

**CAN PRIVATE EQUITY INVESTMENTS SUCCEED WITHOUT
INNOVATION? STRATEGIC DECISION GUIDELINES TO
ENHANCE BUSINESS ACQUISITION PERFORMANCE**

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CAN PRIVATE EQUITY INVESTMENTS SUCCEED WITHOUT INNOVATION? STRATEGIC DECISION GUIDELINES TO ENHANCE BUSINESS ACQUISITION PERFORMANCE

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Dedicated to my parents Jacob and Ester that survived the Holocaust, started a new life and family in Israel, and prioritized their children's education above their own needs.

ABSTRACT

There is sufficient evidence that many private equity (PE) leveraged buyouts (LBOs) fail financially and during this process, destroy significant value for their investors, employees, partners, suppliers, customers, and the economy in the communities in which these businesses operate. PE firms acquire companies and manage them for a short time-period, typically under 7 years, for the purpose of selling them at a higher price and with a high return on investment (ROI). The capital structure of such an acquisition is shaped as an LBO via an investment mix of 20-30 percent in equity and 70-80 percent in debt, which forces the LBO to assume a large debt. During the PE-LBO ownership period, PE partners focus on improving the LBO performance and on increasing its valuation with the objective of exiting the investment with large ROIs for their investors. To facilitate their objectives, the PE firm aligns the LBO's leadership with its goals through changes in the leadership team and creative incentive plans. This research study investigates the influence of PE on innovation in PE LBOs, exploring factors that impact innovation and linking them to reasons for acquisition failures. Primarily, factors studied herein explore hypotheses about the effects of short-term ownership, management restructuring, management incentive plans, and debt size on new product development and innovation. Through the implementation of case study research utilizing surveys of LBO executives, this study uncovers challenges and opportunities that impact PE LBO acquisitions and gleans insight into potential mechanisms for successful financial outcomes. As a result, this study details a rigorous, strategic, and systematic platform that highlights three PE engagement phases with an LBO company. These phases include the acquisition phase, the planning phase, and the execution phase. This platform facilitates decision making and provides guidelines and recommendations to help increase leadership focus on innovation and enhance the success rate of related investments and the future

success of LBOs. Notably, these guidelines are also applicable to the broader merger and acquisition (M&A) market.

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Pursuing a Ph.D. degree while juggling other priorities such as work, and family required a strong long-term commitment. I would not have been able to complete this journey without the endless support and sacrifice of my loving wife Paula.

This dissertation was made possible with the help of many individuals. First of all, I would like to thank my friend, Dr. Gad Selig for planting this seed in my head during 2014-2015. Many thanks go to Dr. Elif Kongar who was always available to advise and guide me through the program. I also would like to express my gratitude to my professor and dissertation supervisor, Dr. Ruba Deeb, who invested endless time in reviewing my work and in providing me guidance. Many thanks also go to the Technology Management faculty professors and committee members, Drs. Christian Bach, Bruce Bowman, Ruba Deeb, Lesley Frame, Elif Kongar, Gad Selig, and Nasir Sheikh.

Finally, after a 5-year commitment to this journey, I am going to invest my time in my family, including my loving children, Lindsay, Will, Ryan, my future daughter in law Marissa, and my adorable grandchildren, Jacob, Olivia, and Elle.

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CHAPTER 1: INTRODUCTION

1.1. The Private Equity Industry

The Private Equity (PE) industry is not a new phenomenon. It started in North America in the 1980s and expanded to the other world regions. One of the largest acquisitions that brought attention to the PE industry was the \$25B acquisition of RJR Nabisco in 1989 by KKR. The acquisition process involved a bidding war between KKR and Shearson-Lehman-Hutton and became an example of corporate greed that is described in the book and the HBO TV series “Barbarians at the Gate: The Fall of RJR Nabisco” [1]. The recession of the early 1990s slowed down PE activities due to many LBO failures. Today, LBO activities reached record level of acquisitions creating over a \$1 trillion-dollar industry [2, 3].

PE firms raise funds from institutional and wealthy individual investors. Institutions include pension, investment, and endowment funds, insurance companies, and banks. Individual investors include high net worth individuals and mutual funds [1, 4]. Once a target amount is reached, raised money is allocated to a fund which is then used by the PE firm to acquire, manage and sell businesses. Once money is committed to a fund, investors have minimal control or influence on the management of the fund’s assets. The life time of a PE fund is 10 years which can be extended by 2 years. At that time, each of these PE funds is closed and liquidated by selling all of its businesses after a pre-determined period of time. Ensuring a great track record of return on investment (ROI) in the range of 12-20 percent annual return from their previous investment funds enables PE firms to raise money for new funds. This great track record also allows PE firms to charge their investors a fee of 1.5-2 percent on the assets under management as well as a 20 percent fee on all fund profits [1, 5, 6]. The relationship between Investors, PE firms, their acquisitions, and creditors is illustrated in figure 1.

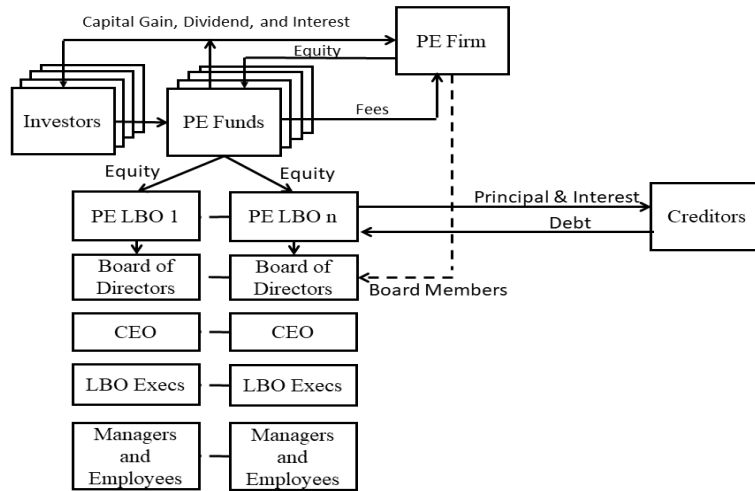


Figure 1: Relationship between investors, PE funds, PE firms, PE LBOs.

PE firms use their funds to acquire companies and manage them for a short time-period, typically under 7 years, for the purpose of selling them at a higher price and with a high ROI. A targeted company can be privately or publicly held and as a result of the acquisition, if publicly held, it is removed from the public markets and becomes private. Acquired companies are controlled by the acquiring PE firms through the creation of a small board of directors with a majority of PE partners. The capital structure of such an acquisition is shaped as a leveraged buyout (LBO) via an investment mix of 20-30 percent in equity and 70-80 percent in debt, which forces the LBO to assume a large debt with creditors. During the following 4-6 years of ownership, PE partners focus on improving the performance of their LBO and on increasing its valuation with the objective of exiting the investment with large profits for their investors. To facilitate their objectives, the PE firm aligns the LBO’s leadership with its goals through changes in the leadership team and creative incentive plans [5].

1.2 Research Problem and Scope

Despite growth in the industry, previous research studies show that many LBOs fail. These numbers are quite large and should be investigated to help identify the root cause of these failures and provide recommendations that will help increase the success rate of these investments. Table 1 provides definitions for success, failure, post exit outcome and impact.

Table 1: Success and failure definitions of PE LBOs

LBO Success and Failure Definitions			
Definition	Exit Event	Post Exit Status	Impact
Success	PE profit ≥ 0	Business Profit > 0 , Business Expansion ≥ 0	Positive outcome for employees, value chain, and the economy of the surrounding communities
Failure	PE profit < 0	Business filed for bankruptcy or closed down	Loss of income to employees, value chain. Economy of the surrounding communities shrinking

Failures of LBOs are not only detrimental to the investors, but also to the employees, the entire value chain and the communities in which they operate. The goal of this research is to uncover reasons for failures and provide recommendations that will enhance the success rate of investments and the future success of the LBOs. More specifically, this research study investigates the influence of PE firms on R&D innovation in their LBOs, exploring hypotheses about factors that impact innovation and how they may correlate to LBO failures. Key factors that are explored herein are illustrated in figure 2 and described below.

One factor is the short-term ownership period. PE firms’ investment horizon is 4-6 years [7] and the organic development of a new product to completion could require 2-3 years. Therefore, the first hypothesis H1 is that **as the investment period approaches its last few years, new product development is not approved by the LBO leadership**. The logic behind it is that new product development approval will require an increase in R&D spending, will not generate new revenues during the PE ownership, and therefore will negatively influence the LBO’s valuation prior to the exit.

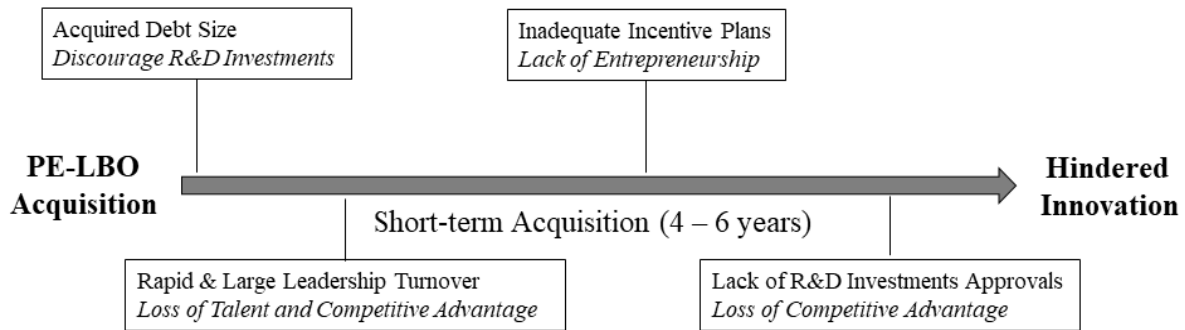


Figure 2: Four factors that impact innovation.

Another factor is the high debt that an LBO company procures during the process of acquisition. This factor forces the LBO leadership to focus on short-term objectives such as using the business cash flow to pay debt. This is achieved through efficiency improvements in the form of improved processes and headcount reductions while discouraging entrepreneurship and long-term innovation that require increased R&D budget. The second hypothesis H2 is that **the leadership of an LBO with a large debt does not increase R&D spending**. The third factor explored herein is the alignment of LBO management with its PE firm’s objectives. Some PE firms choose to replace the executive team to achieve better alignment and stronger business results. While changes at the leadership level could be positive, a complete overhaul of the leadership team will generate negative outcomes that include: 1) Poor business decision making at the executive

level due to lack of market and product expertise, and 2) High employee turnover and a significant loss of knowledge, talent, and competitive advantage. Consequently, the third hypothesis H3 is that **a significant and rapid change of the leadership team results in a large loss of talent.** Lastly, the fourth factor that impacts innovation is the use of the incentive plan as another method of alignment of the LBO management with the PE firm's objective. This incentive plan should have the correct mix of ingredients such as high salary, bonus plan, stock options and severance plan that will correctly align the executive team with the PE firm's objectives. If the incentive plan is not designed properly, the LBO leadership will lack in motivation to perform and drive the business appropriately. For example, since stock options drive long-term behavior and bonus plans reward the leadership on short-term performance of the LBO, if the bonus plan generates better financial reward, then the leadership will be focused on short-term gains rather than the valuation of the company at its exit. The fourth hypothesis H4 is that **stock options plans that are generous and achievable motivate the LBO leadership to invest in innovation. Conversely, stock options plans that are unachievable or provide unattractive payout, result in a leadership team that is unmotivated to invest in innovation.**

1.3 Research Methods

Unlike prior published research that is based on public data or surveys of PE partners, this research is based on data that is collected from LBO executives through personal interviews. The reason for the decision of utilizing case study survey is to retrieve experiential data from objective experts in the field. Most of these executives are no longer associated with the LBOs that employed them, and therefore are able to respond to the survey in an unbiased manner that does not pose a conflict of interest, and without concerns that there will be retaliation from current employers.

This research method implements a qualitative design in the form of case studies that utilize two surveys covering topics that explore, validate or invalidate the aforementioned factors (see Section 1.2). Both surveys utilize a questionnaire that is made of close-ended questions to provide consistent data collection. The first survey is used for gathering data to validate study hypotheses. The second questionnaire is used to validate decision flow charts created from the knowledge gained as a result of addressing study hypotheses. *FreeMind* is used for mapping and visualizing processes and *Microsoft Office* is used to create diagrams and to organize data, generate charts, and perform visual relationship analysis of variables.

1.4 Motivation Behind the Research

There are 4 motives for this research study. The first motive is a significant gap in the literature due to mixed reported results from prior research of innovation in PE LBOs. Researchers who are critics of PE firms indicate that innovation activities at their LBOs are suppressed due to the short-term horizon of the PE portfolio companies, while researchers who are advocates of PE firms claim that their LBOs are more efficient as well as innovative. The second motive is that since many of the LBOs fail, it is important to conduct additional research in this area that will help identify whether lack of innovation is a root cause for these failures. The third motive is that there is a need for developing decision making blueprints that guide PE LBO executives through critical decision making during the very short timeline of acquisition and exit processes. The fourth motive is the vested interest of the researcher in improving the success rate of the LBOs given his knowledge of best practices in this field. As an LBO executive (VP of Software Development) from 2001 to 2006 under the ownership of one PE firm and from 2006 to 2014 (Senior VP of R&D) under the ownership of a different PE firm, these thirteen years brought challenges as well as opportunities. These 2 periods of acquisition were very different and helped

shape a strong understanding of the agent theory and the important role of senior management in driving the LBO business on behalf of the PE. Additionally noted was the impact of the debt and the short-term ownership factors that PE LBOs experience as well as a significant insight to how LBO companies are managed. Therefore, the research topic addressed herein is driven by significant expertise and brings a new perspective to this area of research.

1.5 Potential Contribution of the Proposed Research

This research will extend existing knowledge through a new source of data that will be used to validate or invalidate the hypotheses that influence LBO success. By evaluating the 4 hypothetical factors that can influence PE investments, we aim to fulfill the study objectives and recommend a set of guidelines that will improve the success rate of PE firms in their pursuit of a successful outcome for their investors as well as for their LBO companies and employees, the LBOs' value chain, and the economy for their surrounding communities.

CHAPTER 2: LITERATURE SURVEY

2.1 Private Equity Firms - Background

The PE industry has grown tremendously in the last 3 decades. Despite their growth and popularity, PE firms' financials and operational activities are not well understood, which is mainly attributed to the fact that these firms are exempt from public disclosure requirements [8]. Regardless, significant but inconclusive research was conducted in this area. Researchers who are critics of PE firms suggest that long-term growth such as investments in technology and innovation, is suppressed due to the short-term horizon of the PE portfolio companies, while researchers who are advocates of PE firms believe that these portfolio companies are more efficient and also pursue long-term growth [6]. Despite the differences in opinions, it is evident that many of the LBOs fail. Cumming et al [9] report that during the period 1985-2005 in the UK, there were 1431, or ~ 12 percent LBO failures in a form of default out of 12,267 buyouts. These numbers are quite large and should motivate additional research in this area to help identify the root cause and provide recommendations that will help increase the success rate of these investments.

2.2 Private Equity Firms Short-Term Investment Influence on Innovation

Short-term strategies can negatively impact future business growth since R&D investments and short-term profits do not concur. Such conflicts may result in decisions that reduce investments in R&D [10]. Researchers who are advocates of PE firms assert that despite the short-term investment horizon of the PE ownership, LBO managers still invest in long-term activities, including increasing their patent portfolio [11, 12]. On the other hand, researchers who are PE firms' critics assert that LBOs don't invest in long-term activities since they will not realize the benefits of such investments [13]. Some of these critics state that the requirement to meet short-term performance objectives conflicts with the importance of reaching a competitive advantage,

where the leadership might replace long-term rewarding investment opportunities with lower cost and less risky short-term development projects [14-16]. Others critics state that LBO leaders reduce or postpone long-term projects because they will not endure to benefit from the outcome [16]. Short-term strategies vs. long-term ones are depicted in figure 3.

Short-Term Strategy	Long-Term Strategy
<p>Objectives: Improved Quarterly Results Revenues, earnings, and cash flow Increase efficiencies Process improvements Pay debt Address product issues Increase customer satisfaction Add new customers Management Compensation: Bonus tied to performance Minimal management participation</p>	<p>Objectives: Increase Corporate Valuation Sustainable competitive advantage Add new lines of business Add new products Increase market share Acquire synergetic businesses Comply with industry standards Reduce employee turnover Management Compensation: Time based stock options Severance Expanded management participation</p>

Figure 3: Short-term vs. long-term strategies.

2.3 Influence of Debt Management on LBOs Innovation Activities

Companies that operate under a large debt use their cash flow to reduce their debt rather than investing it in new business opportunities [17, 18]. The need to service the debt forces LBOs to implement a number of strategies. They may restructure to increase control over the company’s operation, improve efficiencies, sell unprofitable lines of business or assets, and scrutinize all future investment projects and strategic innovation [9, 19-21]. It is also evident that despite being highly leveraged, some LBOs are still able to find ways to invest in future R&D programs. One practice is for the executives to emphasize a strategic approach for building an organization for the long-run rather than focusing on tactical short-term reductions in R&D spending. This can be achieved through a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis of the

company, redefinition of the mission statement, and through actions that improve R&D function while eliminating non-strategic company functions and nonessential projects. As an example, Levi Strauss, following its 1985 LBO, reevaluated its competitive position and recognized that the jean market reached its declining life cycle and took strategic actions to recover. Levi Strauss shut down plants while devoting resources to its primary products. The company invested heavily in R&D, focusing on new product development, which resulted in strong financial outcomes. Another practice on how an LBO can correctly invest in R&D is to clearly define the long-term and short-term activities in R&D, the desired types of R&D activities, and their timing. Mission statements for the R&D functions should be established to help achieve company goals by enhancing the required competencies. The successes of Harley Davidson, Duracell and Reliance Electric are the result of redefinition and rebuilding of desired competitive competencies in these companies. Another practice is to allocate R&D resources with a full understanding of the industry norms and the company's goals. Post its 1987 LBO, Uniroyal Chemical increased its R&D spending by 15 percent to develop new products in order to gain market share in its competitive market [22].

2.4 Influence of Management Restructuring on LBOs Performance

Since PE firms are active investors who often control the boards of directors of their portfolio companies (LBOs), they take measures to improve their performance. Notably, one of these actions is to replace existing LBO leaders with new and competent managers that will create a stronger management team [23]. However, it is not always clear if the new recruits possess the appropriate skill set that is needed to successfully lead LBO organizations. Exploring why some LBOs are more entrepreneurial and innovative than others, suggests a strong relationship with the entrepreneurial mindset of senior managers [24]. It is also evident that such restructuring of the

management team can impact competitiveness due to loss of value and talent [4, 9] which is one of the focus areas of this research topic.

2.5 Influence of Incentive Plans on Leadership Behavior

Incentive plans are designed to promote a desired behavior which is why companies align executives with their business objectives through the inclusion of incentive plans in their compensation package. For example, a large grant of stock options compensation plan that includes a specific current and prospective options mix, would influence the behavior of CEOs to make the desired short and long-term business related investments and decisions [25]. Companies use short-term incentives in the form of annual bonus plans that are designed to reward employees for performance. In order to motivate innovation, they design incentive plans that reward long-term success and disregard early failures. Such optimal incentive plans are created from a mix of stock options, option repricing, and attractive severance plans [26]. The total compensation plan for the executive team is designed to incentivize them to maximize the company's value [27]. It is also evident that a carefully crafted compensation plan that increases the potential wealth of the management team, will improve the performance of a firm and its innovation [28]. This idea is also confirmed by other published work highlighting that managers who do not receive stock options, do not invest in innovation, while the ones that receive the options will invest in R&D [29]. Basically, research results support the idea that short-term and long-term investments can successfully co-exist if well-crafted compensation plans are implemented [30].

2.6 Summary

This literature review is focused on the 4 factors and hypotheses that are investigated in the research study. At the onset of this study, it was necessary to validate that a significant number of LBO failures justify the purpose for this research investigation. Furthermore, the available

literature that spans approximately 3 decades indicates that the academic knowledge contribution in the area of PE LBO provides mixed results and is inconclusive, which provides another motivation to conduct this research. In addition, most of the published results described herein were derived from the analysis of sources such as public data sets, private data sets, or surveys with PE partners. However, this research study describes a novel approach for investigating PE-LBOs by introducing a new data source, which is made of ex-LBO executives who provide information on experiential knowledge they gained in leading LBO companies. The collected information is objective since participants are no longer associated with their previous companies and pose no conflict of interest or concerns that there will be retaliation from current employers.

CHAPTER 3: RESEARCH PLAN AND DATA COLLECTION

3.1 Research Method

The research method described herein is qualitative. Unlike prior research that uses public data or survey results from PE partners, this study is based on case study surveys where data is collected from LBO executives. The majority of LBO executives that are participating in the research are no longer associated with the LBOs that employed them or with the PE firms that owned their LBO, and therefore are able to participate in the case study and respond to the survey without concerns that there will be retaliation from current employers.

The case study process is depicted in figure 4. It starts with the creation of a questionnaire. The topics and the questions are derived from the literature survey and prior LBO experience. A small number of interviews with LBO executives are performed to validate and calibrate the survey questions. The survey is then performed and data is collected, aggregated and analyzed to build the theory of this study [31].

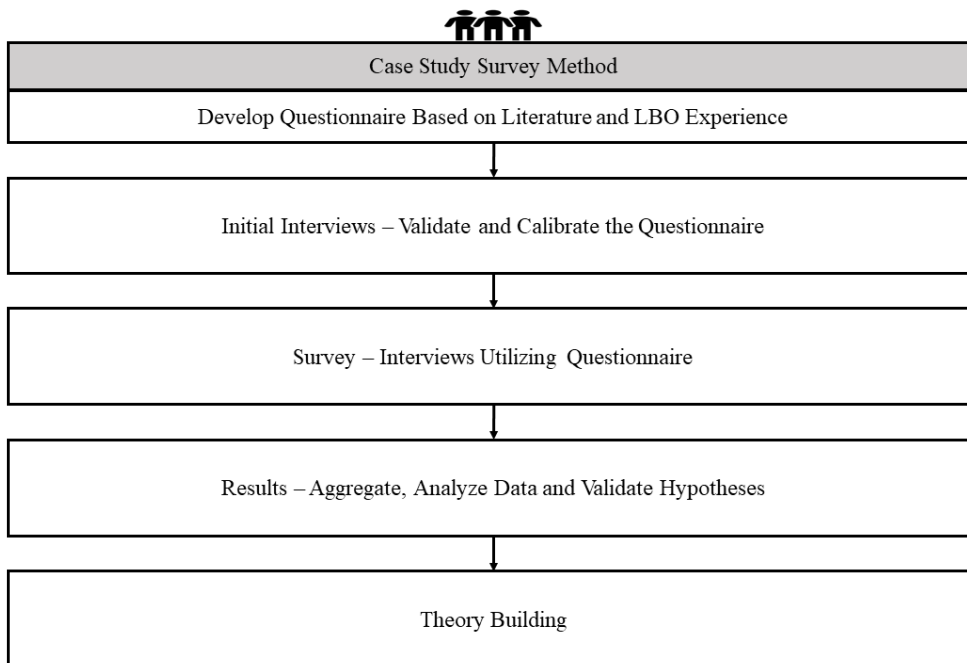


Figure 4: Eisenhardt case study process [31].

In this regard, the study plan implements a UB Institutional Review Board (IRB) approved case study survey research with the intention to interview and evaluate 2 test groups. The first group includes 3 successful PE LBOs and the second group consists of 3 failed PE LBOs as highlighted in figure 5. The study population would include at least 4 executives from each of the LBOs totaling a minimum of 24 participants. Although the population is limited to 24 participants, this limitation will be overcome by consensus of 10 experts. Interviews will be conducted in person

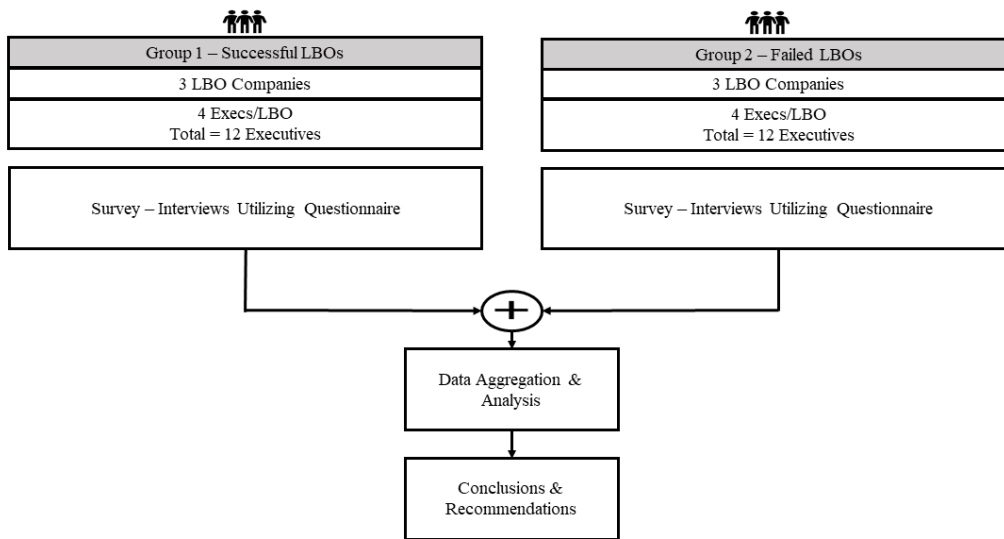


Figure 5: IRB-approved research method strategy.

or via video or phone. To facilitate consistent data collection, an IRB-approved questionnaire was designed to specifically focus on topics that will help investigate the influence of leadership on corporate innovation in PE LBOs, exploring hypotheses about factors that impact innovation and how they may correlate to LBO failures. A schematic representation of the data collection strategy is provided in figure 5.

3.2 Implementation and Test Plan

The survey plan for 6 companies and 24 participants was changed due to difficulties in identifying and securing participants from 6 companies, especially during the COVID 19 pandemic months. Identifying the LBOs and the participants for the interviews required many months of networking. An initial approach was to contact colleagues from past employment and to obtain their consent to participate in the survey. Another approach was to reach deep into the network of school alumni and identify individuals that were or are corporate executives and then to contact them via LinkedIn. Phone calls or in person meetings were established with executives that responded which led to either obtaining additional contacts or reaching a dead end. After many months of networking activities, 22 participants from 4 companies were identified and data collection started. Figure 6 describes the adjusted research plan used herein. The companies are

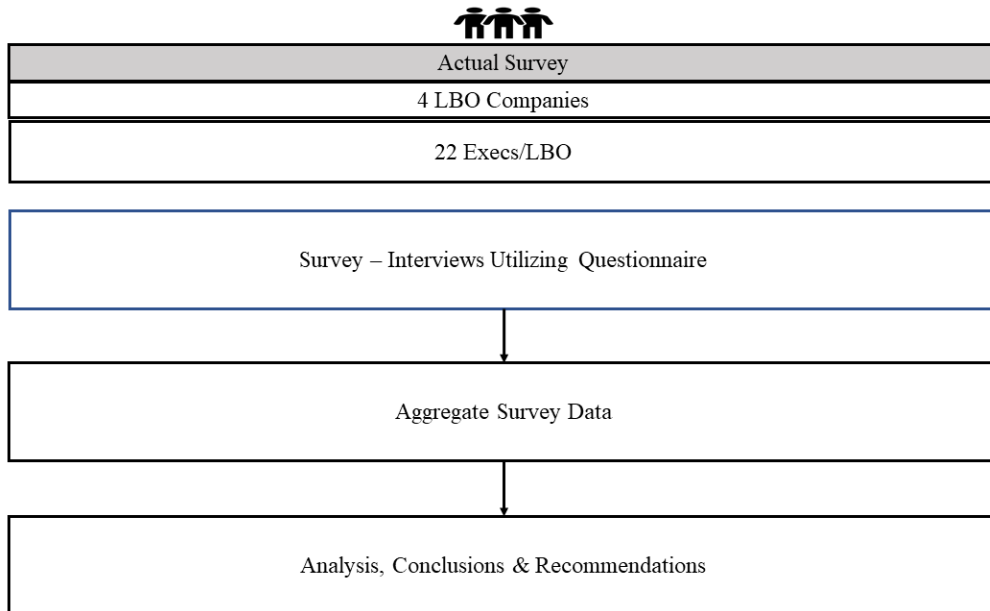


Figure 6: Implemented research plan for the survey.

mid-size US technology companies that operate predominantly in the financial market and the

participants are executives that served in key roles at these companies. The profiles of the 22 participants and their 4 LBO companies are shown in table 2 and table 3.

Table 2: Company profile of the 4 PE LBOs.

Organization Profiles					
Organization	Location	Size	Industry	Market	Market Share
Company A	USA	Midsize	Financial	Mature	45%
Company B	USA	Midsize	Financial	Mature	55%
Company C	USA	Midsize	Financial	Mature	65%
Company D	USA	Midsize	Financial	High growth	30%

Table 3: Survey participants' profiles.

Profiles of Survey Participants				
Participant	Company	Role	Experience (Years)	Areas of Expertise
1	A	CEO	35+	Engineering, Operation, Business
2	A	President	21+	Business, Product Management, Marketing
3	A	CF0	25+	Finance
4	A	CAO	25+	Legal, Human Resources
5	A	VP Software	35+	Product Development, Technology
6	A	VP Architecture	21+	Engineering
7	B	CEO	35+	Business, Operations
8	B	President/COO	30+	Finance
9	B	SVP Operation	30+	Manufacturing, Business
10	B	CAO	25+	Legal, Human Resources
11	B	SVP R&D and Product	35+	Engineering, Business
12	B	Managing Director	22+	Business, Engineering
13	B	SVP Sales Operation	28+	Finance
14	B	Managing Director	20+	Sales, Business
15	B	CFO	35+	Finance
16	C	SVP Operations	30+	Business
17	C	COO	22+	Sales, Business
18	C	CMO	24+	Engineering, Business, Marketing
19	C	COO	21+	Business
20	D	CMO	21+	Business, Product Management, Marketing
21	D	CAO	30+	Human Resources
22	D	CTO	28+	Engineering, Business

In order to provide consistent data, the questionnaire consisted of closed-ended questions.

The questionnaire covered 7 topics where questions were grouped into the corresponding sections:

1. **Background** – This section was designed to corroborate existing literature, to validate the 4 hypotheses, and for understanding the following: a) LBO company type before acquisition; b) The duration of PE ownership; c) The role of the participant after the acquisition; d) Was the participant a new hire post LBO? e) Was the LBO a technology company?
2. **Investment** – This section was designed to corroborate existing literature, to validate H2, the second hypothesis, and to understand: a) The initial investment mix and provide a good idea on the size of the debt; b) Any additional investments the PE firm made during the acquisition? c) What was the investment mix of the additional investment if any? d) What was the source of the additional investment if any?

3. **Incentives & Retention** – This section was designed to corroborate existing literature, to validate H4, the fourth hypothesis, and to collect data that clarifies how a PE firm incentivizes its LBO management and the magnitude or impact of each incentive. Specifically: a) What incentives did the participant receive? b) What was the vesting formula for the stock options? c) How many layers of management were offered incentive plans? d) How meaningful were the options to the recipient? e) How meaningful was the bonus plan to the recipient? f) How secure was the participant in his/her role?

4. **Employee Turnover** – This section was designed to corroborate existing literature, to validate H3, the third hypothesis, and to collect data that helps understand whether a PE firm has an impact on employee turnover, thus leading to a loss of talent and competitive advantage. The questions were therefore designed as follows: a) Was the LBO CEO replaced? b) What percentage of senior management was replaced? c) What percentage of second layer management left the company? d) What was the duration of the restructuring? e) Was there a major loss of talent?

5. **Market** – This section was designed to validate H2, the second hypothesis, and to help understand the size of the company and its ability to generate growth. More specifically: a) The total addressable market; b) The market rate of growth; c) The LBO's market share.

6. **Innovation** – This section was designed to corroborate existing literature, to validate the 4 hypotheses, and to clarify how a PE firm invests in the product innovation process. More specifically: a) What was the R&D budget as percentage of revenues pre and post LBO? b) Did investment in product development post LBO increase and when did it happen during the investment period? c) Describe the pattern of the increase (e.g. one time, as needed, etc.); d) Describe the reason for the increase (e.g. new product, product enhancement, etc.); e) What were the sources of funding for existing and new product development? f) Describe organic product

development strategies; g) Describe merger and acquisition (M & A) strategies; h) Describe product development strategies (e.g. incremental, radical/disruptive, etc.); i) What was the average duration of new product development? j) Did the LBO introduce any new flagship products? k) Did the LBO approve product development that will only complete after the investment exit?

7. **Investment Exit** – This last section was designed to validate the 4 hypotheses, and to clarify exit outcomes: a) Was the exit a financial success? b) Did new products influence success? c) Is the company successful post exit?

Interviews were scheduled and conducted either by phone or in person. The questionnaire, consent form, and a short description about the research topic and objectives were emailed to each participant a few days prior to the interview to give them ample time to review and sign the consent form and prepare for the interview. The questionnaire was revised multiple times during the first 4 interviews based on feedback from the participants that were explicitly asked to comment on the quality of the questions. Collected data was aggregated and analyzed to identify patterns that validate or invalidate a role for innovation impact factors in PE-LBOs described in section 1.2. Although interviews focused on answering close-ended questions, participants were free to elaborate on their answers and to provide their points of view. Answers for close-ended questions were collected at the end of each interview and added to a data table that aggregated all answers in an encoded methodology designed to protect the privacy of participants. Most importantly, the aggregation of data enabled the identification of patterns that correlate to the factors that influence innovation. Figure 7 illustrates the aggregation methodology for the data.

The 7 topics covered by the questionnaire are shown in the top row and the associated questions are grouped under the topic title in row 3, where each question occupies a column. Each row, from row 4 to row 29, represents a participant and the answers that s/he provided. The

Participant	Background				Investment				Incentives & Retention						Employee Turnover					Market			Innovation													Investment Exit						
	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3			
A.I.1	a	c	a	b	a	d	d	a	c	d	c	b	a	d	d	a	a	a	a	b	b	a	c	c	c	d	d	a	a	a	a	a	b,d	a	b	a	b	a	a	a		
A.I.2	a	c	a	a	a	d	d	a	c	d	b	b	a	c	d	a	a	a	c	b	a	a	c	c	c	e	d	f	a	a	a	a	b,d	a	b	b	b	a	a	a		
A.I.3	a	c	b	a	a	d	d	a	c	e	b	b	a	b	d	a	a	a	a	b	b	a	c	b	b	e	e	e	e	a	d	a	b	b	b	a	a	a	a	a		
A.I.4	a	c	b	a	a	a	a	a	c	d	b	b	b	b	d	a	a	a	c	b	c	d	d	b	b	d	f	a	a	a	a	a,b,d	a	b	a	b	a	a	a	a		
A.I.5	a	c	c	a	a	f	d	a	c	e	b	b	c	b	f	a	a	a	c	b	b	a	c	b	b	e	d	a	a	a	a	a,b,d	a	b	a	a	a	a	a	a		
A.I.6	a	c	c	a	a	f	e	a	g	e	b	b	b	a	f	a	a	a	a	b	b	b	c	b	b	d	d	b	a	a	a	b,d	a	b	b	b	a	a	a	a		
B.II.1	c	d	a	a	a	d	d	a	b	d	d	b	a	d	d	a	a	a	c	b	b	a	c	c	c	d	a	a	a	c	b	b,d	c	c	a	a	b	a	b	b		
B.II.2	c	d	b	a	a	d	d	a	b	e	d	b	a	c	d	b	a	a	c	b	b	a	c	b	b	d	a	a	a	a	b	a	b	c	c	a	a	a	a	b	b	
B.II.3	c	d	b	a	a	d	d	a	b	e	d	b	b	c	c	b	a	a	c	b	b	a	c	b	b	d	a	a	a	b	b	a	b	c	c	a	b	a	a	b	b	
B.II.4	c	d	b	a	a	e	a	c	d	d	d	b	b	c	d	b	a	a	c	b	b	a	c	b	b	d	a	a	a	b	b	a	b	c	a	a	b	a	a	b	b	
B.II.5	c	d	b	a	a	d	d	a	b	d	d	b	b	a	c	d	b	a	a	c	b	b	a	c	c	c	d	a	a	a	b	b	a	a	c	a	b	a	a	b	b	
B.II.6	c	d	b	a	a	d	d	a	b	d	d	b	b	a	c	d	b	a	a	a	b	b	b	d	a	a	a	a	a	b	a	a	c	a	b	a	a	a	b	a	b	
B.II.7	c	d	b	a	a	b	c	b	e	d	b	c	c	d	a	d	b	a	b	a	d	d	b	b	d	d	a	a	a	a	b	c	c	a	b	a	a	a	b	a	b	
B.II.8	c	d	b	a	a	d	d	a	b	d	d	b	b	b	d	a	b	a	b	b	c	d	c	c	c	d	d	a	a	b	a	a	c	a	a	c	a	b	a	a	a	b
B.II.9	c	d	b	b	a	a	b	a	c	d	d	d	b	c	e	a	a	a	a	b	d	b	c	c	b	d	a	a	a	c	b	c	c	b	c	b	a	a	a	b	b	
B.I.II	c	d	x	x	a	d	d	a	g	e	d	b	a	c	d	a	a	a	c	b	d	a	d	b	b	d	d	b	a	b	a	a	c	c	a	b	a	a	b	c	c	
C.III.1	c	f	b	b	a	b	a	a	c	e	d	b	d	c	c	a	d	b	b	b	b	a	d	b	e	g	f	e	a	a	b	c	b	a	x	x	x	x	x	x	x	
C.III.2	c	b	b	a	a	c	c	a	c	d	d	b	c	d	d	b	d	b	b	a	d	a	d	b	e	c	a	a	a	b	a	c	d	a	b	b	b	b	x	x		
C.III.3	c	b	b	a	a	a	a	a	d	d	c	b	b	d	d	a	d	a	a	b	d	d	d	c	e	f	e	d	a	f	b	b	c	b	x	x	x	x	x	x	x	
C.III.4	c					a	a	a	b	e	d	b	c	b	f	a	a	a	a	a	d	b	c	e	f	e	d	a	a	a	b	a	a	a	x	x	x	x	x	x	x	
C.III.5																																										
C.III.6																																										
D.IV.1	b	b	b	b	a	c	c	a	d	d	a	d	a	d	d	a	d	c	a	b	d	c	b	c	c	e	d	b,c,e	a	a	c	e	a	b	b	b	a	a	a	a		
D.IV.2	b	c	b	a	a	f	e	c	f	e	e	d	a	b	f	b	b	a	a	b	e	h	f	e	e	g	f	e	a	h	a,c	e	c	c	a	a	a	a	a	b	b	
D.IV.3	b	c	b	b	a	c	c	a	d	e	b	d	a	c	f	a	c	c	a	b	d	d	a	d	d	e	c	a,b	a	a	a,c,d	e	a	a	a	b	b	a	a	a	a	
D.IV.4																																										

Figure 7: Encoded aggregated survey data.

participant name and the LBO name are encoded in column A to protect the participant’s privacy. A number of patterns are highlighted with the aid of a green or a red rectangle that helped identify, validate, or invalidate assumptions or hypotheses. For example, under question 2 regarding the Employee Turnover topic, the participants of company C responded with “d” as their answer. This answer indicates that more than 60 percent of the senior management was replaced by the new PE ownership.

As part of the survey, participants were also rated against their expertise in each of the 7 topics of the survey. The rating is subjective and is based on the knowledge each participant exhibited when answering questions for each of the topics. Table 4 depicts the expertise of the participants in each of the topic areas which is rated on a scale of 1 to 5, where 5 is the highest score and 1 is the lowest score.

Table 4: Participants rating against the 7 topics of the survey.

Participant Rating by Survey Topic							
Participant	Background	Investment	Incentives	Turnover	Market	Innovation	Exit
1	5	4	5	4	5	4	5
2	5	5	4	4	5	5	5
3	5	5	4	4	4	3	5
4	4	4	5	4	3	2	5
5	2	3	2	3	3	5	2
6	3	2	2	3	4	5	2
7	5	5	5	4	5	5	4
8	5	5	4	4	5	3	4
9	5	4	4	3	4	3	4
10	5	4	5	5	3	3	5
11	3	3	4	5	4	5	4
12	4	5	4	4	5	3	5
13	4	4	4	4	5	3	5
14	5	5	5	4	5	5	5
15	5	5	5	4	4	3	5
16	5	4	5	3	4	2	3
17	5	5	5	4	5	4	5
18	5	5	5	4	5	4	3
19	4	4	4	5	5	5	3
20	5	5	4	5	5	4	5
21	5	1	5	5	2	1	4
22	5	5	5	4	5	5	5

CHAPTER 4: RESULTS

4.1 Establishing a Baseline

Participants in the survey represented 4 companies that for confidentiality reasons are named herein as A, B, C, and D. In order to validate or invalidate the aforementioned factors that impact innovation (see Section 1.2), it was important to establish a baseline. The first step was to identify the investment outcomes for each of the 4 companies. Survey results shown in figure 8 identify company C as a failed LBO relative to the others as evident by the data in the chart that clearly shows that none of the participants (of 4 participants) from company C indicated that the company was successful. It is important to also note that company C did not exit its investment yet although the indicators that it was failing to produce a strong ROI for the PE investors are quite strong. On the other hand, executives of company B provided a mixed response where 80 percent believed that the outcome was a success while 20 percent thought that it failed. Additional discussions with participants from company B on this topic helped clarify a few key points about the mixed results. The first point is that if results are judged purely by financial numbers, the investment result was break-even with a flat ROI. The second point asserts that operating in the

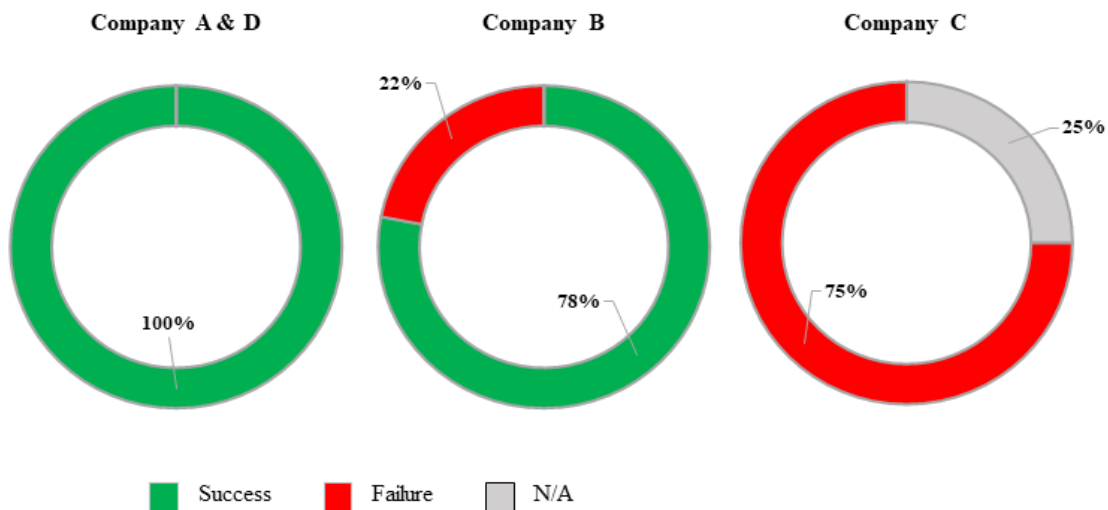


Figure 8: Investment outcome of the four companies in this research study.

financial market during the devastating 2008/2009 financial crisis and still delivering break-even financial results in 2014 should be considered a remarkable success. Lastly, the third point provides practical granularity from a financial investment perspective. The PE firm wrote-down the investment during the financial crisis, accepted it as a loss in its books, and adjusted down the initial equity investment. Therefore, the exit price in relationship to the adjusted original investment value, produced a significant ROI for the investors.

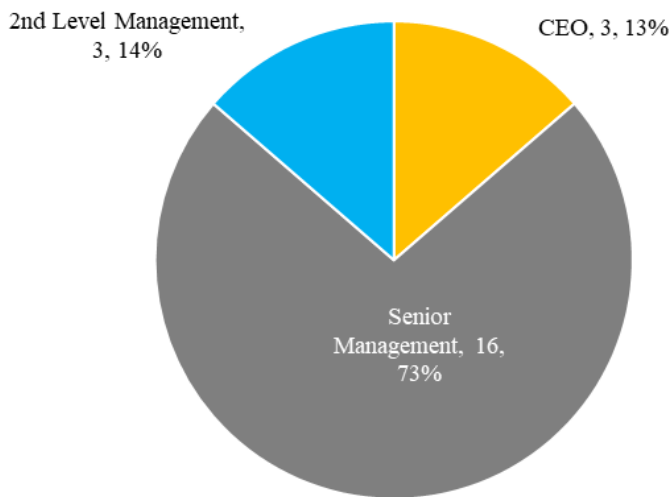


Figure 9: Participants' role in their LBO.

Another set of results helped establish the credibility of LBO participants. Figure 9 emphasizes the credibility of data received from senior level executives of LBOs in this research. Figure 9 shows the distribution of the role that the participants held at their LBO companies. A few participants were CEOs, most participants were senior executives, and some functioned in a vice-president role which was a second management level in their corresponding companies.

Another important result that helped establish the baseline for this research study was to confirm that the investment period duration is consistent with what the literature reports. Figure

10 shows that the duration of PE ownership was less than 10 years. Therefore, results from this study survey indeed corroborate data published in the literature [4, 32, 33].

Most of the LBO participants experienced an ownership duration of 5-7 years. It is important to note that company B was sold after 8 years because the 2008/2009 financial crisis disrupted the market and influenced the PE firm to extend the investment duration to give its LBO time to recover and deliver a better financial outcome to its investors. Company C did not exit the investment at the time of the survey which was reflected by the N/A (not applicable) response.

Baseline information established thus far, identifies companies A, B, and D as successful LBOs and company C as a failed one (Figure 8). Additionally, we learned that the participants were LBO executives that served in key roles (Figure 9) such as corporate executives whose job

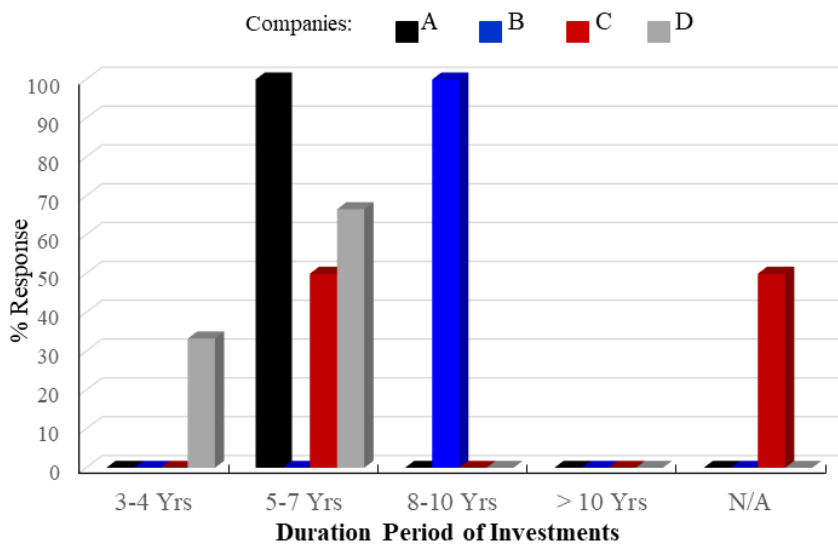


Figure 10: Investment duration period.

titles typically start with 'Chief' and end with 'Officer' (CxO), Senior Vice President, or Vice President and possessed unique and insightful knowledge that was valuable for this research project. Lastly, baseline results from figure 10 validate that PE firms' investment duration is short and under ten years.

4.2 Private Equity Firms Short-Term Investment Influence on Innovation

Once the baseline was established, the next logical step was to validate or invalidate the first innovation factor which is the short-term ownership period. Figure 11 visualizes the data collected from the participants in response to 3 related survey questions. Regarding approvals of projects near the end of the investment period shown in figure 11A, most participants stated that new product development projects that would have completed after the exit were never approved. We can see that all of company A, most of company B, and the majority of company D participants, made this statement, while the participants of company C stated that the topic was not applicable because the exit date was not determined yet. It is important to note that at the time of the survey, company C was owned by its PE firm close to 5 years and therefore was entering the last few years of the PE ownership.

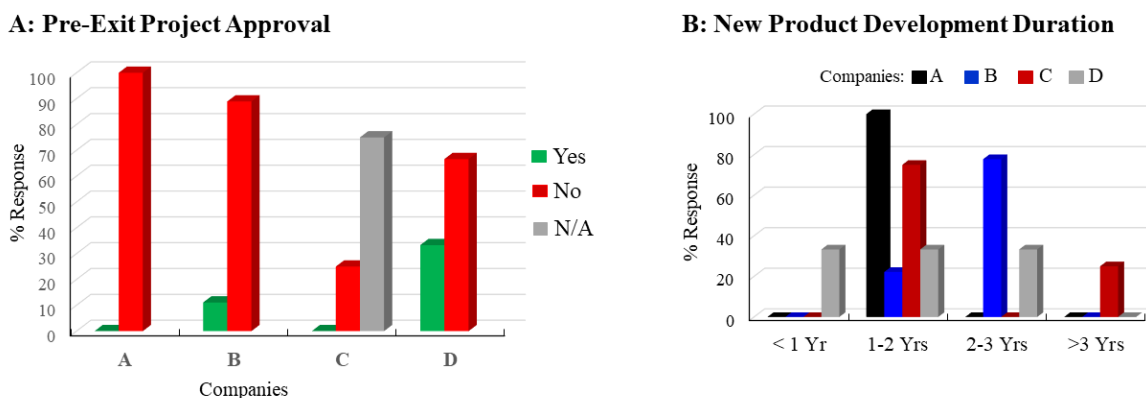


Figure 11: Approval of new development projects that will complete after investment exit.

The duration of new product development at each participants' LBO helps us understand at what point in time of the investment period, a PE firm will stop approving new product development. This important data illustrates that even PE firms that indeed increased R&D investment, stopped doing so 2-3 years prior to the exit event. Results from participants to this

question that are shown in figure 11B, indicate that since product development duration in company A was 1-2 years, company A did not approve new product development in the last 1-2 years of the PE ownership. Although company B participants provided a wider range for product development project duration of up to 3 years, we observe that the company did not approve new product development projects in the last 2 years of the PE ownership, which is corroborated by figure 12B that shows company B increasing their R&D budget only during years 3 through 6 of the 8-year PE ownership. Participants from company C provided sufficient indication that their LBO will act similarly to company A and will most likely stop approving new projects in the final 1-3 years of the investment period. This is because company C has not increased its R&D budget (Figure 12B) after the first 3 years of the PE ownership and its new product development project duration was 1-3 years. On the other hand, company D participants provided a wider range than company B's new project duration, where some participants felt that most new projects were shorter than 1 year. It is very likely that projects of under 1-year duration were approved even in the last year of the ownership, which is corroborated by the feedback in figure 12B that shows that company D increased R&D funding as needed.

Based on results from figure 11, we can ascertain that the LBO leadership at the 4 companies investigated in this study are not likely to approve new product development in the final 1-2 years of the investment. This is consistent with the observations that the companies in this study did not approve projects that would complete after the investment exit.

4.3 Influence of Debt Management on LBOs Innovation Activities

The size of the debt that an LBO manages is another factor that impacts innovation. Figure 12A provides a depiction of the debt size at the participating companies and shows that company C acquired the largest debt since more than 80 percent of the company value was in debt. Company

A and B had the lowest debt size while company D’s debt was in the 70-75 percent of the purchase price. These ratios are understandable when we view the market definition in figure 12C. PE firms

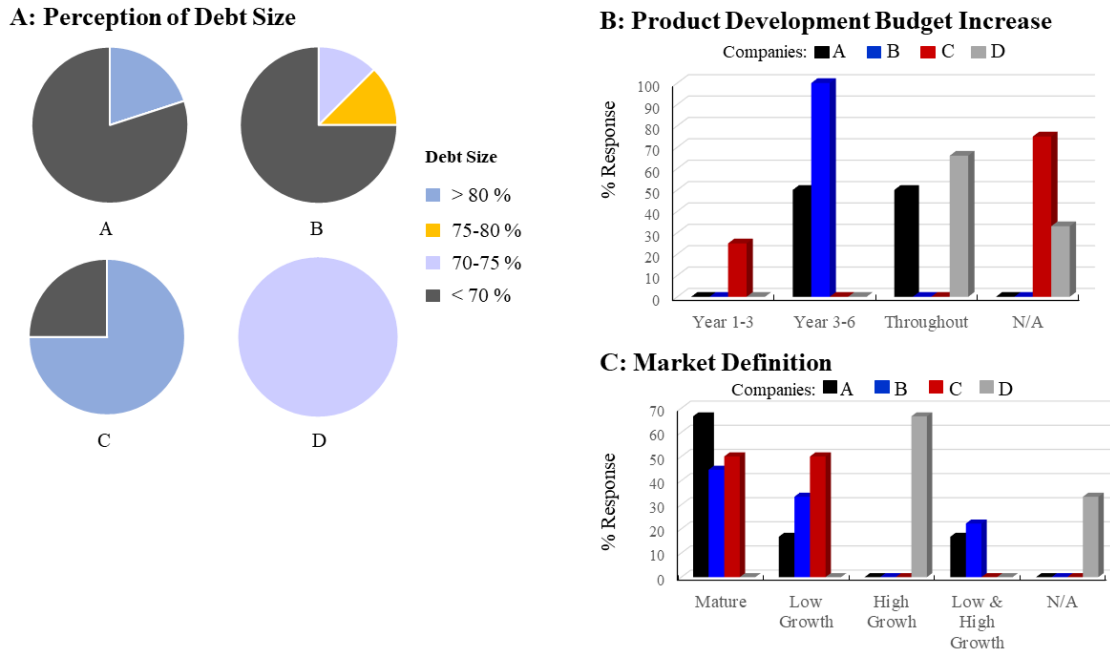


Figure 12: Debt size, development budget increase, and market definition of participating LBOs

do not highly leverage companies that operate in a high growth market since the high ROI would come from the natural growth of the business in such market environment. Figure 12C illustrates that company D operated in a high growth market and had a lower debt to equity ratio while company C operated in a mature/low-growth market and had a very high debt of 80-90 percent of the total purchase price.

The relationship between debt size and the propensity of LBO leadership to increase the R&D budget was addressed by the survey and results are shown in figures 12A & 12B. To illustrate this relationship, we generated a cluster plot to highlight the association between R&D investments and debt size. Using results from 22 participants, we visualize an indirect relationship between R&D spend during investment period and debt size (Figure 13).

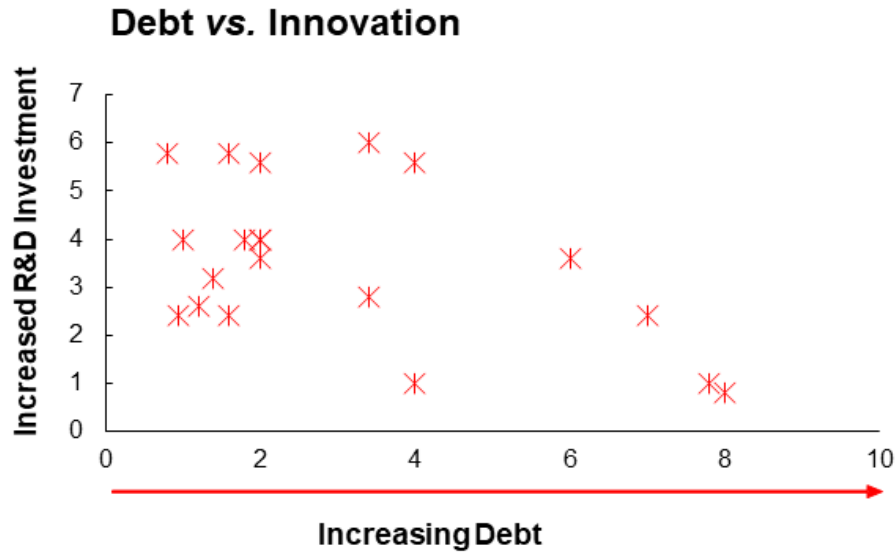


Figure 13: Indirect relationship between R&D investment and the debt size.

When reviewing whether companies A through D increased their R&D budget during the PE firm’s ownership, it is evident that while a very small number of participants from company C believed that their company increased R&D investments, the majority did not experience an increase or were not aware of it. On the other hand, participants from companies A, B, and D provided more convincing and consistent data about increases in R&D budget and the timing of such increases. Results show an indirect relationship between the size of the debt and an increase in R&D investment. This is evident in figure 12A where company C that had the highest debt also shows a lackluster increased investment in R&D in figure 12B.

4.4 Influence of Management Restructuring on LBOs Performance

The alignment of LBO management with the PE firm’s objective is another focal point in the questionnaire. Figure 14A captures the turnover rate of the senior management team in each of the 4 companies. Figure 14B shows the duration of the leadership restructure process, and figure 14C displays the resulting loss of talent in the 4 LBOs in this study.

Figure 14 shows that companies A and B replaced less than 20 percent of senior managers whereas company C replaced greater than 60 percent of its senior management team (Figure 14A) in less than one year (Figure 14B), and company D replaced under 60 percent of its senior management (Figure 14A) in the first 2 years (Figure 14B). Results in figure 14 indicate that companies A and B that introduced only small leadership changes, did not experience loss of talent (Figure 14C), while the actions of replacing most of the senior management team in company C resulted in loss of talent as shown in figure 14C. Company D’s data was inconsistent and therefore it is challenging to determine what percentage of the senior management team was replaced.

Nevertheless, a few hypotheses can be raised to explain why company D did not experience

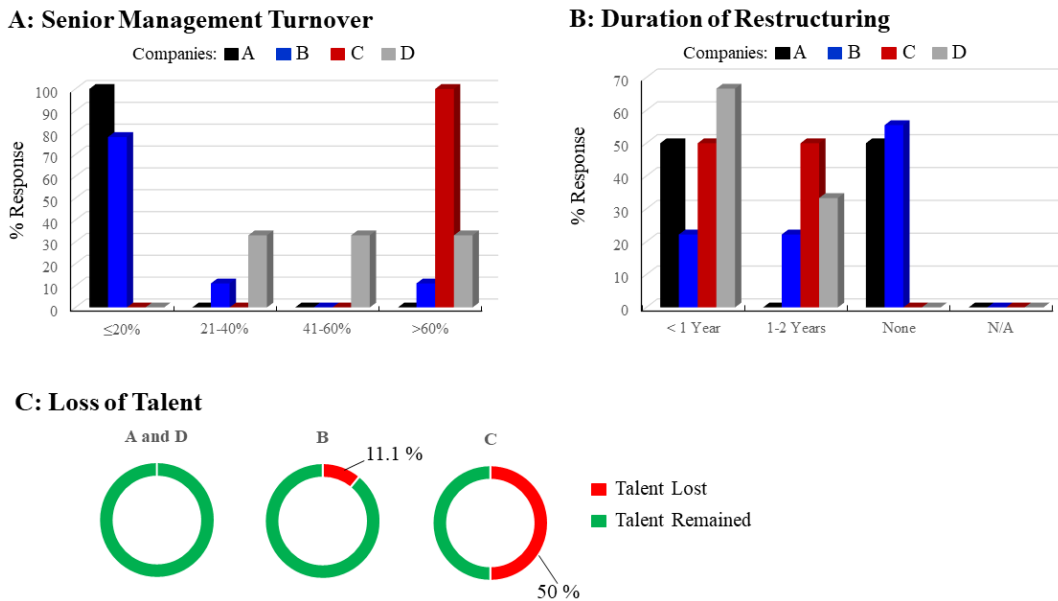


Figure 14: Senior management turnover, senior management restructuring period, and loss of talent relationships.

loss of talent when replacing many leaders in the organization. One hypothesis is that the new (replacement) leadership in company D was composed of strong leaders that brought value and contributed to the success of company D, while the new (replacement) leadership in company C

was not effective in adding value to the company. Another hypothesis is that the replacement activities in company D did not trickle down in the organization and that most of the next layers of management were left untouched, thus leading to minimal to no loss of talent. These hypotheses should become objectives for future research.

4.5 Influence of Incentive Plans on Leadership Behavior

The fourth innovation factor of focus in this research was the composition of the incentive plan, its ability to align the LBO leadership with the investors, to provide a good balance of short-term and long-term behavior, and most importantly, to influence innovative activities that are long-term in nature. Figure 15A shows that the senior teams in this study’s 4 companies received a mix of bonus and stock options plans where some also received a high salary. Participant responses corroborated literature reports in that PE firms align the LBO executives with their objectives through compensation and incentive plans that include high salary, mix of stock options and bonus plans, and severance plans. Figure 15B, highlights the severance plans in companies A-D.

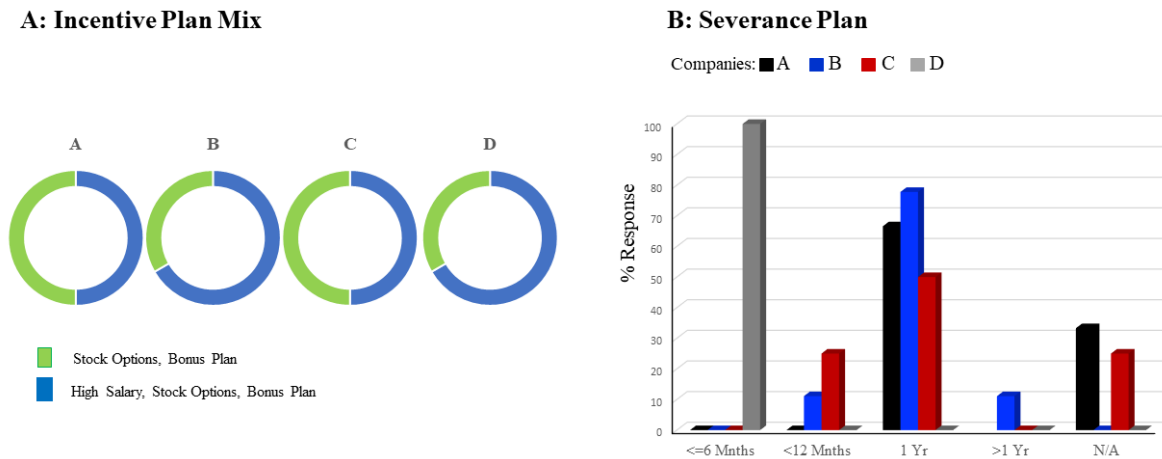


Figure 15: Incentive mix plan and severance plan.

The importance of the severance plan and specifically its duration is that executives with a severance plan of 6 months and greater will feel empowered to take more risk and make difficult decisions without the fear of losing their jobs. Figure 15B shows that the executive team in company B received the most generous plan while the executives in company D had the shortest-term plan.

To demonstrate the impact of a strong stock options plan on the innovative behavior of LBO leadership, we generated a cluster plot to visualize the relationship between the stock options plan and R&D investments from the survey data. The cluster plot (Figure 16) suggests a direct relationship between the two variables.

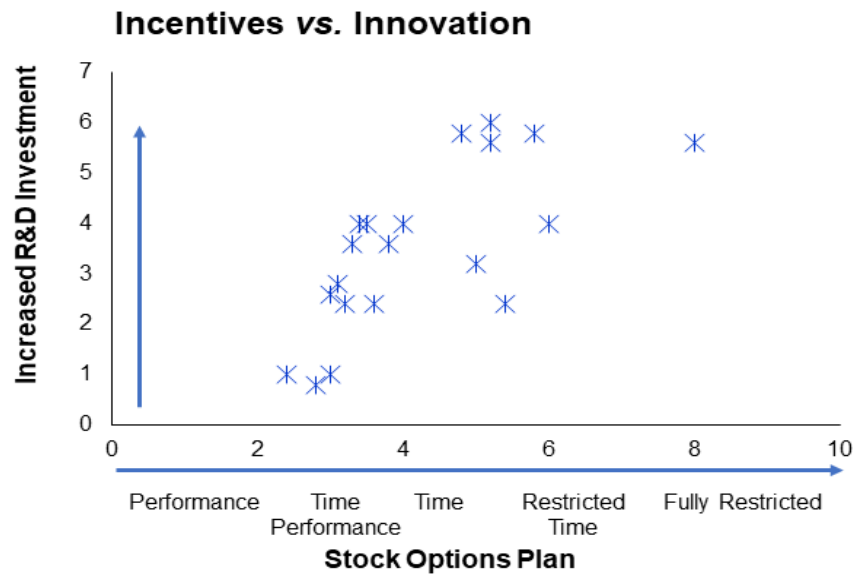


Figure 16: Direct relationship between R&D investments and the stock options plan.

In reviewing the stock options plans from figure 17A, company D had the most gracious plan since the recipients became stock owners with full or time-based vesting upon the initiation of the plan. Company A had the next best plan since the stock options were vested over time

regardless of company performance. Companies B and C provided stock options plans that were based on performance and time. Company B's performance vesting formula was aligned with annual revenue and margins targets while company C's performance metrics were strongly tied to the valuation of the company at the investment exit. During the interview process, it became clear that in company C, the value of the options was below their exercise price ("under water") and that the executives were no longer motivated by the plan. In observing the response distribution of company C participants in figure 17B, we can assert that it favors the "nice to have" or "N/A" (not applicable), which further supports the point above regarding the lack of long-term alignment these executives had with their PE firm. On the other hand, figure 17B shows that most of the participants in companies A, B, and D felt that upon an investment exit event, these options represented a life changing event for them or a great addition to their wealth, clearly motivating them to invest in the long-term valuation of the business. Figure 17C provides an additional data point about company D that expanded the stock options plan to also include its key employees to motivate them to commit to long-term plans, which are typically R&D projects. Figure 17D shows the size of the bonus as percentage of salary. The distribution of the plan across the 4 companies indicates that most of the participants were receiving an annual bonus plan in the range of 30-60 percent of their pay which is a nice addition to the participants' income but not a life changing event. Further analysis shows that the mix of incentives in company C is likely to influence short-term behavior. This is attributed to the fact that the bonus plan was very generous while the stock

options plan was not incentivizing the executives. This is because the stock options plan is tied to the company’s valuation at the exit and was not adjusted to account for the fact that company C was under performing at the time the survey was conducted. In this scenario, it is questionable

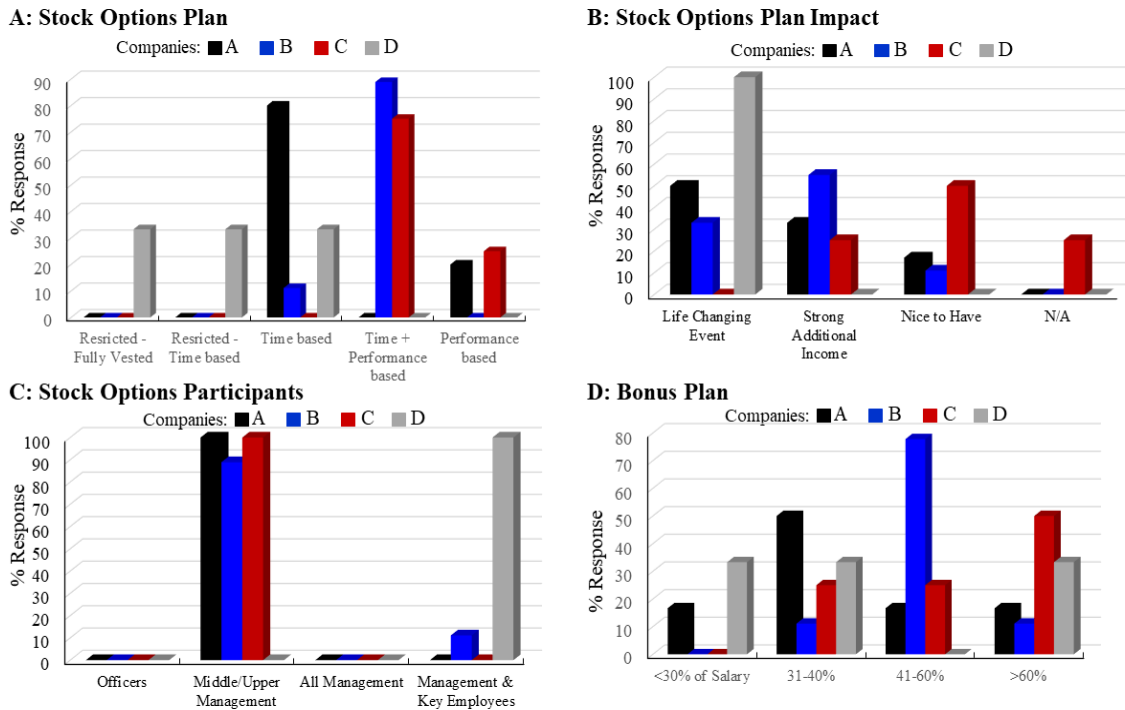


Figure 17: Stock Options and Bonus Plan relationship and their influence on innovation.

whether any company C executive was motivated to invest in long-term innovative activities. Company B, on the other hand provided a similar bonus plan to that of company C. Its stock options were more attractive, and the PE firm also added additional value by playing a more active role in motivating company B’s management team. The stock options were vested based on time and company performance, but when the financial crisis of 2008/2009 brought down the value of the stock options, the PE partners repriced the options by lowering their exercise price in order to keep the management team motivated. This resulted in a committed management team that invested its time and energy in the success of company B.

CHAPTER 5: DEVELOPMENT OF STRATEGIC GUIDELINES

5.1 Preliminary Conclusions

This research project encompassed results from a prepared questionnaire survey conducted in person or via phone interviews with participants that were in the role of executive management at 4 PE LBOs named companies A, B, C, and D. We addressed the 4 hypotheses (H1-H4) that were raised in section 1.2. In particular, for the first hypothesis (H1) that addresses the effect of short-term ownership period on new product development, we demonstrated that due to the short-term nature of the investment period, new product development projects are unlikely to be approved as the company nears the last years of the investment horizon. We also showed that the size of debt is indirectly related to increases in the R&D budget as stated by the second hypothesis (H2). The higher the debt, the less likely that the management team will increase the R&D investment. We also confirmed our prediction from the third hypothesis (H3), that the speed and the size of restructuring the leadership team correlated significantly with talent loss and reduction in business performance. Lastly, we validated the fourth hypothesis (H4) arguing that the composition of incentive plans helps align the executive team with PE objectives. Indeed, results show the influence of the incentive plan on innovation and long-term success. We first confirmed that the mix of incentive plans in the 4 companies included a bonus plan, stock options plan, high salary, and severance which is corroborated by literature reports. We show that the PE firm that imposed the strictest guidelines for the options plan resulted in an unmotivated management team with a potentially poor business outcome. The PE firm that understood the potential downside of an ineffective stock options plan and ensured that the LBO leadership stayed motivated by

Table 5: Investment outcome of companies A, B, C, and D.

Preliminary Research Baseline – Investment Outcome				
Company	Outcome	Exit Event	Post Exit Status	Impact
A, B, D	Success	PE and investors made a profit or broke even	Business is profitable and/or expanding	Positive outcome for employees, value chain, and the economy of the surrounding communities
C	Failure	Currently underperforming. PE and investors will lose money	Business did not exit	Potential loss of income to employees and value chain. Economy of the surrounding communities potentially shrinking

adjusting the exercise price of the stock options plan, was rewarded with a successful financial outcome. Table 5 depicts the investment outcomes of the 4 LBOs in this research project with attention to post exit status, impact on investors, employees, value chain and the surrounding communities.

5.2 Preliminary Recommended Guidelines

The primary objective from this research project is to recommend a set of guidelines that will help improve the success rate of PE firms in their pursuit of a successful outcome for their investors. The recommendations listed below are focused on the 4 hypotheses (H1-H4) examined herein and described above as key to the success of the innovative process and the successful

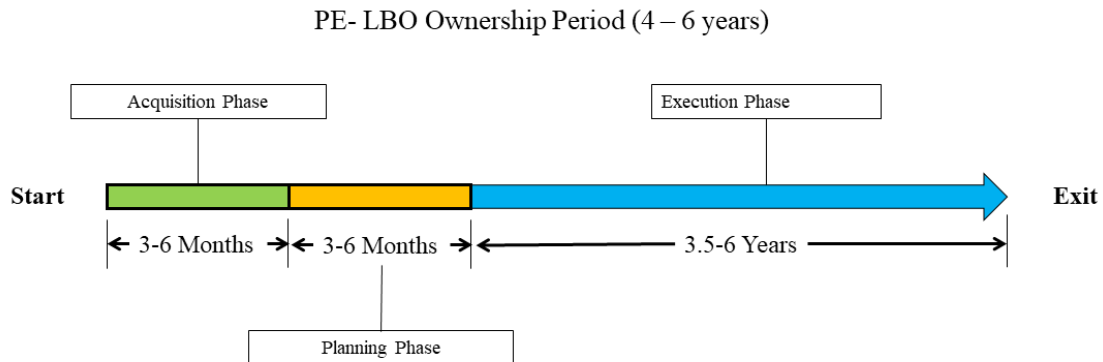


Figure 18: PE engagement phases with LBO company.

outcome of the investment. PE firm partners and their LBO executives should apply the guidelines during the acquisition, planning, and execution phases of the ownership that are shown in figure 18.

5.3 Preliminary Recommended Guideline for Debt Size in the Acquisition Phase

The recommended guidelines that are related to the H2 hypothesis should be implemented in the acquisition phase. During this phase, the PE firm performs due diligence. It engages with the target company, reviews its financials, meets with its customers, vendors, creditors, and leaders, and decides whether they should acquire the company. Some of the decisions a PE firm makes during this phase concern the purchase price and the investment mix. Figure 19 depicts the first decision making process which covers the size of the debt.

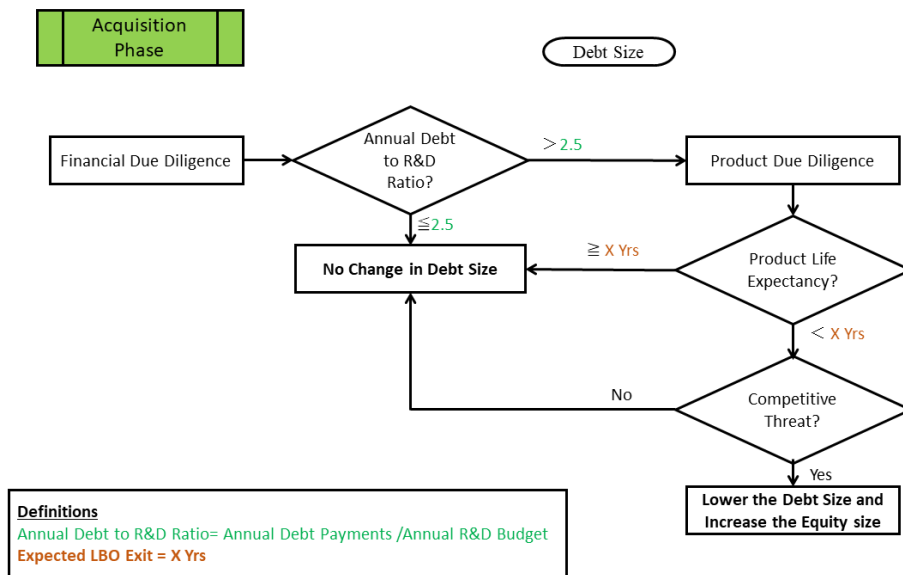


Figure 19: Process and recommended guidelines to determine the debt size.

The process starts with the calculation of the annualized ratio of future debt payments to the current R&D budget. If the ratio is greater than 2.5, a technical “due diligence” is required to determine whether major R&D investment will be required during the PE ownership. If required, the recommendation is to also evaluate the competitive landscape to better understand if deferring

new product development will destroy value during the ownership. If competitors have or are developing better products, the recommendation is to lower the debt size and to increase the equity portion of the investment mix, which would enable the LBO to preserve cash for funding essential product development projects.

5.4 Preliminary Recommended Guideline for Building the Executive Team in the Planning Phase

The recommended guidelines that are related to the H3 hypothesis should be implemented during the planning phase which covers the second decision-making process, immediately after the completion of acquisition. The process in figure 20 captures the recommended steps and decisions for the creation of the new executive management team.

The process starts with the decision on whether to replace or keep the CEO. Once the CEO

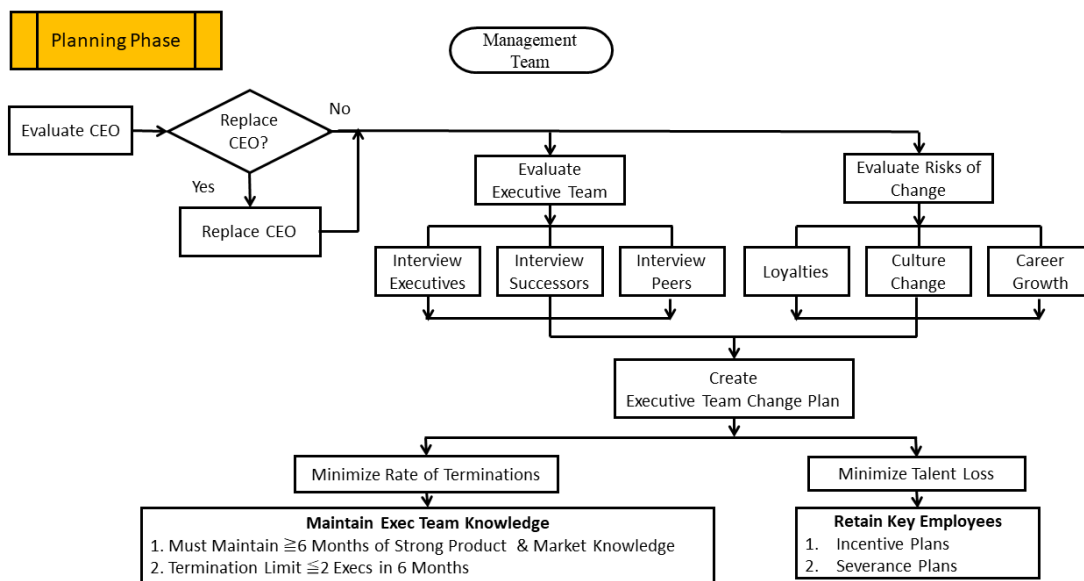


Figure 20: Management team creation process and guidelines.

decision is completed and executed, the formation of the executive team process begins. This study recommends two parallel tracks. In the first track, the CEO interviews existing executives, their peers, and potential successors to decide on who should be replaced or retained. The second track

is designed to mitigate risks that are associated with executive replacements and is focused on interviewing a large sample of employees. The purpose of these interviews is to identify risks such as: loss of talent, culture change, switching loyalty, and career aspirations of employees that could be missed. The interviews should be designed to identify key employees that ought to be retained to avoid a reduction in competitive advantage due to talent loss. The recommendations for mitigating risks from loss of talent are divided into two groups. The first group covers the rate of termination of existing executives to help reduce the impact on employees by limiting the rate of executive replacements to no more than 2 in a 6 months period while ensuring that executives with product and market knowledge do not depart during the same 6 months period. The second group of recommendations is designed to retain key employees that are critical to the success of the organization. This process also includes a recommendation for the creation of incentive and severance plans that include the key employees and is designed to retain them.

5.5 Preliminary Recommended Guidelines for the Incentive Plan in the Planning Phase

The recommended guidelines that are related to the H4 hypothesis should be implemented during the planning phase and covers the third decision-making process is the creation of a management incentive plan. Figure 21 illustrates 3 components that should be addressed by the PE firms. The first component covers the plan for incentivizing the senior management team. The stock options value must be high enough to represent a life changing or a strong additional income event for the recipients, where the required business performance objectives must be audacious but achievable. The second component covers the plan for middle management and key employees. The focus here is on retention and therefore the stock options should include a strong component that vests over time rather than on meeting performance objectives. The plan should also include a long-term bonus plan that is tied to achieving product development objectives and

the overall compensation should carry a value of 50-100 percent of the participants’ annual income. The third component of the incentive plan targets PE firm partners who should consider

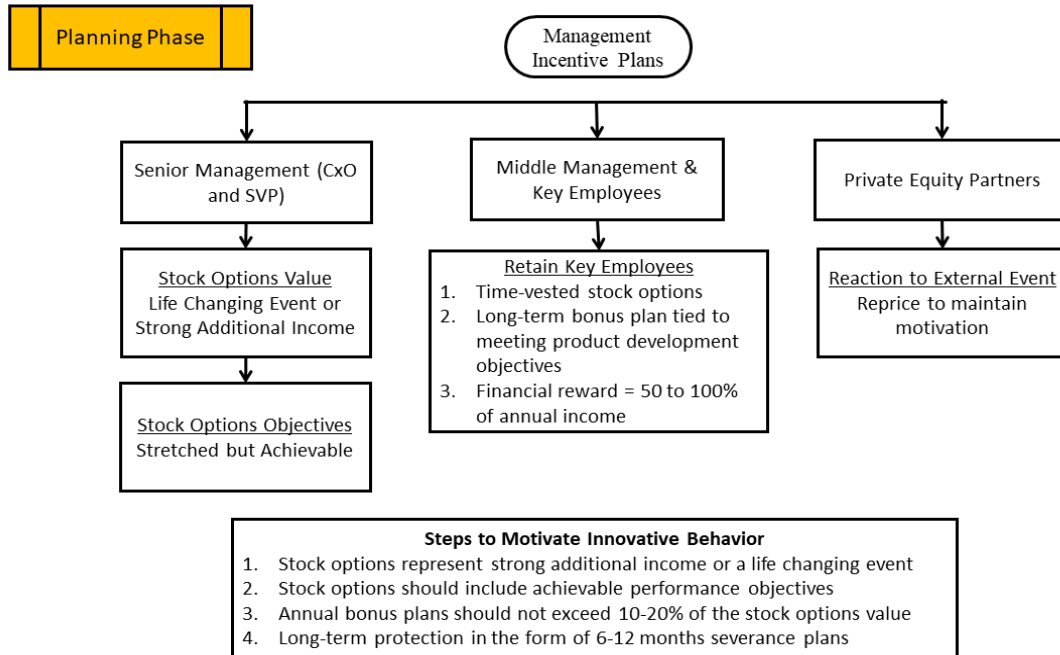


Figure 21: Incentive plan creation process.

adjusting the stock option plan as required if the ability to achieve the objectives has been impacted by external events.

5.6 Preliminary Recommended Guidelines for Project Approvals in the Execution Phase

The recommended guidelines that are related to the H1 hypothesis should be implemented in the execution phase. The fourth and final decision-making process covered in this research study is the project approval process which is shown in figure 22. The first decision point is to determine whether the product will be developed and released before the PE exits the LBO investment. If the answer is positive, then the project should be approved based on its business plan. Otherwise, if the product availability is post exit, then the additional question to be considered is whether the LBO buyer will receive additional value that could positively influence the financial outcome of

the exit. If the answer is positive, the project should be approved. Otherwise, the decision point is whether the LBO company and its employees, value chain, and surrounding communities will receive strong value from the new product. If the answer is positive, this research study recommends project approval.

The next step in this research project is to validate the overarching hypothesis, H1-H4 hypotheses, and the associated guidelines that are described in this chapter.

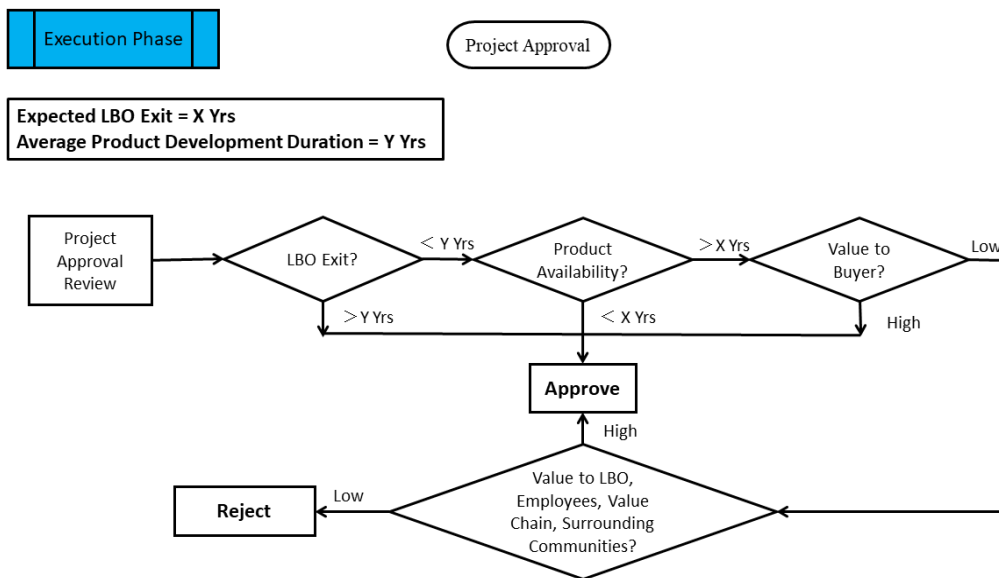


Figure 22: Project approval process.

CHAPTER 6: VALIDATION OF STRATEGIC GUIDELINES

6.1 Validation Method and Logistics

Validating the hypotheses and associated guidelines was an important step in this research project. A case study survey utilizing experts was the most logical approach and 7 of the 22 participants from this study’s survey were selected to participate as experts in the case studies. The group of experts, their associated employments, years of experience and area of expertise are shown in table 6.

Table 6: Profiles of expert participants in the case study survey.

Profiles of Case Study Participants				
Participant	Company	Role	Experience (Years)	Areas of Specialty
1	Company A	CEO	35+	Engineering, Operation, Business
2	Company A	CFO	25+	Finance
3.	Company B	CFO	30+	Finance
4.	Company B	CTO	21+	Product Development, Technology
5	Company C	CMO	21+	Engineering, Product Management, Business
6	Company C	COO	21+	Business
7.	Company D	CMO	21+	Business, Product Management, Marketing

A survey document was created and included 10 questions listed below that were designed to solicit objective feedback used to calibrate the research hypotheses and their associated recommended guidelines. A concise PowerPoint document was also created for participants to describe the hypotheses and provide visualization of the guidelines discussed in chapter 6 that are respectively associated with them. The following is the list of questions in the survey document.

- Do you agree with the overarching hypothesis “PE practices influence organic R&D innovation in PE LBOs”?

a. Agree

- b. Agree with caveats. Please list the caveats**
 - c. Disagree, please discuss why**
 - d. If disagree, please provide 1-3 points that either correct or enhance the overarching hypothesis**

- Do you agree with hypothesis H1 which is: “As the investment period approaches its last few years, new product development is not approved by the LBO leadership”?
 - a. Agree**
 - b. Agree with caveats. Please list the caveats**
 - c. Disagree, please discuss why**
 - d. If Disagree, please provide 1-3 points that either correct or enhance the hypothesis**

- Please provide your feedback to the guidelines for H1 as shown in the project approval slide “The first decision point is to find whether the product will be developed and released before the PE exits the LBO investment. If the answer is positive, then the project should be approved based on its business plan. Otherwise, if the product availability is post exit, then the additional question to be considered is whether the buyer of the LBO will receive additional value that could positively influence the financial outcome of the exit. If the answer is positive, the project should be approved. Otherwise, the next question to be asked is whether the LBO company and its employees, value chain, and surrounding communities will receive strong value from the new product. if the answer is positive, this research recommendation is to approve the project.”
 - a. Agree**
 - b. Disagree, please discuss why**
 - c. Agree with caveats. Please list the caveats**

- Do you agree with hypothesis H2 which is: “The leadership of an LBO with a large debt does not increase R&D spending”?
 - a. Agree**

- b. Agree with caveats. Please list the caveats**
 - c. Disagree**
 - d. If disagree, please provide 1-3 points that either correct or enhance the hypothesis**
- Please provide your feedback to the guidelines for H2 as depicted in the debt size slide.

“The process starts with the calculation of the annualized ratio of debt future payments to current R&D budget. If the ratio is greater than 2.5, a technical due diligence is required to determine whether major R&D Investment will be required during the PE. If required, the recommendation is to also evaluate the competitive landscape to better understand if deferring new product development will destroy value during the ownership. ownership. If the competitors have or are developing a better product, the recommendation is to lower the debt size and to invest more equity in the LBO, which would enable the LBO to preserve cash for funding essential product development projects.”

 - a. Agree**
 - b. Disagree, please discuss why**
 - c. Agree with caveats. Please list the caveats**
- Do you agree with hypothesis H3: “A significant and rapid change of the leadership team results in a large loss of talent”?
 - a. Agree**
 - b. Agree with caveats. Please list the caveats**
 - c. Disagree**
 - d. If disagree, please provide 1-3 points that either correct or enhance the hypothesis**
- Please provide your feedback to the guidelines for H3 as depicted in the Management Team slide. “The second decision-making process that is covered in this research occurs during the planning phase, immediately after the completion of the acquisition. The process shows the recommended steps and decisions for the creation of the new

management team. The process starts with the decision on whether to replace or keep the CEO. Once the CEO decision is completed and executed, the formation of the executive team process starts. This research recommends two parallel tracks. In the first track, the CEO interviews existing executives, their peers, and potential successors. This process enables the CEO to decide which executives should be replaced or kept. The second track is designed to mitigate executive replacements risks and is focused on interviewing a large sample of employees. The purpose of these interviews is to identify risks such as: talent, culture, loyalty, and career aspiration of employees. The interviews should be designed to identify key employees that must be retained to avoid reduction in competitive advantage due to talent loss. The recommendations for mitigating the loss of talent risks are divided into two groups. The first one is covering the rate of replacement of existing executives to help reducing the impact on employees by limiting the rate of executive replacements to no more than 2 in a 6 months period while making sure that product and market knowledge related executives do not depart at the same 6 months period. The second group of recommendations is designed to retain the key employees that are critical to the success of the organization. This process also includes a recommendation for the creation of incentive and severance plans that include the key employees and is designed to retain them.”

- a. Agree**
 - b. Disagree, please discuss why**
 - c. Agree with caveats. Please list the caveats**
- Do you agree with hypothesis H4 which is: “Stock options plans that are generous and achievable motivate the LBO leadership to invest in innovation, or conversely, stock

options plans that are unachievable or provide unattractive payout, result in a leadership team that is unmotivated to invest in innovation”?

- a. **Agree**
- b. **Agree with caveats. Please list the caveats**
- c. **Disagree**
- d. **If disagree, please provide 1-3 points that either correct or enhance the hypothesis**

- Please provide your feedback to the guidelines for H4 “1. Incentivizing the executive team: The stock options value must be high enough to represent a life changing or a strong additional income event for the recipients, where the required business performance objectives must be audacious but achievable; 2. Guidelines for middle management and key employees: Here, the focus is on retaining and therefore the stock options should include a strong component that vests over time rather than on meeting performance objectives. This plan should also include a long-term bonus plan that is tied to achieving product development objectives and the overall compensation should carry a value of 50-100 percent of the participants’ annual income; 3. Guidelines for PE firm partners: Consider adjusting the stock option plan as required if the ability to achieve the objectives has been impacted by external events.”

- a. **Agree**
- b. **Disagree**
- c. **Agree with caveats. Please list the caveats**

- Do you believe that these concepts and guidelines could be broadly used for broader mergers & acquisitions (M&A)?

- a. **Agree**
- b. **Disagree**
- c. **Agree with caveats. Please list the caveats**

The survey was conducted utilizing phone interviews and responses were collected, analyzed, and grouped into 5 separate case studies covering the overarching hypothesis, H1-H4 hypotheses and their associated recommended guidelines where each case study addressed only one hypothesis and its recommended guidelines.

6.2 Results of Case Studies

6.2.1 Case study 1

The first case study was designed to calibrate and validate the overarching hypothesis. The experts listed in table 6 were surveyed individually and were asked if they agreed with this research overarching hypothesis that **PE practices influence organic R&D innovation in PE LBOs**. Their responses are shown in table 7 and provide strong support for the overarching hypothesis. Participant #7 added a caveat stating that PE firms also influence business and operational performance.

Table 7: Responses of the expert participants from case study 1.

Case Study #1 – Overarching Hypothesis				
Participant	Company	Role	Hypothesis	
			Response	Caveats
1	A	CEO	Agree	
2	A	CFO	Agree	
3	B	CTO	Agree	
4	B	CFO	Agree	
5	C	COO	Agree	
6	C	CMO	Agree	
7	D	CMO	Agree	PE firms also influence business and operational

6.2.2 Case study 2

Hypothesis H1 in this research project states that as the investment period approaches its last few years, new product development is not approved by the LBO leadership. Case study 2 was designed to calibrate and validate H1 as well as its associated recommended guidelines that are

described in section 5.6 and figure 22. The experts were surveyed and each was asked to respond to questions 2 and 3 in section 6.1. Survey results show that the experts agreed with the hypothesis and the recommended guidelines and provided a number of suggestions and caveats that are captured in table 8. New input was provided about PE firms indicating that some of them focus on acquiring high growth companies while others focus on mature low growth. Three of the experts believed that PE LBOs that are operating in mature, low-growth markets apply more scrutiny to the project approval process than LBOs that operate in high-growth markets.

Participant #1 stated that projects could be approved late in the investment period if the LBO can show that it cannot exit the investment without the project outcome. This participant also felt that a project might be approved if the project outcome adds value to the buyer. Participant #2 felt that the hypothesis should be revised to be less aggressive. It should replace “is not approved” with “is more scrutinized” and should read as follows: “as the investment period approaches its

Table 8: Responses of the expert participants from case study 2.

Case Study #2 – H1 Hypothesis						
	Response	Hypothesis		Response	Guidelines	
		Caveats			Caveats	
1	Agree	<ul style="list-style-type: none"> ➤ True for mature, low-growth company ➤ Cannot exit unless approved ➤ Might excite a buyer 		Agree	<ul style="list-style-type: none"> ➤ Differentiate between financial and strategic buyer 	
2	Disagree	<ul style="list-style-type: none"> ➤ Replace "not approve" with "more scrutinize" 		Agree	<ul style="list-style-type: none"> ➤ Perceived value to buyer – Revenue growth, profitability, or synergetic (market expansion) 	
3	Agree	<ul style="list-style-type: none"> ➤ True for mature, low growth market 				
4	Agree	<ul style="list-style-type: none"> ➤ Must increase EBITDA, Buyers don't like starved R&D 		Agree		
5	Agree	<ul style="list-style-type: none"> ➤ Will never see the benefits, Conserving cash 		Agree		
6	Agree	<ul style="list-style-type: none"> ➤ If new product, new market, high execution risk 		Agree	<ul style="list-style-type: none"> ➤ Value to seller not to buyer (can increase multiples) ➤ Product does not have to be ready, customer testimonial, committed backlog is good enough 	
7	Agree	<ul style="list-style-type: none"> ➤ True for mature, low growth market 		Agree	<ul style="list-style-type: none"> ➤ Makes sense for mature markets. ➤ Remove decision point about value to company, employees, and community 	

last few years, new product development **is more scrutinized** by the LBO leadership”. Participant #4 felt that the main objective late in the investment is to increase earnings before interest, tax, depreciation and amortization (EBITDA). However, a buyer that follows a strong “due diligence” process will not be interested in acquiring a company that has a “starved” R&D organization. This is because the acquirer will have to significantly increase R&D investment which could impact the ROI. Participant #5 strongly agreed with the hypothesis stating that the PE firm will never realize the benefits and therefore they should conserve cash. Participant #6 believed that only high-risk projects such as a new product or a functionality that enables entry to a new market should not be approved.

The experts also provided solid feedback on the recommended guidelines. Participant #1 suggested to enhance the “value to buyer?” decision box and to insert two additional decision boxes. The first box should be added in order to understand whether the project is part of an offensive or a defensive strategy and the second box in order to understand whether the buyer is strategic or financial. This is important since a strategic buyer will see the value of an offensive strategy in the form of a new product introduction while a financial buyer will be more interested in defensive strategy that only enhances existing product and protects their investment. Participant #2 expanded the definition of “value to buyer” suggesting that revenue growth, profitability, and market synergy should be part of the discussion. It was important that the approval of the project will contribute to the buyer’s profitability and growth. Participant #6 felt that the “product availability” box could represent a lesser investment such as a demonstrable product concept, a committed backlog, or customer testimonials. This expert also felt that the “value to buyer” should be changed to “value to seller” since the seller (PE LBO) can increase the value of the business by making the correct decision. Lastly, participant #7 felt that the recommended guidelines should be

used in a mature market and strongly suggested to remove the decision box “value to LBO, employees, value chain, and surrounding communities”.

6.2.3 Case study 3

Hypothesis H2 states that **the leadership of an LBO with a large debt does not increase R&D spending**. Case study 3 was designed to calibrate and validate H2 as well as its associated recommended guidelines that are described in section 5.3 figure 19. The experts were surveyed and each of them was asked to respond to questions 4 and 5 in section 6.1. The results of the survey

Table 9: Responses of the expert participants from case study 3.

Case Study #3 – H2 Hypothesis				
Hypothesis		Guidelines		
Response	Caveats	Response	Caveats	
1	Agree	➤ More resistance, not an absolute no ➤ 3 variables – Free cash flow, EBITDA, covenants ➤ What if it saves the business?	Agree	➤ Can they negotiate with creditors? ➤ Creditor does not care about long-term – their investors want the interest income
2	Agree	➤ Depends on the type of LBO ➤ Some need every bit of cash to pay the debt	Agree	➤ Use “Adjusted EBITDA” ➤ <2.5 one group of lenders, >2.5 different group of lenders ➤ <2.5 triggers a light due diligence ➤ Due diligence on customers (credit, concentration) and revenues (recurring or capex) ➤ Sell a line of business?
3	Agree	➤ True for mature, low growth market	Agree	
4	Agree	➤ Especially if it has covenants	Agree	➤ Every \$1M in additional R&D spend reduces value by \$1M * Multiples ➤ Every additional \$1M revenue generated by the new product will add \$1M * Multiples to the value ➤ R&D due diligence – - Base level - Incremental revenues
5	Agree		Agree	
6	Agree	➤ Covenants force cutting R&D ➤ R&D payback is long-term ➤ High leverage ratios require improved EBITDA. ➤ R&D spending is impacted.	Agree	➤ PE follows a thesis

show that the experts agreed with the hypothesis and the recommended guidelines and provided numerous of suggestions and caveats that are captured in table 9. Three of the experts believed that PE LBOs that operate in mature, low-growth markets leverage the LBO and do not increase R&D spend. Participant #1 believed that “does not increase” as stated in the hypothesis was a strong statement and believed that the LBO leadership was more resistant to increasing R&D. This

participant also felt that the creditors do not support long-term investments that could impact interest payments that they receive and therefore many of them enforce their philosophy by adding strong covenants to the debt agreement. On the other hand, this participant believed that an increase in R&D spend that could save the business should be approved. Participant #2 stated that some LBOs need every bit of cash and therefore will not increase R&D spend. Participant #4 added that an increase will not occur if the debt is backed by covenants. Participant #6 further made the case that R&D spend will be reduced when covenants are in place.

The experts also provided valuable feedback on the recommended guidelines where most suggested to use a leverage ratio, defined as the debt size divided by the EBITDA, for the measurement of the debt size. Participant #1 stated that PE firms aim to sell at a higher multiple of EBITDA than they bought while paying off the debt over the ownership period. As a result, controlling the free cash flow and EBITDA in compliance with the covenants is what the LBO leadership is forced to do. Participant #2 added that the leverage ratio should use the adjusted EBITDA in the calculation which includes the removal of one-time charges from the EBITDA. This participant stated that there are two types of lenders, one lends under the leverage ratio of 2.5 and the other above 2.5 and suggested to add another step that performs a lightweight due-diligence for the path of < 2.5 leverage ratio. This expert suggested to extend due diligence to customers in the areas of credit, revenue concentration, and the type of revenues (recurring or one time). Lastly, this expert suggested to also consider a decision box on whether the acquired company (LBO) has lines of business that could be sold. Participant #4 explained that valuation formulas are the product of a constant multiplied by the EBITDA. The constant is dubbed “market multiples” and is market dependent. The expert explained that every \$1M in additional R&D spend reduces the sale value by the market multiples of EBITDA times \$1M, and every additional \$1M that is contributed by

the new product to EBITDA, adds the market EBITDA multiples times \$1M to the company value. For example, if the market multiple is 8, then every \$1M of additional R&D spend, reduces the sale value by \$8M and on the other hand, any additional \$1M of product contribution to EBITDA, increases the value by \$8M. This expert also suggested to add R&D due diligence to the guidelines and that the R&D base and incremental levels should be defined. Base level is the minimum level of R&D spend that is required to maintain the products, while incremental level is the R&D spend that is required to enhance the product. Participant # 6 stated that the PE firm decides on the leverage ratio based on a strategy that it follows and practices.

6.2.4 Case study 4

Hypothesis H3 states that **a significant and rapid change within the leadership team results in a large loss of talent.** Case study 4 was designed to calibrate and validate H3 as well as its associated recommended guidelines that are described in section 5.4 figure 20. The experts were surveyed and each of them was asked to respond to questions 6 and 7 in section 6.1. The results of the survey show that the experts agreed with the hypothesis and the recommended guidelines and offered a number of suggestions and caveats that are captured in table 10. All the experts agreed that it is wise to replace members of the executive team. One reason is that incumbent executives could be too myopic in their ways and unable to think beyond their comfort zone. Another reason is that they have been with the company and the market for too long and are lacking the energy that is required to take the company in a new direction. Participant #2 stated that newly hired executives must fit into the company culture, understand the CEO's mission, and have the mental capacity to execute it. Towards that end, participant #7 suggested that the CEO should hire leaders that will work towards what the CEO desires to achieve. On the topic of loss of talent, participant #1 asserted that when an executive is replaced, the next layer of management is impacted while

most employees are not. Participant #5 believed that a large and rapid loss of executives creates a ripple effect through the organization and could result in significant loss of knowledge. Participants #6 and #7 stated that the next layer of management carries strong business and product knowledge and provides the needed expertise that is required to mitigate the sudden exit of a knowledgeable executive. Lastly, participants #1 and #6 suggested to modify the wording of the hypothesis. Participants #1 suggested to soften the language slightly by replacing “will result” with “can result”, and participant #6 suggested to replace “talent” with “knowledge”.

The experts also provided valuable feedback on the recommended guidelines. Participants

Table 10: Responses of the expert participants from case study 4.

Case Study #4 – H3 Hypothesis					
Hypothesis			Guidelines		
Response	Caveats	Response	Caveats	Response	Caveats
1	Agree	<ul style="list-style-type: none"> ➤ Change from "will result in a large loss of talent" to "can result in a loss of talent" ➤ It could affect the next management layer - Does not impact employees 	Agree	<ul style="list-style-type: none"> ➤ Use percentages instead of numbers ➤ Change “Evaluate” to “Build” ➤ CEO unlikely to remove his/her execs after the acquisition 	
2	Agree	<ul style="list-style-type: none"> ➤ Replacement needs to fit into company culture ➤ Do they get the mission? ➤ Do they have the mental capacity to get it done? 	Agree	<ul style="list-style-type: none"> ➤ Replace “Minimize” with “Control Talent Loss” ➤ Numbers depend on size and market ➤ Retain key employees -Add “promotability”, “career path”, or “matching career ambitions” 	
3	Agree		Agree	<ul style="list-style-type: none"> ➤ Recommendations should be in percentage 	
4	Agree		Agree	<ul style="list-style-type: none"> ➤ Under the retaining section- Add promote people 	
5	Agree	<ul style="list-style-type: none"> ➤ Executive loss of knowledge plus ripple effect 	Agree		
6	Agree	<ul style="list-style-type: none"> ➤ Replace “talent” with “knowledge” ➤ Next layer might be strong enough to provide knowledge of bus. and product 	Agree	<ul style="list-style-type: none"> ➤ PE wants to know that the CEO can execute their mission (M&A or Product) 	
7	Agree	<ul style="list-style-type: none"> ➤ Bring in new leadership that will work towards what the CEO wants to achieve ➤ Existing executive might be too myopic in their view and unable to think beyond what their comfort zone ➤ Continuity is provided by the next level of management 	Agree		

#2 and #4 asserted that the “retain key employees” box should also include promotability of employees. Participants #1 and #3 suggested to change the numbers in the box “maintain executive team knowledge” to percentages since numbers could be influenced by market and company size.

Participant #1 also recommended to replace “evaluate executive team” with “build executive team” and was also skeptical about an incumbent CEO terminating one of his/her executives after the acquisition. Lastly, participant #2 suggested to change the title of the box “minimize talent loss” with “control loss of knowledge”.

6.2.5 Case study 5

Hypothesis H4 states that **stock options plans that are generous and achievable motivate the LBO leadership to invest in innovation. Conversely, stock options plans that are unachievable or provide unattractive payout, result in a leadership team that is unmotivated to invest in innovation.** Case study 5 was designed to calibrate and validate H4 as well as its associated recommended guidelines that are described in section 5.5 figure 21.

The experts were surveyed and each of them was asked to respond to questions 8 and 9 in section 6.1. Survey results show that the experts agreed with the hypothesis and the recommended guidelines although they provided several suggestions and caveats that are captured in table 11. Participant #3 recommended to change the beginning of the hypothesis with a condition “Given a long-term goal of achieving innovation,” **stock options plans that are generous and achievable motivate the LBO leadership to invest in innovation. Conversely, stock options plans that are unachievable or provide unattractive payout, result in a leadership team that is**

unmotivated to invest in innovation, which will emphasize the relationship between innovation and time.

Table 11: Responses of the expert participants from case study 5.

Case Study #5 – H4 Hypothesis			
Hypothesis		Guidelines	
Response	Caveats	Response	Caveats
1	Agree	Agree	<ul style="list-style-type: none"> ➤ Annual compensation should have some relationship to the end value of the stock options ➤ PE partners should work with CEO to adjust plan due market conditions ➤ Bottom box – annual compensation plan – remove % ➤ Should be driven by market and company dynamics
2	Agree	Agree	<ul style="list-style-type: none"> ➤ Stock options objectives aligned with PE objectives ➤ Aligned to partners. If PE makes money, execs make money ➤ Bonus – Meeting strategic objectives as well ➤ Annual bonus plan – not in agreement with the percentage range
3	Agree	Agree	<ul style="list-style-type: none"> ➤ Start with: “Given a long-term goal of achieving innovation, stock options plans....motivate the LBO leadership to invest in innovation”
4	Agree	Agree	<ul style="list-style-type: none"> ➤ Communicating the plan is critical for the success of the incentive plan
5	Agree	Agree	<ul style="list-style-type: none"> ➤ PE wanted to first make profit before paying the execs
6	Agree	Agree	
7	Agree	Agree	<ul style="list-style-type: none"> ➤ PE firms evolved and became less generous in their stock options plans, tying them more to their exit financial success ➤ Execs should not be well compensated if the investors do not make money

Participant #7 asserted that the PE firms’ philosophy on incentive plans evolved over the years and is becoming less generous in their stock options plans by linking them closely to their financial success.

The experts also provided valuable feedback on the recommended guidelines. Participants #1 asserted that the annual compensation should have some relationship to the end value of the stock options. This expert also believed that the PE partners should work with the CEO to adjust the stock options plans according to market conditions. Expert #1 stated that the annual compensation that includes salary and bonus should be driven by market and company dynamics and suggested to adjust item 3 in the “Steps to Motivate Innovative Behavior” box. One recommended change is to remove the percentages and the other is to change “bonus” to

“compensation”. Participant #2 asserted that the stock options and the bonus plan objectives must be aligned with the PE objectives. Expert #2 also believed that if the PE firm profits from its investment, then the LBO executives should also profit from their incentive plans. This expert also believed that the percentage of the bonus plan income in relationship to the stock options value should be reviewed. Participant #4 stated that the incentive plan is critical for motivating the leadership team and therefore the CEO must communicate the plan effectively to ensure that all the leaders understand it. Each person who is a recipient of stock options and annual bonus must understand the company’s strategy, milestones, and how it is achievable from his or her perspective. Lastly, participant #7 felt that no person on the LBO team should be well compensated through the incentive plan if the PE firm is not making profit on its investment.

6.3 Calibration of Hypotheses and Recommended Guidelines

Results from the case studies were analyzed, and modifications were introduced to the hypotheses and the recommended guidelines to reflect the experts’ feedback. The following sections describe the calibrated hypotheses and guidelines.

6.3.1 Calibrated H1 and recommended guidelines

Based on the information that was collected, H1 which previously stated the following: **as the investment period approaches its last few years, new product development is not approved by the LBO leadership** was modified to state the following: **as the investment period approaches its last few years, new product development is more scrutinized by the LBO leadership**. The recommended guidelines were also modified to include changes that the experts proposed and are depicted in figure 23. The changes include decision points to ascertain if the project is part of an offensive or defensive strategy. The project should be approved if it is part of

an offensive strategy and the buyer is strategic, or if it is part of a defensive strategy and the buyer is financial.

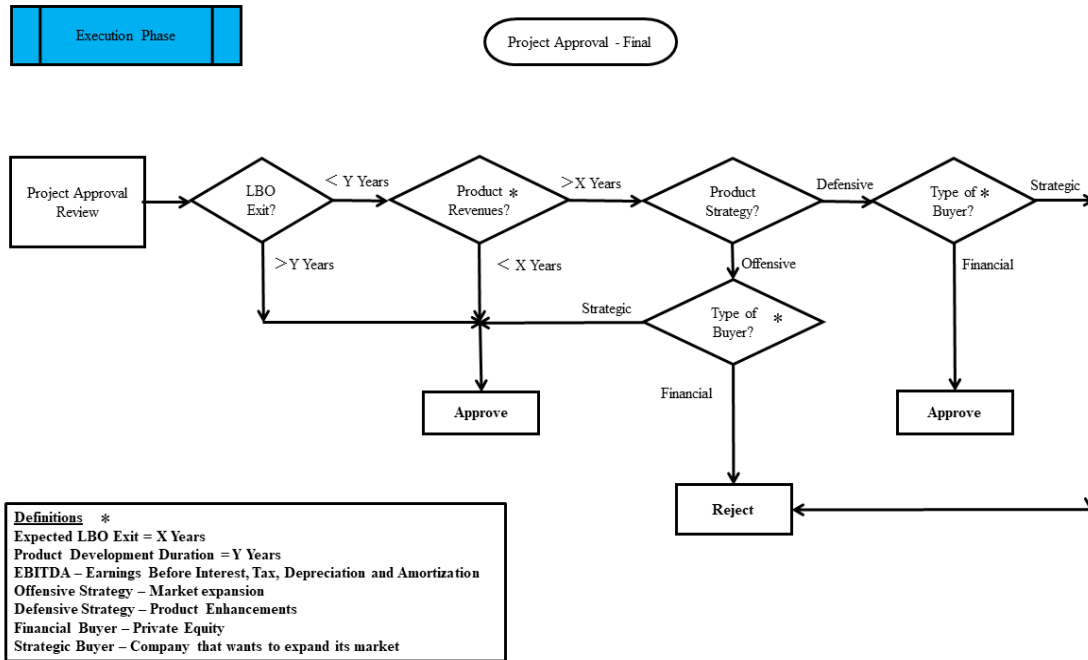


Figure 23: Project approval recommended guidelines – Final.

6.3.2 Calibrated H2 and Recommended Guidelines

Based on the collected information, H2 as stated, received a majority support and did not require any modifications. H2 states that **the leadership of an LBO with a large debt does not increase R&D spending**. The recommended guidelines received sufficient feedback to justify modifications that are depicted in figure 24. The areas of change are annotated with the '*'. The most significant change was replacing the financial ratio from “debt payments/R&D budget” to the leverage ratio “Debt Size/EBITDA”.

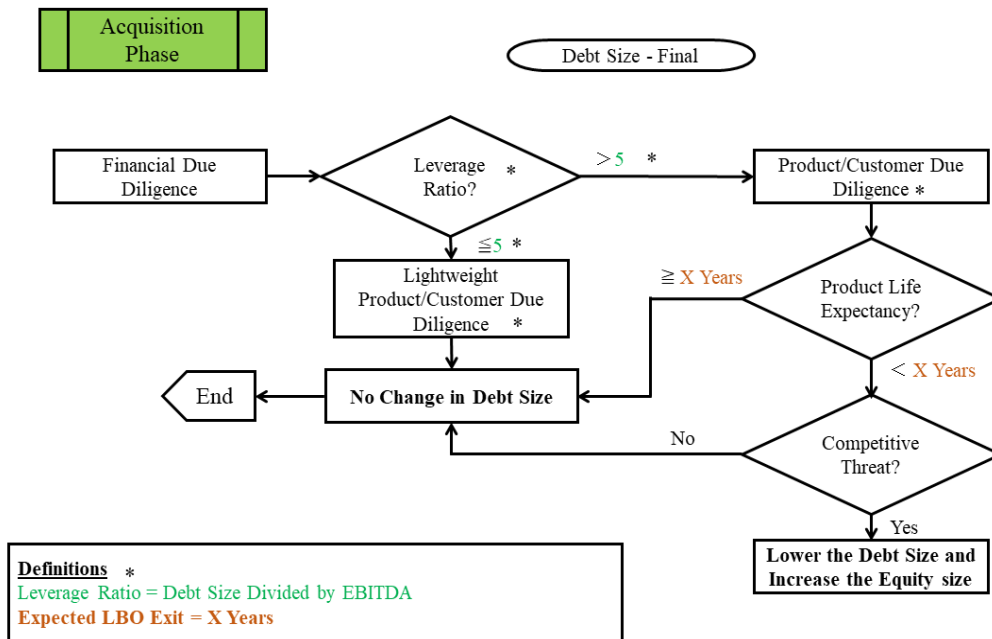


Figure 24: Process and recommended guidelines to determine the debt size.

6.3.3. Calibrated H3 and recommended guidelines

Based on the collected information, H3 which stated the following: **a significant and rapid change of the leadership team results in a large loss of talent**, was modified to **a significant and rapid change of the leadership team can result in a large loss of knowledge**. The recommended guidelines were modified to include the suggestions that were provided by the experts and are depicted in figure 25. The areas of change are annotated with the ‘*’. One change was the addition of “promotability and opportunities” to the “Retain Key Employees” box. The most significant change was the removal of constant numbers in the “Maintain Exec Team Knowledge” box and the introduction of the “Business Knowledge Acquisition” X variable and the “% Leadership Termination Limit” Y variable. The purpose of the change is to make the recommendation generic and applicable to most product companies since the time to acquire the knowledge differs for each market, company, and product. A good example will be a mid-size

company that operates in the financial market and produces communication solutions for the banks. If the company has one SVP of product management, one SVP of R&D and the time for a new executive to become proficient with the market and the product line is 3 months, then $X=3$ and $Y=1$ in order to retain one of the SVPs during the 3-months period of bringing a new executive to the right proficiency level.

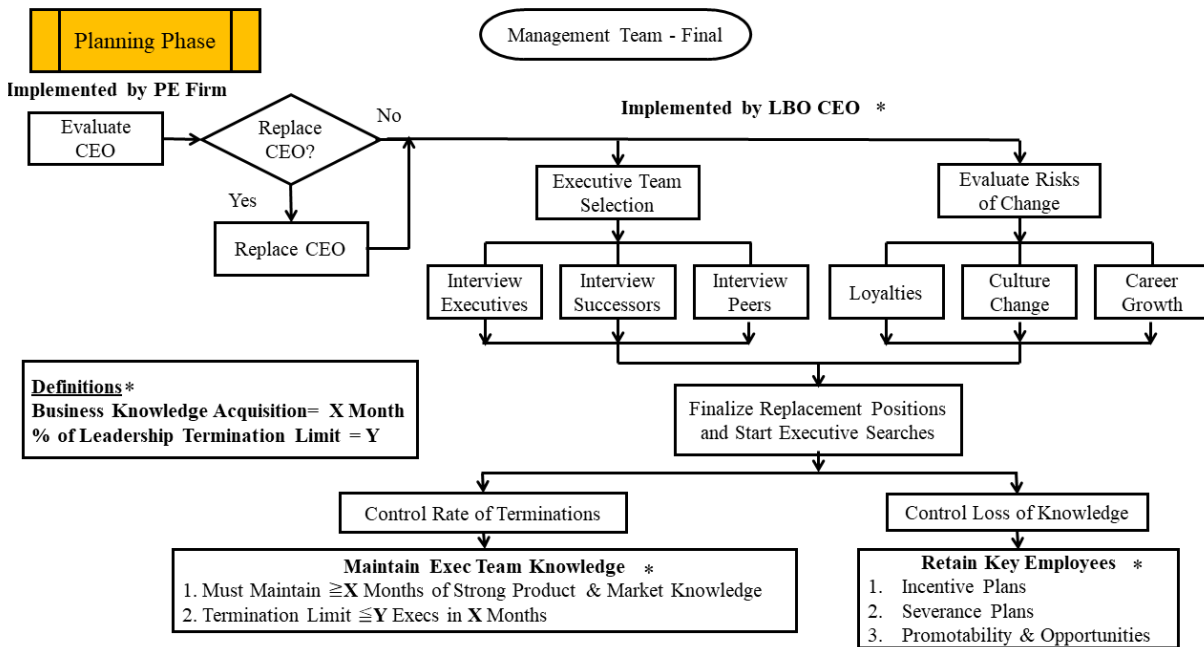


Figure 25: Management team creation process and guidelines.

6.3.4 Calibrated H4 and recommended guidelines

Based on the collected information, H4 which stated the following: **stock options plans that are generous and achievable motivate the LBO leadership to invest in innovation, and conversely, stock options plans that are unachievable or provide unattractive payout, result in a leadership team that is unmotivated to invest in innovation** was modified accordingly.

The hypothesis now states that **Given a long-term goal of achieving innovation, stock options**

plans that are generous and achievable motivate the LBO leadership to invest in innovation, and conversely, stock options plans that are unachievable or provide unattractive payout, result in a leadership team that is unmotivated to invest in innovation.

The recommended guidelines were modified to include the suggestions that were provided by the experts and are depicted in figure 26. The areas of change are annotated with the “*”. The only change is the addition of the importance of motivating the participants through a thorough communication of the incentive plan methodology, objectives, and financial rewards.

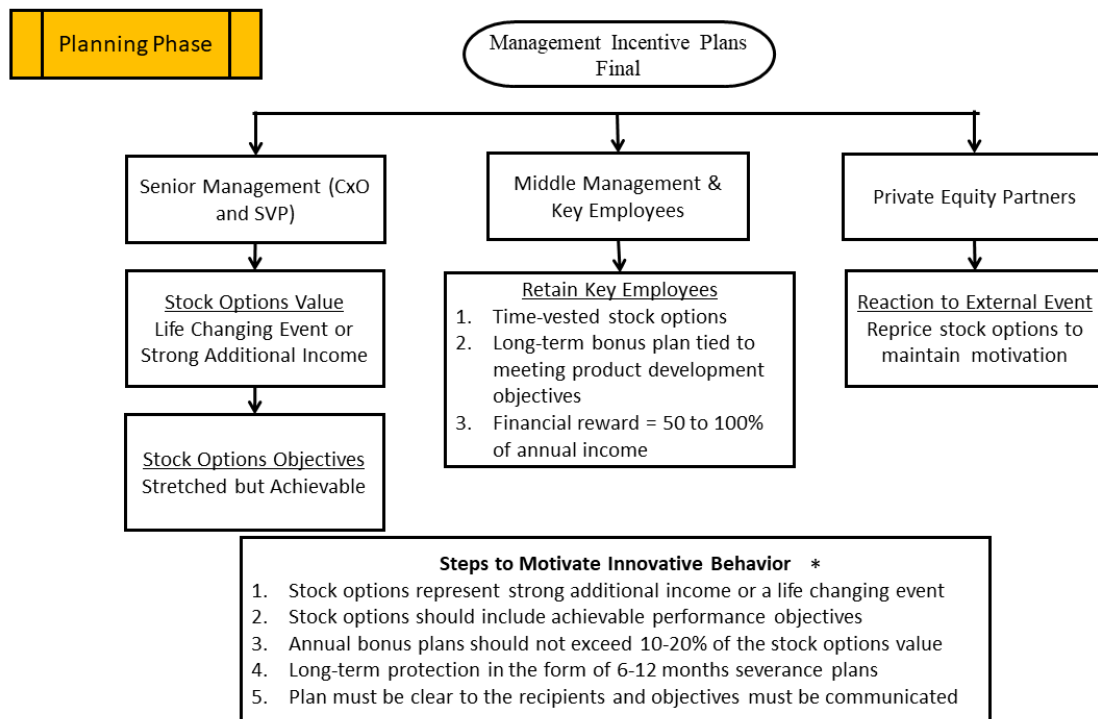


Figure 26: Incentive plan creation process -Final.

CHAPTER 7: DISCUSSION AND CONCLUSION

7.1 Discussion

7.1.1 Validating research study hypotheses

The objective from this research project is to recommend a set of guidelines that will help improve the success rate of PE firms in their pursuit of a successful outcome for their investors. Recommended guidelines were created in association with the hypotheses in the form of process flows. Since the tested hypotheses and the recommended guidelines required further validation by industry experts, a new set of case study surveys were conducted with 7 experts. These experts were specifically selected from the group of 22 LBO executives from 4 PE LBOs that participated in the first survey. Chosen experts viewed the hypotheses and the recommended guidelines for the first time during the interviews and their feedback to the questionnaire helped calibrate the hypotheses and the recommended guidelines. Therefore, this research study is based on results from the two surveys. Four hypotheses (H1-H4) were developed and validated by the survey data and then calibrated based on the results from the second survey. In particular, for the first hypothesis (H1), we demonstrated that **as the investment period approaches its last few years, new product development is more scrutinized by the LBO leadership**. We also showed that **the leadership of an LBO with a large debt does not increase R&D spending** as stated in the second hypothesis (H2). We confirmed our prediction from the third hypothesis (H3), that **a significant and rapid change of the leadership team can result in a large loss of knowledge** and correlated significantly with reduction in business performance. Lastly, we validated the fourth hypothesis (H4), that **given a long-term goal of achieving innovation, stock options plans that are generous and achievable motivate the LBO leadership to invest in innovation. Conversely, stock options plans that are unachievable or provide unattractive payout, result**

in a leadership team that is unmotivated to invest in innovation. We demonstrated H4 by showing the influence of the incentive plan on innovation and long-term success. Notably, the PE firm that imposed the strictest guidelines for the options plan created an unmotivated management team with a potentially poor business outcome.

One additional case study was designed to ascertain whether the recommended guidelines are limited to the PE industry or whether they can be applied in the broader M&A market. The following section discusses the portability of our recommended guidelines to apply to the broader M&A market.

7.1.2 Recommended guidelines

As part of the expert case study survey, participants were asked for their input on whether the recommended guidelines in chapter 5 could be used in the broader M&A market. The results of the survey are captured in table 12. All participants agreed that most of the recommended guidelines could be used in broader M&A. Participant #1 stated that the guidelines will be a great tool for small companies that cannot afford the expensive consulting firms. He also added that MBA programs and young business major graduates will benefit from these guidelines. Participant #2 stated that some PE firms already use handbooks to acquire and manage LBOs and that these recommended guidelines could be used by many other firms. Participant #3 drilled down into each of the recommended guidelines. This expert stated that for H1 the acquired company should approve a project if the product will increase the value for the buyer. H2 guidelines were not applicable in the broader M&A unless acquisitions were financed by creditors. H3 was very applicable for the acquiring company, and H4 guidelines should be used by acquiring companies who are applying a market expansion strategy and seek to retain the executive team and key employees. Participant #5 similarly analyzed each set of recommended guidelines. This expert felt

that H1 is valid and the acquired company will most likely not invest in R&D prior to its potential acquisition. H3 guidelines were ideal for market expansion and consolidation strategies, and H4 was very useful for market expansion strategy. Participant #6 thought that the recommended guidelines are relevant based on the company’s thesis and the strategic direction that it is taking. Participant #7 felt that the acquired company should consider utilizing some of the guidelines to be correctly positioned for acquisition. This expert also asserted that the guidelines are relevant for a company that is acquiring another company as part of a diversification strategy where it is important to retain the leadership, the R&D talent, and to have the correct leverage ratio, while not

Table 12: Responses of the expert participants from case study 6.

Case Study #6 - Guidelines Applicability to Broad M&A		
Response	Caveats	
1	Agree	<ul style="list-style-type: none"> ➤ Could be good for small companies that cannot afford expensive consulting firms ➤ Could be good for MBA programs and for young business graduates
2	Agree	<ul style="list-style-type: none"> ➤ Some PE firms use a handbook of guidelines ➤ Can be used by many companies
3	Agree	
4	Agree	<ul style="list-style-type: none"> ➤ H1 - The acquired company should approve if the product will increase the value for the buyer ➤ H2 - Not sure ➤ H3 - Yes ➤ H4 - Should be focused on retaining if it is market expansion
5	Agree	<ul style="list-style-type: none"> ➤ H1 - Acquired company will not invest prior to acquisition ➤ H3 - Market expansion or consolidation ➤ H4 - Market expansion
6	Agree	<ul style="list-style-type: none"> ➤ What is the thesis? ➤ Changing direction or not?
7	Agree	<ul style="list-style-type: none"> ➤ Not relevant for horizontal integration M&A strategy ➤ Relevant for diversification strategy where it is important to retain the leadership, the R&D talent, to have the correct leverage ratio, etc. ➤ The acquired company should consider utilizing some of the guidelines to be correctly positioned for acquisition

very useful for horizontal integration where the acquiring company is mostly interested in the customer base and will focus on resource consolidation. The aforementioned comments were compiled and entered into table 13 to provide a succinct visualization of the applicability of the recommended guidelines in the market.

7.2 Conclusion

7.2.1 Private equity market implications

The purpose of this research study was to investigate the influence of leadership on innovation in PE LBOs, exploring hypotheses about factors that impact innovation and how they may correlate to LBO failures. We have successfully validated the overarching study hypothesis that PE practices influence organic R&D innovation in PE LBOs. We also validated 4 hypotheses based on a survey that was conducted with 22 participants that served in key executive roles in 4 LBO companies and possessed unique knowledge that was valuable for this research project.

Table 13: Applicability of the recommended guidelines in the broader M&A market.

Recommended Guidelines Applicability to Broad M&A		
	Response	Caveats
General Comments	Agree	<ul style="list-style-type: none"> ➤ Applicable for small companies that cannot afford expensive consulting firms ➤ Applicable for MBA programs and for young business graduates ➤ Some PE firms use a handbook of guidelines ➤ Can be used by many companies ➤ What is the thesis? ➤ Changing direction or not? ➤ Not relevant for horizontal integration M&A strategy ➤ Acquired companies should consider utilizing some of the guidelines to be correctly positioned for acquisition
H1	Agree	<ul style="list-style-type: none"> ➤ The acquired company should approve if the product will increase the value for the buyer ➤ Acquired company will not invest prior to acquisition
H2	Agree	<ul style="list-style-type: none"> ➤ Not necessarily applies to broader M&A unless creditors are involved
H3	Agree	<ul style="list-style-type: none"> ➤ Market expansion or consolidation ➤ Market expansion
H4	Agree	<ul style="list-style-type: none"> ➤ Should be focused on retaining if it is market expansion

Accordingly, we developed 4 recommended guidelines in the form of flowcharts that are associated with the 4 hypotheses and are designed to ensure successful PE investment outcome. We conducted a second survey, this time in the form of a case study and with a more selective group of 7 top executives from our initial survey, and successfully validated the overarching hypothesis, the 4 hypotheses from this research and the 4 recommended guidelines. The valuable

feedback that was received was also instrumental in calibrating the hypotheses and the recommended guidelines. We believe that following these guidelines will improve the outcome of a PE investment. A successful outcome for the investors will also bring success and prosperity to their LBOs' employees, the LBOs' value chain, and the economy for their surrounding communities.

7.2.2 Broader M&A market implications

As part of the second set of surveys, we also conducted a special case study survey (case study #6) to determine whether our guidelines are also applicable in the broader M&A market. The 7 experts that were interviewed believed that the guidelines are very applicable to a broader market and provided additional input that clarifies whether the acquired or acquiring company should be implementing the recommended guidelines. In the case of H1, the acquired company should use the guidelines for H1 as part of a strategy to be acquired. H2 guidelines should be used by the acquiring company if they will use creditors to acquire the target business. H3 and H4 guidelines should be used by the acquiring company if their strategy is market expansion where the acquired management team must be retained and motivated to deliver the results that the acquiring company is expecting. The impact of M&A transactions on the US economy, employees, investors, and to the value chain is tremendous considering data that shows over 12,700 M&A deals in 2019.

7.2.3 Theoretical implication for Technology Management

This research project investigated the impact of PE firms on organic R&D innovation in their portfolio companies. The survey data and additional information that was retrieved from the participating executives in the initial survey and from the expert participants in the following case study surveys, touches on a number of Technology Management (TM) topics that can benefit from

this research. The specific TM subjects that can benefit from this research are Strategic Management, Innovation Strategies, Product Development, and Mergers & Acquisitions. Additional TM implications are that the overarching hypothesis validates the impact of leadership on innovation in M&A and that this research clearly highlights the critical role of leadership in high-risk decision making in mid-size companies. Lastly, the recommended guidelines are designed to enable leadership to make consistent TM decisions that will enhance the business value.

7.2.4 Limitations

Due to the Covid-19 pandemic, many potential participants were inaccessible. The original research plan called for 6 PE LBOs and 24 interview participants. The plan also called for 3 successful and 3 failed LBOs. The implementation only included 22 participants from 4 PE LBOs, of which, 3 were successful and only 1 failed. Three of the 4 LBOs were low growth companies that operated in a mature market and one of the 4 LBOs was a high growth company. Some of the above limitations can be addressed in future research.

7.2.5 Future research

This research study was focused on the influence of PE firms on innovation in their acquired LBOs. We investigated 4 factors, proposed an overarching hypothesis and 4 hypotheses (H1-H4) covering 4 PE LBOs. Due to the limitations that are mentioned in section 7.2.4, this research can be expanded to include additional LBOs and participants (≥ 6 LBOs and ≥ 4 participants for each LBO). The number of failed LBOs should be increased to balance the number of successful LBOs. It will also be beneficial to include in future research companies from other industries to show that the research results are industry agnostic. Similarly, future research may also include a balanced mix of low growth and high growth companies. Another objective for future research will be to

compare and contrast the PE investments in organic and inorganic innovation practices and to determine whether the 4 factors in this research should be expanded or changed. Once the data is collected and analyzed, future research should expand to correlate the data with data from public datasets and public filings. A new research phase should be added in the form of a proof of concept (POC). The POC should include 2-3 companies that will agree to apply the recommended guidelines in their business practices and provide feedback on their usefulness. Following the POC phase, future research may utilize the input from the POC participants to further calibrate and perfect the guidelines.

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Appendix A – IRB Research Approval



APPROVAL OF RESEARCH

June 25, 2019

Mr. Israel Hersh
College of Engineering, Business & Education
University of Bridgeport

Dear Mr. Hersh,

On *June 25, 2019* an IRB member approved the following human subject research:

Type of Review: *Initial*
Project Title: The Influence of Private Equity Short-Term Ownership on
the Failure of Leveraged
Buyouts Firms: A Data Driven Model
Investigator: Israel Hersh
IRB ID: 2019-06-05
Funding Agency: *N/A*
Grant Title: *N/A*
Grant ID: *N/A*
IND or IDE: *N/A*

To request continuing approval, you are to submit a completed “UB HRP-212 FORM: Continuing Review Progress Report” and required attachments by May 25, 2020. For study closure, you are to submit a completed “UB HRP-212 FORM: Continuing Review Progress Report” and required attachments by July 25, 2020.

If continuing review approval is not granted before the expiration date of June 25, 2020 this research expires on that date.

In conducting this research you are required to follow the requirements listed in the *Investigator Manual*.

A black rectangular box containing a handwritten signature in gold ink. Below the signature, the text "Julie F. Demers" and "IRB Administrator" is printed in white.

Sincerely,
Julie F. Demers
Julie F. Demers
IRB Administrator

Cc: Dr. Ruba Deeb

126 Park Avenue • Bridgeport, CT 06604 • Tel: 203.576.4973 • E-mail: irb@bridgeport.edu

Appendix B – IRB Consent Form



UNIVERSITY OF BRIDGEPORT CONSENT TO BE PART OF A RESEARCH STUDY Protocol Number: 2019--06--05

University of Bridgeport Informed Consent Page 1 of 4
[UB HRP-502 Revised 06/18/2019]

1. KEY INFORMATION ABOUT THE RESEARCHERS AND THIS STUDY

Study Title: The Influence of Private Equity Short-Term Ownership on the Failure of Leveraged Buyouts Firms: A Data Driven Model

Study Sponsor: This study does not have a sponsor

Principal Investigator: Israel J Hersh, Ph.D. Candidate, Technology Management, College of Engineering, Business & Education, University of Bridgeport

1.1 Invitation to be Part of a Research Study

You are invited to take part in this research study. You are invited to be in this study because you were an executive in a company that was owned by a Private Equity (PE) firm or because you were an associate or a partner in a PE firm and was managing a Leveraged Buyout (LBO) company. Taking part in this research study is voluntary.

1.2 Important Information about the Research Study¹

Things you should know:

- This research study will use public data and questionnaires to investigate the following questions: (1) Are failures of Private Equity (PE) Leveraged Buyouts (LBO)s influenced by the short-term nature of the ownership? (2) Is it possible for PE LBOs to be innovative despite the short-term horizon of their business strategy? Collected data from this study will be aggregated and analyzed to hopefully provide a recommendation that may improve the success rate of PE firms in their pursuit of a financially rewarding outcome for their investments. If you choose to participate, you will be asked to meet with the principal investigator (PI), Mr. Israel Hersh, for a 1 hour interview where you will be answering questions that Mr. Hersh prepared in advance.
- Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. Whatever you decide will not be held against you.

2. PURPOSE OF THIS STUDY

2.1. What is the research study about and why are we doing the research study?

This study aims to use public data and survey questionnaires to answer the following questions: (1) Are failures of Private Equity (PE) Leveraged Buyouts (LBO)s influenced by the short-term nature of the ownership? (2) Is it possible for PE LBOs to be innovative despite the short-term horizon of their business strategy?

The collected data will be aggregated and analyzed to provide a recommendation that may improve the success rate of PE firms in their pursuit of a financially rewarding outcome for their investments.

¹ See Duke University's example of summary statements at <https://irb.duhs.duke.edu/forms/duhs-sample-consent>

University of Bridgeport Informed Consent Page 2 of 4
[UB HRP-502 Revised 06/18/2019]

2.2. How long will the research last?

We expect that you will be in this research study for 1 hour – the duration of the interview.

2.3. How many people will be studied?

We expect about 54 participants in this research study.

3. WHO MAY PARTICIPATE IN THE STUDY

3.1. What happens if I say yes, I want to be in this research?

If you agree to take part in this study, the PI of this study will request an interview meeting with you. The request will arrive via email or a phone call. The preferred interview method will be an in-person interview and if not possible, then via a video or phone call. If an in-person interview is acceptable to you, you will need to provide the location and the time of your choice. The PI will then send you a calendar invitation by email for an interview. You will also receive by email this consent form to review, sign, scan and email back to the PI. The time devoted to the consent review should not exceed 10 minutes. It is possible that you will want to think about the consent or discuss with your legal counsel prior to taking any action, which could delay signing the consent by about one week. Following your consent, you will receive the interview questions by email. This will help you prepare for the interview. During the interview, whether it is in-person, video, or phone call, the PI will start by explaining the purpose of the study and proceed to ask the same questions in the questionnaire that were emailed to you prior to the interview. The questions are close-ended with multiple-choice answers. After each question is asked, you can state your answer and the PI will circle your answer on his printed questionnaire. It is expected that the interview duration will be under 1 hour.

3.2. What happens if I say no, I do not want to be in this research?

You may decide not to take part in the research and it will not be held against you.

3.3. What happens if I say yes, but I change my mind later?

You may stop at any time and it will not be held against you. If you decide to leave the research, contact the PI so that they can delete your information.

4. INFORMATION ABOUT STUDY RISKS AND BENEFITS

4.1. Is there any way being in this study could be bad for me?

This is a minimal risk study. There are no physical risks associated with this study. The only risk to participants in this research is a potential breach of privacy and confidentiality. The PI will safeguard participants' anonymity by using a coding system that uses letters and numbers instead of contact and company identifiers. The PI will be the only person that knows the encryption code, which will be stored in a password-protected laptop computer. The interaction is solely between the PI and participant in the form of a personal interview. The participants' list, contact information, company names and consent forms will be maintained by the PI only, kept on his password-protected laptop, and destroyed after the research is completed and published. The PI will never publish the identifying information listed above. Some of the questions we will ask you as part of this study may make you feel uncomfortable. You may refuse to answer any of the questions and may request a break at any time during the interview. You may end your participation in this study at any time.

4.2. Will being in this study help me in any way?

There are no direct benefits to you for participating in this study.

5. CONFIDENTIALITY OF SUBJECT RECORDS

5.1. What happens to the information you collect?

We will make every effort to protect your personal information and limit access only to individuals who have a need to review this information. Organizations that may inspect your information include the IRB and other representatives of this organization.

Your identifiable information (name, address, company) collected for this research study will **not** be used or distributed to other investigators for future research studies, even if your identifiers are removed. Following the completion of the data collection phase, the PI will analyze the data utilizing various statistical methods to validate or invalidate the research hypothesis and to provide answers to the research questions stated in the Objectives section above. The data will be correlated to available public data. Personal and company related information will never be published and will be destroyed at the end of the research.

5.2. Can I be removed from the research without my OK?

The person in charge of the research study can remove you from the research study without your approval. A possible reason for removal is if you decide to cancel the interview.

5.3. What else do I need to know?

5.3.1 The research study involves no more than minimal risk.

5.3.2 Participants will not get paid to participate in the research.

6. CONTACT INFORMATION

6.1. Who can I talk to?

If you have questions or concerns about this research, you may contact Israel J Hersh, Ph.D. candidate of Technology Management, College of Engineering, Business, and Education, University of Bridgeport. Contact information is +12032577368 (M), ihersh@my.bridgeport.edu. The faculty advisor is Dr. Ruba Deeb, +12035764399 (W), rubadeeb@bridgeport.edu.

This research has been reviewed and approved by an Institutional Review Board. If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), you may talk to UB's IRB Administrator at (203) 576-4974 or irb@bridgeport.edu.

7. RECORD OF INFORMATION PROVIDED

7.1. What documents will be given to me?

Your signature in the next section means that you have received copies of the following documents: This "Consent to be Part of a Research Study" document. Survey Questionnaire.

8. SIGNATURES

Signature Block for Capable Adult: Long Form

Your signature below documents your permission to take part in this research and to the use and disclosure of your protected health information:

DO NOT SIGN THIS FORM AFTER THIS DATE



June 25, 2020

Signature of subject

Date

Print name of subject

Signature of person obtaining consent

Date

Printed name of person obtaining consent

June 18, 2019

Form Date

Appendix C – 1st Case Study Survey Questionnaire

Dear Participant,

Thank you for agreeing to participate in this survey. Your experience as an executive who worked for a company that was acquired by a private equity (PE) firm is very important. The intent of this survey is to collect data that will help answer a number of research questions and validate or invalidate a number of hypotheses. The PE transactions that are of interest to this research include technology companies and are a single acquisition rather than a combination of multiple acquisitions that were merged or became inter-dependent. We seek your input if your company was acquired by a PE firm and continued to function under the ownership of the PE as a single entity. It is important for the study that you answer all questions. However, if you are uncomfortable with answering any question(s), it is acceptable that you not provide an answer. Your responses to questions within the survey will be presented in an aggregated form with other participants' responses. Personal or company information will be kept confidential and will not be included in the dissemination of research results. The preferred survey method is an in-person interview of 1 hour, however, a video conference or a telephone call of similar length is an acceptable alternative. Again, your feedback is important, thank you for your participation in this survey.

Prerequisites

Was the PE transaction for acquiring your company a single acquisition?

- a. Yes
- b. No (It was a combination of several acquisitions)

Proceed with the questionnaire only if the answer to the question above is “Yes”

Background

1. What was the previous ownership type of your company?
 - a. Public
 - b. Privately owned
 - c. PE
 - d. Others
 - e. Don't know
2. How long did the PE own your company?
 - a. Less than 3 years
 - b. 3 to 4 years
 - c. 5 to 7 years
 - d. 8 to 10 years
 - e. >10 years
 - f. Don't know
3. What was your position in the company?
 - a. CEO
 - b. Officer (EVP, SVP, CXO, VP)
 - c. Middle Management (VP, Director, Senior Manager)
 - d. Manager

- e. Other
4. Were you already an employee at your company before it was acquired by the PE?
 - a. Yes
 - b. No
 5. Was your company a technology company?
 - a. Yes
 - b. No

Investments

1. What percentage of the investment mix was equity?
 - a. 10-20%
 - b. 20-25%
 - c. 25-30%
 - d. 30-40%
 - e. Above 40%
 - f. Don't know
2. What percentage of the investment mix was debt?
 - a. 80-90%
 - b. 75-80%
 - c. 70-75%
 - d. Under 70%
 - e. Don't know
3. Did the PE ownership made additional investments in the business during the ownership period?
 - a. Yes
 - b. No
 - c. Don't know
4. What were the sources of the additional investments?
 - a. Equity
 - b. Loan
 - c. Combination of a and b
 - d. Cashflow
 - e. Others

f. N/A

g. Don't know

Incentives & Retention

1. What incentives did you receive to be aligned with the ownership and their strategy?
(Select all that apply)
 - a. High Salary
 - b. Stock Options
 - c. Annual Bonus
 - d. High salary and Stock Options and Annual Bonus
 - e. Stock Options and Annual Bonus
 - f. None of the above
 - g. Others
2. Stock Options
 - a. Restricted stock – with full vesting
 - b. Vesting was time based
 - c. Vesting was performance based
 - d. Vesting was a combination of b & c
 - e. Vesting was combination of a & b
 - f. N/A
3. What management team layer received stock options?
 - a. Officers only – (CEO & EVPs, SVPs, CXOs, VPs)
 - b. Middle and upper management (Directors, VPs and above)
 - c. All management
 - d. Key employees and management
 - e. Other
 - f. Don't know
4. How meaningful were the stock option grants to you?

- a. Life changing event
 - b. Strong additional income
 - c. Nice to have
 - d. N/A
5. Annual Bonus
- a. < 30% of salary
 - b. 31-40% of salary
 - c. 41-60% of salary
 - d. > 60% of salary
 - e. N/A
6. Did you have a severance package?
- a. \leq 3 months
 - b. \leq 6 months
 - c. < 12 months
 - d. 1 year
 - e. >1 year
 - f. No

Employee Turnover

1. Did the PE replace the CEO?
 - a. Yes
 - b. No
 - c. Don't know

2. What percentage of the senior management team was replaced by the new ownership?
 - a. 0-20%
 - b. 21-40%
 - c. 41-60%
 - d. >60%
 - e. Don't know

3. What percentage of the second management layer was replaced by the new ownership?
 - a. 0-20%
 - b. 21-40%
 - c. 41-60%
 - d. >60%
 - e. Don't know

4. Duration of the exec team restructuring
 - a. <1 year
 - b. 1-2 years
 - c. Restructuring did not occur
 - d. Other
 - e. Don't know

5. Was there a major loss of talent as a result of restructuring?
 - a. Yes

- b. No
- c. Don't know

Market

1. Market size- total addressable market
 - a. < \$500M
 - b. < \$1B
 - c. \$1B - \$2B
 - d. > \$2B
 - e. Don't know

2. Define the market
 - a. Mature
 - b. Low growth (single digit annually)
 - c. High growth (over 20% annually)
 - d. Combination of a and b
 - e. Combination of a and c
 - f. Combination of b and c
 - g. Combination of a, b and c
 - h. Don't know

3. Market share
 - a. < 30%
 - b. < 50%
 - c. 50-60%
 - d. 60-70%
 - e. >70%
 - f. Don't know

Innovation

1. What was the R&D budget as percentage of revenues before you were acquired by the PE?
 - a. <5%
 - b. 5-7%
 - c. 7-10%
 - d. >10%
 - e. Don't know

2. What was the R&D budget as percentage of revenues when you were sold by the PE?
 - a. <5%
 - b. 5-7%
 - c. 7-10%
 - d. >10%
 - e. Don't know

3. If product development investments increased, in what year of the PE ownership did it happen?
 - a. First year
 - b. First 2 years
 - c. First 3 years
 - d. Year 3-6
 - e. Through the entire ownership
 - f. N/A
 - g. Don't know

4. Product development investments increase pattern
 - a. One time increase and then reduced to year 1 level
 - b. One time increase and then stayed flat through the ownership period

- c. Year over year increase
 - d. Increased as needed
 - e. N/A
 - f. Don't know
5. What was the reason for the increase in the R&D budget?
- a. New product
 - b. Implementing existing product enhancements
 - c. Addressing existing product issues
 - d. N/A
 - e. Don't know
 - f. Other
6. How was the current R&D investment funded?
- a. Cashflow
 - b. Additional debt
 - c. Additional equity
 - d. Others
 - e. Don't know
7. How was the increase in organic product development funded?
- a. Utilized one line of business or product as a cash cow
 - b. Sold a line of business
 - c. Combination of a and b
 - d. Additional debt
 - e. Additional equity
 - f. N/A
 - g. Others

- h. Don't know
8. What was the nature of product development investments during the PE ownership
- a. Enhancement to an Existing market -existing product
 - b. A new product in an existing market
 - c. Existing product in a new market
 - d. A new product in a new market
 - e. N/A
 - f. Don't know
9. What was the nature of m & a related product investments during the PE ownership
- a. Enhancing an existing market with existing product
 - b. A new product in an existing market
 - c. Existing product in a new market
 - d. A new product in a new market
 - e. N/A
 - f. Don't know
10. Product development strategy during the PE ownership
- a. Incremental – enhancing existing product lines – short term releases
 - b. Radical/Disruptive – new product, new technology – long-term development cycle
 - c. Combination of a & b
 - d. Don't know
 - e. Other
 - f. N/A
11. What was the average duration of **new** product development cycle during the PE ownership period?
- a. <1 year

- b. 1-2 years
- c. 2-3 years
- d. >3 years
- e. N/A
- f. Don't know

12. Did your company introduce any new flagship products during the PE ownership period?

- a. Yes
- b. No
- c. Don't know

13. Did the company approve the development of strategic products that would only complete after the exit?

- a. Yes
- b. No
- c. Don't know

Investment Exit

1. Did the new product(s) influence the success of exit?
 - a. Yes
 - b. No
2. Was the PE ownership a financial success for the investors?
 - a. Yes
 - b. No
3. Is the company's post exit financial performance successful?
 - a. Yes
 - b. No

Appendix D – Definitions

Definitions	
Bonus plan	Incentive offered to employees in which they can earn extra money by abiding by various requirements
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CMO	Chief Marketing Officer
COO	Chief Operating Officer
CTO	Chief Technology Officer
CxO	Corporate executives whose job titles typically start with 'Chief' and end with 'Officer.'
EBITDA	Net income (or earnings) with interest, taxes, depreciation, and amortization added back
High growth company	Companies generating a return on equity of > 15%
Leverage ratio	Total Debt / EBITDA
Leveraged buyout (LBO)	The acquisition of another company using a significant amount of borrowed money to meet the cost of acquisition
Market share	Percent of total sales in an industry generated by a particular company
Mature market	The stage where the rate of growth slows, perhaps to zero
MBA	Master of Business Administration
Midsize company	Organization that makes more than \$50 million, but less than \$1 billion in annual revenue
M&A	Mergers and Acquisitions
Private Equity (PE)	An alternative investment class and consists of capital that is not listed on a public exchange.
Return on investment (ROI)	A performance measure used to evaluate the efficiency of an investment
Research & Development (R&D)	Activities that companies undertake to innovate and introduce new products and services
Senior management, executive management, upper management	A team of individuals at the highest level of management of an organization
Severance Plan	Provides an employee with severance pay for a specified period of time in the event that his/her employment is involuntarily terminated by the Employer
Stock options plan	Contracts between a company and its employees that give employees the right to buy a specific number of the company's shares at a fixed price within a certain period of time

SVP	Senior Vice President
Valuation	The analytical process of determining the current (or projected) worth of an asset or a company
Value chain	Set of activities that a firm performs in order to deliver a valuable product or service for the market. It includes raw material, supply chain, partners, and customers
VP	Vice President
2nd Level management	Management level that is subordinate to the senior, executive, or upper management
