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Class script for the project
Company valuation via the DCF method

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1 Introduction

Over the years the issue of value was approached by such famous economists as A. Smith, D. Ricardo, J. S. Mill, K. Marks, W. S. Jevons, V. Pareto, J. M. Keynes and many others. “Value” is broadly defined concept. It is characterized by ambiguity – it has many meanings resulting from various, often extensive, theories.

The category of value has always aroused interest and controversy among economists. In economy, the following are considered to be the concepts of value:

1. Use value of a good, which is a function of its ability to meet human needs.
2. Exchange value, which expresses the ability of a good to be exchanged for another good. At the same time, it is worth noting that a good does not have to have an exchange value in order to have a use value. On the other hand, having a use value is a necessary condition for the existence of an exchange value of a good.
3. Basic economic parameter, which is the price of a good, i.e. a monetary expression of its value.
4. Characteristic natural value that exists for everyone, also known as the central value towards which the prices of all goods tend to move in an efficient market.

In free market economy a company is a kind of good and for this reason it must be subject to all rules and mechanisms of market regulations. For this reason, it is considered in the scope of its use and exchange value. Finally, the basic economic parameter is its price, i.e. the monetary expression of its value.

The value of an enterprise is determined by the subjective benefits that its owner (financial and non-financial) will achieve. It is determined substantially by subjective factors. The subjectivism of values results from people’s ideals, preferences and aspirations.

Increasing the value of a company is the main objective of its activities, which creates opportunities for its long-term operation and development. Meeting objective goals causes investors to view it in a better light and ensures that it has no problems in raising capital.

There are many ways of defining the value of a company and several methods determining the value of a business in terms of its economic value, market value, asset value etc. The meaning of value of a business depends on the subject of consideration.

The most common subjects of a company valuation are:

- related to changes in the ownership structure,
- other – resulting from business activity.

The first group of events includes, among others and above all:

- intended sale of an enterprise or part thereof,
- intended purchase of an enterprise or part thereof, buy-sell transactions between the owners of a given company,
- nationalization of a company or its part,
- division of an enterprise,
- merger with other entities,
- contribution made by a company to another company,
- liquidation of an enterprise.

The second group includes the following most typical situations:

- selection of a strategy based on the goodwill (VBM) criterion,
- business property insurance,
- etc.

In the case of this project, the purpose of the company valuation is related to changes in the ownership structure and the DCF (Discounted Cash Flow) method is the proposed approach to valuing a company.

The DCF method is considered to be the most comprehensive and complex method of enterprise valuation. It is basically a separate, coherent theory – the philosophy of understanding values along with the formulated method of their measurement. The most significant drawback is its subjective character resulting from the need to predict most of the parameters on the basis of which the value of a enterprise is estimated. The method requires one to assess factors that will affect the company under investigation by conducting a macroeconomic analysis, a strategic analysis, a financial analysis, a cash flow forecast, a capital cost estimate, an equity value calculation, a comparison of results and involves a person formulating a conclusion on the business valuation of a company. Finally, investors or analysts will know how much worth a company has – whether it is profitable enough for one to invest in it or not.

What is more, this method requires the consideration of interdisciplinary knowledge and skills in the fields of law, marketing, accounting, finance, taxation and so on.

The DCF method has its roots in discount methods for assessing the profitability of investments, which, in contrast to traditional methods, assumes the volatility of the value of money over time, while, for example, the book value method is based on their historical acquisition costs.

The script presents basic theoretical information concerning the methods of company valuation, the DCF method in particular, and examples illustrating the subsequent steps of the DCF method application. Full understanding of the DCF method and proper preparation of the project requires participation in the lecture on Company Valuation Methods. Said examples were prepared by the students: Brigitta Mayori Puteri; *Company valuation method on Sampoerna Tbk., Indonesia, 2020* and Klaudia Karpińska; *Company valuation method on COMARCH SA, Poland, 2020*.

2 Methods of company valuation

In economic theory, one can see the following concepts of value

- Use value
- Exchange value
- Price of a good
- Natural value

The basic economic parameter is the price of a good, that is, the monetary expression of its value.

A distinctive, natural value for every good, also called its central value, is the value towards which the prices of all goods tend to move in an effective market.

Through traditional enterprise valuation methods one obtains the value of "objective" benefits, regardless of who owns a business.

They are based on the income or value of the property. Thus, the following are considered:

- Economic value
- Market value,
- Asset value
  - Book value,
  - Reproduction value,
  - Replacement value,
  - Liquidation value,
- Market capitalization value
- Real option value

2.1 Asset-based methods

The following asset methods are as follows:

- Net asset value method.
- Adjusted net asset method.
- Replacement value method.
- Liquidation value method.

The methods are based on the material and immaterial assets of a company. Its balance sheet is the source of information concerning the value estimation of a company.

For example – the book value method (net asset value method) is presented in Table 2.1.

Table 2.1. The balance sheet and value of a company

Assets	[PLN]	**L+E**	[PLN]
Fixed assets		Equity capital	
Gross Fixed Assets	25,000	capital	18,000
depreciation	200	retained earning	2,520
Net Fixed Assets	24,800	Total equity	20,250
Current assets	7,460	Credit	10,000
inventory	1,000		
receivable	0	Liabilities	1,740
cash	6,460		
Total	32,260	Total	32,260

EV = PLN 32,260 – PLN 11,740 = PLN 20,520

The liquidation value method, also known as the liquidation method, allows a company to estimate its liquidation value, which is defined as the total value of revenues that can be obtained from the sale of individual company assets in the event of a liquidation at a given time perspective.

This value is then reduced by the liquidation costs and the value of the liabilities of a company.

2.2 Comparative (market) methods

The comparative method is based on the assumption that similar assets have a comparable market value. Therefore, if one wishes to value a given asset using this method, it is necessary to find the same one or a similar one, the value of which was determined in a purchase-sale transaction concluded on the market.

In the case of specific entities such as enterprises, the source of this information can found in the following markets:

- primary capital market, which informs about the prices paid for shares of companies as part of placing their new issues,
- secondary capital market, which provides information about prices paid for shares of public companies on the stock exchange or regulated OTC market,
- control market, which is the source of information about prices paid for shares or shares acquired as part of mergers and acquisitions.

Based on this assumption, the value of the company in the comparative methods is determined based on the following formula:

$$EV = P_{ev} \cdot M_r = P_{ev} \cdot \frac{C}{P_{ep}}$$

where:
EV – enterprise (company) value,
P_{ev} – the appropriate economic parameter of the company being valued,
M_r – market multiplier – the market price referred to the relevant parameter of comparable public companies,
C – the market price of comparable public companies,
P_{ep} – an appropriate parameter of comparable public companies.

The most commonly used parameters for the valuation of enterprises in the case of the comparative method are:
- net profit,
- book value,
- revenues,
- pre-tax earnings and interest (EBIT – Earing Before Interest and Taxes),
- profit before tax, interest and depreciation (EBITDA – Earnings Before Interest, Taxes, Depreciation, and Amortization).

Compared to other comparative methods, market multiples are the indicators that are most frequently quoted by listed companies:
- price / earnings ratio (P / E – price to earnings ratio),
- price / book ratio (P / BV – price to book ratio),
- P / EBIT,
- P / EBITDA, etc.

The multiple should be based on a parameter that is as strongly correlated with the market value of companies in a given industry as possible.

Valuation with market multiples is relatively simple and easy compared to other valuation methods of enterprises (especially when it comes to labor-intensive DCF method), which makes it very popular. Almost universal. By far the most popular is its version using the net profit multiplier (P / E).

$$EV = NP \cdot (P/E)_m$$

where:
NP – net profit of valuated enterprise
$(P/E)_m$ – price to earning ratio of comparative company present on stock exchange

2.3 Mixed methods

The valuation methods that are used produce different values. The value of an enterprise depends on the assets of said enterprise and the effectiveness of their use. Thus, it can be concluded that:

$$EV = V_A + goodwill$$

where:
EV – enterprise value,
V_A – value of the net assets of a company.

Goodwill is calculated as a function of asset and income methods.

Depending on the form of this function, there are two groups property methods that may be applied:

- Average value methods (Schmalenbach's method, Swiss method)
- Methods using additional profit as the source of goodwill.

For example, for ($EV_D > EV_M$)

$$EV = EV_M + \frac{EV_D - EV_M}{2} = \frac{EV_M + EV_D}{2} = \frac{1}{2} EV_M + \frac{1}{2} EV_D$$

where:
EV – enterprise value,
EV_M – value of the net assets of an enterprise,
EV_D – income value of an enterprise calculated on the basis of a perpetual model of annuity present value calculation.

A condition for the application of this method introduced by Schmalenbach is the higher value of income than the value of a property, which is what defines good enterprises.

According to the Swiss method, the value of a company is calculated as follows:

$$\mathrm{EV} = \mathrm{EV}_M + \frac{2}{3}(\mathrm{EV}_D - \mathrm{EV}_M) = \frac{\mathrm{EV}_M + 2\mathrm{EV}_D}{3} = \frac{1}{3}\mathrm{EV}_M + \frac{2}{3}\mathrm{EV}_D$$

In general, it can be concluded that the average value methods highlight the company's ability to generate profits and therefore are suitable for high income companies. This is especially true in the case of the Swiss method, which makes the income methods more relevant. This is important when choosing the appropriate valuation method.

In the case of less successful enterprises whose income value is lower than the asset value, the methods require:

1. valuation of an enterprise using the income method, if its financial result is positive,
2. valuation of an enterprise using the liquidation method (hence one of the property methods), if the financial result is negative. Should the asset value be equal to the income value, goodwill will simply be non-existent and the value of an enterprise will be reduced only to the value of its property.

In the case of methods using additional profit, the existence of the goodwill of a company is a condition for the existence of additional profit.

The additional profit is the surplus of the financial result actually achieved by a company over the financial result, which would have been achieved assuming a return on equity (ROE) equal to the cost of the company's capital (interest rate).

Therefore, according to this approach, the value of an enterprise is determined using the following formula:

$$\mathrm{EV} = W_M + n \cdot Z_D$$

where:
EV – enterprise value,
W_M – value of the net assets of an enterprise,
n – number of years of additional profit in the future,
Z_D – value of the predicted additional profit.

Through this method one can express the goodwill value of a company as the n-fold of the projected additional profit of Z_D, whereby the possibility of the additional profit disappearing is determined by limiting the value of n to the range from 3 to 5 years.

2.4 Real option

As in the case of financial security options, real options relate to voluntary decisions or rights, with no obligation to buy or exchange assets at a certain price [Trigeorgis (1996)].

Real options include strategic benefits, intangible assets or investment opportunities that give an option holder the right to all of the cash flows during the lifetime of an asset in return for certain capital expenditures.

For example, having a patent, which is a real option, gives its owner the right, but not the obligation, to use the patented technology in production. There is no cash flow associated with having a patent, but it is hard to deny that said patent has a specific value.

Real options take into account the strategic value brought by new investments, which consists in opening new possibilities in the implementation of new projects or stages of a complex undertaking.

The strategic value is directly related to the flexibility of decisions and actions taken in the management process of an investment project, an example of which may be a change made in the commencement date of said investment project or its scope. Considering the aspect of flexibility, as a result of research on investment projects, the following division applies:

- internal flexibility relating directly to the project, where its value depends on the possibility of changing its scope,
- external flexibility enabling the implementation of other projects, as a result of the commencement of the project under consideration.

It is also assumed that the value of a specific project should be directly proportional to its flexibility.

As in the case of financial options, the value of real options consists of the intrinsic and time value. Their sizes depend mainly on:

- the option validity period, in which the time to obtain the information necessary to manage under uncertainty is longer,
- the uncertainty regarding the current value of a project, the greater the uncertainty regarding the current value of a project, the greater the value of the option ensuring decision flexibility,
- the expected value of the cash flows generated by a project, with the increase of which the value of the options increases,
- the risk-free rate, the increase of which increases the value of an option by increasing the benefits arising in the event of postponing the project implementation date,

- the capital expenditure, the increase of which reduces the value of an option.

Apart from many similarities between financial and real options, the literature on the subject also highlights the differences. In the case of financial options, their buyer takes a passive position, expecting favorable conditions to occur so that the contract can be performed. The holder of a real option, through actions, has the ability to shape the factors influencing the value of an underlying asset. Moreover, it is not always possible to implement an option in kind in conditions that fully eliminate the uncertainty accompanying the undertaking. However, in the case of financial options, on the day of their expiry, the values of all parameters influencing the investor's decision are known and unambiguous.

Taking into account a number of similarities and differences between financial and real options, as well as the characteristics of the latter, the following ideas emerge:

- development (growth) options,
- resignation,
- time alignment,
- company as a purchase option,
- flexibility.

For example, development options, also known as growth options, occur when an enterprise has the potential for future development through the implementation of a project with low or negative profitability. In the process of analyzing an option, it is often referred to as a strategic option. The condition for its implementation is the possibility for an enterprise to achieve an above-average rate of return on projects in the future, the implementation of which depends on the considered at a given moment.

Assuming X as the cost of the underlying instrument, which is also an additional capital expenditure, and ST as the present value of the projected cash flows from a project, a development option will only be exercised when ST>X.

Therefore, it becomes profitable to incur capital expenditure on a project with a negative NPV, because its implementation will enable the commencement of further profitable ventures. However, in the event of no favorable circumstances, the option will expire. Hence, the final value of the company's revenues from the growth option held will be the greater of the following: max (ST – X, 0) (Figure 2.1).

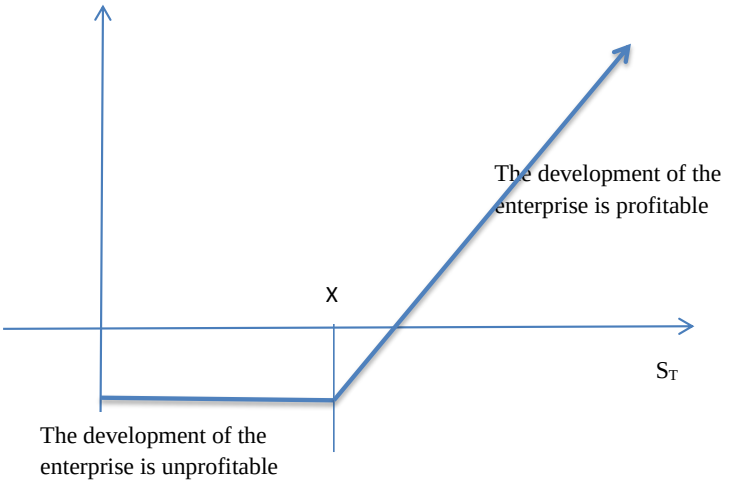


Figure 2.1. Growth option

The relationship between a financial option and a real one is presented in Table 2.2.

Table 2.2. Factors influencing the price of financial and real options on the example of growth options

No.	Financial option	Variable	Real option
1.	Exercise price	X	Investment expenditure
2.	Share price	S	Value of the future cash flows generated by the investment
3.	Option expiry time	T	Time during which an option (an investment) can be exercised
4.	Risk-free rate	R_f	Risk-free rate
5.	Share price volatility	σ^2	Project risk due to volatility of cash flows

2.5 Measures of changes in the company's market value

An enterprise creates surplus value over the face value of the capital invested in it. It is capable of creating additional value if the profitability of said capital is greater than its cost.

EVA – Economic Value Added

The market value of debt capital is usually close to its nominal (book) value, therefore maximizing the value of an enterprise, e.g. a joint-stock company, means maximizing the value of capital employed by its shareholders.

After repayment of principal installments and interest on the debt, the remaining cash flow remains available to the shareholders.

The higher they are, the higher the potential benefits for the shareholders (an increase in dividends means an increase in company share prices).

EVA (Economic Value Added) is a measure of the company's ability to create additional value. The term "economic value added" is used interchangeably with the terms "pure economic profit" and "true economic profit".

$$EVA_t = (ROIC_t - WACC_t) \cdot K_{t-1}$$

where:
$ROIC_t$ – rate of return on capital generated in a given period,
$WACC_t$ – weighted average cost of capital in t period of time,
K_{t-1} – value of capital invested in fixed assets and net working capital at the beginning of the period.

EVA is an internal measure, it measures the effectiveness of a company using the capital entrusted to it. It determines the difference between the operating profit after taxation generated by an enterprise and the total cost of capital (equity and debt capital) calculated on an annual basis:

$$EVA_t = EBIT_t(1-T) - WACC_t \cdot K_{t-1}$$

where:
$EBIT_t$ – operating profit in period t,
T – income tax rate
MVA – Market Value Added

Market Value Added (MVA) means a surplus of the market value of an enterprise (V) over the value of capital invested in it (IC):

$$MVA = V - IC$$

MVA is the difference between the value of cash that would be obtained by shareholders by withdrawing all their capital and the amount previously invested by them in an enterprise (in the form of share purchases and reinvestment of profits).

MVA is a measure of the value of all economic surpluses expected by investors in the future

$$MVA_{t_0} = \sum_{t=1}^{\infty} \frac{EVA_t}{(1+WACC)^t}$$

The MVA values show whether a company generated additional economic value (MVA>0) or loss (MVA<0) in the period of time.

MVA measures the additional value generated by a company over its lifetime.

On the other hand, EVA indicates whether a company created or consumed value in a single period of time.

3 DCF method

The economic value of a company is evaluated via the DCF method, which is considered to be the most comprehensive and complex method of enterprise valuation. It is basically a separate, coherent theory – the philosophy of understanding value along with the formulated method of its measurement. The most significant drawback is its subjective character resulting from the need to forecast most of the parameters on the basis of which the value of an enterprise is being estimated.

Steps of the DCF method:

- Describe the company, offer, assets, the size of its capital, the number of ordinary shares, markets and so on,
- Define the purpose of the company valuation,
- Conduct a fundamental analysis,
- Conduct a strategic analysis,
- Conduct a financial analysis,
- Prepare a FCF (free cash flow) forecast,
- Prepare a capital cost evaluation,
- Calculate EV using the DCF method,
- Present conclusions.

The DCF method has its roots in discount methods for assessing the profitability of investments, which in contrast to traditional methods assumes the volatility of the value of money over time, while, for example, the book value method is based on their historical acquisition costs.

3.1 Company Description

The first step to be taken in the case of the company valuation methods, and the DCF method especially, is to describe a company which serves as an introduction to the business valuation process.

One example of a company description is presented below. It is the description of a tobacco company in Indonesia. Full name of the company is: PT HM Sampoerna Tbk. In the project the name Sampoerna Tbk, or Samporena will be used. For firm description, the Author used company's materials "PT. HM Sampoerna Tbk., n.d.. *About Us: Sampoerna at a glance.* [Online] Available at: https://www.sampoerna.com/sampoerna/en/about-us/overview[Accessed 15 March 2020]".

3.1.1 Overview of tobacco industry in Indonesia

Indonesia has a large and diverse tobacco consumer market with a significant percentage of adult smokers. Approximately 67% of Indonesian men and 5% of Indonesian women are smokers whereas the total population of Indonesia amounts to over 250 million people [https://www.indonesia-investments.com/business/industries-sectors/tobacco/item6873].
For Indonesian women the figure is much lower, because it is less socially acceptable for women to consume cigarettes in Indonesia. Given that two companies within the top ten of the largest Indonesian companies (in terms of market capitalization) listed on the Indonesia Stock Exchange are cigarette manufacturers, it becomes clear how large the tobacco industry of Indonesia really is.

Raw materials are mostly sourced domestically and in combination with cheap labor it makes production costs relatively low. As such, the price of a package of cigarettes in Indonesia is cheap. This has also been the reason why Indonesia's tobacco industry was not touched by the recent global economic downturn. As Indonesians continue to consume more cigarettes, tobacco producers' sales and profit figures remain intact regardless of the decline in exports. The raw materials that are required for the manufacturing process of cigarettes are mostly domestically sourced, implying that foreign exchange volatility has limited impact on prices set by Indonesian retailers (this is also why the recent economic slowdown had a relatively limited impact on the nation's tobacco industry). This prevailing way of sourcing raw materials in combination with Indonesia's cheap labor costs make the production costs of the tobacco industry low. Therefore, even the poorest Indonesians can often be seen smoking.

The kretek cigarettes are tremendously popular among Indonesian smokers. As about 85 percent of all smokers in Indonesia prefer kretek cigarettes than white cigarettes, these clove cigarettes are the clear favorite among Indonesia's smoker community. Kretek – a trademark of Indonesia – is a clove cigarette that consists of tobacco (70 percent) and ground cloves, clove oil as well as other additives (30 percent). Machine-rolled kretek cigarettes contribute around 75 percent to the total cigarette supply in Indonesia, while hand-rolled cigarettes account for nearly 20 percent.

The largest tobacco company in Indonesia and overall one of the largest companies in the country is HM Sampoerna. This company, which controls about 35 percent of the tobacco market in Indonesia, was sold to global cigarette and tobacco giant Philip Morris in 2005 (the New York-based firm controls a 92.50 percent stake). Therefore, HM Sampoerna is also the

company that distributes the Marlboro brand, the world's best-selling cigarette brand, in Indonesia. Other well-known brands of HM Sampoerna include Sampoerna Hijau, Sampoerna A Mild, and the legendary "King of Kretek" Dji Sam Soe. HM Sampoerna listed on the Indonesia Stock Exchange (IDX) in 1990. It is one of the top companies in terms of market capitalization on the IDX.

The second-largest tobacco company in Indonesia is Gudang Garam, controlling around 20 percent of the tobacco market. This company is also positioned within the top ten of largest companies listed on the IDX in terms of market capitalization.

Other key cigarette manufacturers, also listed on the IDX, are Bentoel International Investama and Wismilak Inti Makmur. Two non-listed cigarette manufacturers that play a significant role in the industry are Djarum and Nojorono. Together, the six above-mentioned companies control Indonesia's tobacco and cigarette market.

PT HM Sampoerna Tbk., the largest tobacco company in Indonesia, is the focus of this report. The analysis of the financial aspect of the company presented below in order to show the assessment of the company's worth.

3.1.2 Description of HM Sampoerna Tbk.

PT Hanjaya Mandala Sampoerna Tbk. ("Sampoerna") has been a significant part of Indonesia's tobacco industry for more than a century since its establishment in 1913, with Dji Sam Soe or known as the legendary "King of Kretek". Sampoerna is the pioneer in the Machine-Made Kretek Low Tar (SKM LT) cigarette category in Indonesia by introducing Sampoerna A in 1989. The main brand in Sampoerna is now the leading brand in the Indonesian cigarette market. The Company also produces some of the best-known kretek (clove) cigarette brand families including Sampoerna Kretek and Sampoerna U (PT. HM Sampoerna Tbk., n.d.).

For more than 10 years, Sampoerna has been the market leader in Indonesia, with a 33.0% market share in the Indonesian cigarette market in 2018. Sampoerna is a subsidiary of PT Philip Morris Indonesia ("PMID") and an affiliate of Philip Morris International Inc. ("PMI"), a leading international tobacco company with global brand Marlboro.

The scope of activities of Sampoerna comprises of, among others, manufacturing, trading and distributing cigarettes including distribution of Marlboro, the leading international cigarette brand manufactured by PMID. The company's market is presented in Figure 3.1.

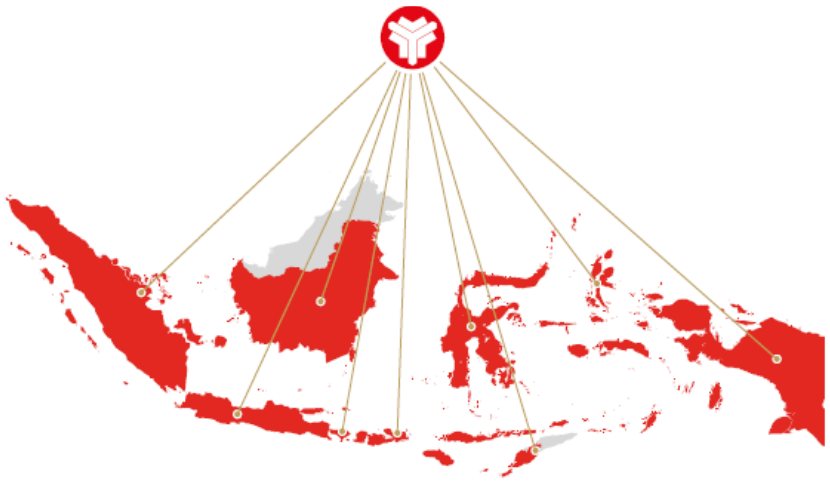


Figure 3.1. Sales and distribution locations of PT HM Sampoerna Tbk.

Sampoerna's experienced management team applies global best practices and world-class systems to oversee more than 25,000 permanent employees within Sampoerna and its subsidiaries. In addition, Sampoerna also collaborates with 38 Third Party Operators ("TPOs") throughout Java and collectively employ around 39,200 people in producing Hand-Rolled Kretek Cigarettes ("SKT").

The Company sells and distributes cigarettes through 114 locations of zone branch offices, sales offices and distribution centers across Indonesia.

3.1.3 Company's products

PT HM Sampoerna Tbk. has several tobacco products in its offer. Below, in Figure 3.2, are shown the products of the company.

Figure 3.2 Products of PT HM Sampoerna Tbk.

3.1.4 Characteristics of PT HM Sampoerna Tbk.

Here are the characteristics of PT HM Sampoerna Tbk. according to Indonesia Stock Exchange (2018).

Main business field: Tobacco industry

Sector : Consumer goods industry

Sub-sector: Tobacco manufacturers

Stock exchange: Indonesia Stock Exchange

Ticker code: HMSP

Permanent employees: > 25,000

Employees of TPOs : 39,200

Revenue: IDR 106,741 trillion (FY 2018)

Net income: IDR 13,538 trillion (FY 2018)

Total assets: IDR 46,602 trillion (FY 2018)

Total equity: IDR 35,358 trillion (FY 2018)

Total cash dividend: 13,632,478,612,680

Authorized capital: 157,500,000,000

Fully paid-up capital: 116,318,076,900

The structure of its shareholders is presented in Table 3.1.

Table 3.1. Shareholders of PT HM Sampoerna Tbk

Name	Type	Amount	Percentage
PT Philip Morris Indonesia	> 5%	107,594,221,125	92.5%
Public	< 5%	8,723,855,775	7.5%
Treasury Stock	Treasury Stock	0	0%
Johannes Budi Wardhana	Direction	75,100	0%

Some financial characteristics of the company:

Market Share:	33%
Volume:	101.4 billion units
Net Sales:	IDR 106.7 trillion
Net Profit:	IDR 13.5 trillion
Return on Assets:	29.1%
Return on Equity:	38.3%
Net Operating Income to Net Sales:	15.8%

3.1.5 Financial Statement of Sampoerna Tbk.

Financial statements of the company is seen in Tables 3.2-3.4.

Table 3.2. Balance sheet of Sampoerna Tbk.

Assets	2018	2017	2016	2015
Total Current Assets	37,831,483	34,180,353	33,647,496	29,807,330
Cash and Short Term Investments	16,790,277	9,875,983	6,690,515	3,068,439
Cash	2,226,570	1,704,170	343,364	338,223
Cash & Equivalents	-	-	-	-
Short Term Investments	14,563,707	8,171,813	6,347,151	2,730,216
Total Receivables, Net	3,815,335	3,780,990	4,996,420	4,726,827
Accounts Receivables-Trade, Net	3,507,601	3,597,922	3,322,526	2,458,742
Total Inventory	16,067,133	19,048,884	20,819,132	20,608,201

Prepaid Expenses	1,158,738	1,416,066	1,141,429	1,325,797
Other Current Assets, Total	-	58,430	-	78,066
Total Assets	46,602,420	43,141,063	42,508,277	38,010,724
Property/Plant/Equipment, Total – Net	7,288,435	6,890,750	6,895,483	6,281,176
Property/Plant/Equipment, Total – Gross	13,110,284	12,146,737	11,553,034	10,343,955
Accumulated Depreciation, Total	-5,821,849	-5,255,987	-4,657,551	-4,062,779
Goodwill, Net	60,423	60,423	60,423	60,423
Intangibles, Net	-	-	-	-
Long Term Investments	535,430	544,704	647,272	667,405
Note Receivable – Long Term	-	-	-	-
Other Long Term Assets, Total	886,649	1,464,833	1,257,603	1,194,390
Other Assets, Total	-	-	-	-
Total Equity	35,358,253	34,112,985	34,175,014	32,016,060
Redeemable Preferred Stock, Total	-	-	-	-
Preferred Stock-Non Redeemable, Net	-	-	-	-
Common Stock, Total	465,272	465,272	465,272	465,272
Additional Paid-In Capital	20,546,151	20,449,204	20,466,910	20,485,848
Retained Earnings (Accumulated Deficit)	13,700,948	12,552,255	12,595,904	10,418,422
Treasury Stock – Common	-	-	-	-
ESOP Debt Guarantee	-	-	-	-
Unrealized Gain (Loss)	-	-	-	-
Other Equity, Total	645,882	646,254	646,928	646,518
Total Current Liabilities	8,793,999	6,482,969	6,428,478	4,538,674
Accounts Payable	3,450,070	3,666,441	3,870,617	3,191,113
Payable/Accrued	-	-	-	-
Accrued Expenses	3,560,030	863,030	868,481	867,118

Notes Payable/Short Term Debt	-	-	-	-
Current Port. of LT Debt/Capital Leases	34411	28937	20768	20,248
Other Current liabilities, Total	1,749,488	1,924,561	1,668,612	460,195
Total Liabilities	11,244,167	9,028,078	8,333,263	5,994,664
Total Long Term Debt	80,649	80,530	65,744	40,878
Long Term Debt	-	-	-	-
Capital Lease Obligations	80,649	80,530	65,744	40,878
Deferred Income Tax	-	-	-	-
Minority Interest	-	-	-	-
Other Liabilities, Total	2,369,519	2,464,579	1,839,041	1,415,112
Total Liabilities & Shareholders' Equity	46,602,420	43,141,063	42,508,277	38,010,724
Total Common Shares Outstanding	116,318.08	116,318.08	116,318.08	116,318.08
Total Preferred Shares Outstanding	-	-	-	-

Table 3.3. Cash flow statement of Sampoerna Tbk.

Cash Flow Statement	2018	2017	2016	2015
Net Income/Starting Line	-	-	-	-
Cash From Operating Activities	20,193,483	15,376,315	14,076,579	811,163
Depreciation/Depletion	235,340	200,305	175,089	163,498
Amortization	-	-	-	-
Deferred Taxes	-	-	-	-
Non-Cash Items	-	-	-	-
Cash Receipts	117,115,876	108,033,945	102,589,715	94,652,091
Cash Payments	-29605986	-27049879	-35252768	-35,758,898
Cash Taxes Paid	-63,540,805	-62,037,886	-53,854,178	-58,061,522
Cash Interest Paid	-30,495	-25,533	-22,324	-138,425

Changes in Working Capital	-3,745,107	-3,544,332	616,134	117,917
Cash From Investing Activities	333,591	-381,049	-362,419	-4,534,423
Capital Expenditures	-984,541	-1,141,933	-1,050,240	-832,984
Other Investing Cash Flow Items, Total	1,318,132	760,884	687,821	-3,701,439
Cash From Financing Activities	-12,512,372	-12,549,712	-10,376,715	5,467,570
Financing Cash Flow Items	-	-	-	-330,080
Total Cash Dividends Paid	-12,480,930	-12,527,457	-10,352,309	-12,250,485
Issuance (Retirement) of Stock, Net	-	-	-	20,768,676
Issuance (Retirement) of Debt, Net	-31,442	-22,255	-24,406	-2,720,541
Foreign Exchange Effects	-	-	-	-
Net Change in Cash	8,014,702	2,445,554	3,337,445	1,744,310

Table 3.4. Income statement of Sampoerna Tbk.

Income Statement	2018	2017	2016	2015
Total Revenue	**10,6741,891**	**99,091,484**	**95,466,657**	**89,069,306**
Revenue	106,741,891	99,091,484	95,466,657	89,069,306
Other Revenue, Total	-	-	-	-
Cost of Revenue, Total	81,251,100	74,875,642	71,611,981	67,304,917
Gross Profit	25,490,791	24,215,842	23,854,676	21,764,389
Total Operating Expenses	**89,761,108**	**82,994,384**	**79,287,339**	**75,083,044**
Selling/General/Admin. Expenses, Total	8,373,523	7,904,192	7,659,235	7,552,820
Research & Development	-	-	-	-
Depreciation/Amortization	235,340	200,305	175,089	163,498
Interest Expense (Income) - Net Operating	-	-	-	-
Unusual Expense (Income)	-	-	-	-
Other Operating Expenses, Total	-98,855	14,245	-158,966	61,809

Operating Income	16,980,783	16,097,100	16,179,318	13,986,262
Interest Income (Expense), Net Non-Operating	999,321	813,846	846,810	-35,326
Gain (Loss) on Sale of Assets	-	-	-	-
Other, Net	-18,835	-16,140	-14,681	-18,292
Net Income Before Taxes	17,961,269	16,894,806	17,011,447	13,932,644
Provision for Income Taxes	4,422,851	4,224,272	4,249,218	3,569,336
Net Income After Taxes	13,538,418	12,670,534	12,762,229	10,363,308
Minority Interest	-	-	-	-
Equity In Affiliates	-	-	-	-
US GAAP Adjustment	-	-	-	-
Net Income Before Extraordinary Items	13,538,418	12,670,534	12,762,229	10,363,308
Total Extraordinary Items	-	-	-	-
Net Income	13,538,418	12,670,534	12,762,229	10,363,308
Total Adjustments to Net Income	-	-	-	-
Income Available to Common Excluding Extraordinary Items	13,538,418	12,670,534	12,762,229	10,363,308
Dilution Adjustment	-	-	-	-
Diluted Net Income	13,538,418	12,670,534	12,762,229	10,363,308
Diluted Weighted Average Shares	116,318.08	116,318.08	116,318.08	111,365.36
Diluted EPS Excluding Extraordinary Items	116.39	108.93	109.72	93.06
DPS - Common Stock Primary Issue	117.2	107.3	107.7	89
Diluted Normalized EPS	115.91	108.91	109.2	92.4

3.2 Fundamental Analysis

Fundamental analysis covers a very diverse and extensive range of issues having a direct or indirect impact on the market situation and prospects for development of the assessed company.

The individual basic stages of fundamental analysis include the analysis of the following aspects of the company's operations:

1. Macroeconomic environment,
2. Industrial environment,
3. Strategic situation of the company,
4. Company's financial standing,
5. Company valuation.

3.2.1 Analysis of the macroeconomic environment

The macroeconomic environment is a common denominator for all companies operating on the market of a given country.

In the case of international concerns, this stage is significantly extended, as it requires an analysis of the macroeconomic situation in all countries in which it operates or the use of aggregated and generalized measures for the entire region or even the world.

The notion of growth in general is crucial to macroeconomic analysis, as increases in profits and cash flow are considered the condition for increasing dividends and share prices and achieving these goals in an economic growth environment becomes much more natural.

Gross Domestic Product

The most general measure of economic activity is Gross Domestic Product (GDP), which is "a measure of the volume of production produced by production factors located on the territory of a given country, regardless of who owns them"

The scale of GDP growth, or decline, indicates the degree of expansion of the economy.

Changes in the level of GDP can be studied by analyzing the four basic variables underlying economic activity:

- Projected increase in employment in the economy,
- Trend of changes in the average number of hours worked in a given period,
- Trend of changes in production per man-hour (labor productivity index),
- Changes in the price level.

The first three of these parameters influence the projected changes in real (inflation-adjusted) GDP, while the last one relates to the analysis of nominal GDP. These values are usually the primary variables in models used to forecast the size of GDP.

Economic cycles

Economic cycles and related trends are of great importance for the results of the fundamental analysis and are determined by the size of GDP. The length of the business cycles is difficult to predict, but a historical framework can be defined for them.

The occurrence of business cycles can be explained by investment processes. As a result of the investments made, especially technological breakthroughs, the phenomenon of cost reduction occurs, which causes the rate of return on capital to increase and is associated with the occurrence of the growth cycle.

Interest rates

In general terms, the interest rate is the price to be paid for the loaned funds. Thus, it represents the rate of return required for a given type of asset – most often government debt securities, resulting from supply and demand.

The reference point for the market level of interest rates is also the level of central rates, set in Poland by the Monetary Policy Council of the NBP (National Bank of Poland).

By controlling the interest rate, the NBP has the potential to significantly influence the phenomena occurring in the economy – primarily the internal demand and inflation. Thus, the central bank plays a regulatory role.

It is generally accepted that pro-development interest rate cuts are beneficial for stock prices as lower interest rates:

- reduce the financial costs of enterprises,
- make it easier to make new investments through lowered loan prices,
- increase potential sales by stimulating internal demand,
- reduce the relative attractiveness of other forms of investment, such as government debt securities.

Other macroeconomic factors

One of the important factors is the unemployment rate, which reflects the occurrence of development or recession processes in the economy. Changes in unemployment rates constitute an important indicator for diagnosing the pro-development or pro-saving climate among enterprises.

The level of inflation is also an important indicator as it reflects the stability of the economy.

In developed countries, the inflation rate tends to be very stable, and deflationary phenomena may usually indicate a recession.

In the analysis of the macroeconomic situation, one should also take into account the fiscal policy, which in Poland is often criticized by economists for both the excessively high level of personal income taxes and the extremely slow pace of corporate tax reduction, as well as the immense complexity and inconsistencies in the tax regulations.

The amount of exchange rates has a significant, although different, impact depending on the nature of the enterprise's activity.

The high local currency exchange rate has a negative impact on enterprises exporting their products, as it causes either an increase in the prices of products offered abroad or a decrease in the exporter's profit margin – depending on the applied pricing policy.

Low quotation of the local currency raises the prices of imported goods, so it may not only threaten the market position of importers, but also present a risk of inflationary pressure, especially in the situation of a high current account deficit.

The result of the macroeconomic analysis should be treated as a starting point for further analysis, more closely related to the audited company itself. In particular, however, the conclusions regarding the current phase of the business cycle provide a valuable indication for choosing the right moment to take a position regarding the company's shares, which shows promising prospects based on the analysis of the results obtained from other elements of the fundamental analysis.

3.2.2 Example of macroeconomic analysis

In this chapter, the fundamental analysis based on macroeconomic parameters, microeconomics parameters, political factors, exchange rates, and economic cycle is further explained.

This subchapter contains several macroeconomic parameters that will be discussed, namely GDP, the level of budget deficit, unemployment rate, public debt, inflation, and stock market.

Gross Domestic Product
GDP in Indonesia is presented in Figure 3.3.

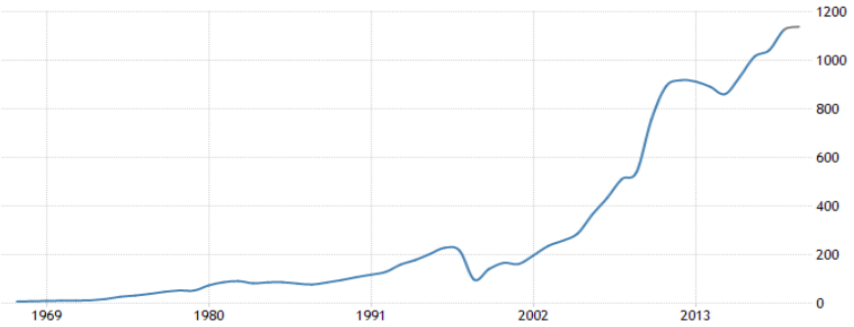


Figure 3.3. GDP of Indonesia, 1967-2019

Between 1969 and 1997, Indonesia's economy grew at an average annual rate of almost seven percent. This achievement enabled the Indonesian economy to grow from the ranks of "lower-income countries" into the category of "lower-middle income countries"(Indonesia-Investments, 2018). Yet, there was the Asian Financial Crisis that "erupted" in the late 1990s had a very negative impact on the Indonesian economy, causing a decline in GDP of 13.6% in 1998 and very limited growth of 0.3% in 1999. Regardless, the country made its efforts to recover. After the Asian Financial Crisis, GDP of Indonesia grew significantly, as shown in the graph – from USD 0.1 trillion to more than USD 1 trillion at the peak of 2018. Although it suffered a decrease in 2015, it increased significantly again in the following year.

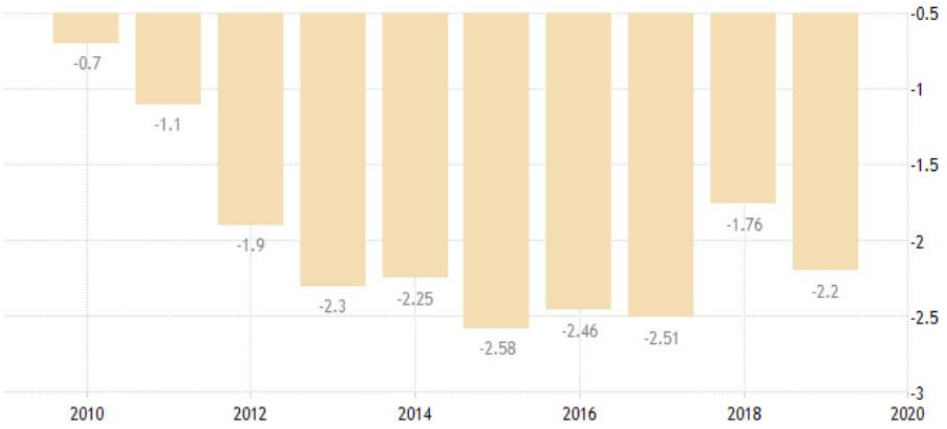
PT HM Sampoerna Tbk., being one of the biggest tobacco companies in Indonesia, contributes to this GDP growth. The company is committed to support the efforts to increase GDP through empowering the sector of Small and Medium Enterprises (SMEs) in Indonesia.

As concrete proof of support for the development of SMEs, Sampoerna through the program titled Sampoerna Retail Community (SRC) has developed 57 retailers in 2008 to more than 60,000 retailers in 2018 and spread in 408 cities in 34 provinces in Indonesia. To note, the SRC is a Sampoerna coaching program for traditional retailers through store management education, marketing strategies, and financial management – where the company also sold its products.

Data from the Indonesian Chamber of Commerce and Industry in 2016 showed that in the last five years the contribution of the SME sector to GDP increased from 57.84% to 60.34%. A survey conducted by Indonesian national media on 8 cities shows that the turnover of SRC contributes IDR 69.3 trillion per year to the GDP of national retail. This shows that the company contribute a quite deal to Indonesian GDP.

Level of budget deficit

The level of budget deficit in Indonesia is presented in Figure 3.4.



Actual	Previous	Highest	Lowest	Dates	Unit	Frequency
-2.20	-1.76	3.02	-2.58	1988 - 2019	percent of GDP	Yearly

Figure 3.4. Level of budget deficit of Indonesia, 2010-2020

Indonesia recorded a Government Budget deficit equal to 2.20 percent of the country's GDP in 2019, greater than the government's target of 1.8 percent due to a revenue shortfall of around Rp 207.9 trillion (USD 15 billion). The government collected IDR 1.96 quadrillion in state revenue last year, below its target of Rp 2.16 quadrillion.

The tax authority collected IDR 1.33 quadrillion in tax revenue last year, or 84.4% of the full-year target, causing a shortfall of IDR 245.5 trillion, the worst in at least five years. The government's strategy to cover the budget deficit, especially in the scope of the health service budget deficit is to take a portion of local government revenue from local cigarette taxes and from the distribution of tobacco excise revenues.

The new Presidential Regulation instructs the local government to channel three-quarters of the budget for health services and anti-smoking campaigns to the Health Office.

Indonesia, as the second largest tobacco market in the world with 100 million smokers, is subjecting cigarettes to three types of taxes. The government imposes the national tobacco tax amounting to 44.7% of the retail price, the local cigarette tax amounting to 4.47% of the prince and the

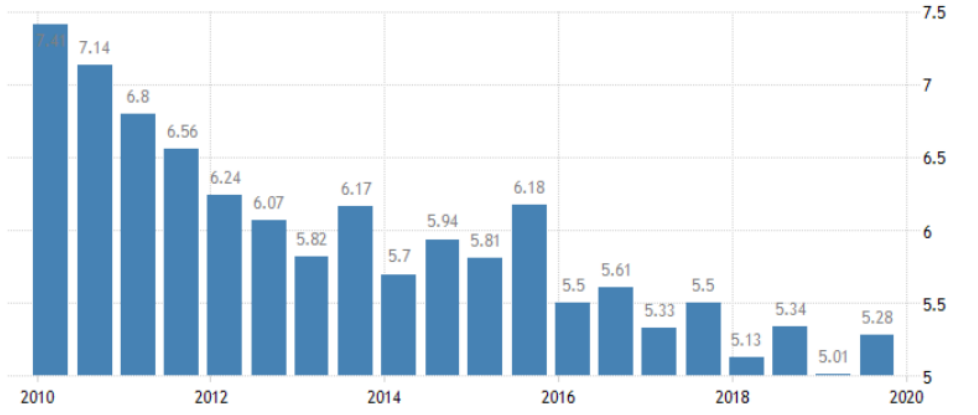
value added tax amounting to 9.1% of the price. Revenues resulting from the national tobacco tax (approx. IDR 148 trillion in 2017) and value-added tax are transferred to the national treasury, whereas the ones resulting from the regional tobacco tax (approx. Rp. 14 trillion) are distributed to regional governments.

Under the Law on Local Taxes and Local Levies (2009), half of the local cigarette tax is obtained; local governments must use it for supporting health services and monitoring the trade in illegal cigarettes and non-smoking areas. However, the implementation of this regulation is different in each local government. This is in line with the Regulation of the Ministry of Health (2017), according to which it is required to use three quarters of the local cigarette tax allocated for health services up to IDR 5.25 trillion to cover health care programs.

As Sampoerna Tbk. is one of the tobacco producers in Indonesia, this affects its product, thus it may have an impact on the price of the product later on.

Unemployment rate

Unemployment rate in Indonesia is shown in Figure 3.5.



Actual	Previous	Highest	Lowest	Dates	Unit	Frequency
5.28	5.01	11.24	2.00	1982 - 2019	percent	Quarterly

Figure 3.5. Level of budget deficit of Indonesia, 2010-2020

Over the years, it seems that there has been a significant decrease of unemployment rate in Indonesia, which is a good thing as it shows that the country's efforts to decrease the unemployment problem are successful.

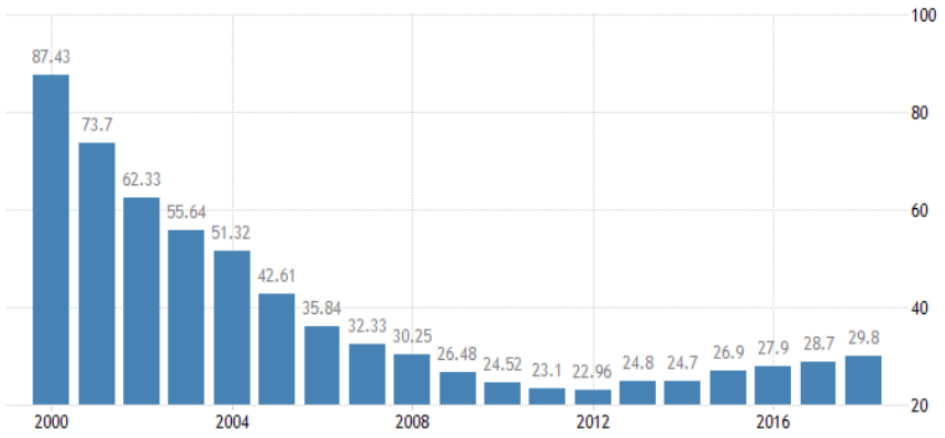
PT HM Sampoerna Tbk. contributes to the aforementioned decrease by providing employment to a significant number of people. One of its products, i.e handmade cigarettes, requires a lot of workforces to do the job. Currently there are 39,200 workers employed by the company for the production of the handmade cigarettes and 28,212 permanent workers. It is quite an amount as there are lots of cigarette manufacturers that already rely on industrial automation to produce cigarettes. The result above shows that the company has its role in decreasing the unemployment rate in the country.

Meanwhile, in the early 2020s, there has been a deterioration – with a large portion of the sector continuing to signal worsening business conditions, exports declining together with consumer amid rising fears over the Coronavirus (COVID-19) outbreak. However, the situation in Indonesia is still considered safe.

Even though there have been many cases of the virus in the past week in Indonesia (34 as of March 12th, 2020), most of the companies still operate normally, including PT HM Sampoerna Tbk. They exercise preventive such measures as temperature checks, provision of masks and hand-sanitizers. For now, the virus has not stopped the company's production, thus allowing the employees to remain productive.

Public debt

The public debt in Indonesia is displayed in Figure 3.6.



Actual	Previous	Highest	Lowest	Dates	Unit	Frequency
29.80	28.70	87.43	22.96	2000 - 2018	percent	Yearly

Figure 3.6. Public debt of Indonesia, 2000-2018

In general, the Government debt as a percent of GDP is used by investors to measure the country's ability to repay its debt in the future, thus affecting the country's borrowing costs and government bond yields.

Indonesia got into a really high public debt in the early 2000s as the country suffered from Asian Financial Crisis in 1998 – causing the country to seek help from the International Monetary Fund (IMF). During the economic crisis, the IMF approved a loan for Indonesia in the amount of 17.36 billion from the Special Drawing Rights (SDR), which is equivalent to USD 23.53. However, only 11.1 billion from the SDR or around USD 14.99 billion was disbursed.

That year, the country also suffered as a result of the regime of its 2nd President, Soeharto, that led the country for more than 30 years without stepping down from his position while trying to develop it by taking out heavy loans, from which, unfortunately, some of the money ended up in his pocket and that of his family (corruption and nepotism). The country was consequently left with an tremendous debt in the early 2000s .

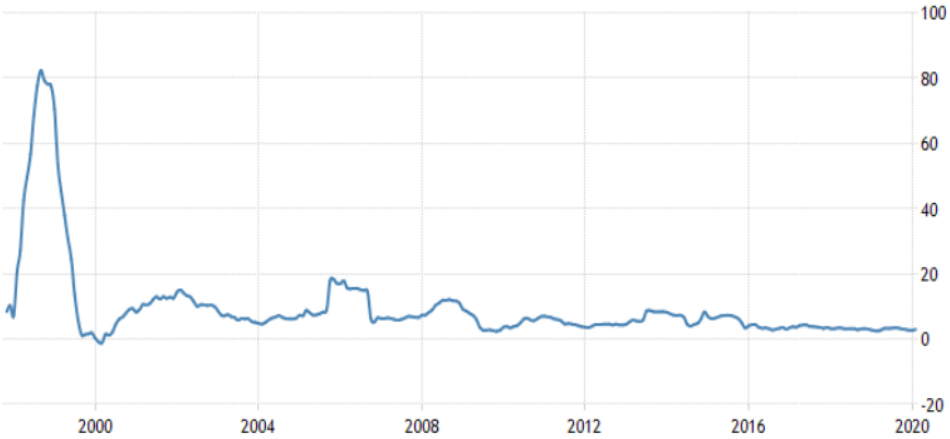
After the big protest in 1998 in response to Soeharto's regime, he stepped down from his position, and from there on, Indonesia gained the opportunity to finally make an attempt to recover. The figure shows that the public debt decreased, which is a good thing for the country. It could not have happened without all the country's development, including the development of its industry, and efforts, in which Sampoerna, participated which has been active in the tobacco market from 1913, has participated.

Inflation

Inflation in Indonesia can be seen in Figure 3.7.

Inflation is a state of the economy in a country in which there is a general trend to increase prices of goods and services over a long (continuous) period of time due to an imbalance in the flow of money and goods. Temporary price increases are not included in inflation. In general, inflation occurs when the amount of money circulating in the community is greater than needed.

Indonesia suffered inflation in the period between 1998 and 1999, when the Asian Financial Crisis happened. The riots that occurred throughout Indonesia at the end of the New Order triggered an inflation of 77.63% in 1998. The surge in prices of goods followed by the weakening of Indonesian's currency, rupiah, down to IDR 16,000/USD, caused the Indonesian economy to contract by more than 13% in 1998.



Actual	Previous	Highest	Lowest	Dates	Unit	Frequency
5.28	5.01	11.24	2.00	1982 - 2019	percent	Quarterly

Figure 3.7. Inflation of Indonesia, 1982-2019

This crisis, which revealed the fragility of the economic fundamentals, quickly spread to all sectors. The dramatic collapse of the Indonesian rupiah, which led the money market and capital market to their collapse, also caused the national banks to experience considerable difficulties. 1998 was the year when Sampoerna Tbk., which initially was a family business, decided to sell all Sampoerna family shares in PT HM Sampoerna Tbk. (40%) to Philip Morris International/PT. Dji Sam Soe. The announcement of the acquisition not only surprised the internal parties but also the company's external parties; where the decision to sell a family business, that has been pioneered since 1913, was considered by various circles to be a very high risk, though, after it was sold, the company's performance was very good at that time. This decision might have been affected by the then Indonesia's monetary crisis.

However, the decision turned out to be good as the performance of PT HM Sampoerna Tbk. in 2004 succeeded in obtaining a net income of IDR 15 trillion with a production value of 41.2 billion cigarettes and ranked first among the cigarette companies controlling 19.4% of the cigarette market share in Indonesia.

Stock Market

Changes on the Stock Market in Indonesia is presented in Figures 3.8. and 3.9.

	Indexes	Price			Day	Year	Date
JCI	JCI	5154	▼	-66.72	-1.28%	-18.88%	Mar/11

Figure 3.8. Stock Market of JCI, 2010-2020

The trends on the Stock Market can impact companies in a lot of ways. The rise and fall of share price values affects the market capitalization of companies, thus affecting their market value. The higher the price of shares is, the more a company is worth in terms of its market value and vice versa. The market value of a company can be important when considering mergers and/or acquisitions that involve shares as part of a deal.

The graph above shows that over the years there was an increasing trend on the Stock Exchange in Indonesia. However, in the early 2020s, it can be seen that the stock market has fallen drastically to the number of 5154 due to March 11th, 2020.

Sampoerna Tbk., listed as HMSP, has also suffered a decrease.

Figure 3.9. Stock Market of JCI, 2010-2020

Most of these declines result from the COVID-19 global pandemic. Market does not tolerate uncertainty, and COVID-19 represents the greatest macroeconomic risk of market uncertainty in years.

A decline in the case of both the Jakarta Composite Index (JCI) and HMSP was caused by the sentiment over the spread of the COVID-19 outside China, including Indonesia. Psychologically, investors still tend to wait in order to see the progress regarding the fight against the outbreak.

Investors must not react too aggressively to buying opportunities during the times of weak economy. Market players are advised to seek for defensive stocks, especially in the sector of consumer goods.

The HMSP stock market will probably decrease over time until the situation with COVID-19 becomes more stable.

3.2.3 Summary of Macroeconomic Analysis

Macroeconomics is the study of the behavior of the economy as a whole, in which the focus is placed on general economic factors that could help an analyst to forecast economic conditions to help consumers, firms, and governments in making better decisions – which is very beneficial considering the valuation of a company.

In the context of GDP, we could see that the cigarette industry plays a considerable role in the economy of Indonesia as, firstly, the country has a large and diverse tobacco consumer market with a significant percentage of adult smokers and, secondly, PT HM Sampoerna Tbk. itself has made its effort to push GDP by establishing the SRC that achieved the number of over 60,000 retailers in 2018 spread in 408 cities and 34 provinces of Indonesia.

As for the budget deficit level, the cigarette industry in Indonesia suffers from the new Presidential Regulation that instructs the local authorities to transfer three-quarters of the budget for health services and anti-smoking campaigns to the healthcare authority, in order to decrease the budget deficit. This regulation has affected the prices of the entire cigarette industry and, of course, PT HM Sampoerna Tbk.

The cigarette industry in Indonesia in particular helps to decrease the country's unemployment rate, as it is highly populated and at the same time has a limited number of jobs to offer its people. Hand-made cigarettes actually make a difference in this regard. PT HM Sampoerna Tbk. that also produces the hand-made cigarette, contributes as well by offering jobs to more than 39,200 workers in Indonesia. The outbreak of COVID-19 that occurred in the early 2020s has not stopped the company's operations and resulted in the establishment of regulations concerning the hygiene and health of its employees.

The public debt of Indonesia had its impact on the country, especially during the Asian Financial Crisis in 1998, when it affected almost the entire domestic industry. However, as seen in the decreasing trend of the public debt, the government has made successful efforts to decrease it through development in many sectors. PT HM Sampoerna Tbk., which is one of the longest-operating cigarette manufacturers in Indonesia that has expanded its business, has also contributed to it.

Similarly, the 1998 Asian Financial Crisis also impacted the inflation in Indonesia. It affected a lot of industries, including PT HM Sampoerna Tbk., which was originally a family-business company in a such a way that it had to sell all of its shares to Philip Morris International. This decision, however, was the right one as the company expanded really well in the years that followed.

Due to the recent COVID-19 outbreak outside China, including Indonesia, there was a declining trend in the case of both the Jakarta Composite Index (JCI) and HMSP. In terms of the investors' attitude, they are still more

inclined to observe how the epidemic progresses rather than act. Many industries, including the cigarette one, will suffer from it, and the HMSP stock market will also probably decrease over time until the situation ofCOVID-19 becomes easier to manage.

3.3 Industry analysis

Industry analysis covers two aspects:

- strategic analysis in which the conditions for running a business by enterprises are identified,
- market analysis that focuses on the behavior of quotations of shares of companies belonging to a given industry on the stock exchange.

3.3.1 Analysis of industry stock quotes

This aspect of the analysis is important from the point of view of trends in the stock market, which largely determine the behavior of all companies, or at least a significant number of them, in a given industry.

Based on this assessment, we can determine whether the overall stock available on the market is undervalued or overvalued.

Therefore, it is possible to identify industries that regularly perform better than the main stock exchange index in the analyzed period and the ones whose rates of return are lower than the average for the entire market. The measurement of the relative behavior of a given industry compared to the market is easier in the case of popular industries in which there is a large group of companies listed on the stock exchange. The stock exchange calculates separate subindices for them, which are given together with the main index quotations, which makes a comparison of the relative behavior of industry indices with the main index a very simple process. The following are some of the examples of the industry indices that are calculated on the Warsaw Stock Exchange (WSE):

- WIG Banks,
- WIG Construction,
- WIG IT and TechWIG,
- WIG Food,
- WIG Telecommunications.

In the case of the analysis of a company which has no officially calculated industry index, the analysis becomes less objective, as the analyst is forced to construct their own measure – similar to an industry index – whose behavior they will have to calculate on the basis of historical data.

It often happens that the mere fact of belonging to a "fashionable" industry, even if the company's development prospects are not very promising, may contribute to an increase in its quotation.

The clearest example of this phenomenon was the IT and Internet boom, which at its peak on the Polish market at the end of 1999 and beginning of 2000. At that time, the quotation levels of companies belonging to this industry exceeded any price levels considered reasonable – from the point of view of classic fundamental analysis.

However, caution is required when extrapolating identified trends into the future – especially when following the fundamental analysis and defining one's investment horizon as long-term.

3.3.2 Political factors – an example

Several political factors affect the tobacco industry in Indonesia.

Political Opportunity Structures (POS): Indonesian Government Regulation

Obligates tobacco industries in Indonesia to standardize their cigarette product to the low tar and nicotine.

Obligates tobacco industries to include health warnings on each product, figure 3.10, that said, "Smoking can cause cancer, heart attacks, impotence or pregnancy and fetal disorders."

Figure 3.10.
Warnings concerning health on a tobacco product

All tobacco product advertisement must not show the act of smoking, as seen in Figure 3.11.

Figure 3.11. Company's banner of a tobacco product

All tobacco products must have warning picture, Figure 3.12.

Figure 3.12. Pictures warning of dangers of smoking

Exchange rates – an example

Below, in Table 3.5. are the exchange rates for the Indonesian currency as of March 18th, 2020 (according to x-rates.com).

Table 3.5. Exchange rates for Indonesian Rupiah

Indonesian Rupiah	1 IDR	inv. 1.00 IDR
US Dollar	0.000065	15,289,968,600
Euro	0.000060	16,612,966,435
British Pound	0.000056	17,709,568,054
Indian Rupee	0.004894	204,322,251
Australian Dollar	0.000113	8,831,147,521
Canadian Dollar	0.000095	10,508,670,595
Singapore Dollar	0.000095	10,577,247,060
Swiss Franc	0.000063	15,762,701,228
Malaysian Ringgit	0.000286	3,496,513,794
Japanese Yen	0.007064	141,571,147

3.3.3 Economic cycle

As the previous macroeconomic analysis indicated, Indonesia reached the lowest point of its economic cycle during the Asian Economic Crisis in 2018. However, after years of crisis, the Indonesian economy has appeared to be moving smoothly towards a brighter future. Although the situation has deteriorated recently due to the impact of the sudden worldwide COVID-19 virus outbreak, the economy should remain mostly unchanged if the country can handle the problem quickly in near future by reducing the existent uncertainty and increasing financial stability.

3.3.4 Summary of macroeconomic analysis

According to the previous data, there will be rapid development in Indonesia in the following years – though only if there is no unpredictable event that might affect its economy. As the cigarette market has been blooming well for many years in Indonesia and smoking has become the habit of most of the Indonesian population, the cigarette industry will remain safe on its own regardless of any future disruptions. Consumers will keep spending their money on cigarettes regardless of the imposed tax or other potential events.

3.4 Strategic analysis

Enterprises meet in the area of their business activity. When analyzing these conditions, it is necessary to assess the company's competitive position and its determinants, its development potential and operational risk to which the company is exposed due to belonging to a given industry.

3.4.1 Strategic analysis of the industry

Strategic industry analysis should emphasize – apart from isolated elements resulting directly from the characteristics of the sector – the following basic elements:

- market size,
- competition structure,
- technologies and related market entry barriers,
- factors determining competitive advantage,
- supplier structure,
- customer structure,
- legal environment,
- political environment,
- industry environment.

The analysis of these areas is the starting point for further analysis of the individual characteristics of the selected industry, in the case of which any attempts at generalization could unnecessarily stiffen and narrow the analytical apparatus, because it is impossible to take into account in advance in a general form all the circumstances that may occur in a given sector and significant impact on the activities of the entities operating there.

Correct identification of the general market model in the analyzed industry may be helpful in the subsequent assessment of the competitive situation and enterprises' ability to react to market phenomena.

The typology of the market models featured in this subchapter covers the following situations:

- Monopoly. A situation in which an enterprise is the only producer in a given field. In a competitive economy, there are laws to protect consumers and increase the scope of competition that usually restrict the creation of monopolies.
- Competitive monopoly. It describes a situation in which there are many enterprises with a similar scope of activity, having a monopoly in a given area or within a certain segment of activity.

- Oligopoly. A monopolistic form in which there is a small number of enterprises in the same area which share the same business profile and which compete with each other.
- Distributed industry. It includes a large number of enterprises with a highly diversified nature of activity, competing with each other in terms of price, quality or the mere presence in a specific area. Local markets play an important role in this model. Market entry barriers are a minor factor here and the creation of a new enterprise does not require large investments.
- Quasi-perfect competition. It refers to a situation in which there is a large number of entities characterized by uniformity of production, and the main competitive factor is price.

Below are the factors that determine the intensity of competition in the industry; however, their relative impact differs depending on the sector studied:

- Competition between existing competitors. For each industry analyzed, it must be determined whether the level of competition that is present within it is currently intense and growing or moderate and stable. It tends to grow when the sector consists of many companies of relatively the same size.
- Threat of new entrants. Even if the industry consists of only a few competitors, the likelihood of the emergence of new companies and thus an increase in competitiveness in a given sector should be taken into account.
- Threat of new substitute products/services. Substitute products reduce the potential profits in a given industry by limiting the prices that participating companies can charge for their products/services.
- Bargaining power of buyers. Buyers can influence the profitability of an industry by demanding lower prices for the products they buy along with better quality and service by negotiating these terms with competing companies.
- Bargaining power of suppliers. Suppliers can change the future rates of return generated by companies in their industry by increasing prices and reducing the quality of the products/services provided.

This analysis provides an overview of a relatively wide set of market conditions within the industry and is a credible starting point for the analysis of individual factors, characteristic for the selected industry, and, consequently, for the transition to the stage of fundamental analysis focused on the enterprise itself, which is in a defined macroeconomic environment and industry.

3.4.2 Analysis of the company's strategic situation

The fundamental issue that appears when assessing the company's strategy is the answer to the question whether the adopted company's strategy will contribute to the creation of value for shareholders. This requires identifying the general model of competitive strategy that the company has adopted. According to Porter's theory, there are three main models that determine the company's approach to its activities:

- Low cost strategy. A company using this strategy strives to produce at the lowest cost to become the leader in its industry.
- Product differentiation strategy. According to this strategy, a company aims to be viewed as unique among its product consumers. The possibilities of product differentiation depend on the specifics of the industry.
- Market niche strategy. It consists in focusing the company's efforts on a specific group of recipients, a specific group of products or a geographically defined market.

It is necessary to determine not only which of the strategies is appropriate, but also and above all, whether it is applied correctly, what the results of its implementation are and whether it will be possible to implement it further in the future. One should assess whether the strategy works over time and whether it is adapted to the changing environment – especially the industrial one.

One element that needs emphasizing when analyzing the company's strategy is the identification of its distinctive competence. In this sense, the strategy of its choice should define the areas in which a company has special competences, giving it an advantage over its competitors. Thus, it is an area of activity in which a company has exceptional skills.

There are five internal areas for which strategies should be defined:

- Marketing strategy. It deals with such issues as the promotion and advertising techniques to be applied, pricing, production structure and the overall image of the company.
- Financial strategy. It defines the organization's capital structure, debt policy, asset management procedures and dividend policy.
- Production strategy. It refers to such problems as the quality of manufactured products, production efficiency, applied technologies and standards.
- Human resources Strategy. It deals with issues related to remuneration, personnel selection, performance appraisal, promotion policy and shaping the work environment.

- Research and development strategy. It focuses on the problems of product development and applied technologies, technology licensing policy as well as pro-innovation activities carried out by a company.

The analysis of a strategy at the level of all of the above-mentioned areas provides extensive information on the company's approach to business – both market-oriented and related to the processes taking place inside the organization. Such analysis can also serve as a means of determining the general philosophy of a company, the value system that guides it, which allows for understanding its activities better and making predictions about the company's future actions more credible.

3.4.3 SWOT analysis

SWOT (i.e. Strengths, Weaknesses, Opportunities, Threats) analysis is a very synthetic, broad and flexible method of examining the strategic position of an enterprise, which focuses on identifying the strengths and weaknesses of an enterprise as well as the opportunities and threats that it faces. Its two first elements are defined as follows:

- Strengths are resources fully or partially controlled by an organization that distinguish it in a positive way in the environment and among its competitors.
- Weaknesses are those aspects of the organization's functioning that limit its efficiency and may block its future development.

Both strengths and weaknesses can be material or immaterial. Two further stages of SWOT analysis are prognostic in nature and their analysis requires a great understanding of the nature of the organization's activities and its environment in order to reliably identify emerging opportunities and threats:

- Opportunities are possible future events that an organization can use to achieve benefits.
- Threats are possible events that could have an adverse effect on the company's operations.

The classic list of opportunities and threats usually concerns five areas of an organization, which are:

- Area of general political, economic and social change,
- Area of market changes,
- Area of design, technological and material changes,
- Area of competitive and cooperating organizations,
- Area of internal activities of an organization.

The results of SWOT analysis are often used for the purposes of forming and modifying corporate strategies.

In fundamental analysis, they serve as a diagnostic tool, which then can be used to compare with the strategy actually adopted and implemented by a company, which will provide help in discovering whether a company is effectively responding to signals appearing within its organization and environment.

In the further part of the analysis, the strategic position of the company's products on the market need to be assessed. The starting point for examining all aspects shaping this element may be tools described in the literature, which are quite universal in nature and allow one to familiarize oneself with the general position of a company together with its products and services on the market.

3.4.4 Ansoff matrix

One such tool is the Ansoff matrix.

Ansoff's concept is based on the analysis of relationships presented below and shows the possibilities for the development of an organization using four basic strategies, highlighted in Table 3.6.

Table 3.6. Ansoff matrix

		Market	
		Old	New
Product	Old	Market penetration	Market development
	New	Product development	Diversification

The market penetration strategy is implemented in such activities of a company that are aimed at increasingly full use of the conditions and opportunities that exist in the sphere already covered by a company.

The market development strategy consists in entering a new market with a currently sold product.

The product development strategy determines the creation of a new, from the buyer's point of view, product and offering it to the same groups of recipients, i.e. on the same market as before.

The diversification strategy means that a company enters new markets and offers new products there. The most open way to use this strategy is to expand by offering new products, often completely unrelated to those produced so far, to new customers.

Identifying the position that a company under valuation occupies in the diagram allows for an overall assessment of its approach to market diversification and to expanding the range of products it offers.

3.4.5 BCG matrix

BCG matrix was developed by the company Boston Consulting Group. This method allows assessing how the company's products are placed on the market and what prospects for the future can be associated with them. This method defines four possible situations in which the company's products can be found, taking into account two variations of the two analyzed parameters, which are presented in Table 3.7.

Table 3.7. BCG matrix

		Relative market share	
		Big	Small
Market growth rate	High	Stars	?
	Low	Dairy cows	Dogs

Identifying which of the four basic groups includes individual products offered by a company studied allows one to better assess its market prospects and to find an explanation for any low or negative cash flows generated when there are many products in the position of stars or question marks in the company's portfolio. It also allows one to discover which ones a company selected in order to use their potential and incur the necessary capital expenditure to transfer products to more profitable areas and achieve significant benefits in the future.

An extended classification of products, already considered classical in the literature, has been proposed. The author presents the following groups of products:

- Current hosts. Products with a high share of income and low development prospects.
- Future hosts. Profitable products with large sales and good prospects.
- Cost-effective special products. Products with a limited sales market, not binding the company's resources, but bringing significant income.
- Products with a future. Products that are in the early stage of development or introduction to the market, but offer potentially great development opportunities.
- Missing products. Products that bring losses.
- Former hosts. Products that are still sold in large numbers, but their costs are soaring and they involve too much time and attention from management.
- Products that can be saved. They are characterized by a significant sales volume, great development opportunities, with a leading position on the market, but at the same time they have one defect that is easy to identify and remove.
- No special products needed. Products that are specialized or sold in a limited market that does not produce a satisfactory income.
- Unjustified specialty products. They are not very profitable; usually they are economically unattractive substitutes for well-selling products.
- Products to satisfy the vanity of management. Products that are not successful despite the investments and high commitment of managers.
- "Cinderella". Products that can be successful if management pays attention to them and provides adequate resources for investment.

This classification completes the picture of a product portfolio of an enterprise. Depending on how great the number of products is included in particular groups, one can determine a general measure of the attractiveness of the products offered by the company on the market. This classification is a bit less convenient to apply, as it does not have clear determinants, such as two dimensions determining market share and market growth in the case of BCG matrix, but it offers more categories, which allow for a more detailed analysis of the products. The two classifications, however, can be used in a mixed manner, one complementing the other, as the former focuses on a market-oriented product situation, while the latter is concentrated on the position of the product from the company's internal point of view.

3.5 Strategic analysis – an example

This subchapter presents the application of the business model framework, competitive advantage, market positioning, and SWOT analysis to the company PT HM Sampoerna Tbk.

Key Activities:

- product manufacture,
- marketing,
- product sales,
- human resources management,
- logistics.

Key Resources:

- Manpower,
- Money: profit, shareholder investments,
- Raw material: tobacco leaf & clove,
- Machine: machine-made kretek cigarettes,
- Information.
- Value Proposition:

***Three Hands Philosophy*:**

- Provision of high quality products to adult smokers in the price category that matches the brand choice,
- Provision of competitive compensation and a good working environment for employees as well as fostering good relationships with business partners,
- Contribution to the wide community.

- **Customer Relationship:**
  Sampoerna has good relationship among its customers. It is fully committed to produce high quality products at a reasonable price for adult consumers. By committing to keep the customer satisfaction level higher, indirectly Sampoerna also maintains its relationship with them. This is achieved through offering relevant products and innovations to meet the changing preferences of their customers.

- **Channels:**
  PT Panama is the sole distributor of Sampoerna Tbk.'s product.

- **Customer Segments:**
  Adult Smokers (16 years old and older).

At figure 3.14 the market positioning of Sampoerna Tbk. along with its competitors.

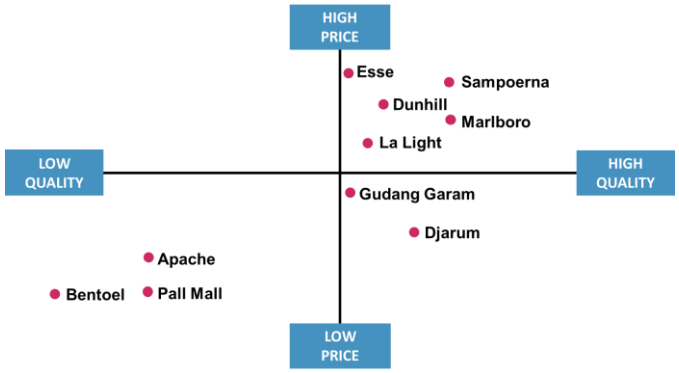


Figure 3.14. Market position of Sampoerna Tbk.

SWOT Analysis

In Table 3.8. 15there is the SWOT analysis of Sampoerna Tbk. presented.

Table 3.8. SWOT analysis for Sampoerna Tbk.

Strength	Weakness
Good quality of raw materials, Market dominance, Company credibility, Good corporate culture, Great capital value, Increasing in ROE of 33%, Best company to satisfy the customers, Market leader in Tobacco industry, Increase in total revenue by 12.6%, Wide variety of variant products, Many loyal customers, Increase in customer for 8.6%.	Increase customers for 8.6%, Quite expensive prices, Machine-Made Clove Cigarette (MCC) Sampoerna Mild cigarette product internationally less popular than other products, MCC market share lost from competitors, Large enough capital to hold periodic events, Slow growth of Sampoerna Hijau cigarettes, Decrease in sales volume of Hand-Rolled Cigarettes for 13%, Work termination of 2,700 labors in 2 main factories, Unaffordable price caused by promotion and material cost, Slow growth on certain product (Sampoerna Hijau), Lack of abilities to compete in global market, Inappropriate capital allocation

Opportunities	Threats
Positive market trends for Low Tar Low Nicotine (LTLN) cigarettes in Indonesia, Innovation of LTLN in cigarette, The possibility of developing new products Indonesian as the second highest smokers in the world, Demand for cigarette increasing 8% annually, Export of cigarette growing (7.4%-10%) annually, Growth of Indonesian population – 1.49% annually, Perception of smoking as a new urban lifestyle.	Regional regulations concerning cigarettes, Increase of competitors of Mild types of cigarettes, High cigarette taxes, Reduction of events sponsored by cigarette companies, Increase in cigarette's tax rate of 8.72% on average, Trends towards healthy life, Increase in cigarette industry total production of 5.55%, Government Regulation of Tobacco Advertising Restrictions, Increase in tobacco prices of 25%, Recently growing demand for electronic cigarettes, Probability of Indonesia join FCTC.

3.6 Financial analysis

Financial reports and other information prepared and provided by the accounting and finance departments of the firm are the basis of the analysis and conclusions for all stakeholders. One of the most popular ways of performing the financial analysis is to make two basic analyses:

- initial analysis,
- ratio analysis.

Initial analysis

Initial analysis covers balance sheet analysis and preliminary income statement analysis. It provides information on the structure of assets, debt, capital and the result of an enterprise.

The preliminary analysis of the balance sheet precedes the ratio analysis.

It provides information on:

- property structure based on asset structure ratios,
- capital structure based on the liability structure ratios,
- capital and asset structure.

Depending on whether one document is analyzed or its subsequent issues from successive reporting periods, this presents the situation of an enterprise in a static or dynamic perspective.

Static analysis shows the sources of financing an asset and its structure at a given moment. The dynamic analysis allows one to determine the direction of changes in this structure and their dynamics in particular periods.

Ratio analysis

Ratio analysis is one of the most important elements of the financial analysis of enterprises. It consists in calculating a number of indicators expressing the relationships between particular values obtained from reporting documents such as the balance sheet and income statements. It is an extension of the preliminary analysis. By means of the calculated values of the indicators, various economic aspects of the enterprise's activity can be synthetically described.

Indicators for economic analysis are generally not ranked according to the needs of recipients, but grouped into sets with similar economic content.

Usually there are five areas of ratio analysis corresponding to various problems of the company's operations:

- financial liquidity – liquidity shows the company's ability to meet short-term obligations, i.e. with payment terms shorter than one year,
- business activity – it consists in analyzing the efficiency of the company's operation,
- profitability of sale – commercial profitability calculated on the basis of sales volume data,
- profitability of capital – economic profitability regarding the entire property of the entity, financial profitability related to the employed equity.
- indebtedness – the focus of which is on two issues: the company's debt level and its ability to repay the debt.

The financial analysis ratios used in each of these groups are calculated on the basis of:

1. data expressing the state of the phenomenon at the beginning and end of the reporting period; the difference shows the changes taking place in a given field in the reporting period under examination due to the relevant economic decisions taken,
2. the average value in the reporting period, calculated on the basis of monthly and quarterly indicators (in case of one year) or, as a last resort, as an average of the values at the beginning and end of the reporting period.

Net working capital NWC

Net working capital is a very important concept, it is equal to the working capital less current and short-term liabilities as well as short-term loans and credits,

Net working capital = Current assets − Current liabilities

This capital serves as a form of security for an enterprise against possible problems in the event of difficulties in selling the manufactured products.

Due to the conditions of the economic activity conducted by a given entity, in practice the net working capital may assume negative and positive values.

- The positive value of the net working capital occurs when a part of the working assets is financed with long-term capital. At first glance, the positive value of capital may be a good sign of the company's financial position, but not in a situation where the entirety of the long-term capital used for this purpose comes from loans granted to a company with interest rates higher than the capital profitability index.
- The zero value of the net working capital has more of a purely theoretical significance; in practice, it may occur briefly as a result of changes in the company's capital structure.
- The third possibility is the negative value of the net working capital. It occurs when a part of the entity's fixed assets is financed by current liabilities. This situation raises some reservations as to the policy and financial position of a company, because the property permanently connected with it was financed with funds with a quick payback period. However, it is often found in typical commercial companies, where the percentage share of fixed assets in relation to current assets is disproportionately small compared to production companies. These companies receive from their suppliers goods with long trade credit, and they use the forms of cash settlements or short-term credit. Therefore, they use the difference between the deadline for the fulfillment of liabilities and the inflow of receivables, which results in the separation of free cash while maintaining or increasing the level of turnover. These funds are then allocated to the fixed assets. This carries the risk of insolvency. Therefore, if the company wants to reduce the risk, it needs to eliminate such a situation.

Table 3.9. shows the main ratios that are used in the financial analysis.

Table 3.9. Definitions of selected financial ratios

Name of ratio	Formula
Liquidity ratio	
	$\text{Current ratio} = \frac{\text{current assets}}{\text{short term liabilities}}$
	$\text{Acid test} = \frac{\text{current assets - inventory}}{\text{short term liabilities}}$
	$\text{Cash liquidity} = \frac{\text{current assets - inventory - receivables}}{\text{short term liabilities}}$
Business activity	
	$\text{Turnover inventory} = \frac{\text{sale}}{\text{average inventory}}$
	$\text{Average period} = \frac{\text{360 days}}{\text{turnover inventory}}$
	$\text{Turnover receivables} = \frac{\text{sale}}{\text{average receivables}}$
	$\text{Average period} = \frac{\text{360 days}}{\text{turnover receivables}}$
	$\text{Turnover cash} = \frac{\text{sale}}{\text{average cash}}$
	$\text{Average period} = \frac{\text{360 days}}{\text{turnover cash}}$
	$\text{Turnover liabilities} = \frac{\text{sale}}{\text{average short term liabilities}}$
	$\text{Average period} = \frac{\text{360 days}}{\text{turnover liabilities}}$
NWC	
	$\text{Turnover NWC} = \frac{\text{sale}}{\text{average NWC}}$
	$\text{Average period} = \frac{\text{360 days}}{\text{turnover NWC}}$
Sale profitability	
	$\text{Gross profit margin} = \frac{\text{gross profit}}{\text{sale}}$
	$\text{Net profit margin} = \frac{\text{net profit}}{\text{sale}}$

Capital profitability	
	$\text{ROA (return on assets)} = \frac{\text{net profit}}{\text{total assets}}$
	$\text{ROE (return on equity)} = \frac{\text{net profit}}{\text{equity capital}}$
Indebtedness	
	$\text{General indebtedness} = \frac{\text{total liabilities}}{\text{total assets}}$
	$\text{D/E (debt to equity)} = \frac{\text{total liabilities}}{\text{equity}}$

The ratio analysis is a fast and effective research method concerning the issues of the functioning of an enterprise and its economic operations. However, when using index analysis to evaluate a company, it should be remembered that it is based solely on economic data from the company's past and at best describes the current state of a company, not its future. At most, it can be the basis for developing the trends of changes within a company.

3.7 Financial analysis – an example

This chapter presents the analysis of the liquidity ratio, accounts receivable turnover ratio, inventory turnover ratio, total asset turnover ratio, fixed asset turnover ratio, working capital turnover ratio, return on equity (ROE), and return on asset (ROA).

Liquidity ratio

Liquidity ratio is the ratio between current assets divided by current liabilities. Based on the data presented in the previous chapter, the liquidity ratio of the company from year to year can be determined.

2018 = 37,831,483/8,793,999 = 4.30

2017 = 34,180,353/6,482,969 = 5.27

2016 = 33,647,496/6,428,478 = 5.23

2015 = 29,807,330/4,538,674 = 6.57

This ratio is decreasing annually with the exception of 2016. The trend describes limited liquidity and poorer coverage for the company.

Accounts receivable turnover ratio

Accounts receivable turnover ratio is the ratio between sales divided by average accounts receivable. Based on the data presented in the previous chapter, the accounts receivable turnover ratio of the company from year to year can be determined.

2018 = 45,956,880/((3,815,335+3,780,990)/2) = 12.10

2017 = 44,103,482/((3,780,990+4,996,420)/2) = 10.05

2016 = 43,728,614/((4,996,420+4,726,827)/2) = 8.99

2015 = 42,100,062/((4,726,827+1,097,937)/2) = 14.46

This ratio has a fluctuating trend, meaning that the firm still collects credits from its customers inefficiently.

Inventory turnover ratio

Inventory turnover ratio is the ratio between costs of goods sold divided by average inventory. Based on the data presented in the previous chapter, the inventory turnover ratio of the company from year to year can be determined.

2018 = 20,701,429/((16,067,133+19,048,884)/2) = 1.18

2017 = 20,087,945/((19,048,884+20,819,132)/2) = 1.01

2016 = 20,049,027/((20,819,132+20,608,201)/2) = 0.97

2015 = 20,499,171/((20,608,201+18,760,258)/2) = 1.04

This ratio has an increasing trend with the exception of 2015, meaning that the company can sell its inventory faster, resulting in the high number of sales.

Total asset turnover ratio

Total asset turnover ratio is the ratio between net sales divided by average total asset. Based on the data presented in the previous chapter, the total asset inventory turnover ratio of the company from year to year can be determined.

2018 = 45,956,880/((46,602,420+43,141,063)/2) = 1.02

2017 = 44,103,482/((43,141,063+42,508,277)/2) = 1.03

2016 = 43,728,614/((42,508,277+38,010,724)/2) = 1.09

2015 = 42,100,062/((38,010,724+28,380,630)/2) = 1.27

This ratio is decreasing annually. It shows that the company needs to put more effort to manage its assets effectively towards the net sales.

Fixed asset turnover ratio

Fixed asset turnover ratio is the ratio between net sales divided by average fixed assets. These fixed assets include property, plant and equipment after depreciation. Based on the data presented in the previous chapter, the fixed asset turnover ratio of the company from year to year can be determined.

2018 = 45,956,880/((7,396,884+7,004,704)/2) = 6.38

2017 = 44,103,482/((7,004,704+7,010,371)/2) = 6.29

2016 = 43,728,614/((7,010,371+6,394,905)/2) = 6.52

2015 = 42,100,062/((6,394,905+6,034,500)/2) = 6.77

There is a downward trend in the case of this ratio with an exception of 2018, which means that the company uses its substantial assets to increase the revenue in an inefficient manner. However, its situation improved in 2018 as it was increasing.

Working capital turnover ratio

Working capital turnover ratio is the ratio between net sales divided by average working capital, where working capital is the result of subtracting current liabilities from the amount of current assets. Based on the data of the previous chapter, the working capital turnover ratio of the company from year to year can be determined.

Below are the average current assets from year to year. The results were obtained by calculating the average value of current assets in a given year with the value of the previous year.

2018 = (38,009,503+34,359,372)/2 = 36,184,437.5

2017 = (34,359,372+33,647,496)/2 = 34,003,434

2016 = (33,647,496+29,807,330)/2 = 31,727,413

2015 = (29,807,330+20,777,514)/2 = 25,292,422

Below are the average current liabilities from year to year. The results were obtained by calculating the average value of the current liabilities in a given year with the value of the previous year.

2018 = (8,793,999+6,482,969)/2 = 7,638,484

2017 = (6,482,969+6,428,478)/2 = 6,455,723.5

2016 = (6,428,478+4,538,674)/2 = 5,483,576

2015 = (4,538,674+13,600,230)/2 = 9,069,452

Below is the working capital turnover ratio from year to year.

2018 = 45,956,880/(36,184,437.5-7,638,484) = 1.61

2017 = 44,103,482/(34,003,434-6,455,723.5) = 1.60

2016 = 43,728,614/(31,727,413-5,483,576) = 1.67

2015 = 42,100,062/(25,292,422-9,069,452) = 2.60

The results show that the working capital turnover ratio has a decreasing trend, with the biggest decrease in the period between 2015 to 2016, while throughout the rest of the years there was not much change (approx. $\pm$1.6). The decrease indicates that the management is being inefficient in using the short-term assets and liabilities of the company for supporting sales. The company can fix it by having a greater number of current assets than current liabilities.

As was presented before, the current asset was increasing annually,which is a good sign, however, there is no clear trend in the scope of the current liabilities, though there is an increasing trend with the exception of 2015. In this case, an upward trend in current liabilities is not a good sign, as it shows that the company has failed to reduce its loan.

Return on equity (ROE)

Return on equity (ROE) is the ratio between net income divided by shareholder equity, based on the data from the previous chapter, the ROE of the company from year to year can be determined.

2018 = 13,538,418/35,358,253 = 0.3829 = 38.29%

2017 = 12,670,534/34,112,985 = 0.3714 = 37.14%

2016 = 12,762,229/34,175,014 = 0.3734 = 37.34%

2015 = 10,363,308/32,016,060 = 0.3237 = 32.37%

ROE increased over the years (with one exception being the period between 2016 and 2017, in which it was stagnant), which indicates that the company can turn effectively its cash into business operations and gives more gains for both itself and its shareholders.

Return on asset (ROA)

Return on asset (ROA) is the ratio between net income divided by total asset. Based on the data of the previous chapter, the ROA of the company from year to year can be determined.

2018 = 13,538,418/46,602,420 = 0.2905 = 29.05%

2017 = 12,670,534/43,141,063 = 0.2937 = 29.37%

2016 = 12,762,229/42,508,277 = 0.3002 = 30.02%

2015 = 10363308/38010,724 = 0.2726 = 27.26%

The ROA fluctuated each year; sometimes it increased, other times it decreased, and in the period between 2017 and 2018, it was stagnant. This illustrates the fluctuation of its assets over the years.

Summary of the financial analysis

In conclusion, the company had mostly downward trend in terms of all ratios, which is not a good sign for it. It did not gain value at that time contrary to the expectations and investors cannot expect greater revenues in the following years. The company should be more careful and work on improving itself in the following years in order to become more stable and efficient, gain trust of investors and fix the current conditions.

3.8 DCF method of calculations

In order to perform the DCF valuation of an enterprise, the following should be specified:

- time frame covered by the valuation,
- level of future cash flows that can be achieved by an entity, which are based on the construction of the so-called free cash flow, in the case of author's FCF project,
- discount rate based on the projected level of the cost of capital financing the company's operations, which reflects the expected rate of return on capital employed by an enterprise (in the case of this project, the discount rate will be the cost of equity),
- final (residual) value after the detailed forecast period of time,

The basis for the valuation of a company using the DCF method is to forecast cash flow, which involves making a skillful forecast of the company's basic financial statements, i.e. its balance sheet, profit and loss account as well as its cash flow statement.

Enterprise Value (EV; alternatively referred to as Market Enterprise Value – MEV) is defined as the sum of present value of future free cash flow.

$$EV = \sum_{t=1}^{\infty} \frac{FCF_t}{(1+r)^t} = \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ldots + \frac{FCF_n}{(1+r)^n} + RV = \sum_{t=1}^{n} \frac{FCF_t}{(1+r)^t} + RV$$

where:
EV – equity value (enterprise value),
RV – updated residual value,
FCF_t – free cash flow in period t,
r – discount rate (cost of capital),
n – the number of years covered by the period of the detailed forecast,
t – consecutive year number, from 1 to infinity.

Most often, two variants of FCFs are defined:

1. Cash flows attributable to owners (i.e. shareholders,) or entities providing equity (Equity) - FCFE from Free Cash Flow to Equity.

FCFE = net profit + depreciation - increase in net working capital - investment expenses - repayment of debt + incurring new loans

2. Total cash flow belonging to all financing parties: owners and creditors – free cash flow to firm (FCFF).

FCFF = FCFE + interest (1 - tax rate) + repayment of debt - incurring new loans = net profit + depreciation - investment expenses - increase in net working capital + interest (1 - tax rate).

In order to calculate EV, it is necessary to forecast the future value of FCF.

These forecasts should be based on rational development assumptions and preceded by the economic and financial analysis of the past results of an enterprise under valuation. A SWOT analysis can be a helpful tool for identifying and classifying its business opportunities and threats.

The problem of the time horizon of the forecast period (from now to infinity) has was partially solved by dividing the time of the forecast into two periods, namely the period of detailed forecast and the later period.

Enterprise value = current value of cash flows in the period of the detailed forecast + current value of cash flows after the period of detailed forecast

The choice of the duration of the detailed forecast period (2-5 years) should be determined by considering two basic factors:

1. Length of the period in which the analyst performing the valuation is able to make a reasonable estimation of the value of individual items in the financial statements of a company being valued. The "reasonable estimation" should be understand as one that can be justified through convincing arguments. The analyst's knowledge, availability of relevant data and information are of great importance.

2. Specificity of a company undergoing valuation and its current economic situation. It mainly concerns taking into account the cyclic nature of a given industry – it is recommended to include a detailed forecast of the full cycle of business activity in a given period.

3.9 Forecasting

One of the most difficult and important aspects of enterprise valuation when using the cash flow approach is the use of appropriate forecasting of the basic economic values relating to an enterprise undergoing valuation. For this purpose, it is necessary to perform in advance both macro- and microeconomic analyses as well as a financial analysis of an enterprise.

The forecasting process, also known as prediction, is a subject of statistics. The process of inferring about the sizes of random variables at a specific future point in time (period) when the output quantity is unknown. A regression function can be used for this purpose. In practice, linear regression is the most commonly used.

Linear regression is the simplest variant. It assumes that the relationship between the explained variable and the explanatory variable is linear. Linear regression assumes that an increase in one variable (predictor, predictors) is accompanied by an increase or a decrease in the other. What is more, the name linear regression refers to the fact that the regression function takes the form of a linear function, i.e.

$$y = a + bx$$

Linear regression analysis aims to calculate such regression coefficients (coefficients in the linear model) in such a way that the model provides the best prediction of the value of the dependent variable and the error of estimation is as small as possible. Thus, regression analysis "fits" such a straight line to the subjects (linear dependence) that the model is as good as possible (burdened with the lowest possible random error).

To determine the regression line, and thus the formula of the linear regression model, the straight-line coefficients *a* and *b* should be calculated.

For this purpose, the method of the least squares error is used. To put it simply, this method provides us with such *a* and *b* coefficients that make the regression line best suited to the collected data.

Based on the historical data y_t, x_t, t = 1, ..., n, the following calculation can be made:

$$\bar{y} = \frac{1}{n}\sum_{t=1}^{n} y_t$$

$$\bar{x} = \frac{1}{n}\sum_{t=1}^{n} x_t,$$

where:
y – dependent variable,
x – explanatory variable.
Using the method of least squares, the following calculation can be made:

$$b = \frac{\sum_{t=1}^{n} y_t x_t - (n)\bar{y}\bar{x}}{\sum_{t=1}^{n-1} x_t^2 - (n)\bar{x}^2}$$

which is a statistical estimation of the parameter *b* and

$$a = \bar{y} - b\bar{x},$$

which is an estimation of the parameter *a*.

Linear regression analysis is the most common type of regression analysis. The reason for this is the relative simplicity of this method of data analysis. Interpretation of the regression function deals with the suitability of individual predictors in the regression model used to predict the level of the dependent variable (regression can be calculated using, for example, MS Excel).

In order to make an FCF prediction, the most commonly used function is the linear regression – a linear trend function of the dependent variable y with given values of the time variable (x = t).

$$y = a + bt,$$

where:
y – theoretical values of the variable determined based on the trend function,
t – time variable,
a – slope of the trend line,
b – constant.

3.9.1 Example of forecasting selected parameters (trend function)

On the basis of the net profits in the period between 2015 and 2018, a forecast was made for the period from 2019 until 2021, which can be seen in Table 3.10 and Figure 3.15.

Table 3.10. Net profit forecast

Year	Net profits
2015	10,363,308
2016	12,762,229
2017	12,670,534
2018	13,538,418
2019	14,692,031
2020	15,635,395
2021	16,578,758

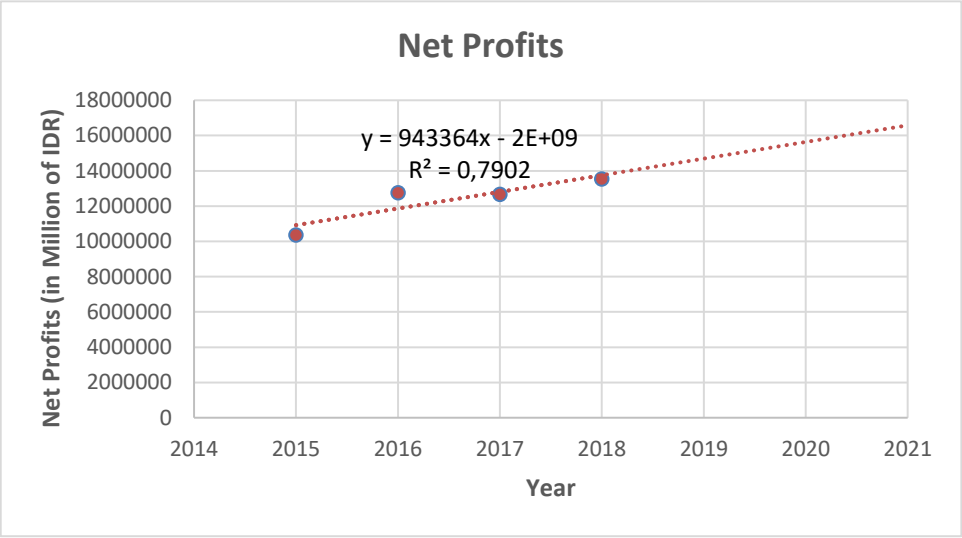


Figure 3.15. Net profit forecast

The graph above was made by plotting the amount of net profits per year to scatter plot in Excel and by adding a trend line. The forecast of the subsequent years, i.e. 2019, 2020 and 2021 was obtained by using the regression equation: y = 943364*x* – 2E+09, with *x* being the year. However, in the case of this forecast, the resulting trend is only increasing meaning net profits will increase in the future. As the R-squared is 0.7902, which is quite

low, one cannot really rely on this regression and result due to the probably insufficient scope.

Another method of forecasting is to use average values of the forecast values. It is assumed that the forecasts published by financial institutions regarding, for example, the sales volume in a given industry are reliable. By examining the share of other quantities in relation to the sales volume, one can predict what the FCF is.

3.9.2 Example of forecasting selected parameters (based on ratios)

The project's detailed forecast period is 5 years. In this period, the percentage increase in sales revenues for individual years is in line with the forecasts of the analysts of Dom Maklerski mBank, see Table 3.11.

Table 3.11. Forecast percentage of sales revenue growth over the detailed forecast period

Detailed forecast period	Sales growth
2019	7 %
2020	5.2%
2021	4.4%
2022	4.3%
2023	4.2%
After detailed forecast period	3%

In the analyzed period 2014-2018, the share of operating costs (without depreciation) in sales revenues ranged from 86 to 92.5%, see Table 3.12. It can be assumed that this share will be similar in the next 5 years. For the purposes of the valuation, one can expect that the maximum share of operating costs in revenues will be the average value of the current state, or 88.7%.

Table 3.12. Share of operating costs in sales revenues in the given years

	2014	2015	2016	2017	2018
Share of operating costs in sales (without depreciation)	86.12%	87.13%	87.34%	92.53%	90.32%
Average	88.7%				

The share of net working capital in sales revenues is presented in Table 3.13.

Table 3.13. The share of net working capital in sales revenues in the period 2014-2018

	2014	2015	2016	2017	2018
Net working capital (in thousands PLN)	310,736	327,268	385,138	384,790	359,451
Share of net working capital (NWC) in sales [%]	29.93	28.92	34.61	34.9	26.24
Average [%]	31				

Knowing the sales volume and assuming the average volume share in sales value, one can predict all the information needed to calculate the FCF forecast, see Table 3.14.

Table 3.14. Projected cash flows attributable to owners

		Detailed forecast period					
	Year	2019	2020	2021	2022	2023	One year after detailed forecast period
+	Sale	1,465,492.33	1,541,697.93	1,609,532.64	1,678,742.54	1,749,249.73	1 801 727,22
-	Operating costs	1,299,891.70	1,367,486.06	1,427,655.45	1,489,044.64	1,551,584.51	1 598 132,05
-	Depreciation	66,313.49	67,440.81	68,587.31	69,753.29	70,939.10	72 145,06
-	Interest	4,305.54	3,444.43	2,583	1,722.22	861.11	0
-	Tax	18,047	19,632	21,034	22,462	23,914	24 975,52
+	Depreciation	66,313.49	67,440.81	68,587.31	69,753.29	70,939.10	72 145,06
-	Investment expenses	70,000.00	70,000.00	70,000.00	70,000.00	70,000.00	70 000,00
-	Repayment of credits and loans	43,055.40	43,055.40	43,055.40	43,055.40	43,055.40	0
-	Change in NWC	29,720.73	23,623.74	21,028.76	21,455.07	21,857.23	16 268, 02
=	**FCFE**	**472.46**	**14,456.24**	**24,175.46**	**31,002.97**	**37,977.13**	**92 351, 63**

3.10 Cash flow forecasting – an example

This chapter provides an explanation to several ways of cash flow forecasting, that is: cash flow from operating activities, net profits, depreciation and debt repayment.

Cash flow from operating activities

Cash flow from operating activities is a section of the company's cash flow statement that informs about the sources and uses of cash from ongoing regular business activities in a given period. This typically includes net income from the income statement, adjustments to net income, and changes in net working capital. Below is the result of the forecast of cash flow from operating activities, including the period 2019-2021 – Table 3.15. and Figure 3.16.

Table 3.15. Cash flow forecast

Year	CF from operating activities
2015	811,163
2016	14,076,579
2017	15,376,315
2018	20,193,483
2019	27,476,059
2020	33,420,729
2021	39,365,398

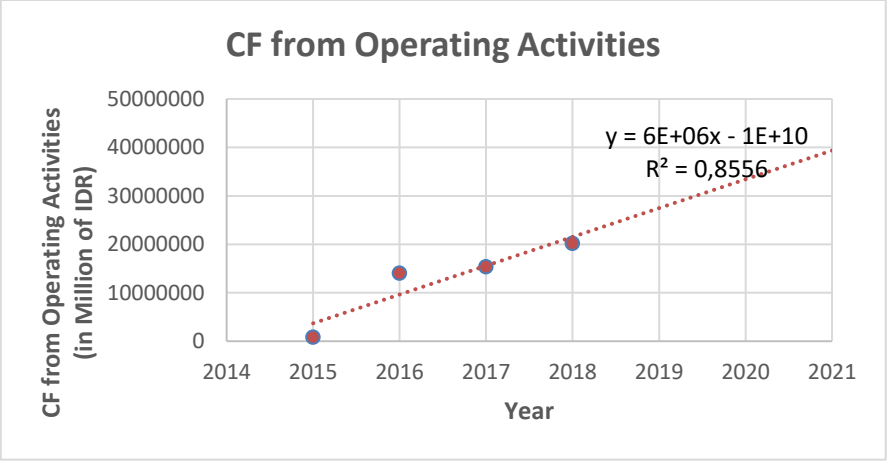


Figure 3.16. Forecast of cash flow from operating activities

The graph above was made by plotting the amount of cash flow per year to scatter plot in Excel and by adding a trend line. The forecast of the subsequent years, i.e. 2019, 2020 and 2021 was obtained by using the regression equation: y = 6E+06*x* – 1E+10, with *x* being the year. Considering the visible increasing trend line, it can be concluded that the CF from operating activities will increase in the future. However, the R-squared is almost 0.8556, hence one cannot rely on this regression so much.

Net profits

Net profit is the gross profit (revenue minus cost of goods) minus operating expenses and all other expenses, such as taxes and interest paid on debt (Maverick, 2019). It is calculated for us and appears on an income statement as net income. Below is shown the result of the forecast of net profits, including the period 2019-2021 – Table 3.16 and Figure 3.17.

Table 3.16. Net profit forecast

Year	Net profits
2015	10,363,308
2016	12,762,229
2017	12,670,534
2018	13,538,418
2019	14,692,031
2020	15,635,395
2021	16,578,758

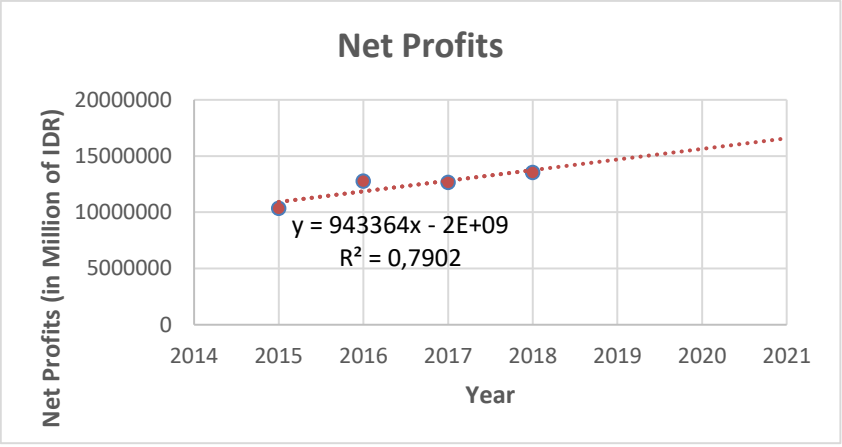


Figure 3.17. Net profit forecast

The graph above was made by plotting the amount of net profits per year to scatter plot in Excel and by adding a trend line. The forecast of the subsequent years, i.e. 2019, 2020 and 2021 was obtained by using the regression equation: y = 943364*x* – 2E+09, with *x* being the year. If one were to compare the result with the financial analysis of the previous chapter, especially the ROE and ROA, in which one of the factors applied is net profits, it could be seen that the trend is fluctuating in the year in which there is a decrease. However, in this forecast, the trend is only increasing,

which means that net profits will increase in the future. As the R-squared is 0.7902, which is quite low, one cannot really rely on this regression and result so much.

Depreciation

Depreciation is an accounting method of allocating the cost of a tangible or physical asset over its useful life or life expectancy. Depreciation represents how much of an asset's value has been used up (Tuovila, 2016). In table 3.17 and figure 3.18 is presented the result of the forecast of depreciation. It forecasts the result from 2019 until 2021.

Table 3.17. Depreciation forecast

Year	Depreciation
2015	163,498
2016	175,089
2017	200,305
2018	235,340
2019	253,743.5
2020	277,817.7
2021	301,891.9

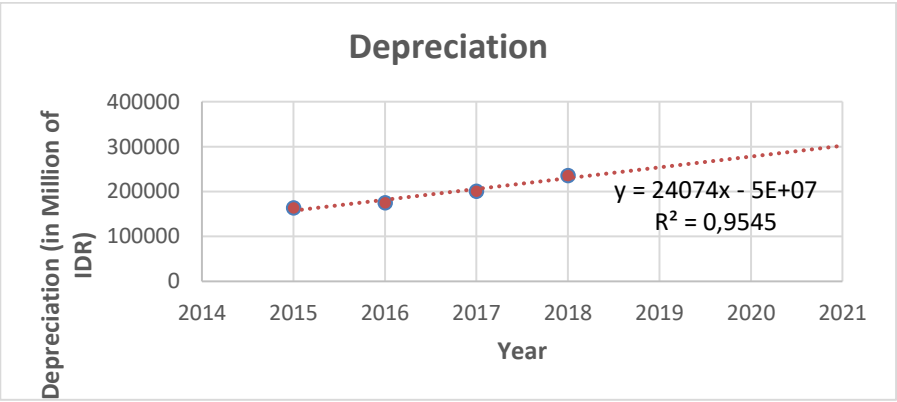


Figure 3.18. Depreciation forecast

The graph above was made by plotting the depreciation amount per year to scatter plot in Excel and by adding a trend line. The forecast of the subsequent years, i.e. 2019, 2020 and 2021 was obtained by using the regression equation: $y = 24074x - 5E + 07$, with x being the year. Considering the increasing trend line, it can be concluded that the depreciation from operating activities will increase in the future, especially as the R-squared is 0.9545, which is closer to 1.

Net working capital (NWC)

Working capital is the difference between the company's current assets, such as cash, accounts receivable (customers' unpaid bills), inventories of raw materials and finished goods as well as its current liabilities, such as accounts payable (Kenton, 2019). Tables 3.18 and 3.19 as well as Figure 3.19 present the result of the forecast of the company's working capital, including the period 2019-2021.

Table 3.18. Working capital in the period 2015-2018

Year	2015	2016	2017	2018
Current asset	29,807,330	33,647,496	34,180,353	37,831,483
Current liabilities	4,538,674	6,428,478	6,482,969	8,793,999
Working capital	25,268,656	27,219,018	27,697,384	29,037,484

*Working capital = Current asset – Current liabilities

Table 3.19. Working capital forecast

Year	Working capital
2015	25,268,656
2016	27,219,018
2017	27,697,384
2018	29,037,484
2019	30,251,848
2020	31,430,333
2021	32,608,818

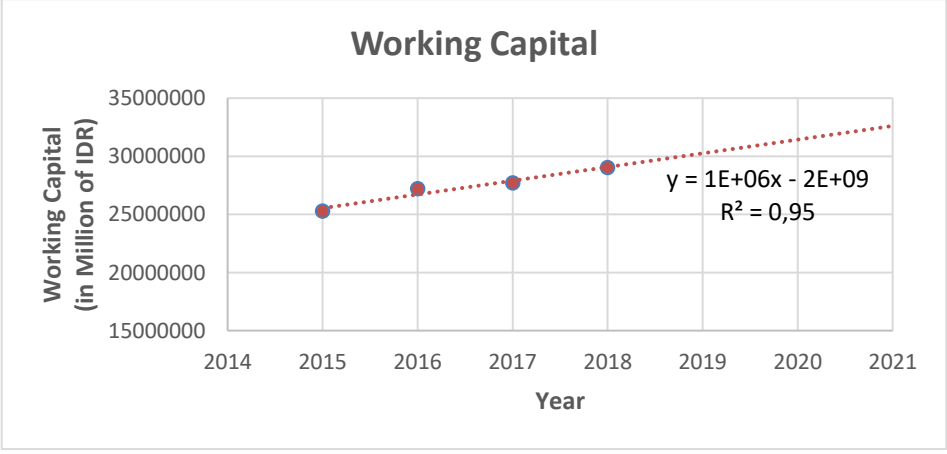


Figure 3.19. Working capital forecast

In order to determine the working capital, one needs to substract the current liabilities from the current assets of a given year. After that, a forecast can be made. The current assets and current liabilities are both increasing every year, creating greater working capital in the following year.

The graph above was made by plotting the working capital amount per year to scatter plot in Excel and by adding a trend line. The forecast of the subsequent years, i.e. 2019, 2020 and 2021 was obtained by using the regression equation: y = 1E+06*x* – 2E+09, with *x* being the year. Considering the increasing trend line, it can be concluded that the working capital will increase in the future, especially as the R-squared is 0.95, which is closer to 1.

The increase of working capital forecast in 2019, 2020 and 2021 is presented below (it is used for cash flow forecasting in the next chapter).

Increase of WC 2019:
WC 2019 – WC 2018 = 30,251,848 – 29,037,484 = 1,214,364

Increase of WC 2020:
WC 2020 – WC 2019 = 31,430,333 – 30,251,848 = 1,178,485

Increase of WC 2021:
WC 2021 – WC 2020 = 32,608,818 – 31,430,333 = 1,178,485

Final forecast of cash flow from operating activities

In the previous subchapter, the forecast of cash flow was prepared using the regression equation. Below is the forecast of cash flow from operating activities prepared using manual calculation with free cash flow to equity (FCFE).

FCFE is a measure of how much cash is available to the equity shareholders of a company after all expenses, reinvestment, and debt are paid. FCFE is a measure of equity capital usage(Kenton, 2019). It covers cash flows attributable to owners, like shareholders or entities, providing equity. The selection of FCFE justified, as it shows a change in the capital structure.

The formula for FCFE is presented below:

FCFE = net profit + depreciation - increase in net working capital - investment expenses - repayment of debt + incurring new loans

New loans and investment expenses are taken out, as the new owner decides, unless this process is already underway. The loans are to be repaid only up to the amount of the old loan. It is assumed that the loan along with investment expenses will be at the same level as it was at the beginning.

Therefore, the following formula applies:

FCFE = net profit + depreciation - increase in networking capital

Below is the forecast of cash flow from operating activities for the years 2019, 2020 and 2021.

FCFE 2019 = 14,692,031 + 253,743.5 – 1,214,364 = 13,731,410.5

FCFE 2020 = 15,635,395 + 277,817.7 – 1,178,485 = 14,734,727.7

FCFE 2021 = 16,578,758 + 301,891.9 – 1,178,485 = 15,702,164.9

Below, in Table 3.30. is the result of a comparison of cash flow from operating activities.

Table 3.20. CF forecast resulting from regression equation and FCFE calculation

Years	Forecast of cash flow resulting from regression equation
2019	27,476,059
2020	33,420,729
2021	39,365,398
Years	**Forecast of cash flow from FCFE**
2019	13,731,410.5
2020	14,734,727.7
2021	15,702,164.9

The two forecasts of the cash flow (from regression equation and FCFE) have similar trends, so in order to determine the final forecast of cash flow statement, an average amount is calculated for both of the cash flow forecasts. Below are the results.

FCFE 2019 = (27,476,059+ 13,731,410.5)/2 = 20,603,734.75

FCFE 2020 = (33,420,729+ 14,734,727.7)/2 = 24,077,728.35

FCFE 2021 = (39,365,398 + 15,702,164.9)/2 = 27,533,781.45

The next step of the DCF method of valuation is to determine the cost of capital.

3.11 Cost of capital

When discounting cash flows, it is necessary to determine the appropriate cost of capital for them, which acts as the discount rate. If the cash flows belonging to all FCFF financing parties are discounted, this will be the weighted average cost of capital (WACC). However, in the case of the DCF method in the direct variant for owners discounting FCFE, the role of the discount rate is fulfilled by the cost of equity (*ke*).

The weighted average cost of capital:

$$WACC = k_d(1-T)\left(\frac{D}{E+D}\right) + k_e\left(\frac{E}{E+D}\right)$$

where:
WACC – weighted average cost of capital,
k_d – cost of debt before tax,
T – income tax rate,
k_d (1-T) – cost of debt after tax,
E – value of equity,
D – value of debt,
E + D – value of total capital (equity + debt),
k_e – cost of equity.

The cost of equity can be estimated in many ways:

1) CAPM (capital asset pricing model):

$$k_e = r_f + \beta(r_m - r_f),$$

where:
k_e – cost of equity capital,
r_f – rate of return on risk-free securities,
β – systematic risk ratio for a given company,
r_m – market portfolio return rate,
(r_m - r_f) – market risk premium.

2) Assumption of a constant increase in net profit (Gordon's model)

$$k_e = D_0 (1 + g) / P_0 + g$$

where:
D_0 – dividend paid,
P_0 – share price,
g – assumed dividend increase.

3) Adoption of the industry's ROE.

Cost of equity – an example

In this subchapter, CAPM is be used to estimate the cost of equity. CAPM describes the relationship between systematic risk and expected return for assets, particularly stocks. CAPM is widely used throughout finance for pricing risky securities and generating expected returns for assets given the risk of those assets and cost of capital (Kenton, 2019).

The formula for CAPM is:

$$k_e = r_f + \beta(r_m - r_f),$$

where:
k_e – cost of equity,
r_f – rate of return of risk-free securities,
β – systematic risk factor for a given company,
r_m – rate of return on the market portfolio,
$(r_m - r_f)$ – market risk premium.

Cost of capital – an example

Regarding the cost of equity, a one-year dividend yield of PT HM Sampoerna Tbk. (HMSP) stock in which the stock is component is being considered. In addition, the resource from β is from the HMSP stock as well (Investing, 2020). For risk free rate, Bank Indonesia's 7-day repo rate is used (Bank Indonesia, 2020). Bank Indonesia Certificates are a riskless investment. Bank Indonesia Rate is the interest rate for Bank Indonesia Certificates for a period of one year, which is distributed to banks. The consideration of using it is that the data taken is the most recent data that best describes current condition, the seven-day average value is taking into account for fluctuation reason, and later at the end of the calculation the range of cost of equity values according to changes in existing historical data can be created.

Table 3.21 presents data for calculating CAPM.

Table 3.21. Data for calculating CAPM

Data	
β	1.19
r_f	4.5%
r_m	5.9%

CAPM is calculated as below:

$k_e = r_f + \beta\,(r_m - r_f) = 4.5\% + 1.19\,(5.9\% - 4.5\%) = 6.17\%$

The obtained result shows that the cost of equity (r-equity) is estimated to be 6.17%. Since FCFE is applied, it is not necessary to calculate WACC, which is normally used to estimate equity valuation of FCFF.

Growth rate

According to Chenn (2020), growth of rates refers to the percentage change of a specific variable within a specific period. For investors, growth rates typically represent the compounded annualized rate of growth of the company's revenues, earnings, dividends or even macro concepts, such as GDP and retail sales.

Table 3.22. Growth rate on the basis of the final cash flow forecast

Year	Final forecast of cash flow	Rate
2019	20,603,734.75	
2020	24,077,728.35	0.169
2021	27,533,781.45	0.144
Average growth rate		0.156

The rate is obtained by subtracting from the current year forecast the one from the previous year and dividing it by the previous year forecast. As it can be seen from the final forecast of cash flow from operating activities, the rate of growth is 0.156 or 15.6%. However, the rate is not feasible if one wishes to calculate valuation to the infinity, so it is assumed that the growth rate will be 2.5%, which is more achievable compared to 15.6%. This percentage is not too low. Moreover, the tobacco industry usually is more stable than other industries regardless of the pandemic or other factors, especially considering that Indonesian consumers will still consume tobacco products.

3.12 Time value of money

Compound interest is the interest that is paid not only on the principal, but also on any interest earned but not withdrawn during earlier periods.

Future value (FV)

In order to calculate the FV at the end of year *n* for any sum compounded at interest rate *i*:

$$\mathrm{FV}_n = \mathrm{PV}(1+i_1)\cdot(1+i_2)\cdot\ldots\cdot(1+i_n) = \mathrm{PV}\prod_{t=1}^{n}(1+i_t)$$

or

$\mathrm{FV}n = \mathrm{PV}o(1+i)n$**,** *for* $i_1 = i_2 = \ldots = i_n = i$

$\mathrm{FV_n}$ – value of PV_o at the end of year n,

$\mathrm{PV_o}$ – principal amount at time 0, or the present value,

i – interest rate per time period,

$\mathrm{i_t}$ – interest rate in period t,

n – number of time periods.

This equation is useful for solving compound value problems involving 1, 2, 3 or even 4 years into the future, it is rather tedious to use this equation for problems involving longer time periods. **Compound value interest factors (*CVIFs*)** are commonly used to simplify such computations.

$$\mathrm{FV}n = \mathrm{PV}o(\mathrm{CVIF}i, n)$$

where:

CFIF – compound value interest factors,

i – nominal interest rate per annum,

n – number of years.

$$CVIF_n^{\,i} = CVIF(n,i) = (1+i)^n$$

The process of calculating future value is shown in Figure 3.20.

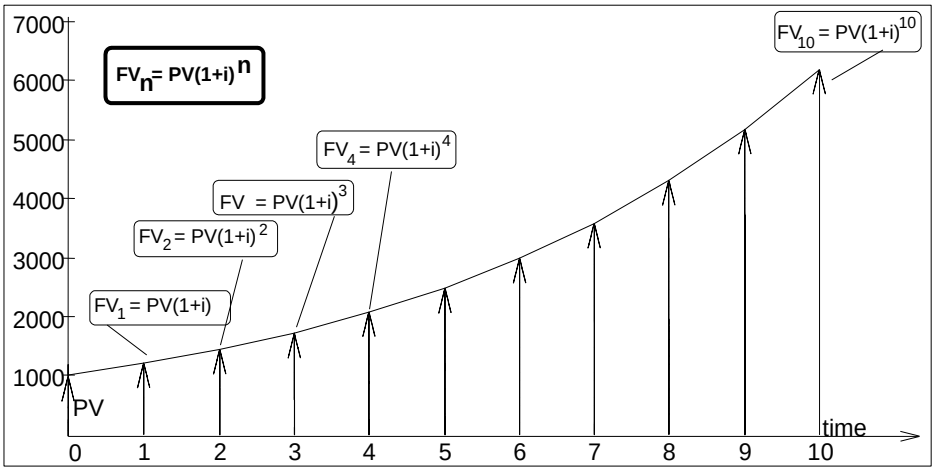


Figure 3.20. Future value calculation process

Both compound and future value calculations can answer the question, "What will be the future value invested today, compounded at some rate of interest, *i*?" The person that makes a decision regarding finances, however, often faces a different kind of problem: Given some future value (FVn), what is its equivalent value today? That is, what is its present value (PVo)?

Present value (PV_o)

Present value is equivalent to some promised future amount. The equivalence depends upon the rate of interest (return) that can be earned on investments during the time period under consideration.

$$PV = \frac{FV_n}{(1+i_1)*(1+i_2)*...*(1+i_n)} = FV_n\left(\prod_{t=1}^{n}(1+i_t)\right)^{-1}$$

$$PV = \frac{FV_n}{(1+i)^n} = FV_n*(1+i)^{-n}, \text{ for } i_1 = i_2 = ... = i_n = i.$$

PV – the principal amount at time 0, or the present value

FV_n – value of PV_o at the end of year n

i – the interest rate per time period

i_t – the interest rate in t period

n – the number of time periods

where $1/(1+i)^n$ is the reciprocal of the compound value factor. The process of finding present values is frequently called **discounting**

or

$PV = FV_n * PVIF_n^i$, where

$PVIF_n^i$ – present value interest factors

$$PVIF_n^i = PVIF(n,i) = \frac{1}{(1+i)^n}.$$

Effective annual rate – (i_{ef})

Effective interest, in contrast to nominal interest, is the actual rate of interest earned by the lender and is generally the most economically relevant definition of interest rate.

Annual nominal interest rates are equivalent to effective annual rates in the case where compounding occurs only once a year at its end.

$$1+i_{ef} = (1+\frac{i_{nom}}{m})^m, \text{so} \quad i_{ef} = (1+\frac{i_{nom}}{m})^m - 1$$

The compound interest for any number of periods during a year may be computed by means of the following equation

$$\mathbf{F}V_{n*m} = PV(\mathbf{1}+\frac{\mathbf{i_{nom}}}{\mathbf{m}})^{\mathbf{m*n}}$$

where:
i_{nom} – annual nominal interest rate,
m – is the number of time during the year the interest is compounded,
n – is the number of years.

For advanced applications, it is useful to know that continuous compounding is obtain by letting m approach infinity in

$$FV_n = PV_o(1+i/m)^{mn}.$$

In this case

$$\mathbf{i_{ef,c}} = \lim_{m\to\infty}(1+\frac{i_{nom}}{m})^m - 1 = \mathbf{e}^{\mathbf{i_{nom}}} - \mathbf{1}$$

where e is the exponential number having the approximate value of 2,71828.

Annuities

Annuity, Figure 3.21, is the payment or receipt of equal amounts of money at intervals over a specified period of time.

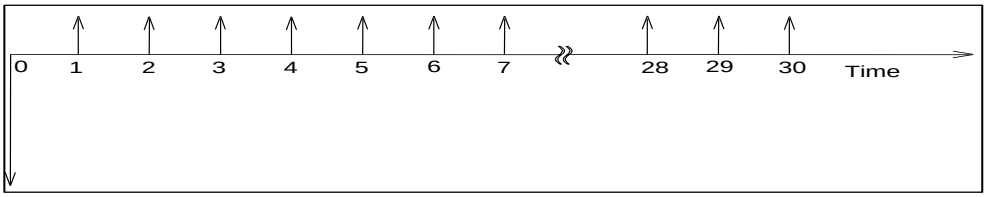


Figure 3.21. Annuity

Ordinary annuity – in this case payments or receipts occur at the end of each period.

Annuity due – in this case payments or receipts occur at the beginning of each period.

The process of future value calculation for annuity is presented in Figures 3.22 and 3.23.

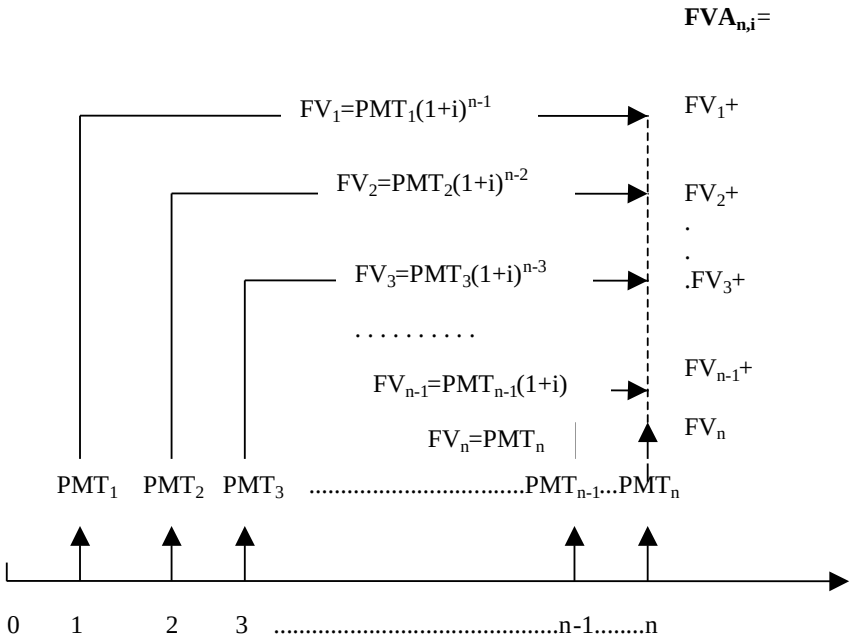


Figure 3.22. Process of calculating future value of capital accumulated over n periods

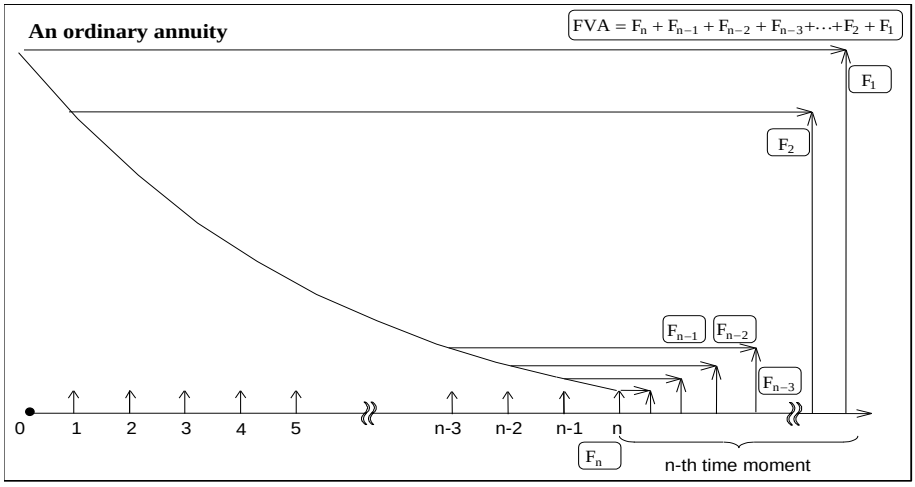


Figure 3.23. Process of calculating future value of accumulated capital – future value annuity

The sum of future value annuity is made up of *n* independent factors:

$$F_1,\ F_2,\ ...,\ F_{n-3},\ F_{n-2},\ F_{n-1},\ F_n.$$

Each of them is a future value of some payments:

$$F_n = \text{PMT}.$$

$$F_{n-1} = \text{PMT} \cdot (1+\text{i}).$$

$$F_{n-2} = \text{PMT} \cdot (1+\text{i})^2,$$

$$F_2 = F_{n-(n-2)} = \text{PMT} \cdot (1+\text{i})^{n-2},$$

$$F_1 = F_{n-(n-1)} = \text{PMT} \cdot (1+\text{i})^{n-1},$$

$$FVA = F_n + F_{n-1} + F_{n-2} + F_{n-3} + \ldots + F_2 + F_1 =$$

$$= PMT + PMT(1+i) + PMT(1+i)^2 + PMT(1+i)^3 + ... +$$

$$+ PMT(1+i)^{n-2} + PMT(1+i)^{n-1}.$$

$$\mathbf{FVA} = \mathbf{PMT}\frac{\mathbf{(1+i)^n - 1}}{\mathbf{i}}, \quad \text{or}$$

$$\mathbf{FVA = PMT * CVIFA}^{\mathbf{i}}_{\mathbf{n}},$$

where:

$$\mathbf{CVIFA}^{\mathbf{i}}_{\mathbf{n}} = \frac{\mathbf{(1+i)^n - 1}}{\mathbf{i}}$$

CVIFA means compound value interest factor for an annuity.

Future value of annuity: **FVAD = FVA · (1+i)**

Present Value of an Ordinary Annuity – PVAN is the sum of the present value of a series of equal periodic payments

$$PVA = \sum_{i=1}^{n} PMT(1+i)^{-t},$$

$$\text{PVA} = \frac{\text{FVA}}{(1+i)^{\text{n}}} = \text{PMT}\frac{(1+\text{i})^{\text{n}} - 1}{\text{i}(1+\text{i})^{\text{n}}} = \text{PMT}\frac{1 - \frac{1}{(1+\text{i})^{\text{n}}}}{\text{i}} = PMT\left(\frac{1}{i} - \frac{1}{i(1+i)^n}\right)$$

The present value of an annuity can be determined by multiplying the annuity amount by the appropriate interest factor:

$$\text{PVA} = \text{PMT} \cdot \text{PVIFA}^{i}_{n} \quad \text{where} \quad PVIFA^{i}_{n} = \frac{1 - \frac{1}{(1+i)^{n}}}{i}$$

PVIFA – Present Value of an Ordinary Annuity Interest Factors

Present Value of Due Annuity-PVAD

PVAD = PVA · (1+i)

Perpetuities

Perpetuity is a financial instrument in which case there is an agreement that the payment of an equal amount of money will be made for an indefinite period of time (that is, forever).

$$PV_{perpetuity} = \lim_{n \to \infty} \text{PMT}\left(\frac{1}{\text{i}} - \frac{1}{\text{i}(1+\text{i})^{\text{n}}}\right) = \lim_{n \to \infty} \text{PMT}\frac{1}{\text{i}} - \lim_{n \to \infty} \text{PMT}\frac{1}{\text{i}(1+\text{i})^{\text{n}}}$$

$$PV_{perpetuity} = \text{PMT}\frac{1}{\text{i}} - \text{PMT}\lim_{n \to \infty}\frac{1}{\text{i}(1+\text{i})^{\text{n}}} = \text{PMT}\frac{1}{\text{i}} - 0$$

so

$$PV_{perpetuity} = \frac{PMT}{i}$$

The process of calculating the balance between annual payments and annual earnings of annuity is presented in Figure 3.24.

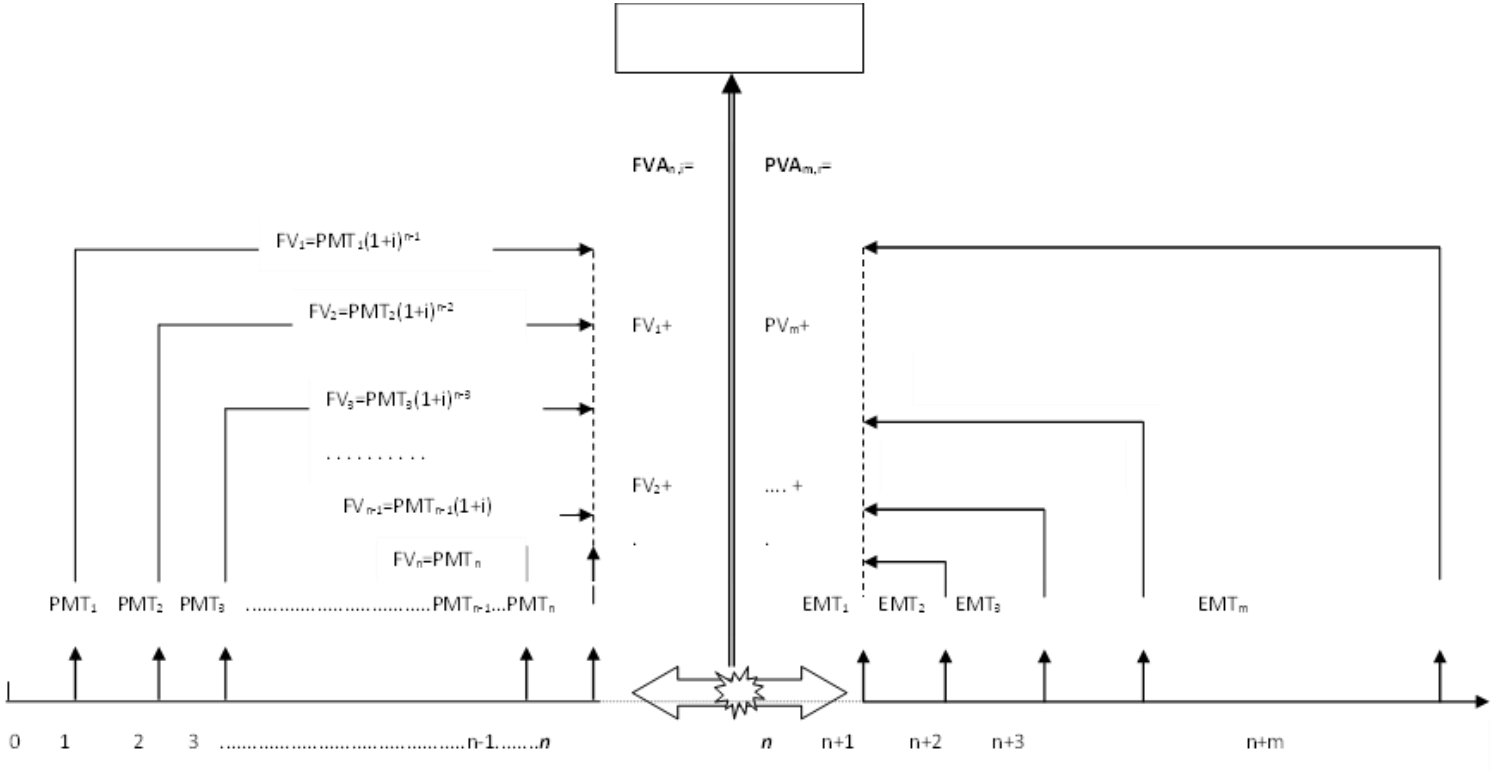


Fig. 3.24. The process of calculating the balance between annual payments and annual earnings

3.13 Residual value

Residual value is estimated through simplified assumptions regarding the company's results – most often by assuming constant growth dynamics – during the continuation period.

Despite the adoption of simplistic assumptions of high quality, estimating the residual value is indispensable because it often represents a large share of the total value of an enterprise.

The most common method of estimating residual value is to use Gordon's model, according to which there is a constant increase in cash flow over an infinitely long period (assuming that the growth of a company – *g* – is less than *r*):

$$RV^{*} = \frac{FCFE_{n+1}}{r-g} \qquad \mathrm{RV} = \mathrm{RV}^{*}\left(\frac{1}{1+\mathrm{r}}\right)^{n},$$

where:
RV – residual value,
$FCFE_{n+1}$ – normalized level of cash flows in the first year after the detailed forecast period,
r – cost of equity capital,
g – expected rate of increase in cash flows over an infinite period.

Remark

The Gordon's formula stems from the fact that the infinite sum of a convergent geometric sequence is finite.

A geometric series is a series:

$$\sum_{n=1}^{\infty} aq^{n-1},$$

where:

$a, q \in \mathbb{R}$

a is the first expression of the geometric series and *q* – the quotient of the geometric series.

When q = 1, all terms of the series are equal. So, the nth subtotal has the following form:

$$S_n = \underbrace{a + a + \ldots + a}_{n} = na.$$

Should $a \neq 0$,

then the geometric series:

$$\sum_{n=1}^{\infty} aq^{n-1}$$

is converge if, and only if, the absolute value of its quotient *q* is less than 1:

$$|q| < 1$$

(for RV calculations, this means that *g* should be less then *r*).

The sum of the series is calculated using the formula:

$$\sum_{n=1}^{\infty} aq^{n-1} = \frac{a}{1-q}.$$

3.14. Enterprise value (EV) calculation

The Enterprise Value EV (some time called Market Enterprise Value MEV) is defined, as was mentioned before, as the sum of present value of future free cash flows

$$EV = \sum_{t=1}^{\infty} \frac{FCF_t}{(1+r)^t} = \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ldots + \frac{FCF_n}{(1+r)^n} + \sum_{t=n+1}^{\infty} \frac{FCF_t}{(1+r)^t} =$$

$$= \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ldots + \frac{FCF_n}{(1+r)^n} + \sum_{s=1}^{\infty} \frac{FCF_{n+s}}{(1+r)^{n+s}} =$$

$$= \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ldots + \frac{FCF_n}{(1+r)^n} + \sum_{s=1}^{\infty} \frac{FCF_{n+s}}{(1+r)^n (1+r)^s} =$$

$$= \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ldots + \frac{FCF_n}{(1+r)^n} + \frac{1}{(1+r)^n} \sum_{s=1}^{\infty} \frac{FCF_{n+s}}{(1+r)^s} =$$

$$= \sum_{t=1}^{n} \frac{FCF_t}{(1+r)^t} + RV$$

where:
EV – equity value (Enterprise Value),
RV – residual value,
FCF_t – free cash flow in period t,
r – discount rate (cost of capital),
n – the number of years covered by the period of the detailed forecast,
t – consecutive year number from 1 to infinity.

If FCF is free cash flow to equity (FCFE):

$$EV = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+\mathrm{r})^t} = \frac{FCFE_1}{(1+r)^1} + \frac{FCFE_2}{(1+r)^2} + \ldots + \frac{FCFE_n}{(1+r)^n} + RV = \sum_{t=1}^{n} \frac{FCFE_t}{(1+r)^t} + RV$$

where:
EV – equity value (enterprise value),
RV – updated residual value,
FCFt – cash flow *t*,
r – discount rate (cost of equity capital) $\boldsymbol{k_e}$,
n – number of years covered by the period of the detailed forecast,
t – consecutive year number from 1 to n

If FCF is free cash flow to the firm (FCFF):

$$EV = \sum_{t=1}^{\infty} \frac{FCFF_t}{(1+WACC)^t} = \frac{FCFF_1}{(1+WACC)^1} + \frac{FCFF_2}{(1+WACC)^2} + \ldots + \frac{FCFF_n}{(1+WACC)^n} + RV - D =$$
$$= \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + RV - D$$

where:
r – discount rate (cost of capital) WACC,
D – debt capital.

3.15 Equity (enterprise) valuation – an example

Valuation is a general process of determining the economic value of a whole business or company unit. Business valuation can be used to determine the

fair value of a business for a variety of reasons, including sale value, establishing partner ownership, taxation, and even divorce proceedings (Hayes, 2019).

The value of equity of PT HM Sampoerna Tbk. is estimated on the basis of the discounted cash flow (DCF) as the value of an enterprise in the income approach is identical to the value of equity, which means that the value of the current future cash flows is attributable to the owners (Wilimowska, 2020). Moreover, the forecast period will be three years.

Below is the formula for the EV, which applies the FCFE:

$$EV = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+\mathrm{r})^t} = \frac{FCFE_1}{(1+r)^1} + \frac{FCFE_2}{(1+r)^2} + \ldots + \frac{FCFE_n}{(1+r)^n} + RV = \sum_{t=1}^{n} \frac{FCFE_t}{(1+r)^t} + RV$$

where:
EV – equity value,
RV – updated residual value,
$FCFE_t$ – cash flow belonging to owners in year *t*,
r – cost of capital – k_e,
n – number of years covered by the period of the detailed forecast,
t – consecutive year number from 1 to *n*,
g – growth rate of cash flow.

RV or updated residual value has its own formula based on Gordon's method as it is seen below (for r > g).

$$RV = RV^* \left(\frac{1}{1+r}\right)^n \; where \; RV^* = \frac{FCFE_{n+1}}{r-g}$$

Example of EV calculation

EV calculation based on the previous forecast data in 2019, 2020 and 2021 for PT HM Sampoerna Tbk. is shown in Tables 3.23. and 3.24.

Table 3.23. Data for valuation calculation

Year	Data	
2019	$FCFE_1$	20,603,734.75
2020	$FCFE_2$	24,077,728.35
2021	$FCFE_3$	27,533,781.45
	g	2.5%
	r	6.17%

Table 3.24. FCFE forecast from Year 1 to Year 3 and in Year 4 with growth rate of 2.5%.

Year	Year-n	Final forecast cash flow	Rate
2019	1	20,603,735	
2020	2	24,077,728	16.9%
2021	3	27,533,781	14.4%
Infinity ∞	4	28,222,126	2.5%

*FCFE∞ forecast is assumed to be at growth rate 2.5%

For these data:

$$RV^* = \frac{FCFE_{n+1}}{r-g} = \frac{FCFE_4}{r-g} = \frac{Rp28222126}{6.17\%-2.5\%} = Rp768,995,258.9$$

$$RV = Rp768,995,258.9\left(\frac{1}{1+6.17\%}\right)^3 = Rp642,566,692.6$$

Taking into consideration data from Tables 3.23. and 3.24. as well as calculated RV, the process of EV calculation is presented in Table 3.25.

Table 3.25. Equity Valuation Calculation

EV	
PV(1st year)	Rp19,406,362
PV(2nd year)	Rp21,360,522
PV(3rd year)	Rp23,007,022
RV	Rp642,566,692
EV	Rp706,340,599

Note: IDR = Rp

The enterprise value is EV = Rp706,340,599

Conclusion

Indonesia has a large and diverse tobacco consumer market with a significant percentage of adult smokers. Approximately 67% of Indonesian men and 5% of Indonesian women are smokers whereas the total population of Indonesia amounts to over 250 million people. HM Sampoerna is the largest tobacco company in Indonesia (and domestically one of the largest in general). This company, which controls approx. 35 percent of the tobacco market in Indonesia, was sold to global cigarette and tobacco giant Philip Morris in 2005. This company is the subject of this valuation method project.

Company valuation is the process of determining the economic value of a business or company. It evaluates a number of factors to determine the fair market value in a sale. The purpose of company valuation is to evaluate those factors that will affect the company under review by conducting fundamental analysis, strategic analysis, financial analysis, cash flow forecasting, capital cost assessment, equity valuation calculation, results comparison so as to finally form a conclusion on PT HM Sampoerna's business valuation.

DCF method, or equity valuation is the most complicated method as it is derived from discount methods of evaluating the profitability of investments, which, unlike traditional methods, assume the variability of the value of money over time. The DCF method relies on the quality of the forecast while taking into consideration the past, present and future. It is the most comprehensive method. On the other hand, the book value method is based on the historical costs of their acquisition. Therefore, the result is based more on the historical costs. However, if something happens in the future, the book value method will not be able to estimate it correctly because it does not use forecasts like the DCF method does.

For PT HM Sampoerna Tbk. itself, the company has a high growth rate of 15.6% (average for year 2019, 2020, and 2021) and can grow significantly due to its numerous strengths and opportunities related to the SWOT analysis. The company also has high ROI and ROE which is around 30%. However, as Indonesia and the world are currently facing COVID-19 pandemic, the country's economy is declining significantly, affecting PT HM Sampoerna Tbk. and resulting in low equity valuation. The company must make more efforts to return to its normal and stable condition. Fortunately, PT HM Sampoerna Tbk. is a tobacco related company products, and in this situation, most Indonesians still consume tobacco. The hope is that this may encourage many investors to invest, so that the price in stock market will increase again in near future and the company will regain its stability faster. In this case, a good investment manager will definitely help the company to overcome this situation.

4 Advantages and disadvantages of the methods

Valuation methods are based on various assumptions. Their use depends on the purposes of the valuation and the availability of information.

Each method has its own advantages and disadvantages.

DCF method

Advantages	Disadvantages
– takes into account the ability of the assets to generate income – is able to identify redundant assets – focuses on the future. Takes into account future income, time, risk, and the impact of capital structure	– complexity – the need to forecast multiple variables (cost of capital, income, risk, etc.) – subjectivity of estimates

Comparative methods

Advantages	Disadvantages
– simplicity – speed of the valuation – suitable for the valuation of small, simple businesses: pharmacies, bakeries	– results dependent on the current value of stock market induced indicators – difficulties in finding comparable companies

Assets-based methods

Advantages	Disadvantages
– easy valuation of the material resources of the enterprise – relative simplicity and unambiguity of the results obtained, arising from the strict formalization of the procedure of their application and the possibility of accurate documentation	– they do not take into account the intangible elements that affect the value of the enterprise, e.g. market position, distribution network, location – they do not take into account the ability of assets to generate income

Mixed methods

Advantages	Disadvantages
– they focus also on the future also – they consider future income, timing, risk, and the impact of the capital and the assets structure	– no rational justification for combining income and property approach – "as an artificial and arbitrary amalgamation of opposing concepts, they have no economic interpretation"

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