Determination of Business Port Terminal Value Using Income Approach

Y A Wedana1,3, I K Gunarta2,4

1,2Department of Industrial Engineering Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia
3agitwedana@gmail.com, 4ikgunarta@gmail.com

Abstract. Under PT X's long-term plan to increase the company's value, PT X plans to acquire one of PT Y's container terminal business units. The acquisition requires several stages of the process from due diligence to estimation of the acquisition value obtained from the valuation results. Business valuation as a critical stage is a process to produce an opinion or an estimate of the fair value of a company. The results of the business appraisal can then be used in investment decision making, generally for business development, mergers, and acquisitions. There are 3 (three) approaches in conducting business valuation, namely asset-based approach, market-based approach, and income-based approach. This research will focus on the company's acquisition plan using income approach (income-based approach). This approach is used by considering the going concern assumption, or the business that is being assessed will continue to run and generate revenue. Two methods can be used to determine the value of a business in income approach (Income-based approach), namely the method of income capitalization (capitalized of income method) and discounted cash flow method (discounted cash flow). This study aims to determine the business value of PT Y's container terminal business unit and the maximum acquisition value used as a consideration in the acquisition. This research uses an income-based approach with a discounted cash flow (DCF) method. The making of financial models begins with making a profit and loss terminal container service projection, then the free cash flow calculation is performed. Furthermore, based on the free cash flow that has been calculated with a discount rate from the Weighted Average Cost of Capital (WACC) which provides the total value of all company capital, the company value that represents the value of the container terminal unit is Rp. 9,171,633,437,067. To find out the maximum acquisition value obtained by calculating the company's return on investment that refers to the cost of capital of PT X. To get a positive rate of return, the IRR value must be greater than the WACC. Under the calculations, the maximum acquisition price of Rp. 7,500,000,000,000 (IRR 9.66%) with a WACC value of PT X of 7.6%. The results of this calculation become material in the acquisition process with PT Y as the owner of the container terminal.

Keywords: Mergers and Acquisitions, Business Valuation, Ports, Container Terminals, Income Approach. Acquisition Value, IRR

1. Introduction

In business competition, it requires every company to continue to be able to develop their business. The development was carried out in order to strengthen competitiveness and increase the value of the company, this requires the company to have the right strategy in achieving company goals. The company itself has the goal of maximizing shareholder wealth by maximizing share prices. To achieve these objectives certainly requires some effective strategies. To achieve these objectives certainly
requires some effective strategies. Before determining the chosen strategy, companies need to develop the most appropriate strategy design that is used to maintain their existence and excellence. One effort to maintain its existence and excellence can be done through internal and external expansion. Internal expansion can be done by expanding the company’s area, or increasing production capacity to increase sales targets. Meanwhile, external expansion can be carried out through merger activities such as acquisitions.

In line with PT Y’s corporate strategy in its efforts to increase the value of the company. PT Y is a company engaged in the management and development of ports in Indonesia focusing on the port business. While PT. X is a subsidiary of PT Y which is engaged in port services in the form of container stevedoring and dry bulk services through environmentally friendly management. Whereas PT Y’s container terminal branch is planned to be acquired by PT X which is a branch of PT Y and is engaged in the same field in container loading and unloading services. The internal synergy policy is the basis for conducting research, especially regarding the plan to manage the branch container terminal owned by PT Y by PT. X as a subsidiary of PT Y, related to the feasibility of the potential development or transformation of the company in the future into a multipurpose terminal operator within PT. Y on a national and regional scale. PT X is considering one strategy to improve company performance and value, in line with the parent company, namely by making an acquisition of one of the container terminal services business units owned by PT Y company which has the same operational activities. In the context of the acquisition of PT Y's container terminal branch, a business assessment is needed to determine the acquisition value of PT Y's container terminal branch. In addition to determining the acquisition value, PT X also requires the fair price of the acquisition to be used as consideration in the acquisition of this acquisition.

Some researcher has conducted acquisition analysis in several companies and several method. Such as uses the Devidend Discount Model (DDM) method has the aim of analyzing the acquisition value of Bank Sinar Harapan Bali by using the Dividend Discount Model (DDM) method [1]. Another study is uses the Free Cash flow Valuation to Firm (FCFF) method. And in the merger scheme a sensitivity test is carried out, so that it knows the fair value of the company in unexpected conditions [2]. Another research with the aim to build an effective financial model and be able to adapt to changes in assumptions that often occur during the merger and acquisition process using valuation methods using discounted cash flow (DCF) in a business merger scheme a sensitivity test is conducted to determine the merger scheme and acquisition [3]. A Zaenal Abidin conducted a study in the telecommunications industry in 2015 titled the analysis of PT Indosat Tbk shares. Regarding the Government's Buy Back plan, in his research, the free cash flow to equity (FCFE) business valuation method was used in determining the buyback amount scheme [4]. Another research has objective to analyze Samsung's acquisition plan by Samsung, in the stages of mergers and acquisitions, a financial model development is conducted to evaluate the discounted cash flow (DCF) method. so as to obtain the value of a business merger synergy between Blackberry and Samsung [5]. Another research aimed at analyzing short-term divestment strategies more effectively than long-term strategies by mergers and acquisitions in container terminals using economic value added (EVA), so that they know positive value of the company [6].

In this study Business valuation uses the income approach with the discounted cash flow (DCF) method. This approach estimates the value of an asset by discounting the value of future cash flows. The DCF method is used to assess equity in business, value the company as a whole, and to assess a small part of the company [7]. The DCF assessment is based on an analysis of historical data and assumptions about future market conditions for supply, demand, revenue, costs and potential risks. This assumption considers the ability of business income from income and expenditure
2. Methods
In achieving the research objectives, several stages are proposed as follows:

2.1 First Stage
This research is to conduct an assessment with the income approach will use the discounted cash flow (DCF) method. This method is based on the calculation of future returns from the company. The first thing to do before carrying out an assessment is to calculate the cost of capital used by the weighted average cost of capital (WACC) which functions as a factor discount. The WACC calculation uses the following equation:

\[ WACC = (W_d \times (I \times [1 - T])) + (W_e \times k_e) \]  

(1)

Where, \( W_d \) shows the weight of debt in the capital structure, \( I \) shows the interest rate on the debt structure of capital, \( T \) shows the company's tax rate, \( W_e \) shows the weight of equity in the capital structure, \( k_e \) shows the cost of equity capital.

2.2 Second Stage
After that the financial model is made as a picture of the projected value of the business that will be obtained in the future. From this model a free cash flow will be obtained which is a picture of the free cash flow that will be obtained from the container terminal services business unit company PT Y. The value of the container terminal services business unit PT Y is depicted from the net present value (NPV) which is the result of discounted flows free cash with a factor discount obtained. The equation to calculate the Net present value (NPV) uses the following equation:

\[ PW(i^*) = \sum_{t=0}^{\infty} F_t (1 + i^*)^{-t} \]  

(2)

Where, \( PW \) is present worth, \( F_t \) is cash flow in period \( t \), \( i^* \) shows the required rate of return \((0 \leq i \leq \infty)\), \( t \) shows investment period.

2.3 Third Stage
PT X's financial feasibility in the acquisition plan. The first step in the financial feasibility analysis is to determine the capital costs required for the acquisition and how the capital structure that will be used in the acquisition process is carried out by PT X. This is used as a basis for calculating the WACC value of PT X. After determining the WACC of PT X, then next step is to make free cash flow for financial feasibility analysis consisting of inflow (inflow from PT X) and outflow (funds spent on the acquisition of PT Y container terminal branch). The next step is to determine the NPV and IRR (Internal Rate of Return) value of the free the cash flow. The third step, to determine the maximum purchase price, a sensitivity analysis is performed. If the value of NPV \( \geq 0 \) and IRR \( \geq WACC \), the cost of acquisition of PT Y container terminal can be said to provide a positive rate of return. The result of sensitivity analysis is the maximum price that can be done by PT X to acquire PT Y container terminal branch.

3. Discussion
3.1 Assessment of Container Terminal Branches
The DCF method can provide an overview of the economic benefits generated by a business now or in the future based on historical financial statements. In addition, the advantage of DCF is to take into account the residual value of the company. The income approach depends very much on the assumptions used by the appraiser. The assumptions used include macro assumptions, qualitative assumptions and tax assumptions. Macro assumptions include macroeconomic variables that are assumed to include: economic growth, inflation rates, the exchange rate of the Rupiah against the US Dollar and Bank Indonesia (SBI) interest rates. Whereas qualitative assumptions include Projected ship flows for 2019-2024, which do not take into account people's shipping vessels (pelra) as production, projections for the production of goods services in 2019-2024 do not account for the flow of goods at the Terminal for Self-interest (TUKS), port service tariffs do not account for increase. The
component that must be known before calculating WACC is the cost of equity capital. The calculation can be seen in table 1.

**Table 1. Cost of Equity Calculation Result**

| Cost of Equity | Calculation Result |
|----------------|--------------------|
| \( k_e \) | \( R_f + \theta (R_m - R_f) \) |
| \( R_f \) | 10% | Yield on FR0044 Series Bonds due in 2024 (10.50%) |
| \( R_m \) | 5.45% | IHSG Rate form July 2011-June 2019 |
| Risk Premium* | -2.65% | \( R_m - R_f \) |
| \( \beta \) (Beta) | 10% | Beta value used is the company's beta levered obtained from data processing that is equal to 0.10 |
| Specified Risks | 3.00% | Risk for the company |
| Cost of Equity | 9.55% |

From the results of the calculation of cost equity in table 1, WACC values can be generated in table 2.

**Table 2. WACC Calculation Result**

\[
WACC = \left[ W_d \times \left( I \times [1-T] \right) \right] + \left( W_e \times k_e \right)
\]

| Description                | 2019            | 2020            | 2021            | 2022            | 2023            | 2024            |
|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Cash inflow                | 579,437,839,065| 651,204,044,634| 702,789,985,293| 745,695,503,944| 836,219,870,585| 936,188,204,560|
| Penyusutan                 | 156,947,447,482| 172,641,742,230| 189,907,616,453| 208,897,218,540| 229,763,846,080| 252,766,238,890|
| Bunga                      | 772,823,780,587| 811,470,206,387| 852,643,717,891| 894,645,902,843| 939,378,198,081| 966,347,107,776|
| Terminal Value             | 731,156,615,314| 824,660,257,075| 893,499,045,463| 955,484,352,544| 1,064,937,718,363| 1,099,809,364,261|
| Total Cash Inflow          | 373,156,615,314| 824,660,257,075| 893,499,045,463| 955,484,352,544| 1,064,937,718,363| 1,099,809,364,261|
| Capital Expenditure        | 270,000,000,000 | 270,000,000,000 | 270,000,000,000 | 270,000,000,000 | 270,000,000,000 | 270,000,000,000 |
| Perusahaan Operating Capital| 47,997,806,502  | 55,595,026,489  | 63,997,802,489  | 72,114,515,687  | 80,326,795,362  | 88,539,095,362  |
| Free Cash Flow             | 321,997,606,502 | 293,595,026,489 | 286,997,802,489 | 322,114,512,877 | 350,326,795,362 | 358,539,095,362 |
| Net Free Cash Flow         | 419,160,608,812 | 531,065,230,582 | 606,536,243,054 | 624,730,330,664 | 742,835,585,746 | 10,686,292,580,900 |
| Tahun Proyeksi             | 4.0 | 3.0 | 2.0 | 1.0 | 0.0 | 0.0 |
| Free Cash Flow             | 317,997,806,502 | 293,595,026,489 | 286,997,802,489 | 322,114,512,877 | 350,326,795,362 | 358,539,095,362 |
| Discount Factor            | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Net Present Value          | 9,371,653,437,667 | 9,371,653,437,667 | 9,371,653,437,667 | 9,371,653,437,667 | 9,371,653,437,667 | 9,371,653,437,667 |

Determination of business value using the DCF method is done by discounting the company's NCF (Net Cash Flow) which is the difference between the cash inflows (Inflow) and cash outflows (Outflows) with a discount rate in the form of WACC. After making financial projections for the PT Y Container Terminal branch, the next step is to make Free Cash Flow. From the CAPM calculation, the \( k_e \) value is then calculated WACC from PT Y Container Terminal Branch. The WACC calculation from PT Y is 9.55%. After getting the PTCC YCC WACC value, the next is the calculation of the PT Y container terminal value by discounting Net Cash Flow with a discount rate (WACC) of 9.55%. NPV is obtained from net cash flows that occur throughout the projection year (2019-2024). The NPV
of the net cash flow at PT Y Container Branch is IDR 9,171,633,437,067 (Table 3), where the NPV represents the value of 100% of PT Y's Container Branches.

### 3.2 Determining the fair price for the acquisition of the Container Terminal Branch Y

This can be done by placing the acquisition price of the PT Y container terminal as a cash outflow with cash inflows in the form of total inflow per period during the projection period. After that the cash inflows are deducted by the cash outflows that generate net cash flows and then the IRR value of the cash flows will be calculated. Because the acquisition price is a variable variable, changes in the acquisition price will result in changes in net cash flow and the IRR value will also change. PT X will not produce a positive rate of return if the acquisition price results in an IRR of less than or equal to the WACC of PT X. So before determining the maximum acquisition price, a WACC calculation from PT X is needed. Table 4 is a WACC calculation from PT X.

#### Table 4. WACC Calculation From PT. X

| Description            | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  |
|------------------------|-------|-------|-------|-------|-------|-------|
| Debt weight in capital structure (Wd) | 0.1%  |       |       |       |       |       |
| Weight of debt interest in capital structure (I) | 10.74% |       |       |       |       |       |
| Tax Rates (T) | 25%   |       |       |       |       |       |
| Cost equity / cost of equity capital (k_e) | 9.55% |       |       |       |       |       |
| Equity weight in the company (We) | 99.9% |       |       |       |       |       |
| WACC | 9.58% |       |       |       |       |       |

From the calculation of WACC PT X, the WACC value was 9.58%. This means that the IRR value must be more than this value so PT X can obtain a positive rate of return.

#### Table 5. Free Cash Flow of Acquisition Price

| Description            | 2019  | 2020  | 2021  | 2022  | 2023  | 2024  |
|------------------------|-------|-------|-------|-------|-------|-------|
| Net Profit | 1,132,463,349.45 | 1,332,842,353.619 | 1,331,560,459.781 | 1,537,945,934.297 | 1,766,917,286.068 | 2,020,080,978.375 |
| Depreasiasi | 6,405,779,561 | 6,708,065,389 | 7,006,488,659 | 7,401,792,091 | 7,834,881,406 | 8,226,625,781 |
| Bangga(Y-Pajak) | 772,828,768 | 811,470,206 | 852,643,717 | 894,445,902 | 938,758,098 | 981,547,307 |
| Total Cash Inflow | 1,139,681,954.784 | 1,340,421,889.214 | 1,339,109,172.156 | 1,546,302,354.291 | 1,775,691,545.962 | 2,029,213,952.263 |
| Cash Inflow | Net Profit | 1,132,463,349.45 | 1,332,842,353.619 | 1,331,560,459.781 | 1,537,945,934.297 | 1,766,917,286.068 | 2,020,080,978.375 |
| Depreasiasi | 6,405,779,561 | 6,708,065,389 | 7,006,488,659 | 7,401,792,091 | 7,834,881,406 | 8,226,625,781 |
| Bangga(Y-Pajak) | 772,828,768 | 811,470,206 | 852,643,717 | 894,445,902 | 938,758,098 | 981,547,307 |
| Total Cash Outflow | 11,309,104,112.473 | 37,938,332,318 | 1,922,388,940 | 39,263,804,007 | 43,578,270,183 | 49,334,673,730 |
| Cash Outflow | Investasi TPKS | 11,259,205,583.35 | - | - | - | - |
| Capex | 1,588,684,950 | 1,588,684,950 | 1,588,684,950 | 1,588,684,950 | 1,588,684,950 | 1,588,684,950 |
| Perubahan Modal Kerja | 221,690,155.861 | 39,526,617,260 | 333,703,990 | 40,792,488,372 | 45,196,955,135 | 49,923,358,689 |
| Total Cash Outflow | 11,309,104,112.473 | 37,938,332,318 | 1,922,388,940 | 39,263,804,007 | 43,578,270,183 | 49,334,673,730 |
| Free Cash Flow | 10.169,422,157.689 | 1,339,109,172.156 | 1,546,302,354.291 | 1,775,691,545.962 | 2,029,213,952.263 |
| Discount Factor | 10.169 | 1.178 | 1.337 | 1.500 | 1.669 | 1.870 |
| Net Present Value | 3,704,774,918,775 | 1,339,109,172.156 | 1,546,302,354.291 | 1,775,691,545.962 | 2,029,213,952.263 | 2,077,548,625,993 |
Table 6. Maximum Acquisition Price for Container Terminal

| INVESTAS | IRR | NPV         |
|----------|-----|-------------|
| IDR 12.000.000.000.000 | -7.58% | -4.482.171.427.276 |
| IDR 11.500.000.000.000 | -6.25% | -3.982.171.427.276 |
| IDR 11.000.000.000.000 | -4.82% | -3.482.171.427.276 |
| IDR 10.500.000.000.000 | -3.28% | -2.982.171.427.276 |
| IDR 10.000.000.000.000 | -1.61% | -2.482.171.427.276 |
| IDR 9.500.000.000.000 | 0.22% | -1.982.171.427.276 |
| IDR 9.000.000.000.000 | 2.22% | -1.482.171.427.276 |
| IDR 8.500.000.000.000 | 4.43% | -0.982.171.427.276 |
| IDR 8.000.000.000.000 | 6.89% | -0.482.171.427.276 |
| **7.518.100.000.000** | **9.55%** | **17.828.572.724** |
| IDR 7.018.100.000.000 | 12.67% | 517.828.572.724 |
| IDR 6.518.100.000.000 | 16.26% | 1.017.828.572.724 |

Table 7. Free Cash Flow of the best price for acquisition

| DESCRIPTION | FREE CASH FLOW PROJECTIONS | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|-------------|---------------------------|------|------|------|------|------|------|
| Cash Inflow |                           |      |      |      |      |      |      |
| Net Profit  |                           | 1.132.463.349.455 | 1.332.842.353.619 | 1.537.945.916.297 | 1.766.917.286.068 | 2.020.000.979.375 |
| Depreciasi  |                           | 6.445.776.561     | 6.768.468.659     | 7.061.702.091      | 7.343.881.696      | 8.226.625.781     |
| Bunga*(1-Pajak) |                     | 772.828.768       | 811.470.316       | 852.043.717        | 894.645.902        | 939.378.198       |
| Total Cash Inflow |                   | 1.139.681.954.784 | 1.340.421.889.214 | 1.339.109.172.156 | 1.546.302.354.291 | 1.775.691.545.962 |
| Cash Outflow |                           |      |      |      |      |      |      |
| Investasi TPKS |                        | 7.518.100.000.000 | -    | -    | -    | -    | -    |
| Capex        |                           | 1.588.644.950     | 1.588.644.950     | 1.588.644.950      | 1.588.644.950      | 1.588.644.950      |
| Pembiayaan Modal/Kerja |     | 221.490.153.001   | 352.021.360       | 333.703.990        | 40.702.805.875     | 45.166.955.133     |
| Total Cash Outflow |                   | 7.297.998.529.089 | 37.938.132.310    | 1.922.388.940      | 43.578.270.105     | 48.334.673.730     |
| Net FCF      |                           | 6.158.316.574.304 | 1.378.360.021.524 | 1.337.186.783.216  | 1.546.302.354.291 | 1.819.269.816.145 |
| Tahun Proyeksi |                        | 0    | 1    | 2    | 3    | 4    | 5    |
| Free Cash Flow |                        | 6.158.316.574.304 | 1.378.360.021.524 | 1.337.186.783.216  | 1.546.302.354.291 | 1.819.269.816.145 |
| Discount Factor |                     |     |      | 1.00 | 2.00 | 3.00 | 4.00 |
| Net Cash Flow |                           | 6.158.316.574.304 | 1.378.360.021.524 | 1.337.186.783.216  | 1.546.302.354.291 | 1.819.269.816.145 |
| Net Present Value |                   | 17.828.572.724    | 17.828.572.724    | 17.828.572.724     | 17.828.572.724     | 17.828.572.724     |
| WACC         |                           | 9.55% | 9.55% | 9.55% | 9.55% | 9.55% | 9.55% |

The sensitivity test table found that the maximum acquisition value that can be carried out by PT X is IDR 7.518.100.000.000 (table 6). This is because up to the maximum acquisition value, the resulting IRR is greater than the WACC of PT X, which is 9.66%. A company is said to be eligible for acquisition if the IRR is greater than WACC. With an IRR value of more than WACC, it can be said that the PT Y container terminal branch is eligible to be acquired up to the maximum investment value. If PT X spent funds to acquire WACC is greater than the maximum value, then it can be said that the acquisition decision is not feasible because the resulting IRR is smaller than WACC from the container terminal PT Y. by the acquirer in the future is less than the acquisition cost incurred.

4. Conclusion

The financial model in the research role is to describe the net cash flow (Free Cash Flow) which consists of income and expenditure flows. Revenue and expense flows are obtained from financial projections projections. From the results of the calculation of WACC from PT Y is 9.55%, then the calculation of the fair value of PT Y container terminal is carried out by discounting Net Cash Flow with a discount rate (WACC) of 9.55%. NPV is obtained from net cash flows that occur during the projected year (2019-2024) of IDR 9.171,633,437,067. One third of the fair value of PT Y’s container terminal branch as the acquisition target is Rp. 9,171,633,437,067, - at a cost of capital of 9.55% PT X calculates the fair price of the acquisition so that it can be seen that the acquisition price gives a negative or positive rate of return. PT X needs to compare the WACC value of PT X (9.55%) with the
IRR result must be greater than the WACC in order to get a positive rate of return. From the calculation of the fair value of the acquisition by PT X with a cost of capital of 9.55% amounting to IDR 7,518,100,000,000.00 where at that value generated an IRR of 9.66% which is above the WACC of PT X. This value produces a positive NPV value of IDR 17,828,572,724.00, thus the fair value of the acquisition of IDR 7,518,100,000,000.00 can be used as a basis for the management of PT X to negotiate acquisition activities.

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