

## THE OPTIMAL CAPITAL STRUCTURE: AN EMPIRICAL STUDY OF INDONESIA COMPANY IN THE FOOD AND BEVERAGE INDUSTRY

By:

Dr. Sylviana Maya Damayanti, CFP<sup>®1)</sup>, Jane Julia Mulyono, MBA<sup>2)</sup>, Dr. Isrochmani Murtaqi<sup>3)</sup>

e-mail: sylvianamaya@gmail.com

Author: Lecturer School of Business and Management, Institut Teknologi Bandung<sup>1)</sup>

School of Business and Management, Institut Teknologi Bandung<sup>2)</sup>

### ABSTRACT

*Optimal capital structure is mix between debt and equity which resulted in maximizing firm's value. Food and beverage sub-sector industry play an important role in Indonesia economic growth as one of the biggest contributor of gross domestic product (GDP) in Non-Oil & Gas Industry. The aim of this study is to determine the optimal capital structure in Indonesia food and beverage manufacturing. Data used in this study from 14 food and beverage companies listed in Indonesia Exchange. This study used Adjusted Present Value (APV) simulation by Aswath Damodaran to determine the optimal capital structure. This simulation started with estimated the unlevered company value then as the level of debt increase the unlevered company value adjusted by the net effect of both the benefit of debt and cost of debt. Company value estimated at each level of debt from 10% - 90% and the debt ratio which resulted in highest company value is the optimum debt ratio. The result from this study shows that there are two companies should have the 0% debt ratio.*

**Keywords:** *Adjusted Present Value (APV), Firm Value, Food and Beverage Industry, Optimal Capital Structure*

### ABSTRAK

*Struktur modal merupakan perpaduan antara utang jangka panjang dengan ekuitas, dimana diharapkan perusahaan dapat mencapai nilai perusahaan yang optimal. Industri makanan dan minuman memegang peranan yang penting dalam pertumbuhan ekonomi di Indonesia, sebagai salah satu penyumbang terbesar Produk Domestik Bruto (PDB) di industri "non-oil & gas". Data yang digunakan dalam studi ini berasal dari 14 perusahaan yang terdaftar pada Bursa Efek Indonesia. Penelitian ini menggunakan pendekatan "Adjusted Present Value" (APV) yang telah disimulasikan oleh Aswath Damodaran untuk menentukan struktur modal yang optimal.*

*Simulai ini dimulai dengan menghitung nilai perusahaan pada saat perusahaan tidak memiliki utang. Kemudian dengan adanya penambahan utang pada struktur modal perusahaan, dilakukan penyesuaian pada nilai perusahaan dengan melakukan perhitungan terhadap keuntungan perusahaan ketika mengambil utang dan risiko yang harus ditanggung perusahaan ketika utang bertambah. Nilai perusahaan dihitung pada tiap level dari 10%-90% dan perusahaan yang memiliki value tertinggi adalah perusahaan yang memiliki rasio utang optimal. Hasil penelitian ini menunjukkan bahwa ada dua perusahaan yang memiliki rasio utang optimal 0%.*

**Keywords:** *Adjusted Present Value (APV), Nilai Perusahaan, Industri Makanan dan Minuman, Struktur Modal Optimal*

## INTRODUCTION

### Background

Indonesia is a country with large number of population. It is a huge market for food and beverage producers especially with the expanding number of middle class which predicted to reach 141 million in 2020. Food and beverages industry is in the top priority of the industrial development in 2015 – 2035 set by the government. With the current economic condition, when national and global economic slowdown, food and beverage industry are remain promising because this is main industry sector which are primary needed by people whether it crisis or not. For many multinational food and beverage companies, Indonesia is one of the most important markets. The growth of the food and beverage industry in the first quarter of 2016 up 7.55% than the same period in the previous year. This indicates the good sign of growth because the raising value was supported by the raising of the sales volume, not only by the raising prices. Therefore, food and beverage companies should grab the change to expand the business. This paper aimed to determine the optimal capital structure for food and beverages sub-sector industry in Indonesia, therefore the companies can efficiently use the fund to expand the business.

### Business Issue

Food and beverage industry in Indonesia plays an important role in influencing economic growth in Indonesia. As one of the important sub-sector industry, it is also important for the industry in this sector to keep it going and growing. As it is known that the global economic slowdown and it also affects the economic condition in Indonesia and cause the purchasing

power weakened. But because food and drinks are fundamental in the life of every human being, many parties are optimistic that the sector will continue to experience growth in the long term.

According to data from the Indonesia Investment Coordinating Board (BKPM), international investment accounted for 60 percent of all manufacturing commitments in Indonesia last year. The country is no longer seen as just a market for food exports, but more as a production base to many international companies. This has led the board to believe that the food sector can be a main driver of growth for the country's manufacturing industry, especially now when the economy is slowing.

Beside infrastructure, food and beverage industry is one of the government concern and one of bank favoritism in bank loan disbursement. Some source of banks in Indonesia stated that small to medium scale of food and beverage manufacturing company is their main target for bank loan disbursement. From current condition of Indonesia economic and food and beverage industry in Indonesia, it is important to grab the opportunity to expand the business, especially for small to medium food and beverage companies. The right financing mix decision will need the most to get the maximum value of the company. This is why this case study of 14 listed company in food and beverage manufacturing sector be done. This case study aims to know the company current financing mix and calculate the optimal capital structure to each company. This way, the company will know if their current capital structure have already optimal to gain the maximum value to the company. Next, the company can make the right decision about the financing mix and when they going to take the debt.

### **Research Objectives**

The objectives of this research are:

- Analyze the capital structure of companies in Food and Beverage sub-sector industry
- To give suggestion for optimal capital structure that should be implemented in the food and beverage companies

### **Literature Review**

#### **Trade-Off Theory**

The trade-off theory is the theory about how a company finance its operation using debt and equity, with considering the balancing of cost and benefit in the capital structure. Trade-off theory is like trading off the cost and the benefit of debt. The optimal capital structure is a trade-

off between the benefit of interest tax saving and the cost of financial distress (bankruptcy cost). Trade-off theory recognizes the tax benefit from interest payments. However, most companies have less leverage than this theory would suggest is optimal.

In comparing with Modigliani-Miller theory, the main difference between two theories is the potential benefit from interest payment in capital structure. In MM theory, they concluded that the value of the company is not affected by the company leverage. MM theory not recognizing the advantage in taking debt because there are no taxes, so there are no tax benefit. MM theory also taking an assumption that there are no direct and indirect cost related to the bankruptcy cost. The trade-off theory of leverage recognized the tax benefit from interest payment and cost of financial distress as consequences taking a debt.

### **Optimal Capital Structure**

Capital structure is proportion on debt and equity used to finance the company. According to Gittman (2012), capital structure is the fund raised from long-term debt and equity. According to Damodaran (2012), the optimal financing mix is the mix that maximizes the firm value where the cash flows to the firm are a function of the debt-equity mix. Therefore, optimal capital structure is financing mix between debt and equity which result in maximizing firm's value.

Companies that use more debt than equity to finance assets have a high leverage ratio and an aggressive capital structure. A company that finance its assets with more equity than debt has a low leverage ratio and a conservative capital structure. High leverage ratio and/or an aggressive capital structure can lead to higher growth rates, and a conservative capital structure can lead to lower growth rates. It is the purpose of company management to find the right mix of debt and equity, which also can be referred as an optimal capital structure of a company.

### **Debt**

Debt is a way to finance the company's operation by borrowing fund. Generally, the greater company's debt, then the greater company's financial leverage. As debt used to finance the company, company as a creditor have an obligation to pay back fund they borrowed and its interest. According to Damodaran (2011), the cost of debt is the market interest rate that the firm has to pay on its debt. This interest can be written off as an expense, so normally debt is the cheapest type of long-term financing.

**Equity**

Another way to finance the company’s operation is equity. Equity financing is the way company raising its capital by selling the company stock or share to the investor, and in return, the investor receive ownership interest in the company. According to Damodaran (2001), equity refers to the type of financing which brings the share of the control of the company’s management. Equity financing is the most expensive way to financing the company, since the return expected by the investor higher than interest pay from bank. The return’s pay to the investor based on residual cash flow from the company and does not give tax benefit. Start-up companies are the one usually might need various rounds of equity financing to meet liquidity needs.

**Methodology**

This paper aimed to find the optimal capital structure of the companies using Adjusted Present Value (APV) Simulation by Aswath Damodaran (Figure 1). Data population taken from 14 food and beverage companies listed in Indonesia Exchange.

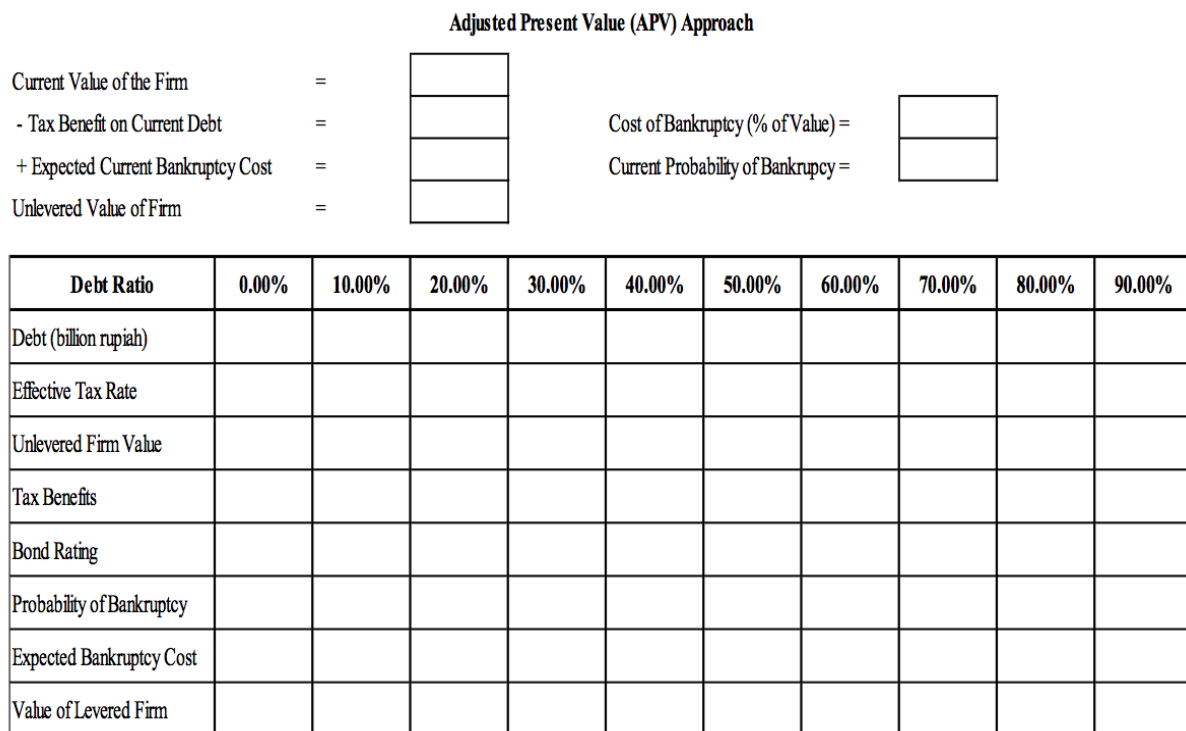


Figure 1: Adjusted Present Value Simulation Result Template by Damodaran

In Adjusted Present Value (APV) approach simulation, the simulation begin with estimating value of debt outstanding each debt ratio. Value of debt outstanding obtained by multiplied each debt ratio with current firm value. Tax benefit of debt obtained by multiplying value of debt with effective tax rate. Effective tax rate at each level of debt obtained by multiplying the current company effective tax rate with pre-tax interest coverage, which pre-tax interest coverage ratio at each level of debt 5 obtained by divided earnings before interest and tax with interest at each level of debt. Interest expense at each level of debt obtained by get the rating for each level of debt and interest rate at certain rating. This simulation calculated the interest rate at each rating based on category of the company. Using the rating above, then probability of bankruptcy at each level of debt can be obtained (from table 2 and 3). Expected bankruptcy cost can be calculated by multiplying probability of bankruptcy by the bankruptcy cost, stated as a percent of unlevered firm value and tax benefit. Then the value of levered firm is a result from value of unlevered firm adding by tax benefit of debt and subtracting with expected cost of bankruptcy.

## RESULT AND ANALYSIS

Adjusted Present Value (APV), is one of four approach to find an optimal financial mix (Damodaran; 2011). Adjusted Present Value (APV) is one of the way to valuing the company. Using the APV Approach, give the debt ratio from 0% until 90% to get company value for each debt ratio to get the debt ratio which give the maximum value. The debt ratio which obtained the largest company value is the optimum debt ratio. APV approach begin with estimated the value of the firm without debt. When debt start added into the company financing strategy, the net effect on company's value considering from both the benefits of borrowing which is tax shields and the costs of borrowing which is the expected bankruptcy cost. The primary benefit of borrowing is a tax benefit from interest payment, because tax is deductible and that the most significant cost of borrowing is the added risk of bankruptcy.

To calculate the value of the company using APV approach, it will be done in three steps. First, it starting with the calculation to find the value of the firm with no leverage or no debt. Then estimate the present value of the interest tax savings which occurred as result borrowing a given amount of money. Last step, the value of the firm with certain level of debt obtained by added the risk of financial distress as a consequences of the borrowing (probability of firm going bankrupt, and the expected cost of bankruptcy).

- *Unlevered Firm Value* The first step in APV approach is estimated the value of unlevered firm. The value of unlevered company means the value of the company when we assume that the company has no debt.

$$\text{Value of Unlevered Firm} = \frac{FCFF_0(1+g)}{r_u - g}$$

Where:

FCFF0 = Current after-tax operating cash flow to the firm,

$r_u$  = Unlevered cost of equity and g is the expected growth rate,

g = growth rates

In this paper, assuming taken where cash flows grow at a constant rate in perpetuity. But in the real case of the company can estimate its value using any growth assumption which reasonable to the company. The inputs needed for this valuation are the expected cash flows, growth rates and the unlevered cost of equity. Unlevered cost of equity estimated by analyze and compute the unlevered beta of the firm. The unlevered beta then can then be used as the unlevered cost of equity.

$$\beta_{unlevered} = \frac{\beta_{current}}{(1 + (1-t) \frac{Debt}{Equity})}$$

Where:

$\beta_{unlevered}$  = Unlevered beta of the firm

$\beta_{current}$  = Current equity beta of the firm

t = Tax rate for the firm

Debt/Equity = Current debt/equity ratio

- *Present Value of Tax Benefit from Debt* The second step in this approach is to calculate interest tax saving as an expected tax benefit from each debt composition (debt-to-equity ratio). This tax benefit is a function of the tax rate of the firm and is discounted at the cost of debt to show the riskiness of this cash flow. If the tax savings assume as a perpetuity,

Value of Tax Benefits

$$= \frac{(Tax Rate)(Cost of Debt)(Debt)}{Cost of Debt}$$

$$= (Tax Rate)(Debt)$$

$$= t_c D$$

This paper use the marginal tax rate of the company and it is assumed to stay constant over time. If the company anticipate the tax rate changing over time, then the present value of the tax benefit of debt still can be calculated by not using the equation for the perpetuity growth.

- *Estimating Expected Bankruptcy Cost* The third step in adjusted present value (APV) approach is to evaluate the effect that occurred as consequences of the given level of debt on the firm's probability of default and on expected bankruptcy costs. As the value of debt increasing, the expected cost of bankruptcy also increase. The cost of bankruptcy can be estimated as product of the probability of bankruptcy and the direct and indirect cost of bankruptcy (Damodaran, 2011). More borrowing, then increasing the probability of bankruptcy and hence the expected bankruptcy cost.

If  $\pi_{\alpha}$  is the probability of bankruptcy as a consequences of additional debt and BC is the present value of the bankruptcy cost, the present value of expected bankruptcy cost then can be calculated:

$$= (\text{Probability of Bankruptcy})(\text{PV of Bankruptcy Cost})$$

$$= \pi_{\alpha} BC$$

The probability of bankruptcy already given in the simulation based on the first way above. The probability of bankruptcy estimated based on the rating of the company. The rating of the company use the synthetic rating based upon interest coverage ratio that already provide by Damodaran in the simulation. Probability of bankruptcy divided into two categories of companies: small or riskier companies and large or stable companies. Table 1 dan Table 2 below are the synthetic rating and probability of bankruptcy used in the simulation based on the size of the company.



**Table 1: Bankruptcy Probability for Larger or Stable Companies**

If interest coverage ratio is		Rating is	Spread is	Bankruptcy Probability
>	≤ to			
-100000	0.199999	D2/D	12.00%	100%
0.2	0.649999	C2/C	10.00%	85%
0.65	0.799999	Ca2/CC	8.00%	70.00%
0.8	1.249999	Caa/CCC	7.00%	59.01%
1.25	1.499999	B3/B-	6.00%	45.00%
1.5	1.749999	Ba1/BB+	5.00%	36.80%
1.75	1.999999	Ba2/BB	4.00%	25.00%
2	2.249999	B1/B+	3.25%	16.63%
2.25	2.499999	B2/B	2.75%	10.00%
2.5	2.999999	Baa2/BBB	1.75%	7.54%
3	4.249999	A3/A-	1.20%	2.50%
4.25	5.499999	A2/A	1.00%	0.66%
5.5	6.499999	A1/A+	0.90%	0.60%
6.5	8.499999	Aa2/AA	0.70%	0.51%
8.50	100000	Aaa/AAA	0.40%	0.07%

**Table 2: Bankruptcy Probability for Smaller or Riskier Companies**

If interest coverage ratio is		Rating is	Spread is	Bankruptcy Probability
>	≤ to			
-100000	0.499999	D2/D	12.00%	100%
0.5	0.799999	C2/C	10.00%	85%
0.8	1.249999	Ca2/CC	8.00%	70.00%
1.25	1.499999	Caa/CCC	7.00%	59.01%
1.5	1.999999	B3/B-	6.00%	45.00%
2	2.499999	Ba1/BB+	5.00%	36.80%
2.5	2.999999	Ba2/BB	4.00%	25.00%
3	3.499999	B1/B+	3.25%	16.63%
3.5	3.999999	B2/B	2.75%	10.00%
4	4.499999	Baa2/BBB	1.75%	7.54%
4.5	5.999999	A3/A-	1.20%	2.50%
6	7.499999	A2/A	1.00%	0.66%
7.5	9.499999	A1/A+	0.90%	0.60%
9.5	12.499999	Aa2/AA	0.70%	0.51%
12.5	100000	Aaa/AAA	0.40%	0.07%

The present value of bankruptcy cost estimated from direct cost of bankruptcy and indirect cost of bankruptcy as a percentage of market value of company. This paper used 5% direct cost of bankruptcy and 5% indirect cost of bankruptcy.

- *Value of Levered Firm* In Adjusted Present Value (APV) approach, the company value with certain level of debt is obtained by adding the net effect of additional borrowing to the unlevered firm's value. Therefore, the company value formula become:

***Value of Levered Firms***

$$= \text{Value of Unlevered Firms} + \text{Present Value of Tax Benefits} \\ - \text{Expected Bankruptcy Cost}$$

Value of Levered Firm

$$= \frac{FCFF_0(1+g)}{(\rho_u - g)} + t_c D - \pi_a BC$$

To estimate the optimum capital structure using Damodaran's Adjusted Present Value simulation there are several data input for this simulation such as: company's earnings before tax and interest, company's beta, effective tax rate, government bond rate and company's category selection (whether the company is larger/ stable companies or smaller/ riskier company). The company's category selection affect to simulation calculation especially company's bond rating.

Company's beta computed respectively and given the different result of each company. The effective tax rate and long-term government bond rate are the same for all company: 35% and 7.50%. Government bond rate taken from INDO'16 (data from Bank Indonesia). The risk premium taken from Damodaran's country risk premium for Indonesia 3.46% and country default spread also taken from the same source. Indonesia default spread is 2.47%. Optimal debt ratio obtained when the value of the company reach the maximum. There are two determinant of the optimal debt ratio: company specific factors and macroeconomics factor. Therefore, company's financial performance measurement and analysis of the business need to be done.

## CONCLUSION AND RECOMMENDATION

### Conclusion

From the result of all simulation of the company using APV approach simulation, table below will show the current debt ratio and optimal debt ratio as the result from APV approach simulation. It will show the market value of the company at current debt ratio and the market value of the company at optimal debt ratio along with the growth if company use optimal debt ratio.

**Table 3: Summary APV Simulation result of Food and Beverage Listed Companies**

Listed Food and Beverage Companies	Current Debt Ratio	Optimal Debt Ratio	Difference	Current Market Value of The Company (billion rupiah)	Market Value with Optimal Debt Ratio (billion rupiah)	Difference (billion rupiah)	Market Value Growth
Tiga Pilar Sejahtera (AISA)	56%	50%	-6%	6,695	9,696	3,001	45%
Tri Banyan Tirta (ALTO)	57%	0%	-57%	721	1,187	466	65%
Wihmar Cahaya Indoensia (CEKA)	57%	70%	13%	830	1,453	623	75%
Delta Djakarta (DLTA)	18%	10%	-8%	4,083	4,485	402	10%
Indofood CBP (ICBP)	38%	40%	2%	54,811	60,868	6,057	11%
Indofood Sukses Makmur (INDF)	53%	50%	-3%	74,634	99,674	25,040	34%
Multi Bintang Indonesia (MLBI)	63%	10%	-53%	25,495	26,068	573	2%
Mayora Indah (MYOR)	54%	90%	36%	1,359	4,623	3,264	240%
Prashida Aneka Niaga (PSDN)	48%	0%	-48%	245	547	302	123%
Nippon Indosari Corporindo (ROTI)	56%	10%	-46%	8,377	9,307	930	11%
Sekar Bumi (SKBM)	56%	50%	-6%	674	830	156	23%
Sekar Laut (SKLT)	60%	70%	10%	205	300	95	46%
Siantar Top (STTP)	47%	40%	-7%	4,140	4,686	546	13%
Ultrajaya Milk (ULTJ)	21%	10%	-11%	13,720	14,173	453	3%

From the summary table above, it can be seen that when the company apply optimal debt ratio, the value of the company will growth better as expected. In Indonesia food and beverage industry listed companies, mostly companies operated in around 50% debt ratio. And based on the simulation result companies mostly have it optimum debt ratio around 40% - 50% with the growth of the company's value at average 50%.

There are two companies that suggested to not take any debt or optimal debt ratio for those companies is 0%. Those companies are Tri Banyan Tirta, Tbk (ALTO) and Prashida Aneka Niaga, Tbk (PSDN). The reason for the result of this optimal debt ratio is because ALTO have it earnings cannot meet the company obligation to pay the debt interest. In other word, ALTO earnings smaller than it interest, so the interest coverage ratio for ALTO is below one which affected to the company's rating (since in the adjusted present value simulation the company's rating based on synthetic rating) and the smaller interest coverage ratio it will get worse to the company's rating and the probability of bankruptcy goes higher. With this reason, only 0% of debt ratio will the only way to minimize it probability of bankruptcy and maximize the company's value. For Prashida Aneka Niaga, Tbk (PSDN), the caused was by negative earnings of the company or because the earnings impossible to meet the obligation of the debt. Therefore the result from the APV approach for PSD also 0% debt ratio.

Another company like Multi Bintang Indonesia, Tbk (MLBI), was quite extremely over levered and to get the maximum company's value MLBI should down the debt ratio to 10% from 63% (minus 53%). At 2014, MLBI had a new plant built as their new business strategy to reach wide market not only in the alcohol beverage market but also in non-alcohol beverage market. They want to be known not only as a brewing company, but also as a beverage company. As a compensation for their new business strategy, the company debt goes up. Not only built a new plant, they also make a new corporate identity which need to take more

operation cost especially in advertising to advertise their new corporate identity. With the new business strategy, which come to the result of high debt, the company face a new challenge to cover up the debt. In April 2015, the government make a new regulation about restriction of alcohol beverage distribution (Minister of Trade regulation No.06/2015). This regulation aggravate existing conditions where in 2014 the government issued a new regulation on increasing excise duty of beer companies as of 18.2%. With this condition, MLBI struggling with their debt as their earnings decline.

The difference between current debt ratio taken by companies and the optimal debt ratio result from APV approach simulation for the other companies at average 2%. It can be say that in general, the food and beverage listed companies almost approaching the ideal condition to get the maximum value of the company.

## **Recommendation**

### **Recommendation for Food and Beverage Industry in Indonesia**

The food and beverage listed companies, generally are companies in term ‘age’, are quite ‘aged’ companies and have loyal customer for the company product. Even generally listed companies are in over levered condition but this firm are believed in not under bankruptcy threat. So companies suggested to take some good project with new equity if companies have good new investment. Or companies can use retained earnings to pay off debt, reduce or eliminate dividends, issue new equity to pay off debt. If companies do not have any good new investment. Some under levered companies can take good new investment with debt or use receivable to repurchase stock.

### **Recommendation for further research**

Related to the existence of APV approach flaws, which is difficult to determine the expected bankruptcy cost (especially indirect cost of bankruptcy), the author suggested to perform another studies to determine the indirect cost of bankruptcy in food and beverage industry in Indonesia.

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