

**VALUE CREATION IN VENTURE CAPITAL INVESTED COMPANIES
THROUGH EXECUTIVE COMPENSATION BASED ON PERFORMANCE
EVALUATION**

RODRIGO PEREIRA GREGORY, MSc

Universidade Federal de Santa Catarina

LETÍCIA KERN DA ROSA, BA

Universidade Federal de Santa Catarina

CESAR MEDEIROS CUPERTINO, Dr.

Universidade do Vale do Itajaí

REINALDO DE ALMEIDA COELHO, Dr.

Universidade do Estado de Santa Catarina

Summary

In companies invested by venture capital funds entrepreneurs usually take both the roles of shareholders and executives. However, their interests are not always fully aligned with those of investors, as they can come to prioritize their short-term compensation through salaries and bonuses at the expense of obtaining a higher company value in the long run. This can lead to an agency problem as the fund seeks to maximize the company's value since, at some point, there is an expectation that their shares will be sold in order to obtain return on the invested capital. In this context, the purpose of this work consisted in proposing an executive compensation model for companies invested by venture capital funds that aligns the needs of the firm's executives in obtaining short-term gains with those of the shareholders, especially investors and investment managers that seek return by increasing the value of their shares. A literature analysis was performed in order to look for the fundamentals regarding this issue, which allowed the determination of the main value drivers that impact the valuation of companies, and the performance indicators associated with them. Additionally, 280 panel regressions were carried out using data from 23 Brazilian technology based companies between the years 2012 and 2014, that were invested by a Brazilian venture capital fund. The goal was to assess the relationship of executive compensation with different revenue and profitability measures of companies, as gross revenue, net revenues, EBITDA, and net profit, taking into account the impact of inflation, budgeted vs. actual performance, and lagging. The results points out that it is possible to propose a fixed, variable and total executive compensation determination model that takes into account the important variable identified in this study that could be directly applied by small and medium size high tech companies.

Keywords: Compensation, Performance evaluation, Agency Conflict.

Thematic Area: Controladoria e Contabilidade Gerencial (CCG).



1. Introduction

Maximizing the company's value, which results in maximization of shareholder value, is one of the main objectives of the companies that seek profit, among other goals. This is particularly important for investee companies by venture capital funds since, being high-risk projects, they are expected to be high return investments (GOMPERS, LERNER, 2001). Increasing the company's value is the work of the executives assigned to business management roles. In companies invested by venture capital funds, entrepreneurs, in most cases, take on both the roles of shareholder and executive. Some investors in startups claim that the investments allocated to the company are made, in fact, in the entrepreneurs, as they are usually the ones who have the technology and knowledge of the business at this early stage of the project. In other words, the entrepreneur "is the business" and without it the company loses much of its value or may possibly cease to exist (MACMILLAN; SIEGEL; NARASIMHA, 1986).

According to Brealey, Myers and Allen (2008), managers are concerned about their own future and, in some cases, this can cause them to make decisions that conflict with the interests of shareholders, i.e. leading to maximization of return to the managers, not necessarily to the shareholders. In this way, as entrepreneurs are at the same time, shareholders and executives, their interests are not always the same as those of investors in maximizing the company's value. Due to various factors such as the difference between risk profile of the fund and of entrepreneurs, the latter are likely to prioritize their short-term compensation through salaries and bonuses at the expense of maximizing the company's value in the long run (ARTHURS; BUSENITZ, 2003). This situation fits into the Agency Theory, which, according to Eisenhardt (1989), occurs when the relationship between the principal (shareholder) and the agent (executive) possess different objectives and risk profiles. Managers therefore will act only in accordance with the interests of shareholders when they have the right incentives, and these depend on how the performance of managers is assessed and rewarded, as shown by Brealey, Myers and Allen, 2008.

Companies invested by venture capital funds have a relatively short time to be able to significantly increase their value and, consequently, bring high returns for investors and other shareholders. Therefore, it is necessary that these companies have a compensation system for executives aligned with the performance indicators that consequently comprehend the value drivers that will maximize the company's value. In addition, it is common that shareholders, including investors, approve the total compensation of managers. The negotiation of fixed and variable salaries can be turbulent, in some cases leading to future relationship problems between investors and executives, who might also be the entrepreneurs themselves. As funds invest in companies with long-term goals, it is essential that the relationship between investors, entrepreneurs and executives be preserved. Based on the issues depicted above, the objective of this article is to present a compensation model for executives of companies invested by Venture Capital-VC funds that is aligned with the company's value drivers. The most relevant value drivers to these companies in many cases come from valuation methods base on multiples of comparable companies, like net revenue and EBITDA, as explained later in this work. Next, section 2 presents the Literature Review, section 3 presents the Data Collection and Definition of Variables, section 4 presents the Data Analysis and Results, and section 5 the Conclusion.

2. Literature Review

2.1. Venture capital

A long-term investor, according to Leite and Souza (2001), builds a portfolio of assets with risk and return characteristics that differ from the ones of a stock market portfolio. This



provides the possibility to obtain higher returns than the market, being thus subject to a higher risk and also less liquidity. Among these investors are the venture capital funds, which estimate the risk in terms of probability of commercial failure, that is, the more likely a company is to enter bankruptcy, the higher the risk (TYEBJEE, BRUNO, 1984). These investments are considered high-risk based on various factors, such as illiquidity of assets, remunerate investors with potentially high returns and bridge the gap of the need of entrepreneurs for resources to fund innovative ventures (ZIDER, 1998). The returns are related to the ability of fund managers to identify the high growth potential opportunities in small and medium start-ups or companies already in the market but in need of capital and organization for development (ROSA; RAADE, 2006).

According to Tyebjee and Bruno (1984) the venture capital investment process consists of five steps: 1) prospecting investment opportunities; 2) screening, a phase in which most of the proposals are rejected based on the fund's investment criteria; 3) valuation, in which the opportunities are evaluated in detail; 4) structuring of the business, which is the detailed negotiation between the entrepreneur and the investor; 5) post-investment activities in which the venture capital fund contributes to the growth of the company. Finally, these investments end with the exit of the fund, usually when the company opens capital or is sold to strategic investors (GUPTA; SAPIENZA, 1992). In Brazil, despite venture capital initiatives arising at the end of the 70s, one could say that the industry was only established after the stabilization of the national currency in the mid 90's (FURTADO; LOPES, 2005).

The managers of venture capital funds have several responsibilities, being the first of them to oversee the relationship with the investors who provide the capital (GOMPERS; LERNER, 2004). The influence of investors in the company, however, is stressed by Beckman, Burton and O'Reilly (2007), who affirm that the venture capital funds, when controlling the management team, can positively influence the company's success. The relationship of managers with entrepreneurs, thus, is equally important. The work of Macmillan, Siegel and Narasimha (1986) illustrates this issue by comparing venture capital with horse races. The authors point out that regardless of the horse, that is, the company's product, the jockey, being the entrepreneur, is the one who is largely responsible for the final outcome. Beckman, Burton and O'Reilly (2007) assert that companies with high-level entrepreneurs are more likely to conduct an IPO in the future. In addition, the authors highlight the importance of entrepreneurs' previous experiences and of having a management team in the company.

According to Sahlman (1990), no agreement entered into between entrepreneurs and venture capital funds can anticipate possible disagreements and conflicts, which explains, in part, the fact that investors closely monitor the operation of its investees. Among the activities of the funds in the company are participating in the council, assisting in recruitment and Compensation of key personnel, developing tactics and strategies as well as relationships with suppliers and customers. In addition, the VC investment manager has a key role in fundraising besides mergers and acquisitions transactions (SAHLMAN, 1990).

2.2. Agency theory and executive compensation

According to Jensen et al. (2004), poor corporate governance structures can lead to compensation practices that may destroy company value. In effect, companies with poor governance have greater possibilities to develop agency problems. In addition, executives of these firms receive higher salaries than other companies and produce worse results (CORE; HOLTHAUSEN; LARCKER, 1999). The agency relations happen, according to Jensen and Meckling (1976), when a person is hired by someone to perform a certain activity on their behalf, there being, in this case, delegation of authority. The contractee, or principal, expects



the contracted party, called the agent, to act in order to maximize the results of this activity by working in accordance with the interests of the former. So that the relationship between principal and agent is maximized, the first must monitor the second's behavior and offer encouragement. These expenditures with monitoring and incentives are called agency costs (EISENHARDT, 1989).

Despite the fact that the Agency Theory has been initially developed to illustrate the context of relations between shareholders and managers of listed companies on the stock market, Arthurs and Busenitz (2003) argue that the logic can be used to explain the relationship between venture capital funds and entrepreneurs. Since entrepreneurs usually take on two roles, the shareholder and the executive, in some cases they are likely to wish to increase their income in the short term (as executives), due to the high probability of this type of business not being successful, in exchange for greater profitability in the future (as a shareholder). This may happen, for example, when the entrepreneur makes the decision to have a higher level of Compensation. In this context, the agent needs to be motivated so that, in the role of manager, the executive may act in order to be in agreement with the shareholders as much as possible.

When VC funds' goals are aligned with the entrepreneurs', the problem in theory ceases to exist (ARTHURS; BUSENITZ, 2003). Thus, Eisenhardt (1989) suggests that funds should offer incentives and conduct monitoring to achieve the goal to protect or mitigate the possible agency problems. Compensation packages, including fixed and variable Compensation, seek to minimize the effects or differences of interests between principal and agent (DITTMANN, MAUG, 2007). The Compensation, according to some authors, consists in the most effective method to suit the interests of principal and agent, as the benefits that shareholders grant, when properly employed, tend to motivate executives to make the company achieve better results (JENSEN; MURPHY, 1990; GAREN, 1994; KYRIACOU; MASE, 2006; HARRIS, 2009). Jensen et al. (2004) concluded that corporate governance is closely related to Compensation policies. The second is how compensation varies depending on the observed performance. Most of the literature on executive compensation deals with the relationship between the CEO and the value creation for shareholders, being the CEO better compensated when they create greater value for shareholders (MURPHY, 2012). According to Balkin and Gomez-Mejia (1987), compensation is one of the most complex and important systems management given that it simultaneously encourages the search for a better performance and aligns the actions of people with the strategic goals of the company. Through compensation, the individuals' efforts are channeled to meet the strategic objectives of the business and, when well designed, can significantly increase the results of the company (GOMEZ-MEJIA; WELBOURNE, 1988).

As pointed by Murphy (1999), compensation may appear in a variety of wide-ranging forms from base salary, annual bonus and long-term incentive to different forms of equity compensation. Despite the large variety in Compensation practices between companies, most compensation packages have four components: fixed salary, annual variable bonus, stock option and long-term incentive plan. Although companies apply different forms of compensation, the use of a variable compensation took off along with the wave of quality programs and organizational improvements. Steinberg (2003), however, suggests that the company should endeavor to set a fixed component of Compensation that ensures the executive savings capacity. Most discussions on executives' incentives in the United States are exclusively focused on incentives based on shares, since the change in wealth of the executive by the stock price variation is more significant than any other form of compensation (HALL; LIEBMAN, 1998). Murphy (2012) points out that, from a behavioral perspective, the annual bonus plans based on financial metrics can be as important as stock compensation in



order to direct the activities of the executive. In this sense, the author argues that CEOs generally understand how to increase the financial results by increasing revenue and reducing costs and expenses, but do not understand how their actions affect the price of the company's shares. Indeed, the variable salary based on the company's result metrics could generate a stronger incentive than those based on equity, even if the compensation is smaller in magnitude.

2.3. Valuation

Despite the large use of the discounted cash flow method as shown by Pintado et al. (2007), methods based in multiples of comparable companies are used very often, particularly when the VC managers are looking for liquidity. Due to the highly subjective assumptions made by asset pricing models such as discounted cash flow, investors regularly use the valuation by Multiples (LIE, LIE, 2002). Some examples of applications of this method can be seen in Berk and De Marzo (2013) and Damodaran (2006). These methods are widely used because, despite the limitations, they do not depend on the cost of capital or the CAPM once they are based on market parameters. These parameters are developed by taking into account prior negotiations involving mergers and acquisitions of other companies. For this, publicly listed companies are generally used, in which multiples can be easily calculated by dividing the value of the company by the selected factor, like earnings example. Each of the multiples has its advantages and disadvantages as shown by Damodaran (2006), and can be best applied to business of different sizes and different industrial sectors. The valuation using multiples rely heavily on some measures of revenue or earnings. Thus, it can be said that these variables are critical parameters in determining the value of an asset.

2.4. Performance Evaluation

Performance measurement and management systems have been the focus of many studies, which resulted on different concepts being available throughout the literature. Henri (2008), for example, gives the performance evaluation system the role of cushioning the tension between creative innovation and the achievement of goals in business, balancing the major organizational dilemma between control and flexibility. Ahn Cao and Chrétien (2009), however, define the performance evaluation as a trade-off analysis tool between different criteria for the evaluated object, such as risk and return. Wouters & Wilderom (2008), on the other hand, advocate a broader approach, in which a performance evaluation system, even before the implementation of action plans for decision-making, aids top management in formulating an organizational strategy, establishing goals, monitoring strategic objectives and aligning expectations. Several studies have come to advocate the use of more balanced metrics (NEELY, 1999). The Balanced Scorecard, one of the most outstanding work on performance evaluation, both in the academic as in the business world, arises in this context. The Balanced Scorecard consists of a simplified approach on performance management of a company or organization that uses balanced indicators into four integrated dimensions, allowing it to be more focused to long-term metrics instead of purely financial metrics (KAPLAN; NORTON, 1992).

Despite its simplicity, the Balanced Scorecard is not a model that can be applied directly in business in general. In other words, companies need to make customizations to the template including its mission, strategy, technology and culture (KAPLAN; NORTON, 1993). This change in concept and approach can also be found in the work of Bititci et al. (1997), with the classification of performance evaluation as an information system used by managers as a support for decision. The initiative for a performance evaluation system in an enterprise, according to Townley, Cooper and Oakes (2003), should take place in the different



hierarchical levels so that it is not only supported, but also built covering essential aspects to the success of business. In this sense, systems built in a top-down manner, even if well-intentioned, would be much more likely to fail given that they would not contain important information of the other employees, thus being incomplete. The involvement of executives, however, is critical and must occur intensely (SCOTT; TIESSEN, 1999). In addition, according to Bititci (2006), when the performance evaluation system is successfully implemented and well used in a company, the chances of a cultural change, which leads to a more participatory and consultative management style, are raised. Despite the evolution of the different approaches, the concept of financial performance is still dominant in empirical research. Moreover, there is no consensus among researchers about which indicators should apply to performance evaluation systems (CARTON; HOFER, 2006).

The difficulties involved in measuring performance in some cases, especially the CEO's, are illustrated by Murphy (2012). The president's contributions to the increase in value of the company are not, in most cases, directly measurable. In addition, the possible evaluation metrics will inevitably exclude ways in which value is generated, and will include effects of factors that are not related to the CEO's efforts and will cease to reveal the ways in which it destroys value. Indeed, the challenge of designing an incentive plan is to choose the performance evaluation measures that capture important aspects of the executives' contribution to generate company value and, at the same time, recognize that there are limitations, which can cause unintended side effects (MURPHY, 2012).

3. Data Collection and Definition of Variables

The general objective of the work is to develop a Compensation model for executives of Brazilian emerging companies invested by venture capital funds. Therefore, it is important to analyze the existence of the relationship between the Compensation of executives of Brazilian companies invested by venture capital funds with different performance measures.

As there is a great difficulty in obtaining data from privately held companies in Brazil, especially from companies invested by venture capital funds, the work was done only from the data of companies invested by the Criatec Mutual Investment Fund of Emerging Companies. This alone makes of this study a pioneering work and of great relevance, due to the lack of data available to this time.

Criatec is a venture capital fund of BNDES (National Bank for Economic and Social Development) and BNB (Bank of the Northeast), with a nationwide presence focused on technology-based early-stage companies. Although the fund has made thirty-six investments since its inception in 2008, data were obtained from only twenty-three companies in the portfolio. The reduction in the number of companies is justified by the exclusion of companies that did not earn revenues in the period and those that had already been disinvested in the period selected. The observations were obtained on an annual basis for the period from 2012 to 2014. The year 2012 was chosen because it was the year that the fund approved the last investments and the year 2014 because it was the last period in which data was available.

Different measures of compensation of executives and of the companies invested by the fund Criatec were collected from the years 2012 to 2014. The values called "realized" in the tables above are the real data obtained in each one of the periods by the companies. The data classified as "budgeted" are the different measures planned by the companies for a given year, as a result of the planning carried out by the company executives. Gross Revenue (GR), Net Revenue (NR) and Net Income (NI) represent the basic measures that constitute the Income Statement. The EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization), is a non-accounting measure widely used by the market and has a clear definition in the literature. Compensation measures represent the total gross amount paid to company



executives in a given year. The fixed compensation represents the sum of the monthly salaries of the executives paid during the year. The variable compensation represents the total excess compensation paid to managers during the year. The total compensation is the sum of the first two.

Just a few companies had some kind of variable compensation for their executives. Thus, the analysis containing only the variable compensation were made with the 16 observations available. Comparisons with the fixed compensation and with the total compensation took into account all the 69 observations of the 23 companies. An analysis of the fixed and total compensations of the 16 observations containing both fixed and variable compensation was also made, that is, excluding cases where the variable compensation was zero, in this work denominated filtered fixed compensation and filtered total compensation. The variables called corrected in this work represent the updated data for 2012 and 2013 with the National Consumer Price Index (IPCA) inflation index of 5.91% and 6.41% of the years of 2013 and 2014, respectively. Finally, an analysis was also made of the performance measures of one year $t-1$ with the Compensation of year t . The performance variables used in this regression were referred to as "time shift".

4. Data Analysis and Results

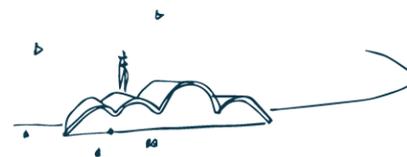
4.1 Data Analysis

The study involved twenty-three companies invested by a Brazilian venture capital fund focused on early-stage technology-based companies in the years from 2012 to 2014. Table 4 below shows that, companies showed a high growth. The gross revenue of the portfolio of companies used in this work grew by 43% in 2013 and increased to R\$161.9 million in 2014, representing an accumulated growth of approximately 74% in two years. Net revenues show similar growth to revenues. On the other hand, EBITDA, which was negative in 2012 and represented -1% of net revenue, is 8%, representing a growth of 108% in the last year. However, the net income of the portfolio shows negative values in all periods, which suggests that companies are still using funds from the fund and third parties to finance growth. Compared with the values in the table above, it is possible to observe that all realized values of the sum of the portfolio were below what was budgeted. In addition, the difference between budgeted and realized increases when observing EBITDA and net profit values. Linking executive compensation to both revenue and gross revenue and profitability measures such as EBITDA and net income could cause the difference between planned and realized to decrease.

Through the regressions we sought to identify how the performance measures explain the compensation measures for the data collected. More specifically, it was analyzed how gross revenue (ROB), net revenue (ROL), EBITDA and net income explain the fixed, variable and total compensation of the executives of these companies. These performance variables were chosen because they influence the evolution of the company's value. The first step before the analysis consisted of defining the most adequate regression type for the data.

In this work the panels were constructed with three time series, that is, one for each year (2012 to 2014) and twenty-three cross-sections for the cases in which the variable compensation effect was not evaluated and up to seven for the latter. In the first case, that is, with all the observations, the panels generated are balanced because it contains in the three years the twenty-three observations. Indeed, in cases where data are reduced because of variable compensation, the panels are unbalanced since the number of companies with variable compensation (four in 2012, five in 2013 and seven in 2014) increases over the years.

In addition, in the case of the time displacement, which will be better explained later, a period of time was lost maintaining the cross sections, that is, the different companies.



Performance measures were defined as independent variables and those of compensation as dependent variables. The software was used to combine the variables one by one and then to perform the panel regressions. As a result 280 panel regressions were generated. Regressions considered meaningless were then discarded, for example, those that combined filtered data with unfiltered data or inflation-corrected data with uncorrected data. An example of a meaningless combination would be NR (total observations) with the total compensation filtered (reduced observations). In effect, for example, the NR combinations with the total compensation and the NR filtered with the total filtered compensation were maintained, maintaining consistency in the number of observations of the companies' data. After this filtering, 50 regressions were left that will have their results discussed below.

The regressions were evaluated based on R^2 , that is, the coefficient of determination that indicates how much the model can explain the observed values. In other words, it can be said that R^2 represents the percentage of the variation of the dependent variable (in this case the compensation measures) which is explained by the independent variable (in this case the company performance measures). Although the adjusted R^2 is also presented, the R^2 was used because the regressions have only one independent variable. We also evaluate the F and t statistics of the regressions and coefficients, respectively. In this paper, we expect a level of significance of at least 10% for these statistics.

Finally, the Hausman test was applied to determine which panel regression method (fixed effects model or random effects) would be more appropriate in each of the regressions. In the cases the fixed effect regression was recommended, the Panel Least Squares method was run. In the case of random effects, the EGLS (Cross-section random effects) Panel was used.

4.2 Results and Discussion

Table 1 presents a summarized view of the R^2 of the panel regressions performed in this study, about which the discussion present further bellow is based.

Table 1 – Summary of R^2 from the Panel Regressions

	Values of R^2				
	TOT	FIX	TOTF	FIXF	VAR
Performed GR	76,61%	70,65%	81,66%	95,37%	90,27%
Performed NR	75,50%	69,69%	82,17%	95,53%	90,39%
Performed EBITDA	21,08%	16,49%	45,19%	42,63%	90,32%
Performed NP	7,19%	5,18%	8,52%	9,19%	16,17%
Budgeted GR	95,54%	55,12%	86,75%	87,46%	90,47%
Budgeted NR	95,82%	63,73%	76,34%	80,09%	91,21%
Adjusted GR	76,62%	70,75%	81,52%	95,00%	91,01%
Adjusted NR	75,88%	70,24%	82,68%	73,23%	91,21%
Last year's GR	74,88%	63,88%	99,96%	71,31%	77,20%
Last year's NR	78,50%	68,65%	98,29%	72,13%	76,97%

The gross revenue variable (GR) was combined with the total compensation (TOT) and fixed compensation (FIX) variables, while the filtered gross revenue (GRF) was combined with the filtered total compensation (TOTF), filtered fixed compensation (FIXF) and variable compensation (VAR). In this work, where filtered (reduced) compensation measures such as filtered total compensation, filtered fixed compensation and variable compensation are



implied, it is implied that it was combined with a filtered performance measure, filtered gross revenue, even if in the analysis the term gross revenue or GR is used instead of filtered gross revenue or GRF. This rationale applies to all the analyzes carried out below. Data analysis shows that the three regressions have good data adjustments. The regression of the total compensation has a R^2 of 76.61%, while the fixed compensation reached a value of 70.65%. Already the filtered total compensation reached an R^2 of 81.66%. The other observations had higher R^2 values, namely 95.37% for the fixed and 90.27% for the variable, but presented problems in the significance of the coefficients, impairing the reliability of the results.

These problems in the significance tests may be due to the small number of observations in the filtered data. One way to try to mitigate problems would be to redo the regressions by forcing the intercept to zero, for example. This, however, would be economically unviable because even with a zero turnover the company needs to pay its executives. The results of the net compensation regressions were similar to those of R^2 in terms of gross revenue. The values for total, fixed and total filtered compensation were 75.50%, 69.69% and 82.17%. As in the previous analysis, the highest result was the total salary filtered, which is slightly higher than the observed for GR. The lower value of R^2 for total compensation also occurred in the analysis of gross revenue, with the value observed in the regression with NR being slightly lower than in the regression with GR. The same pattern of R^2 values above 90% was also observed for the measures with problems in the t-test, with fixed compensation obtaining a R^2 of 95.53% and the variable with 90.39%.

Comparatively, the results of the regressions with the GR are similar to those of the NR, and the first one had two of the three regressions with the best R^2 results. In fact, it can be said that for the observed data both gross revenue and net revenue have a good adjustment to the compensation measures. The analysis of the results of the regressions with EBITDA shows that all of them pass the F test with a level of significance below 10%, with statistical F values below 1%. Different from what happened with GR and NR, four of the five regressions of the EBITDA with the measures of compensation pass in the test t with level of significance below 1%. However, the regression with the variable compensation has a significance above 77% for the coefficient, being 10% suggested. The regressions that passed the tests can be visualized in figures 8, 9, 10 and 11 along with the distribution of EBITDA measures with the different types of compensation.

Different from what was observed with gross revenue and net revenue, the inclusion of EBITDA generates lower R^2 regressions. In the cases of total and fixed compensation, which contained all companies, the coefficient falls to 21.08% and 16.49% respectively. In the regressions composed of the total filtered compensation (45.19%) and fixed (42.63%) the R^2 generated are below the cases in which these compensation measures were combined with the gross and net revenue, but above the two measures of EBITDA without the filtered data. As in the GR and NR analyzes, the R^2 values of the filtered data are larger than the others. This may suggest that, for this work, companies that practice variable compensation have a greater adjustment of performance measures with the compensation measures. The net profit regressions, unlike the other variables, presented problems in the significance of the F test for three of the five regressions, namely total filtered, fixed and variable fixed compensation. The first two had significance levels above 25%, while the latter was slightly above the desired 10% (12.26%).

The same measures of compensation also presented problems in the significance of the coefficients (test t), and the variable compensation presented a value of 10.52% for the coefficient, slightly above the significance of 10%. In the case of total and fixed compensation, although both have passed the tests, they present results for tests F and t above that observed with the measures of GR, NR and EBITDA. Although the variable



compensation was not within the desired parameters, the graph of the data will be shown with its regression since, for the net profit, it was slightly above 10%. The regressions of compensation with the net profit had the worst values of R², that is to say, the percentage explained in the variation of the compensation by the equation from the profit variation is smaller than in the panel regressions that used the other measures of performance.

Similarly to what happened in the previous analysis with EBITDA, R² in the combination with total compensation was higher than that observed in fixed compensation (7.19% versus 5.18%). The variable compensation presented a coefficient of determination of 16.17%, higher than the others. The total filtered and fixed filtered compensation measures, which also did not pass the tests, presented lower values of R² (8.52% and 9.19%, respectively). These observations suggest that, for the companies in this study, the measures of GR and NR have better results than EBITDA, which in turn was better than profit. In fact, regression results tend to worsen both in terms of R² and in statistical tests F and t when "falling" in the DRE of revenue for profit. In addition, it can be suggested that the variations in EBITDA and mainly in net income explain little the variations in the Compensation of the companies evaluated in this work. The regressions with the gross revenue instead of the historical one, that is, that actually performed by the company passed the F test with significance below 1% as can be seen in the table above. For the only test that did not pass the test was the regression with variable compensation, with a level of significance of 65.71%. Unlike the historical GR, the regression with filtered fixed compensation passed the statistical tests.

The inclusion of GR and NR budgeted in the panel regression with the total compensation yielded expressive R² values, namely 95.54% and 95.82%, respectively. Compared with historical figures there was an improvement of approximately 20 percentage points. For the fixed compensation, however, the inclusion of the budgeted measures worsened the results found in the combination with the GR and NR performed in approximately 16 percentage points for the first, falling from 70.65% to 55.12% and 6 percentage points for the Second (69.69% to 63.73%). In the filtered data, it was only possible to analyze the combinations with the total compensation. When comparing the budgeted with the one performed in the case of GR, an improvement in R² values is observed from 81.66% to 86.75%. For NR, the regression with budgeted amounts generates R² smaller, falling from 82.17% to 76.34%. Regressions of fixed compensation filtered with gross revenue and historical net revenue did not pass the significance tests. In this way, it was not possible to compare the budgeted values with those performed.

Despite of that, it can be seen that the regressions of GR and NR (filtered) with the fixed compensation presented R² values slightly higher than when combined with the total filtered income. Analysis of the data shows that it is difficult to suggest whether the budgeted or realized figures have a better fit to the compensation measures. For the GR, the budgeted showed a higher R² in two of the three observations. For NR, the reverse occurs. For the total performed compensation, the regressions with the budgeted showed better coefficients of determination. In fixed compensation regressions with historical GR stand out. For the determination of the model, since some values have a better fit in the budgeted and others with performed, the decision to use performed or budgeted values will be determined by other factors as will be shown later.

The impact of inflation on panel regressions was also analyzed by correcting the revenue and compensation data by IPCA indexes for the years 2013 and 2014. The results of these adjustments are shown in tables 13 and 14 below. Regressions with corrected historical gross revenue passed the F test with significance below 1%. For the t-test, the same was observed as the one observed in the NR analysis, that is, the corrected regressions with fixed



compensation and variable compensation did not pass the test because they presented significance for the intercept and for the determination coefficient of 71.51 % And 74.38%, respectively. The impact of inflation on the data, as could be seen above, was slightly positive, with an improvement of approximately 0.5 percentage points for NR, but practically without changes in GR. The only occasion on which there is no improvement in data is the regression of total filtered revenue combined with gross revenue which, when corrected, results in the R2 falling from 81.66% to 81.52%. Although the improvement in the values of R2 as a consequence of the correction was small, for the companies in this study inflation had little influence on the data. However, it is a variable to be considered in the analysis, especially in the application of the model. In fact, during the elaboration of the executive compensation model, the issue of inflation will be discussed.

The third analysis consisted of evaluating the impact of the temporal shift of part of the data pair on the panel regressions. In other words, the data pairs with the compensation and revenue measures that in the previous analyzes were the same year, in this analysis will be compared with a difference of one year. More specifically, new combinations were created in the data pairs using the Compensation of a given year, for example 2013, with the gross and net revenue measures of the previous year, ie 2012. Additionally, Data already corrected for inflation in the previous analysis. It is also important to note that, due to the time displacement, one year was lost in these regressions, since the revenue measures of 2012 and 2013 were combined with the compensation data of 2013 and 2014, respectively. For NR with time displacement, the regressions also presented results for the F test below 1% as can be seen in Table 17 above. In the t-test only the regressions with total compensation, fixed compensation and fixed were significantly below 10%. The filtered total compensation, however, was close to the established limit, with values of t of 0% for the angular coefficient and 11.02% for the intercept.

However, when the impact on regressions with total and fixed compensation is evaluated, there is a fall in R2 of 1.7 and 6.8 percentage points, respectively. For NR it is also possible to compare these last two compensating measures. When evaluating the net income with time displacement with the total salary there is an improvement in R2 of 3 percentage points. However, when observing the fixed compensation, it can be seen that the value falls by approximately 1 percentage point. The net revenue regression with total filtered earnings, as seen above, had a slightly higher significance than that established in test t. This regression presented a R2 very close to that obtained for the GR with time shift combined with the total compensation filtered, reaching a value of 98.29%. In addition, this adjustment in NR represents an improvement of approximately 16 percentage points in relation to historic NR.

The highest value of R2 found in the different regressions that presented significance below 10% in the t and F tests was obtained by the time displacement of the corrected gross revenue filtered with the filtered total compensation. Most of the regressions that did not pass the tests failed to present a significance greater than 50%. In the temporal displacement, the three regressions that failed had a significance below 18%. In addition, as mentioned, the NR regression with the filtered compensation, which was one percentage point higher than required, presented a value of R2 quite close to that observed for the GR. Although there has been no improvement for all the regressions in this study, it may be important to correlate executive compensation for a given year with what was observed in terms of results in the previous year. In fact, the temporal shift will be discussed in more detail in the next section dealing with the elaboration of the compensation model.



4.3 Model Proposition

Based on the analysis of the previous section, some observations can be made on the relationship between the performance and compensation measures of the companies studied. The first is that gross and net revenue are the performance measures that best fit the executives' compensation compared to EBITDA and net income. The large difference between R² values observed when using EBITDA and profit as performance measures, might be due to the fact that companies from the study are relatively small companies, still with little governance and that were recently invested by venture capital funds. This context may have contributed to the low coefficients of determination for EBITDA and for profit, as these companies have not yet been able to generate significant gains in the first years of investment.

In addition, the initial investment years of the fund cause additional impacts, since companies usually have smaller earnings in the following years after the investment that many times are accounted as expenditures, such as new hires, marketing and sales expenses, R&D investments. All of them tend to hurt earnings. In addition, the revenue measures tend to work better for a compensation model focused in such companies because they are subject to lower variations over time than the earnings measures. The differences between net and gross revenue in the regressions were not significant. Indeed, the proposed executive compensation model could use gross revenue as a metric to define compensation with executives without major losses.

Gross revenue was the measure that reached the best R² in all regressions in the GR pair with time shift combined with the total filtered compensation (99.96%). However, comparing the regressions of GR and NR, the second presented better determination coefficients in seven of the thirteen possible comparisons. The proposal to use net revenue in the executive compensation model that will be presented is mainly based on the fact that NR expels some effects that can distort revenues, such as discards that are often caused by revenue incentives based on billing. The overall objective of the work is to create a model that suggests the compensation of executives based on some measure of performance in order to avoid possible conflicts in the wage negotiations that may happen between executives and shareholders or, in the context of this work, between entrepreneurs and other executives and investors, respectively. In addition, the model must be capable of linking, in some way, the compensation to the shareholders' long-term interests.

As observed in the previous analysis, the different regressions with variable compensation failed in all t-tests, that is, they were above the suggested level of significance. This may have been due not only to the fact that few companies have made a variable compensation, but also because they may have used different criteria and targets for payment, as well as having defined different amounts to be paid in the event of achieving the goals. In addition, the amounts paid by some companies may have been related to a partial achievement of the targets, which could have contributed to the unsatisfactory result of these regressions. In fact, it is proposed to use the total compensation of executives in the model, which includes fixed and variable compensation, as a way to meet the above mentioned points. It should also be noted that, as well as net revenue, the regressions that contained the total compensation presented, in general, a better adjustment of the coefficient of determination in the different analyzes when compared to the fixed and variable compensation.

The Compensation that will be proposed for a given year t will be established based on the net revenue measures. However, it can be related to the performed net revenue values of the previous year $t-1$ or to the projected values for year t . The regressions made on the total compensation of executives in relation to the net revenue observed in the previous year and on the net revenue budgeted for the period presented R² values of 78.50% and 95.82%, respectively. In the filtered data, to carry out the comparison, it is necessary to consider the



NR case that was slightly above that stipulated for the t test. In this case, the observed values were 98.29% and 76.34%. If the filtered regressions were considered, the best R² would have been 98.29% of the case with time displacement. If only regressions with significance below 10% were used, only a comparison can be made and in this case the budgeted measure stands out with time displacement.

One factor that would not be convenient about using the budgeted net revenue for the period is that executives may not achieve projected NR. In this scenario, the company would spend resources to pay the fixed compensation of executives without being sure of the attainment of the net revenue used to determine such salary. The suggested option for the elaboration of the model, therefore, is to use the net revenue observed in the previous year to determine the total compensation of executives in the current period. The model, in this way, will suggest the total compensation of executives for a given year t based on the net revenue performed in t-1. For the different regressions that used the measures of net revenue a good adequacy of the same, with values of R² above 75% was observed. The following figures show the regressions combining the data from the previous year's net revenue with the total compensation of the companies as a whole and those that worked with some type of variable compensation, that is, of the filtered data. For the former, a R² of 78.50% is observed, and for the latter a value of 98.29%, quite close to 1.

According to what has been discussed above and for its simplicity that will facilitate the practical application, it is proposed to use a model based on a linear equation. The dependent variable proposed in the model will consist of the total compensation of the directors for a certain size of company. It is important to highlight that in the model, this compensation will represent the cap that limits the maximum annual compensation of all the company's main executives defined for one year t from the net revenue observed in year t-1. The choice of a model that encompasses the total compensation of the group of executives is justified by the fact that the companies invested by funds generally need to approve a cap for total compensation of the board of directors at a shareholders' meeting. In addition, this structure allows different salaries for executives to be practiced within this limit, which would not be practical for the case where the model considers only the average compensation of a director.

In fact, the model was designed considering a standard scenario of a company with four top executives. On average, most companies have a CEO (Chief Executive Officer), a CFO (Chief Financial Officer), a CIO (Chief Innovation Officer), and a CMO (Chief Marketing & Sales Officer). It is important to note that, as the total compensation cap of the board is being defined, the model works for a structure with fewer executives, but also with a different number. Their executives at the cap or with the same salaries. The data suggest that for the companies studied executive compensation was moderately proportional to the size of the company and from some point other than zero, since startup companies with no revenues need to remunerate their managers.

The study Salary Guide 2015 of Robert Halfe one of the different works on the Compensation practiced in Brazil for different positions in the companies. The wages that appear in this study were divided between small and medium-sized companies, with revenues up to R\$500 million and large in size above this limit. For the category of small and medium-sized companies, the study shows that the lower limit of the fixed compensation of some directors, such as the commercial director and the chief financial officer, for example, is R\$15 thousand. The value of the intercept in the model was defined from an initial value minimally satisfactory so that a good executive, in theory, decided to accept the challenge of managing a startup.

This also applies to entrepreneurs who, in the role of managers, also need to be remunerated by their company. The amount set for the cap of the Board's total annual



compensation in a zero billing scenario was R\$720 thousand. Considering the number of four executives proposed, an average total salary cap of R\$15 thousand per director is reached per month. Considering that the value proposed in the model comprises an initial fixed and variable compensation that totals R\$15 thousand, and that this amount is a suggested cap, it can be said that the values are reasonable when compared to what is practiced in the market. Regressions Of the previous figure have coefficients of determination of 78.50% and 98.29%. It is noted, however, that the intercept of the figures is approximately R\$206 thousand and R\$183 thousand, respectively.

The intercepts are less than half of what was suggested. This difference could be explained by some factors such as the fact that the companies studied have a number of directors less than four, but mainly because the model proposes a total compensation cap, that is, the maximum compensation limit for the body of managers who can be paid to a company with no revenue. The regressions suggested in the figures have an angular coefficient of 0.0733 and 0.0839 for total and total filtered salaries, respectively. These figures are relatively high and cause total compensation to increase very rapidly with net revenue growth. A simulation with NR amounts of R\$50 million and R\$100 million would lead to a monthly average cap per director of R\$81 thousand and R\$157 thousand and R\$91 thousand and R\$179 thousand for the combination of total and filtered total compensation, respectively.

Indeed, for this model a more modest coefficient of 0.025 is suggested in which the total compensation caps for the same NR values would fall to monthly average values for each of the four directors of R\$41 thousand and R\$67 thousand, respectively. This value was proposed based on the Salary Guide 2015 after some simulations with different coefficient values, from which the amount of 0.025 seemed to keep the compensation attractive enough for the executive without, however, being exaggerated. It is important to emphasize that if one wishes to be more aggressive with compensation or even more conservative, one can increase or decrease value of the coefficient of the model. The suggested model has the following format:

Equation 1 - Proposal for an Executive Compensation Model

$$TRT_t = 720 + \frac{(2,5 * RO L_{t-1})}{100} \quad (1)$$

Where:

TRT_T is the Total Annual Compensation Cap (R\$ thousand) of the four Executives for year t;

NR_(t-1) is the net Revenue (R\$thousand) of the company of the year (t-1);

All study companies were invested by venture capital funds. Therefore, the fund managers, who are the representatives of the shareholders in the companies, are aligned with the main objective proposed for the company that is to maximize the value of the company until the moment of the divestment, that is, the exit from the fund and eventually the Entrepreneurs through the sale of their holdings. The premise used is that entrepreneurs, in the role of shareholders, are also in line that the main objective of the company is to maximize its value. However, as seen earlier, it is possible that entrepreneurs, in the role of executives, can also seek a personal return in the short term to the detriment of the above. This problem of agency may be more evident in the managers who were hired by the company, since they may not have great incentives to seek to increase the value of the company in the long term, preferring personal gains in the short term.



As already presented, the most used valuation methods are based on some measure of profit, namely EBITDA, EBIT or net profit. In this way, performance metrics and targets for each of the company's executives must be aligned with the maximization of these measures of profitability in the short and long term. The measure adopted as a driver of value in this work is the net profit because, unlike EBIT and EBITDA, it captures, among others, the company's disbursements with financial expenses, which theoretically would condition executives to seek financing with more attractive interest rates Or ways to reduce the amount of short-term financing, especially with commercial banks.

It can be inferred that the model above, in a certain way, already has some relation with performance, since the compensation cap depends on the values of net revenue reached in the previous year, which would condition executives to seek higher net revenues. This total compensation, however, must be divided between fixed and variable salary. The aggressive proposal suggested by the author to allocate 40% of the total compensation to the variable portion seeks to make the executives motivated to achieve the goals, but at the same time have a minimally good fixed compensation. This level is also aligned with the practice being implemented by in many companies invested by venture capital funds, where the variable compensation ranges from 30% to 50% of the total compensation. Adjustments in the application of the model so that it is even more aggressive or conservative can be done by changing the parameters above. The suggestion is that, from the total compensation stipulated in the model, the division between fixed and variable is as follows:

Equations 2, 3 and 4 –Fixed and Variable Compensation

$$TRT_t = TRF_t + TRV_t \quad (2)$$

$$TRF_t = 0,6 TRT_t \quad (3)$$

$$TRV_t = 0,4 TRT_t \quad (4)$$

Where:

TRF_t - is the Fixed Compensation Cap stipulated for year t

TRV_t is the Variable Compensation Cap stipulated for year t

The fixed compensation cap, in this way, depends only on the net revenue realized in year t-1 and is the basis that will be paid to executives during year t. Variable compensation, however, although it also has its cap defined from the NR of year t-1, must be related to the performance of the company in year t, that is, it will be paid at the end of year t by achieving goals. In this model, the fixed compensation is proportional to the size of the company under the assumption that the larger companies would require more experienced executives and, consequently, a higher compensation. On the other hand, the variable compensation that also has its cap increased with the revenue growth has payment based on the income generated and the attainment of goals as a way to share the results obtained by a good job. According to these parameters, it is proposed to use a model that would yield a total compensation to be shared among the executives, of which part would be fixed and part would be based on the performance of the company and the executives.

The proposal consists in linking the payment of the variable compensation to the net profit goal or the amount of the budgeted income for the period as a way to reduce the agency problems and to align the interests of the executives with the long-term interests of the investors. It is important to note that linking only the variable compensation to the profit does not guarantee that the value of the company is maximized. Directors may, for example, reduce research and development investments by eroding marketing investments in order to achieve stipulated profit or perform some other manipulation of results.



In this way, the agency problem would not be mitigated since the long term of the company could be hampered. This point is addressed by Murphy (2012) who states that when CEOs are paid on the basis of short-term metrics they think in the short term, for example, reducing R & D expenses even if this reduces the company's value in the long run. It is important to remember, however, that planning the expected earnings for year t , usually are approved by shareholders, among them investors. As in this mode of investment the funds are very close to the daily life of the company, these agency problems raised above could be reduced. Thus, it would be possible to suggest that, in a scenario in which a company invested by a venture capital fund applies the proposed model of compensation in a more simplified way, linking all variable compensation of managers to the achievement of the budgeted profit target for year t , The model would approach its objective since the variable compensation will be paid upon reaching the profit stipulated by the shareholders.

In this case, the question of the directors' operational decisions that could harm the company in the long run would be reduced in part because of the close monitoring of fund managers. The suggestion made in all cases is that profit is the point of Reference to the definition of the variable compensation of the team, either based solely on the profit target of the period or the profit itself linked to other performance indicators defined based on the company's value drivers. In more complex models, which may be the subject of further studies, the profit target can be a trigger for the payment of variable compensation that will be linked to different performance indicators of each manager. In other words, one can define profit as the starting point, that is, by reaching the stipulated profit value, one begins to observe the performance metrics defined for each director to evaluate the possible payment of the variable compensation.

5. Conclusion

The present study resulted in the proposition of a model of executive compensation that seeks to contribute to the resolution of the research problem, that is, a model that suggests the total annual compensation of executives in order to avoid possible periodic conflicts between executives and shareholders and that align compensation with value drivers of the firm, aiming to positively influence the future value of the company.

After analyzing the different panel regressions with the historical data, the first conclusion was that the regressions with the filtered values presented worse results in the test t and F in relation to the data with the totality of the companies. All regressions with variable compensation had significance levels in at least one of the tests above the desired 10%. On the other hand, all regressions with total and fixed compensation passed the tests of significance. Regarding the coefficient of determination, the regressions with the net profit, followed by the regressions with the EBITDA, were those that had a worse adjustment in terms of R^2 when combined with the different measures of compensation. The replacement of net income and EBITDA by gross and net revenue resulted in a significant improvement in R^2 , with gross revenues presenting values close to those of net revenue, with a minimal difference in favor of the former.

Then, the historical regressions of gross revenue and net revenue were compared with the regressions with the data budgeted for the same period. It is important to note that these additional analyzes did not include the measures of EBITDA and net profit, since they had R^2 values significantly lower than those of GR and NR. Regression analysis showed, in general, fairly balanced values for the coefficients of determination of budgeted and performed data. Thus, for the companies in this study, it was not possible to determine which alternative presents better coefficients of determination. Subsequently, the effect of inflation in the data was evaluated through the IPCA correction of the values realized for NR and GR. The



analysis of the corrected regressions, compared with the historical regressions, showed that the inflation adjustment showed an almost imperceptible improvement in the R² of the companies of this work.

Finally, we used the GR and NR performance measures corrected by the IPCA of a year t-1 compared to the historical corrective measures of one year t. Also we can say that the time shift did not generate consistent improvements in the companies of the study, Since in some cases historical data maintained higher coefficients of determination. However, the highest value of R² obtained in the work was a regression with time displacement. The analysis carried out with the companies invested by the Criatec fund was important for the parameterization of the model.

The first observation that could be made is that net revenue, along with gross revenue, is a performance measure that has a better adjustment to executive compensation compared to others. Because of this, in addition to other reasons, the proposed executive compensation model uses net revenue from the previous year to determine the total compensation cap in the current period for a company in order to avoid problems in compensation negotiations.

In order for the model to also be aligned with the value established for the company, the proposal consists in dividing this cap into a fixed portion and a variable portion, the latter necessarily having to be related to another value driver based on earnings, like net profit or EBITDA. The total compensation to be shared among the firm's executives, is proportional to the size of the company, since larger and more complex companies demand more experienced executives who cost more for the company. Fixed and variable compensations also accompany this growth, but the second, based on performance, should rely more heavily on the earnings generated and the achievement of the goals for the payment to be made.

It is also important to point out that even though this study sheds some light on an important issue which has been receiving little attention, it has its shortcomings in terms of data, sampling, and other statistic matters. Future studies would provide great contributions if they can overcome some of these shortcomings through using, more companies, invested by different funds, and for longer periods of time.

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