}p < 0.1$.

My results were robust to several checks detailed in Appendix E. Please see Appendix F for qualitative examples involving firms from the sample of this study.

DISCUSSION

Theoretical contributions

First, my study advances prior research that examined how pressures from institutional actors such as financial market investors affect firms' strategic decisions during technological change (Benner, 2007, 2008, 2010; Benner & Ranganathan, 2012, 2013, 2017; Hossnofsky & Junge, 2019; Tripsas, 2009). This stream of research has primarily studied how investor expectations impact a firm's internally driven strategic decisions such as capital expenditure and R&D investments during technological change. My study advances this research stream to the domain of external resource-accessing strategic decisions, for example, technology acquisitions. A central implication of my study is that investor expectations may enable

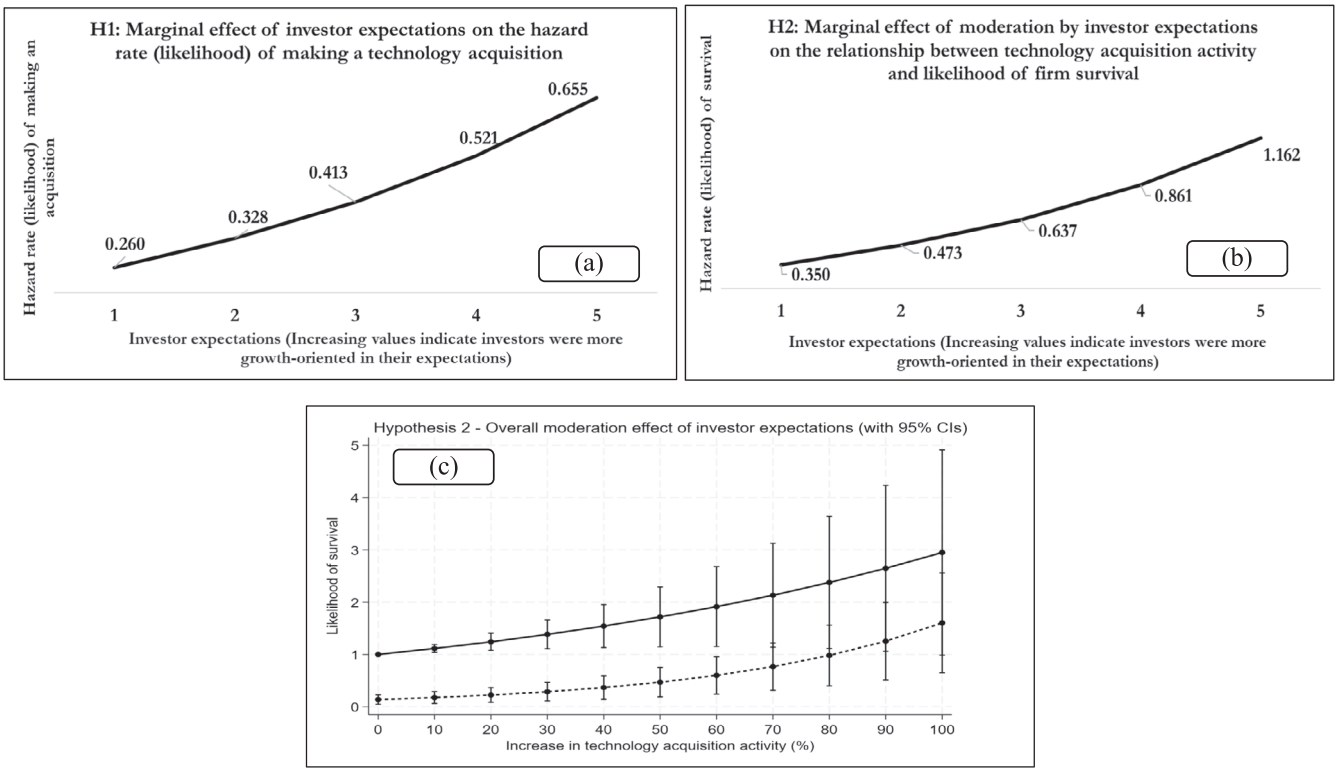

FIGURE 1 Graphical representation of hypotheses results. Panel (a) shows the marginal effects of investor expectations on the likelihood of making a technology acquisition (H1a and H1b). Panel (b) shows the marginal effects of moderation by investor expectations on the relationship between technology acquisition activity and the likelihood of firm survival (H2) for a 100% increase in technology acquisition activity. All marginal effects were significant at $p < 0.05$. Panel (c) shows the overall interaction effect for H2. To plot the overall interaction effect, the investor profile score variable was classified as more growth-oriented and less growth-oriented (more growth-oriented $= \mu i + \sigma i$ and less growth-oriented $= \mu i - \sigma i$, where μi is the mean of the investor profile score in the ith firm year and σi is the standard deviation of the score in the ith firm year). The solid and dashed lines refer to investor expectations being more growth-oriented and less growth-oriented respectively. The 95% confidence intervals are shown in panel (c)

or constrain firms from making technology acquisitions during technological change. The results for Hypotheses 1a and 1b demonstrate that when investor expectations were growth-oriented, investors exerted an "enabling" effect due to which the likelihood of a firm making a technology acquisition increased by more than two and a half times relative to when investor expectations were income-oriented wherein investors exerted a "constraining" effect that decreased the likelihood of acquisition.

In addition, the above-mentioned research stream did not examine how investor expectations affect firm survival, a central outcome of concern for firms facing technological change. My study finds support for a novel moderating effect of investor expectations that positively moderated (strengthened) the relationship between firms' technology acquisition activity and their likelihood of survival when investor expectations were growth-oriented. The result for Hypothesis 2 shows that if a firm was encouraged by the enabling effect of investor expectations when they were growth-oriented and indeed engaged in technology acquisition activity, its likelihood of survival increased by more than one-third. This result indicates that investor expectations played a key role in determining whether a firm with a particular value creation reputation was able to make technology acquisitions to adapt and survive technological change. Thus, I demonstrate that investor expectations may be an important mechanism that drives firm heterogeneity during technological change by separating survivors from non-survivors.

Second, my study advances research on the organizational reputation lens. Prior research has examined how a firm's reputation affects its strategic decisions and outcomes in different competitive and institutional contexts (Blagoeva, Kavusan, & Jansen, 2020; Fasaei, Tempelaar, & Jansen, 2018; Graffin, Haleblian, & Kiley, 2016; Haleblian, Pfarrer, & Kiley, 2017; Pfarrer, Pollock, & Rindova, 2010; Zavyalova et al., 2016). However, this research stream has not examined the outcome of firm survival in a context of technological change, a salient form of transformation in firms' competitive environments (Christensen et al., 2018; Henderson & Clark, 1990; Klepper & Simons, 1997, 2000; Tripsas, 1997). I demonstrate that the value creation reputations of firms may shape investor expectations that

may in turn enable or constrain firms from making technology acquisitions and thus affect firm survival during technological change. In addition, to the best of my knowledge, this study is the first that examines how a firm's reputation may affect its likelihood of surviving technological change. Thus, my study advances research on the reputation lens that has primarily employed the responses of institutional actors as outcomes of interest, for example, Fortune 500 rankings (Basdeo et al., 2006), abnormal returns (Haleblian, Pfarrer, & Kiley, 2017; Pfarrer, Pollock, & Rindova, 2010), financial analyst recommendations (Fasaei, Tempelaar, & Jansen, 2018), and monetary donations by institutional stakeholders (Zavyalova et al., 2016).

Third, although prior research on EVT examined how investors respond to alliances, acquisitions, and other strategic decisions (Blagoeva, Kavusan, & Jansen, 2020; Fasaei, Tempelaar, & Jansen, 2018; Graffin, Haleblian, & Kiley, 2016; Haleblian, Pfarrer, & Kiley, 2017; Paruchuri, Han, & Prakash, 2021), it has not investigated the implications that expectancy violations may pose for outcomes such as firm survival. I expand the EVT's predictive validity in terms of how expectancy violations on the part of investors may enable or constrain firms from making technology acquisitions, a strategic decision that may be crucial for them to adapt and survive technological change. My results indicate support for a novel moderating effect of investor expectations on the relationship between technology acquisition activity and the likelihood of survival demonstrating that positive and negative expectancy violations may assume a critical role as survival-enhancing mechanisms during technological change. Thus, my study illustrates the importance of the EVT and its mechanisms, that is, positive and negative expectancy violations in predicting whether firms may be able to undertake highly visible strategic decisions such as acquisitions and whether they may survive environmental transformations such as technological change.

Finally, my study addresses an important void in research on industry convergence wherein there is little theoretical insight related to *how* external resource-accessing strategic decisions such as acquisitions enable firms to explore to adapt and survive convergence. This is an important line of inquiry as during convergence, firms cannot go it alone and need to leverage external resource-accessing strategic decisions such as acquisitions. My study establishes technology acquisitions as a key survival-enhancing mechanism as it shows how they may enable firms to adapt to convergence. Hence, my study advances recent research that examined firm adaptation during convergence (Benner & Tripsas, 2012; Chaturvedi, Hsu, & Prescott, 2024; Chaturvedi & Prescott, 2020, 2022; Lee, 2007).

Limitations and future research

The limitations of my study point to interesting avenues for future research. First, the results of my study demonstrate how investors may encourage firms with a growth reputation to make technology acquisitions to adapt to and survive technological change but may constrain firms with an income reputation from doing so. In this context, it seems the fate of firms with an income reputation may be deterministic and is likely to place them on a path to extinction if they are unable to make technology acquisitions to adapt to and survive industry convergence. Hence, a key question relates to what strategies may firms with an income reputation employ to adapt and survive technological change. It is likely that such firms may make alliances or avail of corporate venture capital to adapt to technological change as these external resource-accessing decisions may be less visible to financial investors relative to acquisitions (Chaturvedi, 2023; Jensen, 2004; Ozcan & Overby, 2008; Tong & Li, 2011). It is likely that alliances and corporate venture capital may not lead to negative expectancy violation for investors as they may incur less investment and entail less uncertainty in outcomes in contrast to acquisitions. Second, scholars may contemplate examining whether the results of my study bear external validity and are valid in other contexts of technological change apart from industry convergence.

CONCLUSION

Although technology acquisitions are a plausible alternative for adaptation and survival during technological change, this study finds that they may only be a viable strategy for firms with a growth reputation, that is, when investors expect that these firms will consistently increase revenue in future periods. What firms with an income reputation, that is, when investors have expectations that these firms will consistently yield dividends to shareholders, need to do to adapt and survive technological change remains an interesting area for future research.

AUTHOR CONTRIBUTIONS

Tuhin Chaturvedi—Conceptualization, methodology, software, validation, formal analysis, investigation, data collection and curation, writing—original draft, visualization, project administration.

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CONFLICT OF INTEREST STATEMENT

The author declares that he has no known competing financial interests or personal relationships that may have influenced the research findings reported in this study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

This study was carried out under due ethical considerations related to the practice of empirical research.

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