

ESCALATION OR ESCAPE FROM BUSINESS UNIT DOWNTURNS: EMPIRICAL EVIDENCE

"Considering the competence of the products and change in line-up that we are preparing, as well as new products that will change the premium landscape, we think we can pull off a turnaround in 2021," said CEO of LG, Brian Kwon, one year before the shutdown of mobile business after operating loss for 22 consecutive quarters (Mu-Hyun, 2020). Similarly, in 2014, Sony's CEO, Hirai, made a public statement asserting, "If you are asking if we have any plan to sell off our TV business, I can say we have absolutely no plan to do so right now" (Forbes, 2014). This resolute statement, made in the wake of substantial losses totalling \$7.8 billion in the TV sector over a decade, signalled their commitment to reviving the unit. Studies find that having invested significant resources (e.g., Capex, R&D), and in the face of negative feedback, decision-makers typically maintain or increase commitment to their goal, despite considerable uncertainty about its potential success (Sleesman et al., 2018; Staw, 1976). Furthermore, McKinsey & Company have found that the probability of a struggling business achieving significant growth or becoming profitable within three years is less than 35% (Horn et al., 2006).

Scholars have argued that a firm's commitment to various business initiatives depends on its structure and the extent to which it is partitioned across different business/sectors. For example, Experimental psychologists have demonstrated that having alternatives to a focal, underperforming business can effectively de-escalate commitment (e.g., Burson et al., 2013; Drummond, 2014; Harvey & Victoravich, 2009; Kwong & Wong, 2014; McCain, 1986; Northcraft & Neale, 1986); having alternatives not only facilitates robust performance comparisons (McCain, 1986), but alleviates the burden of sunk costs (Kwong & Wong, 2014). It also finds that alternatives provide confidence to abandon an underperforming option (Northcraft & Neale, 1986). Consequently, these firms are better positioned to strategically benefit from the availability of alternatives and effectively manage business overcommitments. Thus, having multiple business alternatives arguably reduce the attachment to any single entity, allowing for confident decision-making in the face of uncertainty (Kolev, 2016).

However, empirical studies in strategy and finance seem to demonstrate differing behaviors. For example, M-form firms often demonstrate a propensity for reallocating resources towards underperforming divisions, a practice supported by finance literature as a way to stabilize performance across sectors and mitigate risks associated with volatile markets (Duchin & Sosyura, 2013; Ozbas & Scharfstein, 2010; Scharfstein & Stein, 2000). It was observed in 75% of cash reallocation cases (Billett & Mauer, 2015). Besides, Arrfelt et al. (2013) highlight that reallocate resources to struggling business units is aimed to achieve equal performance across all units. Consequently, firms with numerous business units may engage more frequently in this practice, using their broader resource base to support weaker segments, potentially leading to sooner recoveries and reduced likelihood of

negative returns. Thus, the presence of alternatives not only acts as a financial cushion during times of uncertainty but also as a strategic approach to address business underperformance.

Thus, it appears that findings in experimental psychology do not align with those from observational strategy research, leaving the nature of firm behavior during business downturns somewhat ambiguous. This paper aims to further explore and test how firms manage escalation of commitment and the recovery dynamics of loss-making units in relation to the availability of alternative business units. The study is novel in its focus on commitment and recovery (1) at the business unit level, differing from the project-level analysis prevalent in literature; and (2) in moving beyond the simplistic binary of exit vs. continuation to examine how firms respond to loss-making business units through comparisons of business *retention*, *recovery*, and endogenous *asset sales*.

This research is structured as follows. Following the introduction, we provided current state of the research. Then, the methodology of the research provides information on sampling, dependent and independent variables along with research design. Then, the results section provides the empirical analysis and discussions of the research findings. Finally, the conclusion summarizes the results and presents practical implications.

LITERATURE REVIEW

The organizational structure plays a vital role in shaping the flow of capital within an organization. It influences how information is shared, how problems are framed, and how solutions are developed (Joseph, Klingebiel, & Wilson, 2016). In particular, how firm structure affects the persistence of questionable or failing courses of action has been a focal point of scrutiny among scholars (Sleesman et al., 2018). Despite progress in this area, the studies conducted vary across different contexts, settings, and timelines, which can lead to a fragmented view of the phenomenon and, at times, contradictory findings.

In a multibusiness firm facing negative profits in any specific business, the decision-making extends beyond the simple binary choice of exit or stay. There are at least two related considerations: first, whether to partially or fully retain the business if the decision is to stay (e.g., Damaraju et al., 2015; Vidal & Mitchell, 2015); and second, whether to leverage alternative businesses to support the focal unit, and this might increase the preference to keep the focal business. Although divestment literature primarily addresses these decisions under the rubric “To Divest or not to Divest” (Koley, 2016, p. 179), exploring the nuances between partial and full divestiture remains relatively underexamined. Moreover, the strategy of using other business units to support a struggling unit has been even neglected in divestment and escalation of commitment research, leaving a gap in our understanding of how to respond to underperformance.

These issues are primarily analyzed through two distinct academic lenses: *experimental psychology* and *empirical strategy & finance*. Each perspective offers unique insights, yet they converge on the recognition—either directly or indirectly—that a multi-business structure can effectively mitigate business underperformance. However, they diverge in their explanations of how such structures navigate these challenges and achieve potential outcomes.

Experimental psychology

In experimental psychology, research is typically conducted in controlled lab settings. The early empirical investigations into the role of optionality and investment commitments are rooted in studies of McCain (1986) and Northcraft and Neale (1986), both of whom highlighted the existence of de-escalated commitments in the presence of alternatives. Specifically, in McCain (1986)'s study, 100 individuals were tasked with determining the allocation of a developmental budget for a conglomerate firm. One group was not presented with alternatives, while the comparison group was offered three alternatives to the unsuccessful investment. The results indicated that the group presented with alternatives tended to make costs more salient and enable comparisons of performance, aiding in specifying the causes of an investment's setback. Essentially, when other investments performed well, it suggested potential issues with the investor's own investment, making them more inclined to refuse additional support. In a concurrent study, Northcraft and Neale (1986) emphasized how the concept of opportunity cost linked to alternatives enabled participants to more accurately evaluate the real costs of continuing with an underperforming option. This led to a more effective accounting for sunk costs in future decisions. They illustrated that by shifting from conventional "go/no go" decisions to a broader evaluation of potential alternatives, decision-makers could more thoroughly weigh the costs and benefits associated with each option, including the potential losses involved in continuing with or abandoning an option.

This optionality led individuals to a more cautious stance towards underperforming options, heightening perceived uncertainty (Harvey & Victoravich, 2009), reducing the likelihood of accepting minimal chances of avoiding losses (Keil et al., 1995), and fostering a consideration of past performance in future decisions (Goltz, 1999; Hantula & Crowell, 1994; Schaubroeck & Davis, 1994). Further research has delved into how the presentation of alternatives, rather than their mere existence, impacts decision-making. For example, Burson et al. (2013) demonstrated the existence of a unit dependence among individuals, where the perception of possessions varies with the quantity. In their experiment, participants were provided with varying quantities of chocolates—a single chocolate, five chocolates, and one box of chocolates (containing twenty units)—and were tasked with deciding whether to sell them to buyers (the experiment also included buyers). Individuals possessing a single

chocolate, or several individual chocolates, tended to conceive of "one piece" as the relevant unit, thus exhibiting an endowment effect in the former but not the latter case. In other words, individuals with a greater number of chocolates were more willing to part with them at a reduced price, suggesting that higher quantities diminish the perceived value of each individual unit. Conversely, those given a box of chocolates perceived "one box" as the relevant unit, even though there were twenty units inside.

In support, Kwong and Wong (2014)'s study involved student participants who were tasked with allocating resources between two projects (escalation vs. alternative options), with options divided into three alternatives, including both an escalation and a separate alternative option. In one scenario, these options were split into three alternatives, including both an escalation and an alternative option. When participants encountered a situation where the primary project received negative feedback, they were more inclined to reallocate resources away from the underperforming option toward an alternative, especially when the alternative was further divided into multiple options. For example, if an alternative option labelled "industrial products" was subdivided into "battery," "LCD display," and "other industrial products," students demonstrated a higher propensity to redirect their investments. In contrast, the study indicated that the commitments is amplified when the escalation option itself is divided into multiple alternatives rather than being presented as a single escalation option. Thus, despite the potential persistence of commitments even when alternatives are presented (e.g., Fox et al., 2009; Ting & Wallsten, 2011), individuals with a greater quantity of units attributed proportionally less value to each individual option, thereby facilitating the drop/sale of single options (Burson et al., 2013; Kolev, 2016; Kwong & Wong, 2014).

Collectively, these studies illuminate how alternatives can shift firms' focus from underperforming units, reducing dependence on a single option and increasing the likelihood of deviating when uncertainty arises. Such dynamics suggest that companies with more diversified portfolios (Berry, 2010; Kolev, 2016; McCain, 1986) or finer partitioned units (Argyres & Lovallo, 2022) might possess strategic advantages in terminating operations more swiftly, favoring divestment or closure over retention, and enhancing their resource reallocation capabilities (e.g., Berry, 2010; Dickler & Folta, 2020; Khanna & Tice, 2001; Lowe & Ziedonis, 2006). Consequently, firms with multiple business units may divest assets and exit businesses more rapidly, generally preferring exit strategies over retention and recovery, supported by the presence of other well performing units.

Empirical finance and management

Despite the wealth of experimental findings, Barry M. Staw, the first to introduce the phenomenon, offered a retrospective critique of the lab-based research: "I was pleased, on the one hand, that my early work was being followed up. On the other hand, I was uncomfortable with the near

total reliance on laboratory research to test the phenomenon. I kept wondering why no one had yet conducted a case study to see how escalation takes place in a real organization, and why no one had yet conducted archival research to demonstrate escalation's effects across multiple settings over time" (Staw, 2016, p. 10). The research on resource allocation within multi-divisional organizations seems to suggest that multibusiness firms might also be better positioned to address unit underperformance using resources from profitable and overperforming units, potentially mitigating the traditional escalation traps through additional financial aids.

The dynamic investment nature within multi-divisional firms is well-documented in finance literature. For instance, Berger and Ofek (1995) has highlighted that internal resource allocation, particularly in cash-rich diversified firms, often results in an overallocation of resources to business segments with limited or unfavorable investment prospects. This resonated with Lamont's (1997) and Shin and Stulz's (1998) subsequent studies, which showed that the capital expenditures of diversified firms were less responsive to industry opportunities than the capital expenditures of more focused firms. Thereafter, most of the literature on internal capital markets in finance revolved around the link between the diversification discount and capital misallocation in diversified firms (Sengul et al., 2019). This phenomenon, termed corporate "socialism," has been systematically observed and documented by Rajan, Servaes, and Zingales (2000), particularly in firms boasting diverse sets of resources and opportunities. Similarly, Cremers, Huang, & Sautner (2011) indicate that managers tend to favour uniform performance across business units, aiming to stabilize the volatility across them. They argue this is achieved by cross-subsidizing units to shield them from external shocks, ensuring each has enough capital to manage sudden drops in performance. Billett and Mauer (2015) further supports these assertions, finding that this phenomenon occurs in 75% of cash reallocations. These studies underscore the presence of agency issues, suggesting that managers of underperforming units are disproportionately more able to attract capital.

However, management scholars highlight the behavioral tendencies that influence resource allocation preferences toward underperforming units within firms. For example, in a thought-provoking paper, Arrfelt et al. (2013) observes resources are allocated into the underperforming units to reduce performance disparities and level the playing field among divisions. Ma et al. (2023) further supports this illustrated that the firm is more inclined to increase capital allocations and renew plant & equipment in units where they underperform compared to other sister units. Such firms might hesitate to divest underperforming units, partly because strong performance elsewhere in the firm acts as a buffer, discouraging swift exits. Hu et al. (2017) revealed that firm strives to correct any negative discrepancy between desired and realized outcomes when business operates below sister units, but above competitors. This underperformance within the firm motivates efforts to bring its performance

in line with more successful units. However, Hu et al. (2017) also noted that a clear indication of underperformance becomes apparent when a unit falls short of both internal and external benchmarks, prompting the firm to allocate more relative attention to that unit and engage in a problemistic search. Such searches can lead to corrective actions, such as increased investments (Kotiloglu et al., 2021), particularly when additional resources are available (Cyert & March, 1963; Greve, 2003; Kuusela et al., 2017; Lu & Wong, 2019). Furthermore, there is tendency to take greater risks (Bromiley, 1991).

For example, Joseph and Gaba (2015) demonstrated that significant underperformance relative to aspirations increased new product introductions among cellular phone producers. Similarly, Cao et al. (2024) and Lu and Wong (2019) documented increased investments in explorative innovations. Additionally, Yu et al. (2019) showed that firms might initially constrain investments to address problems with familiar solutions but, as underperformance becomes evident, the need to find new solutions escalates. This often leads firms to explore beyond their usual knowledge base and invest in more distant and innovative projects, thus broadening their R&D efforts. Therefore, underperformance does not necessarily precipitate a swift exit but may instead lead to intensified focus and resource reallocation to revive the unit.

This pattern might become particularly relevant when a firm has numerous businesses, as underperforming units can receive an influx of resources from a wide range of funding sources. Strong performance in other units often acts as a buffer, deterring exits or asset sales from struggling segments by generating slack resources that bolster confidence and slow divestment decisions (Kuusela et al., 2017). Consequently, the underperformance of certain units draws greater scrutiny from corporate headquarters, leading to a strategic reallocation of resources from successful to struggling units in an effort to equalize performance levels. For instance, (Kamzabek et al., 2024- XXX my competitive response paper) demonstrates that a firm's tendency to allocate resources to struggling units increases with the number of business units it operates. This suggests that firms may indeed channel cash generated from other units to support those experiencing downturns. This scenario might result in reduced divestment (Kuusela et al., 2017), increased investments (Cao et al., 2024; Kuusela et al., 2017; Lu & Wong, 2019) as part of a problemistic search strategy aimed at improving from prior performance (e.g., Hu et al., 2017). This scenario hints at a potential positive relationship between the number of business units and the likelihood of revitalizing underperforming segments. In other words, the more units a firm possesses, the greater the reserve of resources it can allocate to improve lagging ones.¹ Thus, having multiple business units can not only deepen commitment to ongoing business, but

¹ This phenomenon may not be limited to agency issues. Following Bardolet et al. (2011), if the resource allocation were strictly related to agency issues, we would observe no correlation between the number of alternatives and the resource allocated to the business. As later sections of this study show, the recovery nature of the business is related to the number of alternatives the business has. This demonstrates that firms have a behavioral tendency to fix underperforming units with more cash sources.

also expedite the recovery process, controlling for industry and firm level characteristics. However, exit decisions may be compelled in scenarios where multiple units underperform simultaneously, leading to a scarcity of slack resources available to support them.

METHODOLOGY

Sampling

We used a sample of S&P 1500 companies from COMPUSTAT. We exclude public administration firms and conglomerates, financial firms, and utility firms due to their differing performance measures and regulations (Hu et al., 2023). COMPUSTAT classifies business units based on a company's reported industry segment or product line. A notable limitation of the segment data is the variability in the criteria different firms use to define a business unit. Additionally, some firms report multiple business units within the same industry, complicating the identification of specific units involved in asset sales or exits. These business units are also inconsistently named across different periods. To effectively manage these complexities, we adopted the consolidation technique developed by Bardolet et al. (2011), which involves grouping reported segments at the four-digit Standard Industry Classification (SIC) code level as a single business unit. This method allows for a more standardized comparison of business units.

From our initial sample of all standalone businesses and business units within firms between 2000 and 2018, we selected those that had experienced negative profitability at least once during these periods. We excluded initial profitable periods of businesses, including only periods of negative profitability in the first year (see Table 1). Additionally, we excluded periods where the business had constant profitability. For instance, in the case of our example firm in Table 1, we omitted Y1 and Y2 due to positive profitability in these periods, commencing our analysis from Y3, when the unit's unprofitable performance began. Y11 and Y12 were also excluded because they demonstrated sustained profitability following profitable Y10. Finally, we selected periods in which there was at least 50% underperformance. This allowed business units with fluctuating performance to be selected, indicating uncertainty about performance in the next period.

Table 1 Sampling example

Year	Y1	Y2	Y3	Y4	Y6	Y7	Y8	Y9	Y10	Y11	Y12
Profitability of unit	+	+	−	−	−	−	+	−	+	+	+
Included in our sample?	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No

To address the issue of left-censored data, we excluded all businesses with initial observations beginning (i.e., units that were underperforming) in 2000 because EoC for these businesses may have commenced before 2000. For instance, if a firm began experiencing unprofitability in 1998, using 2000

as the first observation period would omit crucial information and potentially lead to biased estimates. Thus, we confirmed that all included businesses were profitable at the start of 2000, with any unprofitable periods occurring only after this date.

Additionally, to maintain statistical integrity and avoid violating independence assumptions, we included only one business per firm in our dataset. This was crucial because our primary independent variable—the number of alternative units—would be constant across multiple businesses within the same firm, skewing the data. Including multiple units from the same firm could artificially inflate the statistical power attributed to specific firms. Thus, we retained only one unit per firm to ensure robustness. Our final sample consists of 1,336 standalone businesses and business units. Notably, about 29% of the businesses in our sample were never profitable during the observation period.

Design

We used survival models to estimate duration of commitment, encompassing time until exit, sale, or recovery occurs. Our dataset has three relevant features. *First*, recovery and assets may involve recurring events (i.e., recovered more than once) over the observation periods. *Second*, other confounding variables simultaneously affect firm behaviour, indicating competing risks. *Third*, recovery or asset divestment influences subsequent recovery and divestment behaviours. To account for these features, we applied the Prentice, Williams and Peterson Total Time (PWP-TT) model (Prentice et al., 1981), an advancement of the Cox proportional hazards model tailored for recurring events. The model employs a stratified Cox proportional hazard approach, stratifying the analysis by the sequence of event occurrences. It operates under the premise that a business is not exposed to a subsequent recovery/asset sale occurrence until the preceding one has taken place. That is, instead of using classical Cox method that resets the time to zero after each event for a given business, this method allows the time measure to continually increase after each event for a given business unit (Lee and Wang 2003, Prentice et al. 1981); meaning, the time to an event is always measured from the start of the data collection (i.e., 1st observation) for that unit.

We also tested the robustness of the result with the industry-shared Frailty model. The inclusion of a frailty term is a valuable strategy for addressing endogeneity issues related to firm-specific heterogeneity (Gutierrez, 2002). The model assumes that each firm or industry has systemically lower or higher rate of asset sale, exit or recoveries for reasons not explained by the covariates. By applying a random effect, the Frailty term considers those units within the same industries to have similar characteristics due to they share similar characteristics (details in Cleves et al., 2010). This method

was also applied in other Strategy research (e.g., Bigelow et al., 2019; Kim, 2016; Leone & Reichstein, 2012; Yu et al., 2022).

Additionally, we conducted an omitted variable endogeneity test using the inference to replacement (IRR) test with “konfound” command in STATA (Busenbark et al., 2022). As the IRR test is not tailored for the Cox model, we assessed it using panel logit model estimates (following the methodology described by Wang et al., 2023). The results suggest that to undermine our conclusions regarding *N of units*’ influence on asset sale, business recovery and business exit, 85.61%, 42.06% and 25.8%, of the estimates would need to be attributable to omitted variable bias. In practical terms, this means that to invalidate our inferences, 25.8%, 85.61% and 42.06%, respectively, would need to be replaced with cases exhibiting zero effect. These high percentages suggest that for the coefficients to be biased, they would have to be substantially influenced, which is unlikely given these values. This analysis strengthens our confidence that omitted variable bias is unlikely to substantially affect our conclusions. Furthermore, our analysis confirmed the absence of multicollinearity issues, with the maximum VIF value of 2.38.

Dependent variables

Business recovery

As the Cox model requires the dependent variable to be a binary, we assigned a value of 0 to periods when the business was unprofitable, and 1 to periods of profit. The average it takes a firm 3.5 years to recover such a unit, varying from two to a maximum of 18 years.

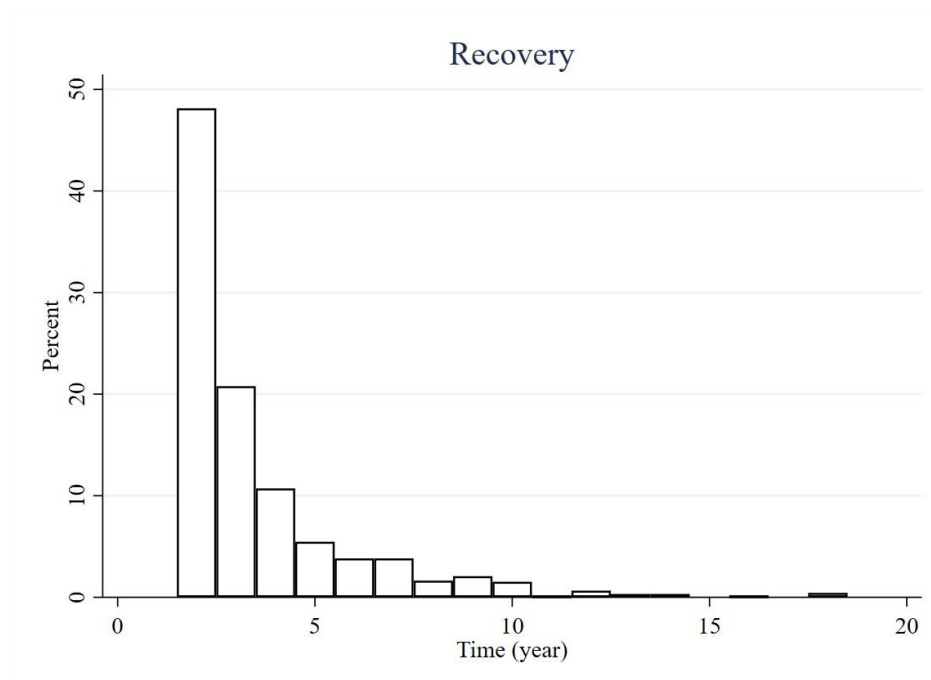


Figure 1 Years and share of profitable periods.

Business exit

Business exit was classified as a business not continuing in the following year and failing to generate a profit in the final year of observation. In our final sample, 200 firms (15%) exited loss-making units, 664 firms (49.7%) successfully returned their businesses to profitability, and the remaining 35.3% continued to escalate their commitment to unprofitable units. The average time taken to exit a unit was 2.8 years (see Figure 2).

Note that not all unprofitable units, such as those in early stages or growth phases, signify an underperformance or escalation of commitment. Recovery times for each unit depend heavily on the specific nature of the business and the industry context, with some units recovering sooner in certain industries than in others. To accurately assess escalation of commitment, we first estimated the time until recovery occurs for each unit, controlling for firm & industry characteristics. This recovery time then served as a benchmark to evaluate whether a firm has escalated its commitments or not (see Table 2). For example, if an unprofitable business unit is retained for longer than its expected recovery time, this suggests overcommitment. This suggests that the underperforming business is retained longer than the time it was expected to become profitable. Conversely, if the business retention period aligns with, or is not visibly longer (or shorten) than, the expected recovery time, this implies an effective retention strategy, indicating timely de-escalation of commitment. However, if a firm exits from a business unit earlier than the expected recovery time, this suggests an early exit.

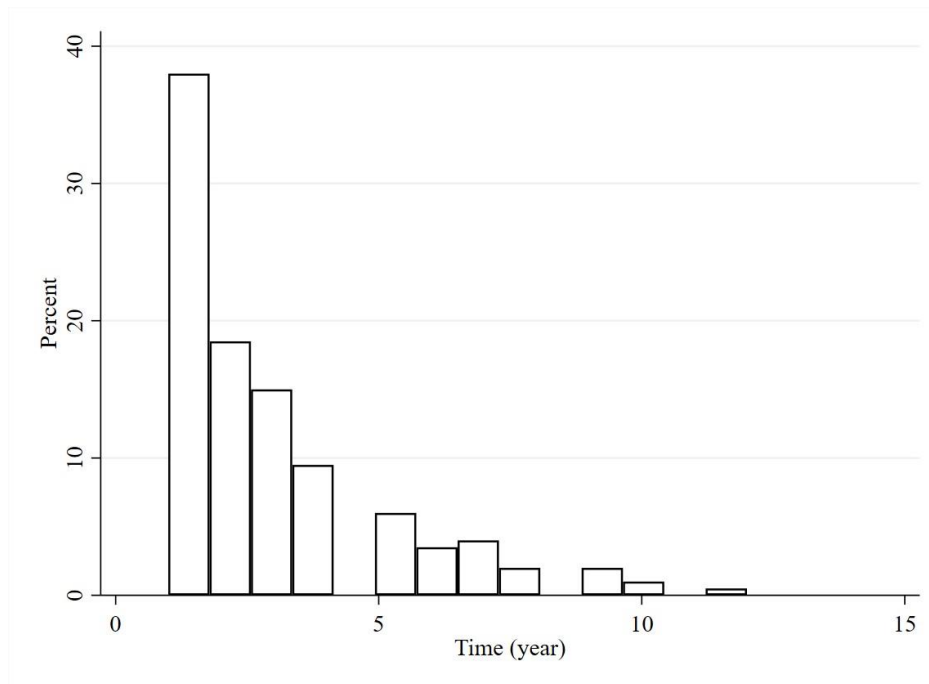


Figure 2 Years and share of business exits.

Table 2 Defining Escalation of Commitment

Condition	Classification
Expected retention time of a loss-making unit > the expected recovery period.	Escalation of commitment
Expected retention time of a loss-making unit $\approx$ the expected recovery period.	Timely de-escalation
Expected retention time of a loss-making unit < the expected recovery period.	Early de-escalation

For example, if a business remains unprofitable for around four years, and the recovery time expected by peer benchmarks is 2.5 years, this will signify a clear escalated commitment, advising firms to consider exiting the business. In this manner, we analyze how businesses, for example, with one alternative investment, differ in terms of exit times and recovery times compared to businesses with two alternative investments. For instance, if the gap between the exit time and the expected recovery time (where exit time exceeds recovery time) widens with an increase in the number of alternative units, this suggests that firms with more alternatives tend to retain unprofitable businesses longer than those expected to return to profitability. This pattern would serve as an indicator of escalated commitment.

Asset sale

We also account for asset sales, as businesses may divest underperforming assets as part of their exit or recovery strategy, using the SDC Platinum dataset, which provides information about how assets are divested. Other scholars show that they may still retain ownership of unit, and partially divest assets during uncertainty (Damaraju et al., 2015). The SDC Platinum database enables distinction between divestiture of assets (i.e., asset sale) and acquisition of entire firm by other firms (Laamanen

et al., 2014). The latter was excluded. We assign a value of 1 if assets in the underperforming business were sold to other firms, and 0 otherwise. Our final sample has 172 cases of asset sales. Also, due to the limited number of cases (i.e., only 4), business spin-offs (e.g., Denison, 2009)—were not included in our analysis. The average time taken to sell assets from these units is reported as 2.9 years.

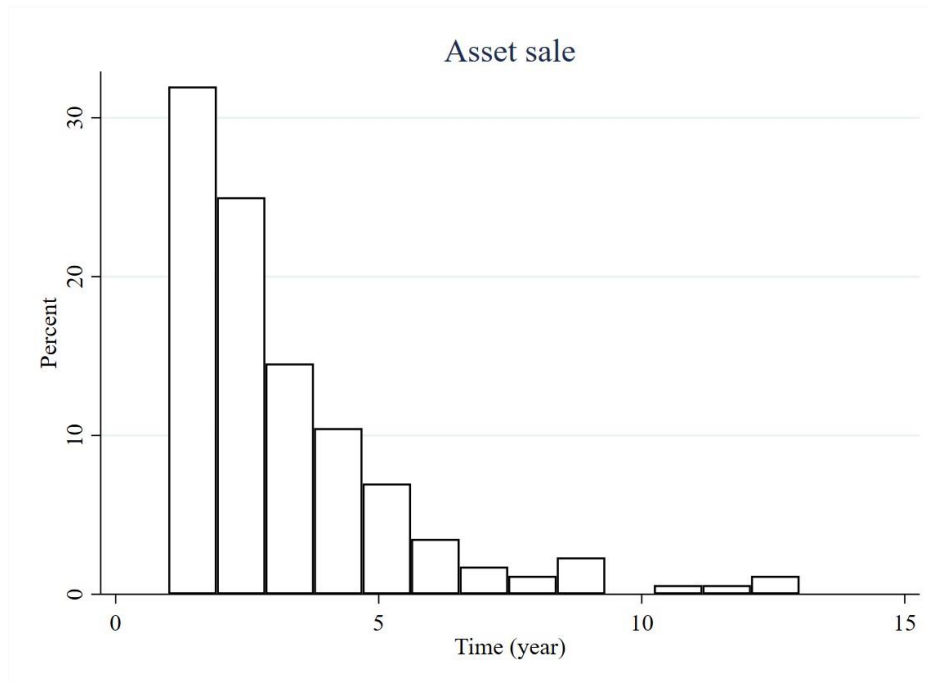


Figure 3 Years and share of asset sale actions undertaken

Table 3 displays descriptive statistics comparing asset sales with unit recovery and losses. The data reveal that, in the majority of instances (52.7%), assets were not sold during unprofitable periods. Conversely, assets were sold in only 19.5% of cases when experiencing unprofitability.

Table 3. Asset sales in unprofitable and profitable periods

Asset sale	Unit recovery		
	Unprofitable	Profitable	Total
Not sold	52.7%	20.6%	73.3%
Sold	19.5%	7.1%	26.7%
Total	72.2%	27.8%	100%

Independent variable

Number (N) of alternative businesses.

We counted the businesses operated by the firm as an alternative to our focal underperforming business unit. As the criteria employed by firms to define a business unit in the COMPUSTAT segment data varies, we used a standardized criterion (Bardolet et al., 2011), that is, SIC codes to aggregate

reported segments at the four-digit SIC code industry level. In our sample, a firm is associated with as many business units as there are industries at the four-digit level.

Number (N) of underperforming businesses.

This study focuses on the number (N) of alternative units in predicting overcommitment to focal units but acknowledges that firms may be committed to other unprofitable businesses. The presence of underperformance across multiple units not only leads to increased losses but also indicates overall firm underperformance, which may, in turn, prompt more immediate divestments and exits. Alternatively, Fox et al. (2009) found that less attractive alternatives could lead to reinvestment in the original project, whereas more attractive options, as in experiments by Northcraft and Neale (1986), led to de-escalated commitments. This pattern suggests that the relative appeal of alternatives significantly influences investment decisions and demonstrates whether firms can redeploy cash generated from other units to address underperformance. Therefore, we included a count of alternative units exhibiting negative profits in the focal year. Furthermore, incorporating this variable modifies the main dependent variable from *N of alternatives* to *N of profitable alternatives*, revealing whether the positive performance of alternative units plays a role in de-escalation of commitments.

Control variables.

Business unit level controls

First, we added the business level characteristics, such as *unit newness* to the firm, *business growth* and the *size of the unit* in the company. It's important to recognize that a business unit might exhibit one of two distinct characteristics in terms of future returns. First, a unit could incur losses during its early years as it navigates through phases of exploration and development typical of new ventures. Second, a previously successful unit might start underperforming due to an inadequate response to market dynamics and competition. These scenarios call for differing allocation strategies: while losses are anticipated and seen as an investment in the growth of new units, underperformance in established units is often viewed as a setback requiring immediate remedial actions. Consequently, firms might have different expectations for the recovery timelines of these two types of units. To accommodate this distinction in our analysis, we have added a dummy variable to indicate whether a unit is a new venture (*unit newness*).

The *growth of the unit* is another aspect which may lead the firm to retain those units. Even though the BU has a negative profitability, firm may set goals to just focus on growth in the short term. *Business size* indicates the power of the business (Bardolet et al., 2017), measured by business sales divided by firm sales.

Firm level controls

Firm size is measured by a logarithmic transformation of total assets. It has been noted that larger firms tend to be slower in making divestment decisions (Kolev, 2016; Shimizu & Hitt, 2005). *Prior corporate performance*, as measured by the return on assets (ROA) in the preceding period, is shown to influence firm decision-making; those having experienced past success often strongly believe they can achieve current success. To account for present performance, we incorporated *present performance (ROA)* and *operational cash flow (cash flow over total assets)*, which provide firms with excess resources to allocate to underperforming businesses. Additionally, we controlled the firm's external borrowing and debt repayments by examining the *financial cash flow*, specifically the net financial cash flow as a proportion of total firm assets. This metric helps determine whether the firm experienced an increase in external cash inflows or faced financial obligations to repay debts. Lastly, we included *N of related businesses*, measured by the total *N* of businesses in the same 2-digit SIC industry.

Industry level controls

According to the behavioural theory of the firm, firms' aspirations may be influenced by *Industry performance* (Arrfelt et al., 2015), with positive competitor performance potentially leading to escalated commitments in that industry (Hsieh et al., 2015), hence we added median performance of the SIC 3-digit industry for that year. We also controlled for the median SIC 3-digit *growth rate* of the industry to measure industry trend (Chang, 1996).

Table 4 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
N of alternatives	3,821	1.43	1.30	0.00	9.00
N of loss units	3,821	0.29	0.58	0.00	5.00
Related units	3,821	1.39	0.69	1.00	6.00
Unit newness	3,821	0.22	0.41	0.00	1.00
Industry growth rate ^⓪	3,818	0.04	0.12	-0.37	0.37
Business growth rate ^⓪	3,821	0.18	0.95	-0.75	6.95
Industry profitability ^⓪	3,811	0.02	0.21	-1.31	0.35
BU size	3,818	0.45	0.39	0.00	1.00
Firm size	3,775	7.07	2.02	1.40	13.17
Prior firm performance ^⓪	3,768	-0.03	0.13	-0.63	0.25
Present firm performance ^⓪	3,753	-0.04	0.15	-0.72	0.23
Operational cash flow ^⓪	3,814	0.06	0.09	-0.23	0.28
Financial cash flow ^⓪	3,814	0.00	0.10	-0.31	0.42

^⓪ winsorized at 1 and 99 percentiles

RESULTS

First, we conducted PWP-TT regressions to estimate exit rates from underperforming units (Table 5). The model with predictors (Models 2 & 3) demonstrates superior explanatory power, indicated by a lower Akaike Information Criteria, compared to that with only controls (Model 1). In Model 2, we only included N of alternatives as the primary predictor, revealing a positive effect ($b = 0.291, p < 0.01$). That is, for each additional alternative business, a firm's likelihood of exit increases by 0.29 or 29%. In the full model (Model 4), we incorporated both N of alternative businesses and N of unprofitable businesses, finding similar effects. That is, for each additional alternative profitable business, a firm's likelihood of exit increases by 22.9% ($p < 0.01$). We also found a significant positive impact of N of alternative underperforming businesses on business exits (Model 3; $b = 0.236, p < 0.05$). Model 3 & 5 was designed to test the robustness of these findings using an industry-shared frailty term. We applied the Weibull distribution to all frailty models after determining, through comparison of Akaike Information Criteria, that it provides greater explanatory power than other distributions, such as Gompertz or Exponential. These models consistently demonstrated the positive effects of the number of alternative units ($b = 0.246, p < 0.01$), the number of positive alternatives ($b = 0.159, p < 0.05$), and a significant increase in the hazard rate of exiting driven by the number of loss-making units ($b = 0.323, p < 0.01$).

Additionally, our data revealed that firms are less likely to exit from industries with higher growth rates ($b = -3.370$ in PWP-TT; $b = -2.768$ in frailty term; all $p < 0.01$), implying that each unit increase in industry growth rate substantially decreases the likelihood of exit. Similarly, newer units showed a lower probability of exit compared to more established ones, as evidenced by negative coefficients across all models ($b = -0.449$ in the PWP-TT; $b = -0.411$ in the frailty term model; all p -values < 0.05). Larger businesses also exhibited a reduced likelihood of exit ($b = -1.949$ in PWP-TT; $b = -2.338$ in frailty term; all $p < 0.01$).

The final interaction analysis (Model 6) aimed to contextualize exit decisions as the number of units increased, assessing the influence of industry growth and performance. Classic behavioral theory of the firm suggests that firms may use internal and external anchoring points to decide on further investments (Cyert & March, 1963; Hu et al., 2017). Accordingly, we test how firms adjust their aspirations as the number of units increases. We did not support the impact of industry growth and performance on exit decisions. However, there was marginal evidence for an interaction between the N and the N of loss-making units ($b = 0.0761, p < 0.1$). These results suggest that as the number of units increases, their quantity and profitability hold more explanatory power for exit decisions than do industry characteristics, potentially indicating that firms set aspirations based on the availability of alternatives and the performance of their sister units.

--- Insert Table 5 here---

Table 6 shows the duration of a firm's retention of underperforming assets. Model 2 tests the effect of N on the hazard rate of divestment, finding support for a positive effect ($b = 0.172$; $p < 0.05$). Incorporating both predictors in the Model 4 revealed N of underperforming businesses as a significant determinant of the divestment hazard rate, not N of positive alternatives. Specifically, Model 4 showed that each additional loss-making unit increases the likelihood of engaging in problemistic search and asset sale activities by 35.3% ($b=0.353$; $p<0.01$), suggesting a heightened response to underperformance when other units are also underperforming. Including an industry-shared frailty term ($b=0.438$; $p<0.01$; Model 5) yielded a similar coefficient, reaffirming our results. To ensure these findings are robust, we controlled for firm's overall performance and cash flow, previous performance, size, and industry-specific factors. Overall, the analyses support the conclusion that firms are more likely to engage in asset sale activities for loss-making units when they have more alternatives. This tendency often precedes decisions to exit these units.

In addition, asset divestments are more likely to occur in larger businesses ($b = 0.884$, $p < 0.01$, Model 4), after overall firm underperformance ($b= -1.392$, $p < 0.05$, Model 4). We also found the presence of related businesses prompts swift divestments ($b = 0.357$, $p < 0.01$). These results are corroborated by the Frailty model in Model 5. Furthermore, our analysis reveals that financial borrowings tend to delay asset sales ($b = -2.013$, $p < 0.05$; Model 5).

--- insert Table 6 here---

We test the recovery nature of loss businesses separately in the Table 7. The results indicate a significant effect of the N on recovery rates ($b = 0.086$; $p < 0.05$; Model 2), demonstrating that each additional alternative unit increases the likelihood of recovery, on average, by 8.6%. Alongside prior analyses, our findings highlight a positive impact of alternatives on the likelihoods of all events (i.e., exit, asset sale, and recovery). However, there is a pronounced discrepancy among these strategic options: on average, the likelihood of exiting is 29.1%, of selling assets is 17.2%, and of recovery is 8.6% with each additional alternative. This significant gap indicates that firms are more inclined to adopt exit strategies over retention, suggesting a strategic preference for mitigating losses rather than engaging in recovery efforts in many scenarios.

The impact on recovery duration is more pronounced when considering the profitability of these alternatives: each additional profitable unit increases the recovery likelihood by 13.1% ($b = 0.131$; $p < 0.01$; Model 4), whereas each unprofitable unit decreases it by 22.5% ($b = -0.225$; $p < 0.01$; Model 4) in PWP-TT models. Under the industry-shared frailty model, we obtained the similar effect, with

profitable units increasing the recovery likelihood by 15.5% (Model 5; $p < 0.01$) and unprofitable units reducing it by 21.4% (Model 5; $p < 0.01$). The study further demonstrates an increased likelihood of recovery in more profitable industries (Model 4; $b = 1.093$; $p < 0.01$), suggesting that industry profitability can serve as a reliable benchmark for deciding to continue operations. Additionally, businesses that are either growing ($b=0.152$, $p<0.01$) or are situated in growing markets ($b=1.274$, $p<0.01$) are likely to turn to profitability sooner. The impact of business unit size on recovery efforts was significant (Model 4; $b = 0.897$; $p < 0.01$), with larger units showing higher recovery rates.

In Model 6, we seek to understand the dynamics of business recovery as the number of units increased, specifically identifying which businesses firms prioritize for recovery. Considering, firms seek a reference point in term allocations decisions (Cyert & March, 1963), we interacted N with industry growth, profitability and business growth. Results indicated that there was no significant effect on the likelihood of recovery in industries where growth is favorable. However, the analysis yielded a negative coefficient for the interaction term between N and *industry profitability* ($b=-0.334$, $p<0.05$), alongside a positive coefficient for the first-order terms of N ($b=0.196$, $p<0.01$) and industry profitability rate ($b=1.692$, $p<0.01$). This shows a positive effect of N on recovery likelihood across all industry profitability levels. This suggests that firms with more units are more likely to invest in recovering underperforming units, even in scenarios where overall industry profitability is not favourable (see Figure 8 in Appendix II). Overall, these results imply a strategic focus on revitalizing weaker segments as part of a broader strategy, regardless of firm industry characteristics. Additionally, when we explored the interaction between N and business growth rate, we observed a negative coefficient for the interaction term ($b = -0.0775$, $p < 0.01$). The accompanying *Appendix III* (Figure 6) illustrating this complex effect shows that firms with a larger number of business units tend to pursue recovery in businesses across the spectrum of growth rates, with a slight preference for businesses exhibiting higher growth rates.

Lastly, Model 7 examined how firms with various alternative businesses manage underperformance in their largest units.² Initially, we analyzed the interaction between business size and the N , yielding a positive coefficient for the interaction effect ($b = 0.323$, $p < 0.01$) and a positive effect for the first-order lagged unit size ($b = 0.590$, $p < 0.01$). This analysis suggests that firms strategically use other units to support the recovery of their largest unit, indicating a high level of attention and resources are directed towards these significant segments. Additionally, we observed a tendency for asset sales in these units, as indicated by a positive coefficient for the interaction in the

² The significant discrepancies between the durations for retention ($b = -1.949$ for exit) and recovery ($b = 0.897$ for recovery) suggest that firms often maintain their commitments to underperforming units far longer than the anticipated recovery timeline (see Figure 7 in Appendix III).

asset sale estimation ($b = 0.684$; $p < 0.01$; Model 6 in Table 6). However, there was no significant indication of exits increasing as the number of units grows (Model 7 in Table 5). This may imply that firms prefer to retain and recover their largest units by reallocating resources and managing asset sales, which can lead to quicker recovery processes.

Additionally, this may imply that the strategic splitting of businesses could influence the recovery dynamics of the focal business, as increasing the N through splits also impacts this dynamic. To further support the latter, we investigated how business size interacts with the addition or termination of units within the same industry segment (i.e., SIC 4-digit). This analysis aimed to understand the strategic decisions behind either expanding or consolidating business units and how these actions affect the overall health and recovery potential of the primary business unit. We observed a negative coefficient for the interaction term ($b = -0.357$, $p < 0.05$), a positive coefficient for first-order business size ($b = 0.590$, $p < 0.01$), and a negative coefficient for the first-order units added/dropped ($b = -0.354$, $p < 0.01$), indicating that splitting the focal business into different entities within the same industry impacts recovery strategies. Figure 9 in Appendix III detail these complex interactions. The overall pattern suggests that firms are more adept at managing underperformance in their largest units by segmenting these businesses into distinct entities, whether within the same segment or across different ones, especially during downturns.

--- insert Table 7 here---

DISCUSSION

Our study demonstrates that alternative investment options significantly influence firms' strategic decisions concerning unprofitable business units. Specifically, introducing an additional unit increases the likelihood of exiting a loss-making unit by 29.1% on average, suggesting that an increase in the number of business units helps mitigate losses and de-escalate commitment to the focal unit more rapidly. Meanwhile, the hazard rate of recovery of the focal business increases by 8.6% with one additional business unit, implying that firms utilize cash generated from profitable units to recover unprofitable or underperforming units (consistent with Arrfelt et al., 2013; Billett & Mauer, 2015; Ozbas & Scharfstein, 2010). Consequently, these high exit and recovery rates demonstrate that the M-form structure indeed offers greater investment flexibility (e.g., Argyres & Lovallo, 2023; Dickler & Folta, 2020).

Interestingly, there is a significant discrepancy between the likelihoods of exit (29.1%) and recovery (8.6%), suggesting that firms with multiple units are more predisposed to exit underperforming units swiftly rather than pursuing recovery efforts (See Figure 4). This trend

underscores a strategic preference for mitigating losses rather than attempting to turn around underperforming units, aligning with Northcraft & Neale's (1986) observations on firms' tendencies to favor exit strategies. This tendency suggests that with more units available, firms may attribute less value to each individual unit, reducing sunk cost effects and endowment biases. Additionally, this propensity to exit is substantially amplified when other units are also underperforming, suggesting that poor performance across multiple areas intensifies the drive to cut losses and free up resources.

Moreover, our findings reveal that firms often engage in problemistic searches within multiple underperforming units (e.g., Kacperczyk et al., 2015), particularly when these units are related. As more units underperform, indicating potential firm-wide issues, the likelihood of asset sales and business exits increases (Chang, 1996). Specifically, the presence of an additional underperforming unit escalates the likelihood of asset sales by 35.3% and business exits by 23.6%, while diminishing the hazard rate of recovery by 22.5%. Interestingly, there is a marked preference for partial divestments when multiple units begin to underperform simultaneously, evidenced by a higher likelihood of asset sales (35.3%) compared to complete exits (23.6%). This pattern diverges from scenarios involving multiple alternative units (i.e., regardless of their profitability), where a higher number of units tends to favor exits over partial divestment. Thus, the decision between opting for a complete exit or pursuing staged divestments, akin to real options (e.g. Damaraju et al., 2015), hinges on the performance of other business units within the firm. The profitability of alternative units seems leads managers to conclude definitively that the focal unit is underperforming rather than facing uncertainty, prompting quicker decisions to exit completely. However, when multiple units are underperforming, firms tend to opt for partial asset sales, which introduces a level of perceived uncertainty.

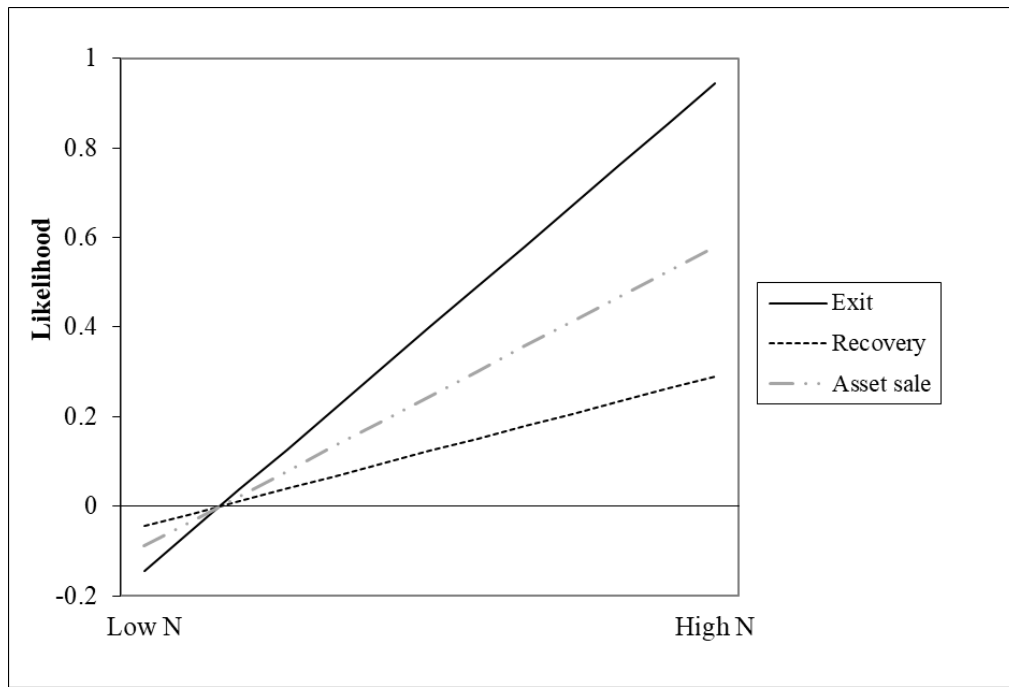


Figure 4. High N of alternatives (mean + 1.5SD), Low N of alternatives (mean – 1.5 SD)

We also find that firms escalate their commitment to their largest business units, often overcommitting despite unprofitability. Specifically, when a business represents 50% of the firm's sales, it retains a strikingly high hazard rate of retention at 97%, compared to a 45% hazard rate of recovery, as shown in Figure 7. This significant gap highlights a deeper commitment to larger units, driven perhaps by their pivotal role in the firm, closely tied to the company's overall identity or legacy (Feldman, 2014). Moreover, the complexity inherent in managing these units—such as their considerable political influence (Bardolet et al., 2017), operational coarseness (Argyres & Lovallo, 2022), vertical interdependencies (Chan et al., 2007) and the horizontal technological interconnectedness within the unit (Khanna et al., 2018)—further exacerbates the escalation of commitment. For instance, research by Khanna et al. (2018) on the pharmaceutical industry reveals that cognitive overload from interdependencies between patented inventions may cause managers to sustain underperforming interdependent projects longer than optimal.

Further, our analysis reveals that large businesses are more likely to recover when a firm is partitioned into additional business units. This phenomenon can be attributed to two primary factors: *First*, with more business units, the perceived importance of the largest units diminishes, leading to less cognitive attachment. For instance, a business contributing to 60% of total sales might be viewed as less critical in a firm with four additional units compared to one with only two. This reduction in perceived importance increases the likelihood of asset divestitures in firms with more business units. Given the complexity of exiting from large businesses—which can be seen as both a strategic and cognitive challenge—partial divestitures may emerge as a more feasible solution. *Second*, firms with

a greater number of business units have the ability to mobilize additional resources, which can be crucial for revitalizing a struggling major division. Each unit within the firm can potentially contribute resources, thereby increasing the overall pool available for recovery efforts. Hence, the synergy of partial divestitures and enhanced resource availability can effectively address these challenges, providing a plausible framework for recovery in large business units. Additionally, other scholars have suggested that strategic changes in leadership, such as replacing a CEO with an outsider, can also facilitate de-escalation of commitments, especially if the business unit is a legacy one (Feldman, 2014; Hayward & Shimizu, 2006; Shimizu & Hitt, 2005).

Additionally, there are significant benefits to firms in splitting large units into independent businesses during downturns.³ The benefits of this approach include specialization and targeted management, which can help identify both high performers and underperformers more effectively within the organizational structure. This approach is in line with findings that suggest more alternatives lead to increased exit decisions and divestitures, subsequently freeing up capital for reinvestment. Other scholars have highlighted the potential benefits for growth identification (Joseph & Wilson, 2018) and innovation enhancement (Klingebiel & Rammer, 2021) through such partitioning. A notable example of this strategy in action is Sony's restructuring of its electronics business. The company spun off its Television and Audio & Video units in 2014 and 2015, respectively, into independent business units specifically to tackle underperformance. This restructuring also included the sale of its PC business, illustrating a comprehensive approach to divesting non-strategic assets and concentrating on more profitable or strategically important areas. This example underscores the practical application and potential benefits of dividing larger business units to better manage and potentially recover from periods of underperformance. Some practitioners even advocate for increasing the granularity of business units up to as many as 200 individual units (Baghai et al., 2009).

Furthermore, the competitive environment plays a crucial role in firms' commitment decisions. For example, Hsieh et al. (2015) demonstrated that firm's reference on competitors' action quantity and profitability when making their own exit or stay decisions. We further support this behavior, showing that firms tend to overcommit to businesses operating where competitors have a higher growth rate (see also Chang, 1996). Specifically, with a growth increase of 4%, the hazard rate of retention rises to 13.5%, while the recovery likelihood only increased by 5% (Figure 11 in *Appendix III*), indicating that firms are more than twice as likely to commit (i.e., stay) to a unit beyond the expected recovery timeline. In other words when firms observe competitors thriving in these trending segments, they may develop an overly optimistic view of potential profitability, leading to excessive

³ We also tested whether the addition of units was due to M&As, but our analysis did not reveal any significant effects from M&As. This leads us to conclude that the additional business units may primarily be due to the splitting up of existing businesses.

commitment to underperforming units. Furthermore, Hsieh et al. (2015) found that positive performances by smaller competitors heighten a firm's likelihood to escalate commitment. Extending this research, we actually demonstrate that median industry performance positively correlates with the performance of the focal business. For example, if the industry's return on sales rises by 4%, the likelihood of a unit's recovery improves by 4.4%. This positive correlation implies that firms could benefit from monitoring the performance of other businesses within the industry.

Theoretical contribution

This paper significantly contributes to the literature on escalation of commitment, behavioral strategy and behavioural theory of the firm in several key areas. Firstly, we demonstrate that the presence of alternatives enhances allocational flexibility, leading to an increase in exits, asset sales, and recoveries during business downturns. However, we also highlight a managerial tendency to divest or exit questionable business rather than committing further resources for recovery when alternative exists. Importantly, our findings indicate a higher likelihood of exiting when alternatives are performing well, suggesting that managers may perceive a clear signal of underperformance in the focal unit relative to others. Conversely, there is a higher tendency for partial divestiture, such as asset sales, when alternative units are also underperforming. This indicates that firms might anchor their optimism on the performance of alternatives, affecting their strategic decisions. Our results align with the idea driven by the question "Driven by Aspirations, But in What Direction?" (Kuusela et al., 2017, p. 1101) showing that the further a unit is from the aspired performance—in our case, turning a profit—the more swiftly divestiture decisions are made, especially when more alternative businesses are present.

Second, our findings suggest that the allocation of resources to underperforming units is influenced not only by agency issues (Duchin & Sosyura, 2013; Ozbas & Scharfstein, 2010; Scharfstein & Stein, 2000) but also by the behavioral tendency of firms to equalize performance across their businesses (Arrfelt et al., 2013). Firms with multiple units often set higher aspirations for lagging units based on the performance of overperforming ones and reallocate more capital to underperforming unit to enhance their performance. The presence of multiple alternatives within a firm enhances this capacity for resource reallocation, as each unit contributes to a collective effort to revive weaker segments, increasing the likelihood of recovery where alternatives are plentiful. Additionally, we add that firms with more units tend to focus on bridging gaps between the sister units rather than responding to external market dynamics.

Thirdly, the study identifies specific contexts in which firms are particularly prone to overcommitment to underperforming business. These include trending industries, where the allure of

potential gains can obscure rational decision-making, within their largest business units, which are often seen as too big to fail, and in newly established units, where initial optimism can delay necessary corrective actions.

Conclusion

In conclusion, the availability of alternative investments tends to shorten the timeline for exiting and selling off assets, or alternatively, speeds up the recovery time. This observation is consistent with findings from both experimental psychology and empirical studies in strategy and finance. Furthermore, having multiple business units not only facilitates a rapid de-escalation of commitment from unprofitable businesses but also enables these exits to potentially aid in the quicker recovery of other underperforming units.

Table 5 Survival Model for Business Exit

VARIABLES	(1) PWP-TT Controls	(2) PWP-TT 1 st predictor	(3) Frailty term 1 st predictor	(4) PWP-TT Two predictors	(5) Frailty term Two predictors	(6) PWP-TT Interactions	(7) PWP-TT Exit largest unit
N of alternative		0.291*** (0.0721)	0.246*** (0.0647)	0.229*** (0.0797)	0.159** (0.0721)	0.292*** (0.0927)	0.238*** (0.0879)
N of loss units				0.236** (0.110)	0.323*** (0.107)	0.503** (0.196)	0.287** (0.118)
N × N of loss units						-0.0761* (0.0448)	
N × Industry performance						0.0140 (0.346)	
N × Industry growth						0.271 (0.464)	
Business size × N							0.0795 (0.276)
Related units	0.310*** (0.116)	0.142 (0.122)	0.154* (0.0907)	0.125 (0.120)	0.137 (0.0907)	0.133 (0.121)	0.105 (0.130)
Unit newness	-0.399** (0.193)	-0.415** (0.193)	-0.354** (0.177)	-0.449** (0.194)	-0.411** (0.178)	-0.440** (0.194)	-0.431** (0.212)
Industry growth	-3.353*** (0.809)	-3.377*** (0.800)	-2.743*** (0.739)	-3.370*** (0.816)	-2.768*** (0.737)	-4.050*** (1.282)	-3.589*** (0.972)
Business growth	-0.143 (0.153)	-0.150 (0.157)	-0.0908 (0.0981)	-0.146 (0.154)	-0.0871 (0.0973)	-0.153 (0.156)	-0.507 (0.320)
Industry performance	-1.561* (0.910)	-1.555 (0.948)	0.0218 (0.438)	-1.608* (0.967)	-0.0133 (0.433)	-1.487 (1.498)	-3.224*** (1.148)
Business size	-2.386*** (0.348)	-1.961*** (0.358)	-2.334*** (0.304)	-1.949*** (0.356)	-2.338*** (0.303)	-1.835*** (0.368)	-2.160*** (0.460)
Firm size	-0.0809* (0.0475)	-0.159*** (0.0533)	-0.136*** (0.0437)	-0.149*** (0.0542)	-0.124*** (0.0435)	-0.154*** (0.0546)	-0.140** (0.0563)
Prior firm performance	0.533 (0.613)	0.491 (0.640)	0.805 (0.691)	0.513 (0.637)	0.820 (0.688)	0.542 (0.642)	0.308 (0.668)
Present firm performance	-1.468*** (0.475)	-1.413*** (0.474)	-1.809*** (0.457)	-1.193** (0.478)	-1.502*** (0.470)	-1.045** (0.482)	-1.171** (0.507)
Operational cash flow	-1.628 (1.134)	-1.319 (1.196)	-0.348 (1.070)	-1.188 (1.185)	0.0674 (1.066)	-1.175 (1.185)	-0.935 (1.316)
Financial cash flow	0.438 (0.939)	0.577 (0.965)	0.167 (0.730)	0.539 (0.963)	0.251 (0.728)	0.527 (0.969)	0.630 (0.995)
γ			0.462*** (0.0530)		0.462*** (0.0533)		
$\ln(\theta)$			-15.04 (813.3)		-13.90 (642.1)		
Constant			-1.460** (0.573)		-1.361** (0.574)		
Time, industry fixed effects	...	...	...	...	...	...	
Pseudo r-squared	...	...	...	...	...	...	
Chi-square	...	...	...	...	...	...	
Akaike crit. (AIC)	...	...	...	...	...	...	
Observations	3,728	3,728	3,728	3,728	3,728	3,728	3,470
Number of firms	253	253	253	253	253	253	1,322
Number of events							183

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6 Survival Model for Asset Divestment

VARIABLES	(1) PWP-TT Controls	(2) PWP-TT 1 st predictor	(3) Frailty term 1 st predictor	(4) PWP-TT Two predictors	(5) Frailty term Two predictors	(6) PWP-TT Largest unit
N of alternative		0.172** (0.0851)	0.176** (0.0845)	0.0663 (0.0907)	0.0671 (0.0921)	-0.0535 (0.105)
N of loss units				0.353*** (0.133)	0.438*** (0.124)	0.258* (0.149)
N × Business size						0.684*** (0.202)
Related units	0.471*** (0.109)	0.350*** (0.122)	0.425*** (0.113)	0.357*** (0.120)	0.426*** (0.112)	0.335*** (0.121)
Unit newness	-0.841* (0.446)	-0.817* (0.447)	-0.657** (0.284)	-0.863* (0.457)	-0.746*** (0.287)	-0.956** (0.451)
Industry growth	1.442 (0.932)	1.538* (0.925)	0.856 (0.824)	1.500* (0.892)	0.771 (0.828)	1.430 (0.896)
Business growth	-0.0263 (0.151)	-0.0316 (0.156)	-0.0431 (0.125)	-0.00531 (0.147)	-0.0279 (0.122)	-0.00696 (0.170)
Industry performance	-0.461 (0.887)	-0.489 (0.888)	-0.264 (0.559)	-0.603 (0.859)	-0.321 (0.559)	-0.605 (0.873)
Business size	0.631** (0.293)	0.936*** (0.353)	1.038*** (0.319)	0.884*** (0.336)	1.013*** (0.315)	0.228 (0.365)
Firm size	0.263*** (0.0460)	0.238*** (0.0480)	0.240*** (0.0494)	0.258*** (0.0486)	0.262*** (0.0497)	0.259*** (0.0471)
Prior firm performance	-1.239** (0.551)	-1.305** (0.549)	-1.149* (0.593)	-1.392** (0.548)	-1.191** (0.588)	-1.372** (0.580)
Present firm performance	-0.442 (0.572)	-0.380 (0.568)	-0.720 (0.572)	-0.139 (0.580)	-0.471 (0.585)	-0.323 (0.562)
Operational cash flow	-2.945** (1.279)	-2.845** (1.301)	-1.959 (1.206)	-2.750** (1.246)	-1.872 (1.186)	-3.173** (1.299)
Financial cash flow	-1.716** (0.871)	-1.577* (0.877)	-1.834** (0.869)	-1.605* (0.888)	-2.013** (0.873)	-1.720* (0.971)
γ			0.381*** (0.0578)		0.386*** (0.0571)	
$\ln(\theta)$			-0.771* (0.429)		-0.786* (0.433)	
Constant			-6.907*** (1.118)		-6.912*** (1.122)	
Time, industry fixed effects	...	...	...	...	...	...
Pseudo r-squared	...	...	...	...	...	...
Chi-square	...	...	...	...	...	...
Akaike crit. (AIC)	...	...	...	...	...	...
Observations	3,728	3,728	3,728	3,728	3,728	3,470
Number of IDs	253	253	253	253	253	1,322
N of events						162

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7 Survival Model for Business Recovery

VARIABLES	(1) PWP-TT Controls	(2) PWP-TT 1 st predictor	(3) Frailty term 1 st predictor	(4) PWP-TT Two predictors	(5) Frailty term Two predictors	(6) PWP-TT Reference points	(7) PWP-TT Split ups
N of alternative		0.0863** (0.0386)	0.118*** (0.0413)	0.131*** (0.0391)	0.155*** (0.0434)	0.196*** (0.0443)	0.0200 (0.0492)
N of loss units				-0.225*** (0.0822)	-0.214*** (0.0829)	-0.0121 (0.157)	-0.230*** (0.0844)
N × N of loss units						0.196*** (0.0443)	
N × Industry growth						0.0790 (0.212)	
N × Industry performance						-0.344** (0.171)	
N × Business growth						-0.0775*** (0.0263)	
Business size × N of alternatives							0.323*** (0.0785)
Business size × Units added							-0.357** (0.171)
Units added							0.354** (0.149)
Related units	0.106** (0.042)	0.0622 (0.0459)	0.149*** (0.0576)	0.0601 (0.0459)	0.146** (0.0577)	0.0664 (0.0467)	0.0485 (0.0461)
Unit newness	-0.287*** (0.098)	-0.288*** (0.0972)	-0.358*** (0.105)	-0.284*** (0.0964)	-0.346*** (0.105)	-0.276*** (0.0945)	-0.291*** (0.0965)
Industry growth	1.258*** (0.368)	1.261*** (0.369)	1.486*** (0.387)	1.274*** (0.363)	1.510*** (0.387)	1.153** (0.478)	1.297*** (0.362)
Business growth	0.152*** (0.023)	0.153*** (0.0237)	0.158*** (0.0318)	0.152*** (0.0236)	0.158*** (0.0319)	0.270*** (0.0437)	0.167*** (0.0248)
Industry performance	1.042** (0.493)	1.051** (0.494)	0.761*** (0.279)	1.093** (0.498)	0.775*** (0.281)	1.692*** (0.592)	1.111** (0.499)
Business size	0.720*** (0.098)	0.865*** (0.121)	0.583*** (0.134)	0.897*** (0.121)	0.595*** (0.135)	0.966*** (0.120)	0.590*** (0.135)
Firm size	0.0428** (0.017)	0.0323* (0.0176)	0.00807 (0.0211)	0.0286 (0.0177)	0.00607 (0.0211)	0.0263 (0.0176)	0.0355** (0.0176)
Prior firm performance	-0.697*** (0.242)	-0.673*** (0.244)	-1.425*** (0.254)	-0.698*** (0.245)	-1.457*** (0.255)	-0.649*** (0.245)	-0.662*** (0.248)
Present firm performance	3.061*** (0.398)	3.046*** (0.400)	3.258*** (0.398)	2.918*** (0.399)	3.150*** (0.400)	2.904*** (0.394)	2.929*** (0.402)
Operational cash flow	2.642*** (0.497)	2.716*** (0.497)	2.552*** (0.542)	2.668*** (0.496)	2.453*** (0.548)	2.636*** (0.493)	2.522*** (0.493)
Financial cash flow	0.056 (0.354)	0.0566 (0.354)	-0.323 (0.389)	0.0683 (0.353)	-0.315 (0.390)	0.0640 (0.341)	0.0166 (0.352)
γ			0.540*** (0.0260)		0.542*** (0.0260)		
ln(θ)			-2.255*** (0.319)		-2.225*** (0.316)		
Constant			-23.37 (9,788)		-22.42 (5,975)		
Time, industry fixed effects	...	...	...	...	...	...	...
Pseudo r-squared	...	...	...	...	...	...	...
Chi-square	...	...	...	...	...	...	...
Akaike crit. (AIC)	...	...	...	...	...	...	...
Observations	3,728	3,728	3,728	3,728	3,728	3,728	3,469
Number of groups	253	253	253	253	253	253	1,322

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

APPENDIX I

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Business recovery	1.000														
(2) Business exit	-0.132*	1.000													
(3) Asset sale	0.014	0.017	1.000												
(4) <i>N</i>	-0.034*	0.133*	0.045*	1.000											
(5) <i>N</i> of loss unit	-0.100*	0.140*	0.074*	0.417*	1.000										
(6) Related units	0.007	0.063*	0.092*	0.401*	0.189*	1.000									
(7) Unit newness	-0.064*	0.017	-0.062*	0.192*	0.092*	0.087*	1.000								
(8) Industry growth	0.163*	-0.053*	-0.007	-0.031	-0.063*	-0.017	0.080*	1.000							
(9) Business growth	0.080*	-0.031	-0.023	0.016	-0.029	0.036*	0.163*	0.178*	1.000						
(10) Industry performance	0.075*	0.012	-0.012	0.059*	0.021	0.013	0.046*	0.089*	0.005	1.000					
(11) Business size	0.110*	-0.141*	0.058*	-0.624*	-0.212*	-0.265*	-0.364*	-0.021	-0.092*	-0.078*	1.000				
(12) Firm size	0.063*	-0.009	0.102*	0.384*	0.072*	0.188*	0.035*	-0.006	0.009	-0.004	-0.222*	1.000			
(13) Firm performance _{t-1}	-0.049*	0.001	-0.055*	0.179*	-0.070*	0.063*	0.078*	0.038*	0.056*	0.014	-0.250*	0.203*	1.000		
(14) Firm performance _t	0.216*	-0.060*	-0.033*	0.183*	-0.175*	0.068*	0.066*	0.135*	0.075*	0.050*	-0.265*	0.240*	0.365*	1.000	
(15) Operational cash flow	0.145*	-0.022	-0.025	0.138*	-0.105*	0.105*	0.050*	-0.033*	0.047*	0.057*	-0.224*	0.223*	0.312*	0.405*	1.000
(16) Financial cash flow	-0.081*	0.010	-0.032*	-0.075*	0.018	-0.055*	0.029	0.050*	0.063*	-0.050*	0.091*	-0.034*	-0.055*	-0.136*	-0.385*

* $p < 0.05$

APPENDIX II

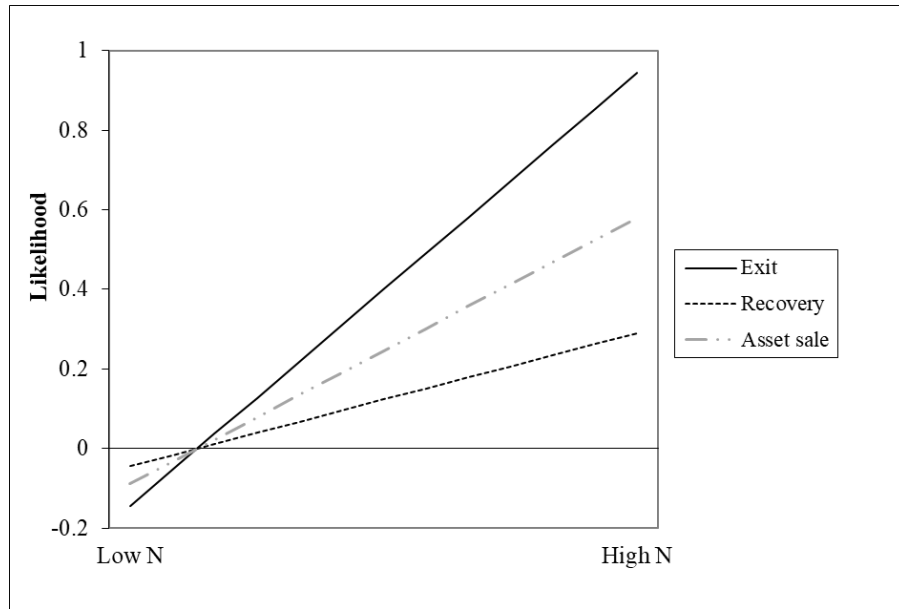


Figure 5 Hazard rates: *N* of alternatives.

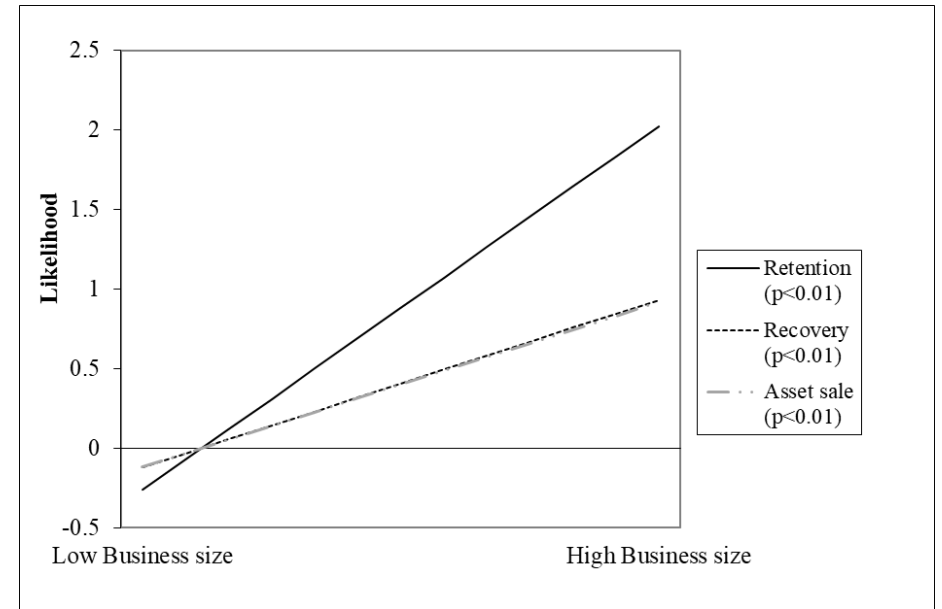


Figure 7 Hazard rates: Business size comparisons.

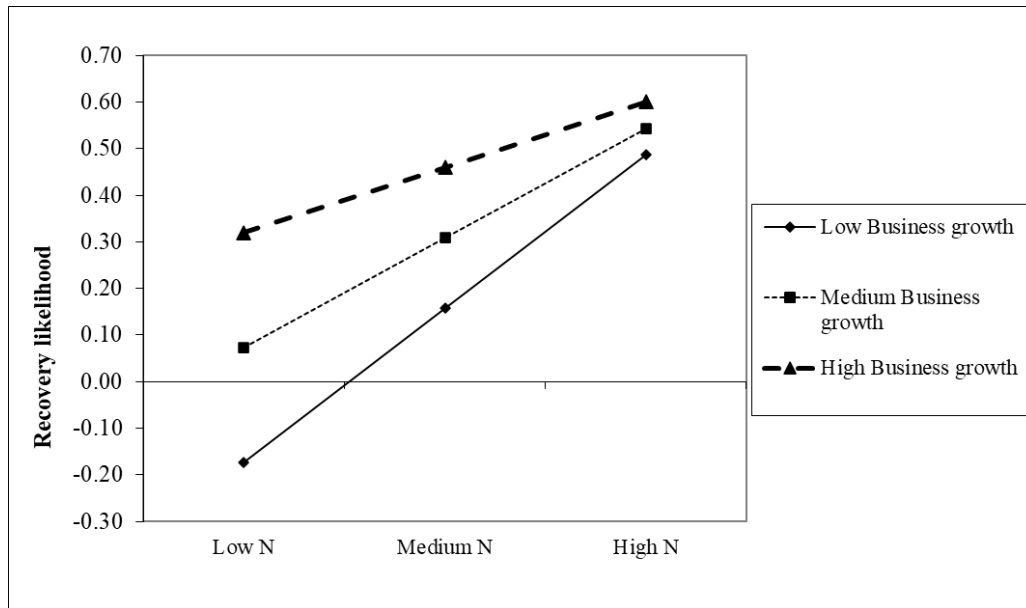


Figure 6

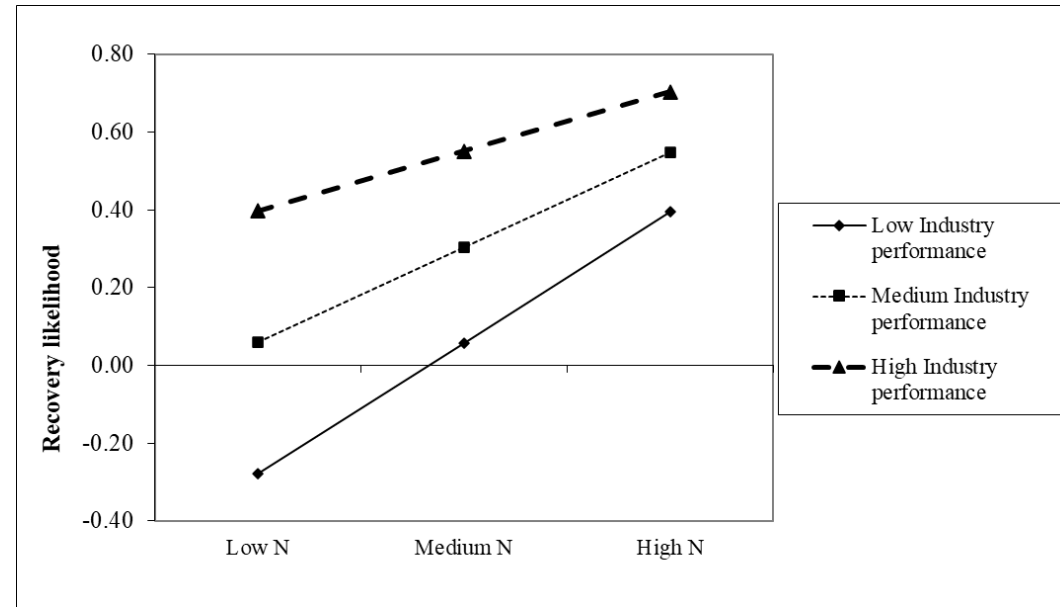


Figure 8

APPENDIX II

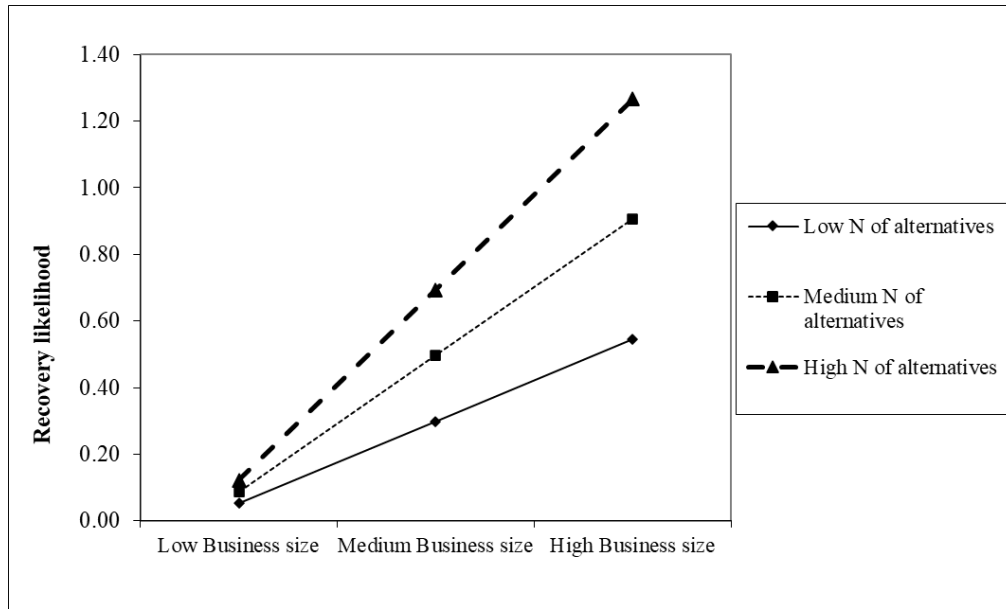


Figure 9 Changes in large business: a unit added or dropped across segments.

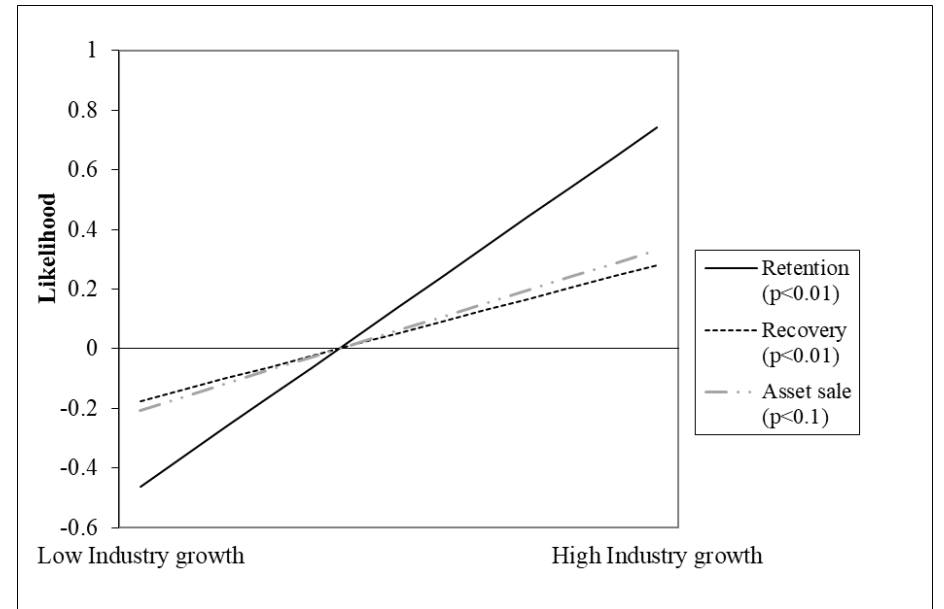


Figure 11 Hazard rates in growing industries.

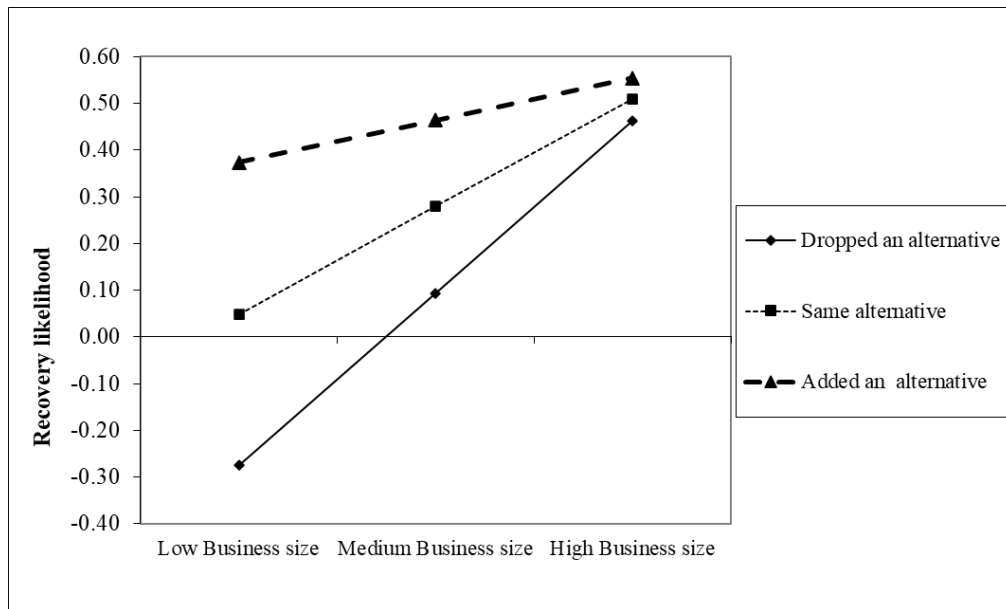


Figure 10 Changes in largest business: a unit added or dropped within the same segment.

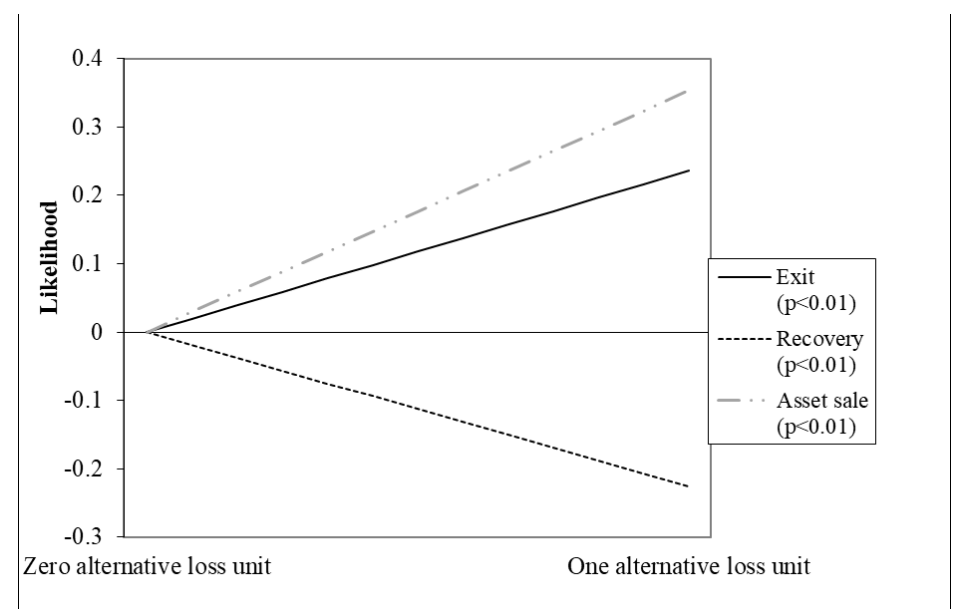


Figure 12

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