

Gloomy days for Latin America: Success and Failures in past decisions and Future Capital Structure Choices

Abstract

In the management literature there is consensus that personal characteristics and biases affect the CEO decisions, but the effect of past experiences, has little attention. We study how do success and failure influence the capital structure decisions. Using an experimental approach we simulate experiences and then evaluate this choices. We find that individuals who live failure compensate the high operational risk of a given project with lower leverage, while the capital structure decision of those who experience success is independent of the degree of operational risk. Our result have practical implications for Latin America, especially in this gloomy days.

Keywords; Corporate finance, financial decision making, experimental finance, capital structure decisions, anchoring.

1. Introduction

In the last twenty years ending in 2014, capital structure decisions, as a component of strategic management, have received limited attention in Latin America because the region has experienced a positive performance period, characterized among others, by macroeconomic stability, strong economic growth, increased capital inflows, and in general, a good mood for risk appetite and seeking investment opportunities (Brenes, Camacho, Ciravegna, & Pichardo, 2016). A consequence of this economic growth, is an increase in the level of corporate indebtedness, partially fueled at a macroeconomic level for a stronger local currencies and lower dollar interest rates.

For the mid of 2014-2015, the context has changed dramatically for Latin America. Emerging markets faced slower growth and a major economic and financial instability. The slowdown in China caused a dramatic fall in commodity prices, eroding the main source of income and foreign exchange for the majority of Latin American countries. Falling prices for copper, oil, soy, coffee and grains, among others, has jeopardized the financial viability of Latin companies, as a consequence of a diminished liquidity and increased company bankruptcy risk, putting the capital structure decisions in the main focus of the strategy management area. In this gloomy days, the understanding of how do success and failure experiences in past financial decisions influence future capital structure choices is a demanding issue for our countries. Specially, this is relevant in emerging markets, where the lack of development in the financial sector provoke that capital markets function with imperfect efficiency, altering the cost of capital of the companies, and in consequence, their economic value (Kearney, 2012)

In the standard corporate finance models, managers have preferences and beliefs that are fully rational to make decisions that maximize the value of the firm. Complementing the results of standard models, there is evidence that supports the idea that personal characteristics, traits, preferences, and biases of managers affect their corporate finance decisions (See Baker & Wurgler (2014) for a survey). However, there is new evidence that propose that experiences influence the decision

making process of the managers. Dittmar & Duchin (2015) find that firms managed by CEOs that previously worked in a company that underwent financial distress, exhibit a sharp reduction in debt issuance, an increase in cash holdings and a reduction in capital expenditure, particularly relevant in Latin America. In consequence we are motivated to improve the understanding whether failures arising from past financial decisions, could improve the quality of future financial decisions. Our argument, in line with the Cognitive Experiential Self Theory (CEST) (Denes-Raj & Epstein, 1994), is that past experience, in particular experience of success and failure of decisions regarding a similar problem in the past, plays an important role in the present. This is because individuals tend to repeat (avoid) past decisions that had good (bad) outcomes, meaning that they repeat decisions that previously coincided with pleasure and avoid those that coincided with pain. From the financial perspective, this means that subjects that choose a capital structure in the past, and fail, are prone to change their decision in the present in order to avoid the bad past outcomes, while whom were successful will repeat their decision. For study the link between experiences and corporate finance decisions, and to avoid endogeneity problems, we design an experiment by randomly delivering experiences of success and failure, and control for personal traits and personal characteristics. This allows us to be sure that there are no other differences in the participants than the particular bias for which we test the behavioral response. The experiment have two stage. In the first, we treat a group of business students with a sense of failure (success) by giving them negative (positive) feedback about a capital structure decision they are asked to make. In the second, we ask them to decide the capital structure for two different projects: one with high and the other with low operational risk.

1.1 Decision making process, anchors and past experiences

Regarding the decision making process, Kahneman (2003) argues that this is associated with a cognitive architecture comprised of a fast, automatic, intuitive system with low levels of cognitive effort (system 1), and a system of high cognitive effort, controlled by slow, studied, serialized, and neutral decisions (system 2). Many complex decisions and judgments are based on system 1 because individuals are prone to behavioral biases. Epley & Gilovich (2005); Tversky & Kahneman (1973) indicate that people face complex decisions on a daily basis, and that some biases in these decisions are generated because individuals tend to think little about their decisions as they are using system 1 where decisions are based on heuristics and not in a cognitive process or system 2. Past experience, in particular those of success and failure in decisions concerning a similar problem plays an important role. Individuals tend to repeat (avoid) past decisions that had good (bad) outcomes, meaning they repeat choices that previously coincided with pleasure and avoid those that coincided with pain (Denes-Raj & Epstein, 1994). People will keep using system 1 if were successful but they will turn to system 2 if they systematically fail. Failures incentivize subjects to reassess their heuristic and turn towards a process centered on cognitive effort. This phenomenon, known as Cognitive-experiential self-theory (CEST) (Denes-Raj & Epstein (1994)),

indicates that the decision making process, where people make rational decisions, is based on maximizing pleasure or gains and minimizing pain or losses, where subjects use two parallel processing systems: cognitive and experiential.

Epley & Gilovich (2005) report that one heuristic used in system 1 are anchors. Yet while these heuristics are very useful in certain contexts, they sometimes cause severe systematic errors because the adjustment from an anchor in many cases is insufficient. Subjects form beliefs by adjusting from a potentially arbitrary starting point, and the bias is that the final belief is biased toward this anchor (Dunning, Griffin, Milojkovic, & Ross, 1990; Epley, Keysar, Van Boven, & Gilovich, 2004; Koriat, Lichtenstein, Fischhoff, & Combs, 1980).

One reason as to why most judgments and decisions are made intuitively, based on heuristics, is due to the law of minimal mental effort. (Kool, McGuire, Rosen, & Botvinick, 2010), indicate that people are not used to thinking hard. This implies they tend to avoid decisions that demand a high cognitive effort as it carries internal costs when more precise and diligent procedures are used, generating suboptimal behaviors when making decisions ((John W Payne et al., 1993; Shah & Oppenheimer, 2008) .

There is evidence of the effects of anchors and reference points on financial decisions. In the forex markets, Westerhoff (2003) find evidence of misalignments in exchange rates, since traders exhibit anchoring behavior. In making debt decisions, (Dougal, Engelberg, Parsons, & Van Wesepe, 2015) show that for current debt contracts, managers, bankers and debtors are unable to not integrate the past, using former debt conditions as anchors or reference points. This behavior is particularly high in periods of dramatic change in financial environments, when the prior deal is more recent and when the decision makers are the same. In the same way but related to initial public offerings, (Kaustia & Knüpfer, 2008) state that when subscribing to IPOs investors cannot step back and abstract themselves from their experiences when evaluating new decisions. Consequently, they tend to assign too much relevance to past results as decision-making tools rather than to a rational decision-making process. Finally, when it comes to investment decisions, (Baker, Pan, & Wurgler, 2012) find that deal participants in mergers and acquisitions do indeed focus on recent price peaks, particularly the 52-week high, which acts as an anchor, i.e., a starting point for negotiations.

1.2. Financial decisions and past experiences

There is a small recent body of literature that explores the relation between experiences and corporate finance decisions. (Malmendier & Nagel, 2011) show that managers who lived during the Great Depression are averse to using debt compared to those who did not, whereas managers who served during World War II choose more aggressive capital structures characterized by heightened leverage. Benmelech & Frydman (2014) find that CEOs who have served in the military tend to have lower investments and R&D, and do not use excessive leverage. Dessaint & Matray (2014) find that CEOs that experienced natural disaster (eg. hurricanes) increase the corporate cash holdings, heightening the financial cost of the firm.

Past experience is important because it generates learning through making mistakes. In stable environments with rules and clear implications for our choices, analyzing the results of a decision, i.e., feedback, generates a change in the decision process. In a financial context, Barber & Odean (2013) indicate that learning from experience is repeating behaviors that previously coincided with pleasure and avoiding those that coincided with pain. Choi, Laibson, Madrian, & Metrick (2009) show that investors use their experience when making savings decisions; those whose 401(k) accounts have experienced greater returns or lower variance extrapolate past results, thus increasing their saving rates. Strahilevitz, Odean, & Barber (2011) find that investors' previous experiences with a stock affect their willingness to repurchase that stock; these investors repurchase stocks whose previous purchase resulted in positive emotions and avoid those that resulted in negative emotions. (Chhabra, De, Gondhi, & Pochiraju, 2011; Huang, 2012) establish that investors tend to repeat their trading behavior when their most recent trades are successful. Kaustia & Knüpfer (2008) state that when participating in IPOs, investors are more prone to subscribe to a new offering if their previous experience has been successful.

The above behavior shows that subjects follow strategies in which they have experienced success, even if that success does not predict future success. This leads one to wonder about the quality of these decisions in certain circumstances. For example, what happens when environments are uncertain and decision makers are bounded rational? (Baker & Wurgler, 2014) state that managers do not always form beliefs logically, nor do they convert a given set of beliefs into decisions in a consistently and rationally – sentiment and irrational behavior emerge in corporate finance decisions.

Accordingly, we argue that individuals learn from their past experiences in such a way they repeat the decision-making when this yields benefits for them, and they modify it when generated losses. Thus, we expect that subjects that experience success using anchors in past capital structure decisions, continue using them in the future because this heuristic produced successes in the past. By contrast, we expect that those who experience failure using anchors, motivated to avoid future negative results, change their behavior towards a decision-making based on a cognitive system with greater mental effort.

According to this our hypothesis is that:

Hypothesis 1: Individuals will choose capital structure decisions using anchors.

Hypothesis 2: Individuals who experience failure (success) adjust their capital structure more (less) according to the operative risk of the projects.

2. The Experiment

In this study we observe the effect of success and failure experiences on the capital structure decisions. Since it is difficult to test this effect with field data (the level of experience is difficult to observe), we developed an experiment with undergraduate and graduate students. This allows us to control the effect of the work experience, since the participants have similar experience.

The experiment has two steps: a business game simulation and a capital structure decision. In the first stage, we treated the individuals with success or failure based on the feedback received regarding three consecutive business decisions they had to make. In the second stage, the subjects chose between projects with different levels of operational risk and then assigned a capital structure to them. Individuals in the success (failure) group, regardless of their decisions, received positive (negative) feedback so as to artificially create experiences of success (failure).

The experiment is 2 x 2. The first factor is represented by the feedback of the success and failure that the participants in each group receive during the business game simulation. The control group participates in the business game simulation, but does not receive feedback. The second factor corresponds at the level of operating leverage of the projects to be financed: low and high cash flow variability.

2.1. Participants

Participants were students in their fourth and fifth years of business-related programs at the Universidad Adolfo Ibáñez in Chile. They participated voluntarily and only once in the experiment; the classification of the experimental group was random. There is no statistical difference between the experimental groups of the sample. Participants had a mean age of 22.81 years and had completed or were enrolled at the time in an average of 7.5 finance and economics courses. The average work experience was 3.78 months.

2.2. Materials and experiment

The experiment included two treatment groups. Across them, we varied the feedback received in the business simulation. The first group (success group) played the game and received positive feedback. The second group (failure group) played the same game but received negative feedback. Additionally, we included a control group, who played the game but did not receive feedback. Logistically, we conducted the experiment on a virtual platform for one month. To minimize the transfer of information between students, we chose participants across different years, programs and regions of Chile. The incentive to participate was a bonus on their academic evaluations.

2.3. Procedures

Participants were randomly placed in one of the two conditions (success and failure feedback). Before starting the experiment we gave instructions (detailed in Appendix A) and applied a questionnaire to measure the personal characteristics of the participants (detailed in Appendix B). The questionnaire is designed to collect demographic

information and personal characteristics related to financial decision process as overconfidence, impatience and risk aversion¹. The experiment began with a business game simulation, and concluded with two capital structure decisions.

The treatment consisted in generating experiences of successes and failures in the participants. For this purpose we designed a business game simulation (detailed in Appendix C). We designed a game that emulated random business situations, in order to make participants to think that the results depended on their ability and effort in making decisions. In this game the participants made three sequential investment decisions on a winery company context: (1) lease vs. build wineries; (2) produce wine in bulk or bottled; and (3) local vs. export market. Participants were provided with information for each investment decision. The information included a narrative description of the choice, cash flows and its probabilities. After each investment decision, participants received feedback. This included an outcome and an explication. Those subjected to success (failure), regardless of their decisions, received positive (negative) feedback so as to artificially generate experiences of success (failure) in them. This business game was applied through a virtual platform where the participants entered using a password which allowed them to participate in the experiment only once. In the last stage the individuals assessed the cash flows of two projects with different operational risk levels sequentially (first the low-risk project and then the high-risk project), and assigned a capital structure to each (detailed in Appendix D).

2.4. Results

We verified whether, regardless of the experience of success or failure, the subjects used internal anchors to make financial decisions, i.e., if the capital structure assigned in the first project changed in the second. Table 1 shows the decisions of the control group as well as the student's t-tests to evaluate differences between the leverage assigned to each project.

In relation to the *Hypothesis 1*, Table 2 Column 9 shows the difference between the leverage assigned to each project. Specifically, the control group assigns on average a leverage of 0.43 in the project with low operational risk, whereas it assigns a leverage of 0.39 in the project with high operational risk. Despite the inverse relation between leverage and operational risk, the difference is not statistically significant (Diff = 0.04, $p > .1$). This evidence suggests that individuals use internal anchors to assign leverage because they repeat this decision regardless of the operational risk of the project, i.e., adjustment of the leverage for the high-risk project is insufficient (Hamada, 1972).

For *Hypothesis 2*, in the case of the group of participants with the success treatment, the average financial leverage selected was 43% for both the low and high operational risk projects (Diff = 0.00, $p > .1$). This result indicates that those in the success treatment, did not adjust the capital structure according to the operational risk of the project, and use the financial

¹ (Gervais, S., 2010) indicates that overconfident managers tend to overinvest, initiate more mergers, start more new firms and invest in more novel projects. (Heaton, 2002), (Malmendier & Tate, 2005) and (Malmendier, Tate, & Yan, 2007) observe that overconfidence leads managers to undervalue debt risk with respect to equity, incentivizing higher levels of indebtedness. (Graham, Harvey, & Puri, 2013) report that there is a relationship between the managers' level of impatience and their financial decisions through incentive mechanisms. (Malmendier, Tate, & Yan, 2011) demonstrate that past experiences influence an individual's risk aversion, affecting his financial decisions.

leverage of the initial project, as a reference point or anchor. For the individuals subjected to the failure treatment, we observe that they chose different levels of indebtedness for each project, negatively correlating them with their operational risk. Table 1 shows an average leverage of 45% and 37% for the low and high operational risk projects, respectively, resulting in a statistically significant difference ($\text{Diff} = 0.07, p < .05$). This result suggests that failure experiences generate a change in the decision-making process. The use of internal anchors is replaced by a process based on a rational system that requires a greater level of cognitive effort, improving the quality of the decision from the financial point of view.

Insert table 1

Second, we controlled for personal characteristics such as risk aversion, overconfidence and impatience, as well as demographic variables such as gender, age, academic ranking and experience. To do this, an ordinary least squares (OLS) estimation was performed. The dependent variable is the difference between leverage of the projects with high and low operational risk.

Table 2 shows the estimations of the OLS models. The coefficient of the experimental variable is statistically significant (Column (a) $b = -.11, p < .05$). This result does not reject hypothesis H1 in the sense that the previous experiences of success and failure affect the quality of the indebtedness decision. In other words, the evidence indicates that the success experience determines that individuals adjust the leverage less considering the operational risk of the projects compared to the subjects who experienced failures. Additionally, we see that risk aversion has a negative effect and is statistically significant in relation to the assignment of leverage (Column (a) $b = -.07, p < .05$), indicating that, independent of the experience of success or failure, more risk-averse individuals tend to make greater leverage adjustments between projects with different operational risks.

3. Discussion

Our results are consistent with the *Hypothesis 1* where individuals in the control group keep using system 1, based on internal anchors. The results suggest that, in the presence of two projects with different operational risks and equal expected return, individuals are prone to use the intuition-based system 1 and low mental effort. Specifically, when choosing capital structure in two consecutive projects - low and high operational risk – individuals use internal anchors because they assign leverage to the second project very similar to first. This allows them to perform this task rapidly and with little effort. Nevertheless, an important implication of this is that the quality of the decision is not sufficient, since they do not consider in their evaluation that the second project carries a greater operational risk. These results are consistent with Epley & Gilovich (2005), who indicate that when individuals face complex decisions, some errors in those decisions can be explained by the fact that people think very little. Accordingly, Epley & Gilovich (2005); Epley et al., (2004); Kahneman (2003); Tversky & Kahneman (1973) note that subjects commonly base their decisions on anchors; in other words, intuitive

ways of responding to future problems using past experiences and/or information as reference points². For example, Dougal, Engelberg, Parsons, & Van Wesep (2015) have found evidence that for current loan contracts debtors and creditors use past loan conditions in contracts as anchors or reference points, even if the market conditions have changed.

On the other hand, our result provide support for the hypothesis 2. In this past experiences affect capital structure decisions because people that have failed exert higher cognitive effort and depart from anchors, while successful individuals stick to anchors. This affects the quality of decisions. In line with empirical studies in finance that show that experience influences individuals' behavior, and that they repeat behaviors are consistent with good results and avoid those that are not ((Choi et al., 2009; Kaustia & Knüpfer, 2008; Malmendier & Nagel, 2011; Strahilevitz et al., 2011). For instance, (Malmendier & Nagel, 2011) show that experiences influence an individual's risk aversion, affecting his financial decisions. For example, managers who lived during the Great Depression are averse to using debt compared to those who did not, whereas managers who served during World War II choose more aggressive capital structures characterized by heightened leverage. Consequently, these authors show that past experiences and behavioral traits persist, which help explain the phenomenon of invariability of the capital structure over time, and they link risk aversion and experiences to financial decisions.

Practical implications

Our main findings have practical implications for firms and financial managers. As the behavioral corporate literature suggests there is a relationship between experiences and capital structure decisions. When deciding the financial leverage between two projects with different degree of operational risk, those treated in the experiment with the sense of failure does take into account the operational risk as an input and tries to compensate that risk by diminishing the financial leverage of the projects. From the point of view of organizations the results suggests that current financial decisions made by managers are influenced by factors that affected the success and failure of their past decisions.

An important factor on the quality of these financial decisions is the economic context. As in periods of expansion (contraction) there is a greater (lower) probability of success in business decisions, the influence of these experiences on the decisions that managers will take in the near future will be higher. Thus, the quality of these future choices will be affected by the results of those past decisions made during booms and downturns times, which in turn influence the decisional process used by managers: System 1 or System 2. In a Latin American context, where the business cycle is less stable and more volatile than developed countries, the connection between economic evolution and the quality of the financial decisions is greater.

² Judgment errors would decrease if people were willing to stop for a moment and think a little, thus making an effort before making decisions (Dunning et al., 1990; Epley et al., 2004). Kool et al., (2010) point out that people tend to avoid decisions that require high levels of mental effort or cognitive processing; this behavior is known as the Law of Minimum Effort. Evidence indicates that when a task requires high levels of mental effort and considers high internal costs, decision making can become suboptimal when individuals use heuristics that simplify the answer to these problems (Tversky & Kahneman, 1973).

Finally, from the point of view of the strategic management of the firms, in order to improve the quality of the financial management decisions, firms should develop compensation and retention schemes that not only consider the outcome of the decisions, but also promote improvements in the decisional process thought the time. This point is particularly important for emerging markets firms in the actual economic downturn. For example, punishing too much bad decisions today may be counterproductive for tomorrow's decisions and vice versa. As an example, if a board wants to lower the risk taking in a firm during the next financial crisis, a good solution may not be remove managers that got into troubles in 2008-9 and keep those that did not. For the contrary, a strategic way is to maintain in the organization those who failed and possibly will improve their decision making process.

By using students from business programs with the same academic training in financial matters and who also have similar experience, we avoided the problem of the effect of the differences in experience and training that managers in real life have, and which affect the quality in their decision-making. Still, the interpretation and generalization of our results may be limited by the fact that at corporate level, most decisions are not made individually but, on the contrary, many are assessed and discussed in committees or working groups.

It would be interesting to extend this analysis in two directions. First, one can explore other corporate financial decisions with different levels of complexity and impact on the stakeholder's value creation processes, such as mergers and acquisitions, asset splitting, dividends, the repurchase of shares, and so forth. Second, in terms of the mechanism, we believe one can delve more deeply into understanding the effects that success and failure have on the level of an individual's overconfidence and self-attribution.

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Table 1 - Experimental results and statistical tests. The table reports the mean, 25th and 75th percentile of financial leverage for each treatment group (Success, Failure and Control) and project (Low and high operational risk). Difference in mean shows the difference between financial leverage for low and high operational risk project. *** Statistical significance at 1%; ** Statistical significance at 5%; * Statistical significance at 10%.

	Sequential decision 4 Low Operational Risk				Sequential decision 5 High Operational Risk				Difference in mean (9)
	N (1)	Mean (2)	P25 (3)	P75 (4)	N (5)	Mean (6)	P25 (7)	P75 (8)	
Success	109	0.43	0.20	0.60	110	0.43	0.20	0.60	0.00
Failure	87	0.45	0.20	0.70	87	0.37	0.15	0.60	0.07**
Difference in mean		0.02				-0.06*			
Control	98	0.43	0.20	0.60	98	0.39	0.20	0.50	0.04
TOTAL	294	0.43	0.20	0.60	295	0.40	0.20	0.60	0.03**

Note: The table reports the mean, 25th and 75th percentiles of financial leverage for each treatment group (Success, Failure and Control) and project (low and high operational risk). Difference in mean shows the difference between financial leverage for low and high operational risk project. *** Statistical significance at 1%; ** Statistical significance at 5%; * Statistical significance at 10%.

Table 2. Multivariate tests of the experiment 1. The table reports the OLS coefficients. The dependent variable corresponds to the difference in leverage assigned to two sequential projects of low and high operational risk. Experimental variables identified the treatment group, where 1 represents the success group and 2 the failure group. Risk aversion identifies the subjects' attitudes to risk, where 0 indicates highly risk averse, 1 moderately averse and 2 not very risk-averse. *** Statistical significance at 1%; ** Statistical significance at 5%; * Statistical significance at 10%.

	(a)	(b)	(c)	(d)
Experimental	-0.11**	-0.12**	-0.10*	-0.11**
Risk Aversion	-0.07**	-0.07**		
Time preference	-0.16		0.01	
Overconfidence	-0.04			-0.04
Age	-0.01	-0.01	-0.02	-0.01
Gender	-0.01*	-0.09*	-0.07	-0.07
Experience	0.02	0.02	0.01	0.01
Academic Ranking	0.01	0.01	0.01	0.01
Constant	0.74	0.45	0.65	0.50
N Obs	140	140	140	140
R2 Adjust	0.03	0.04	0.00	0.00
Prob > F	0.14	0.08	0.33	0.30
LR chi2		0.96	5.63	5.27
Prob > chi2		0.62	0.06	0.07

Appendix A-Experiment instructions

Dear students, together with a group of researchers we are studying topics related to decision-making in finance. We are asking for your help and cooperation by responding to a survey published in *webcursos*. To take part, you must be registered in the Experimental Research I course in 2013 - 2014 via the link: <http://webcursos.uai.cl/course/view.php?id=20659>

Once in the course you must take the following steps:

1. Begin to answer the survey directly in webcursos.
2. Save your answers and leave the course.

Your responses are completely anonymous, and we ask that you help us voluntarily in this experiment by giving in your answer by Thursday 20/11/2014 at the latest.

To encourage your participation, your Professor of Finance will add 5 base points to your total score on the third test of the course you are attending, as long as 90% of the students in your section SUCCESSFULLY respond to the questionnaire.

Therefore, you are asked to read the instructions CAREFULLY and answer to the best of your ability.

Appendix B. Questionnaire

- 1 Sex: Male/Female
- 2 Marital status: Single/Married
- 3 Program in which you are registered: Undergraduate business studies/Another undergraduate program - Master in Finance/Master in another topic/MBA/MSc.
- 4 Do you have any work experience? What kind? Employed full time in a position related to finance/employed full time in other positions/internship in position related to finance/Internship in others positions/No, I have no experience.
- 5 How many years of experience do you have?
- 6 Which university admission test did you take? PAA/PSU
- 7 What score did you get?
- 8 What do you think your position is in your class in terms of your undergraduate grades? Above average/Average/Below average
- 9 The accumulated inflation in October 2014 is 5.1%. What ranges do you think the accumulated inflation will be in December 2014?
- 10 The variation of the CPI (inflation) in October 2014 was 1.04% over the previous month, higher than October of the previous year, which was 0.2% monthly. In relation to this, indicate what its projection will be for October 2015. Please indicate three values where the first scenario considers the smallest variation in the expected CPI, the second the most likely variation in CPI and the third the greatest variation in expected CPI.
- 11 Suppose you are the only support for your family and your doctor advises you to change jobs because of allergies. You must choose between two possible jobs
 - A A job with 100% probability of paying your family's monthly expenses
 - B A job with 50% probability of paying twice your family's monthly expenses, but with another 50% probability of paying only 67% of your family's expenses.
- 12 Only if you answered A in the previous question. What job would you have chosen if the options were
 - A A job with a 100% probability of paying your family's monthly expenses.
 - B A job with a 50% probability of paying twice your family's monthly expenses, but with another 50% probability of only paying 80% of your family's monthly expenses.
- 13 Only if you answered B in the previous question. What job would you have chosen if the options were
 - A A job with a 100% probability of paying your family's monthly expenses

- B A job with a 50% probability of paying twice your family's monthly expenses, but with another 50% probability of paying only half of your family's monthly expenses.
- 14 Assume that you will receive a payment of \$1,000,000 a year from now. Suppose that you can advance this payment to receive it today, but you must pay a sum of money. How much would this number be?
 - 15 Imagine you will receive a payment of \$900,000 in the next month, which can go up to \$1,500,000 or drop to \$300,000 depending on whether you are successful. If you could get out of this deal and ensure a fixed payment, what would this amount be?

Appendix C. Business Game Simulation

Business game instructions

The responses are anonymous and analyzed in the form of total sums. Next, we will present three decisions related to the wine business, where you must choose between two investment options. We ask that you read the situations carefully and answer in the most realistic way possible, adjusting for your knowledge, abilities and/or experiences.

At each stage there is **ONLY ONE** correct decision, and success or failure will depend on your skill and ability to evaluate each of the alternatives correctly. For your company to be successful, you will have to make decisions considering all the information available, because the **success of the business will depend on your effort and ability to choose the best option at each stage.**

After each response you will see the results obtained when the same game is applied to a set of 98 executives in Chilean MBA programs.

Business game context

You are the manager of a vineyard located in the Colchagua Valley, recognized as one of the best wine-producing areas in the world. Your company owns 150 hectares of Cabernet Sauvignon vineyards, which are in full production. The company does **NOT** own its own warehouse, having to produce its wine in external warehouses, a concept known as warehouse leasing. This business model has given the company satisfactory results; however, the increase in competition within the industry and more informed clients has determined a new expansion dynamic for the business.

Historically wine sales have grown close to 3% annually, but during the last two years, **this rate has increased up to 5%, initiating a cycle of economic expansion.** This growth is explained by an increase in the amount of wine sold thanks to new consumption behaviors, as well as by a price increase due to the incorporation of technology in the industry which has enabled the production of a better quality wine.

Business game - Investment sequential decisions

Next, three stages will appear where you, as manager of the vineyard, will have to decide on two options that will affect the company’s performance. ***Consider that the company has a 10% annual opportunity cost. At each stage you must consider all the information given, because only one option is correct.***

	Success treatment	Failure treatment																												
Sequential decision 1 “Lease versus Build”	<p>Lease vs. Build: You are evaluating the possibility of building your own warehouse with French technology to produce your wine, and stop leasing this service.</p> <p><u>Lease:</u> If you decide to continue leasing, the return for the next 3 years is estimated to be:</p> <table border="1"> <thead> <tr> <th></th> <th>Investment</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td>Cash Flows (Millions of CLP)</td> <td>0</td> <td>50</td> <td>55</td> <td>60</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Investment	Year 1	Year 2	Year 3	Cash Flows (Millions of CLP)	0	50	55	60						<p><u>Build:</u> If you build your warehouse, you will have to invest 60 million Chilean pesos, and it is estimated that your return in the next 3 years will be:</p> <table border="1"> <thead> <tr> <th></th> <th>Investment</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Investment	Year 1	Year 2	Year 3					
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<p>Feedback sequential decision 1</p> <p>“Lease versus Build”</p>	<table border="1"> <thead> <tr> <th><u>Success feedback treatment</u></th> <th><u>Failure feedback treatment</u></th> </tr> </thead> <tbody> <tr> <td> <p>Lease: Congratulations, you have chosen the correct alternative. In the study conducted on a set of Chilean executives, only 18% were successful. The companies that decided to build failed, as they could not adapt the technology to the particularities of Chile.</p> <p>Build: Congratulations, you have chosen the correct alternative. In the study conducted on a set of Chilean executives, only 18% were successful. The companies that decided to lease failed, as excess demand for leases increased the price of the service.</p> </td> <td> <p>Lease: Too bad, you are part of the minority of executives who decided to continue leasing and failed. The companies that decided to build were successful, as excess demand for leases increased the price of the service.</p> <p>Build: Too bad, you are part of the minority of executives who decided to build their warehouse and failed. The companies that decided to lease were successful, as those that built could not adapt the technology to the particularities of Chile and their costs increased.</p> </td> </tr> </tbody> </table>	<u>Success feedback treatment</u>	<u>Failure feedback treatment</u>	<p>Lease: Congratulations, you have chosen the correct alternative. In the study conducted on a set of Chilean executives, only 18% were successful. The companies that decided to build failed, as they could not adapt the technology to the particularities of Chile.</p> <p>Build: Congratulations, you have chosen the correct alternative. In the study conducted on a set of Chilean executives, only 18% were successful. The companies that decided to lease failed, as excess demand for leases increased the price of the service.</p>	<p>Lease: Too bad, you are part of the minority of executives who decided to continue leasing and failed. The companies that decided to build were successful, as excess demand for leases increased the price of the service.</p> <p>Build: Too bad, you are part of the minority of executives who decided to build their warehouse and failed. The companies that decided to lease were successful, as those that built could not adapt the technology to the particularities of Chile and their costs increased.</p>																								
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<p>Sequential decision 2</p> <p>“Bulk versus Bottled”</p>	<p>Bulk vs. Bottled: It has already been 3 years since your decision to continue leasing, and now the industry is growing at rates of 30% annually. As a result, your management team proposes the following: to stop producing wine in bulk and start producing bottled wine with a label.</p> <p>Bulk: If you decide to continue receiving the wine in bulk, it is estimated that your return in the following 3 years will be:</p> <table border="1"> <thead> <tr> <th></th> <th>Investment</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td>Cash Flows (Millions of CLP)</td> <td>0</td> <td>65</td> <td>85</td> <td>100</td> </tr> </tbody> </table> <p>Bottled: If you decide to receive bottled wine, you will have to invest 150 million Chilean pesos in developing the brand image and positioning the wine on the market, and it is estimated that the flows for the next 3 years will be: _</p> <table border="1"> <thead> <tr> <th></th> <th>Investment</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td>Cash Flows (Millions of CLP)</td> <td>-150</td> <td>120</td> <td>140</td> <td>170</td> </tr> </tbody> </table> <p style="text-align: center;">Strategic analysis of the decision</p> <table border="1"> <thead> <tr> <th>Bulk</th> <th>Bottled</th> </tr> </thead> <tbody> <tr> <td>Low margins and fixed costs</td> <td>High margins and fixed costs</td> </tr> <tr> <td>Low marketing risk</td> <td>High marketing risk</td> </tr> <tr> <td>Low risk in continuing with a business you already know</td> <td>Differentiated product, with low risk of oversupply on the market</td> </tr> </tbody> </table>		Investment	Year 1	Year 2	Year 3	Cash Flows (Millions of CLP)	0	65	85	100		Investment	Year 1	Year 2	Year 3	Cash Flows (Millions of CLP)	-150	120	140	170	Bulk	Bottled	Low margins and fixed costs	High margins and fixed costs	Low marketing risk	High marketing risk	Low risk in continuing with a business you already know	Differentiated product, with low risk of oversupply on the market
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<p>Feedback sequential decision 2</p> <p>“Bulk versus Bottled”</p>	<p><u>Success feedback treatment</u></p> <p>Bulk: Good decision. You have chosen the correct alternative. In the study conducted on a set of Chilean executives only 21% were successful when choosing to lease and sell wine in bulk. The companies that decided to bottle failed, as the market is immature and has not yet learned to assess and consume wine with high added value.</p> <p>Bottled: Good decision. You have chosen the correct alternative. In the study conducted on a set of Chilean executives only 21% were successful when deciding to lease and sell bottled wine. The companies that decided to continue selling in bulk faced an oversupply of wine due to good harvests, which caused prices to drop.</p>	<p><u>Failure feedback treatment</u></p> <p>Bulk: Your decision is incorrect. You are part of the minority of executives who decided to build their warehouse to sell wine in bulk and failed. The companies that decided to bottle were successful as the market valued a wine with high added value.</p> <p>Bottled: Your decision is incorrect. You are part of the minority of executives who decided to build their warehouse and start selling bottled wine and failed. The companies that decided to continue selling in bulk were successful because the market did not value a wine of higher price and quality like the bottled one, and consequently revenues fell.</p>																												
<p>Sequential decision 3</p> <p>“Local versus Export market”</p>	<p>Local vs. Export: It has been 6 years since your decision to lease and sell wine in bulk, and now the industry, after growing at annual rates of 30%, has undergone a deceleration phase with annual growth rates of 5%. Consequently, an external adviser proposes the following project: to stop selling all the wine in bulk on the Chilean market in order to sell 20% of the wine on the foreign market.</p> <p>Local: If you decide to continue selling wine in bulk on the domestic market, it is estimated that your returns in the following 3 years will be:</p> <table border="1" data-bbox="495 1239 1323 1339"> <thead> <tr> <th></th> <th>Investment</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td>Cash Flows (Millions of CLP)</td> <td>0</td> <td>90</td> <td>95</td> <td>99</td> </tr> </tbody> </table> <p>Export: If you decide to export part of the bulk wine, you will have to invest 218 million pesos in commercial tours and export documents with the purpose of positioning the wine abroad, estimating a return in the next 3 years: _</p> <table border="1" data-bbox="495 1533 1323 1633"> <thead> <tr> <th></th> <th>Investment</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> </tr> </thead> <tbody> <tr> <td>Cash Flows (Millions of CLP)</td> <td>-218</td> <td>170</td> <td>189</td> <td>190</td> </tr> </tbody> </table> <p style="text-align: center;">Strategic analysis of the decision</p> <table border="1" data-bbox="495 1696 1323 1906"> <thead> <tr> <th>Local</th> <th>Export</th> </tr> </thead> <tbody> <tr> <td>Avoid the effect of the price of the dollar</td> <td>Greater diversification of the client portfolio</td> </tr> <tr> <td>Greater competition with substitutes (beer)</td> <td>Access to further refinement and spending power</td> </tr> <tr> <td>Lower marketing costs</td> <td>Lower risk of domestic recession</td> </tr> </tbody> </table>			Investment	Year 1	Year 2	Year 3	Cash Flows (Millions of CLP)	0	90	95	99		Investment	Year 1	Year 2	Year 3	Cash Flows (Millions of CLP)	-218	170	189	190	Local	Export	Avoid the effect of the price of the dollar	Greater diversification of the client portfolio	Greater competition with substitutes (beer)	Access to further refinement and spending power	Lower marketing costs	Lower risk of domestic recession
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<p>2 “Bulk versus Bottled”</p>	<p>Local: Congratulations, you have chosen the correct alternative. In the study conducted on a set of Chilean executives only 13% were successful when deciding to lease, produce in bulk and continue selling on the domestic market. The companies that decided to lease, and sell in bulk on the international market failed, as this market did not value an undifferentiated product, which caused exports to decrease. Export: Congratulations, you have chosen the correct alternative. In the study conducted on a set of Chilean executives only 13% were successful when deciding to lease, to produce in bulk and export. The companies that decided to lease, produce in bulk and sell on the domestic market failed, as the beer industry (wine substitute) initiated a price war in the domestic market, causing prices to drop.</p>	<p>Local: Unfortunately, you are part of the minority of executives who decided to lease, produce in bulk and continue selling on the local market and failed. The companies that decided to lease, and sell wine in bulk on the international market were successful, as the beer industry (wine substitute) initiated a price war in the domestic market, causing prices to drop. Export: Unfortunately, you are part of the minority of executives who decided to lease, and produce and export wine in bulk, and failed. The companies that decided to lease and continue selling wine in bulk on the domestic market were successful, as a sudden drop in the dollar caused losses for exporters.</p>
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Appendix D. Capital structure decision

Leverage decision context

As the manager of the vineyard, you must decide to buy some of the following companies to expand your business, where each requires an investment of MM\$ 250. The first task is to buy a company in the same valley dedicated to grape production to make white wine, while the second is to buy another company in the same valley, but dedicated to grape production to make champagne. Indicate your willingness to invest in the following businesses. The data on the return flows in MM\$ with their respective probabilities are next:

- a Company that produces grapes to make champagne (low operational risk project). Score the following from 1 (never invest) to 5 (invest)

Scenario	Probability	Perpetual cash flow
Optimist	33.3%	94
Normal	33.4%	50
Pessimist	33.3%	6

- a Company that produces grapes to make white wine (high operational risk project). Score the following from 1 (never invest) to 5 (invest)

Scenario	Probability	Perpetual cash flow
Optimist	33.3%	172
Normal	33.4%	50
Pessimist	33.3%	-72

 Sequential decision 4 – Low operational risk project

Consider that you will ultimately buy the company that produces grapes to make champagne, for which your bank offers you a credit at an annual interest rate of 10% for a 5-year term. How much debt you would take to finance Chilean MM\$ 250 of required investment? Additionally, you have information from a public study that indicates that the mean indebtedness of wine producers in Chile is 75%. The indebtedness alternatives went from 0% to 100% in 5% increments.

Sequential decision 5 – High operational risk project

Consider that you will finally buy the company that produces grapes to make white wine, for which your bank offers you a credit at an annual interest rate of 10% for 5-year term. How much debt you would take to finance Chilean MM\$ 250 of required investment? Additionally, you have information from a public study that indicates that the mean indebtedness of wine producers in Chile is 75%. The indebtedness alternatives went from 0% to 100% in 5% increments.
