Analysis Of Work Productivity Based On The Multi-Factor Productivity Measurement Model (MFPMM)

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Abstract – **Work productivity is a measure of comparing quality and quantity in a particular time unit to achieve work results effectively and efficiently by using existing resources. Work productivity can increase effectiveness which refers to achieving maximum performance. This relates to quality, quantity, time, and efficiency, which relates to efforts to compare inputs with their actual use or how the work is completed. This company experienced a decline in productivity because of several factors. The total decrease decreased by 11.67% in period 2 of the 2021 study. The method used in this study is the Multi-Factor Productivity Measurement Model to analyze the factors of decreased productivity with several factors analyses carried out, namely the analysis of Weighted Change Ratio, Cost To Revenue Ratio, Productivity Ratio, Weighted Performance Indexes, Rupiah Effect On Profit. The results of research on work productivity based on the MFPMM, namely the value of the WCR analysis, show a decrease in productivity due to the use of inputs, which has increased by 24.49%. The results of the CRR analysis show an average cost increase of 34.11%. The PR value shows that the total input productivity has decreased from the base period of 11.67%. WPI shows the results of the comparison of period 2 to period 1, namely Productivity -0.37, Price recovery -0.23, and Profitability -11.67. The REP value shows Productivity -IDR 3,349,244.81, Price recovery -IDR 116,434,078.08, and Profitability -IDR 119,783,322.89.**

Keywords – **Cost To Revenue Ratio, MFPMM, Productivity Ratio, Weighted Change Ratio, Weighted Performance Indexes, Productivity**

I. INTRODUCTION

Productivity is critical for a long-term competitiveness and profitability of organizations[1]. Productivity analysis aims to measure whether the resources used in the production process are optimal in generating profitability[2].PT Wadi Daya Sakti is a company engaged in inspection services. This company was founded in March 2006. This company provides Ship Construction Thickness Measurement services in a predetermined area on the ship's surface, ship hull, keel, and other areas. The target market of PT. Wadi Daya Sakti is a shipping company that exists throughout Indonesia. Thickness measurement in ship construction is a work that measures the thickness of ship plates[3] using several unique tools and operating standards that have been agreed upon by international Association of Classification Societies (IACS)members for the safety of both passengers and goods to be sent to specific areas in the Indonesian seas. Thickness measurements are required in order to check the ship's structural parts. If the ship

owner does not carry it out, then it must be witnessed by the surveyor. This requires the surveyor to be on board while the work is being carried out, as far as necessary, to control the work process (IACS Procedural Requirement).

The company experienced a decrease in productivity. Problems with decreased productivity occurred, including the target for completion of work needed to be achieved correctly, the total income expected by the company not being achieved, and a difference of IDR 902,000,000 in 2020 and IDR 1,166,200,000. Of the total ship construction that the company hopes for, it has yet to be achieved, namely around 15 in 2020 and 22 in 2021. In this study, the researchers used the MFPMM method to examine problems and then provided suggestions for improvements to productivity that had decreased.

MFPMM (Multi-Factor Productivity Measurement Model) is a dynamic and comprehensive approach to tracking profitability and productivity performance, stabilizing prices, and focusing on input changes related to the system's output under study. Multifactor productivity is defined as output per unit of combined inputs of – capital, labor, energy, materials, and purchased business services[4]. multifactor productivity, which measures construction productivity using a combination of three resource inputs (i.e. labour, equipment and material)[5], [6]. MFPMM is used to measure productivity and price changes[7]. Multifactor productivity measured as output per unit cost of the resource inputs[8], but in this research focus includes quantity, price, cost per service, and the value of income and costs. Characteristics of MFPMM model are the revaluation, devaluation, and indexation[4], [9]. The critical premise of this model is that profitability is a function of productivity and price recovery.

II. RESEARCH METHOD

The research method used in the MFPMM (Muti Factor Productivity Measurement Model) includes primary data, which is information collected through observation, interviews, work practices, and documentation in the field, and secondary data, which is data obtained that existed previously at PT. Wadi Daya Sakti is in the form of supporting primary data, namely data on labor, raw materials, operational costs, report books, and the three steps used in the analysis:

Weighted Change Ratio (WCR), According to [4] explains that the Weighted Change Ratio (WCR) describes the increase or decrease in the percentage of one item from the base period to the current period. Calculation (WCR) consists of 3 calculations, namely the calculation of Change in Quantity, Change in Price, and Change in Value. Pointing and percentage, and period changes from the base period to the next period.

- WCR quantity output:

$$\frac{\sum_{i}^{n}= 1\ (Oi2)(Pi1)}{\sum_{i}^{n}= 1(Oi1)(Pi1)} \qquad (1)$$

- WCR quantity input

$$\frac{\sum_{i}^{n}= 1\ (Qi2)(Ci1)}{\sum_{i}^{n}= 1(Qi1)(Ci1)} \qquad (2)$$

a. Cost To Revenue Ratio (CRR). If the ratio is less than 1, the company is operating in a good direction, measuring the cost ratio of using each input to the income obtained by the total output Cost to revenue ratio calculated and written at (3) and (4).

- CRR period 1

$$\frac{1ij1}{\sum_{i}^{n}=1ji1} \qquad (3)$$

- CRR period 2

$$\frac{1ij2}{\sum_{i}^{n}=1ji2} \qquad (4)$$

b. The productivity Ratio (PR), This ratio describes the company's operational ability to sell using its assets[10]. Productivity Ratio describes the level of productivity in the base period and the current period. Productivity Ratio measurement between the base and current periods will show an increase or decrease in overall productivity for each component and is used in calculating the Productivity Index (IP). [11] explains that in calculating IP, the index in the base period is given a value of 100, which measures the ratio of output to input productivity.

- PR period 1

$$\frac{\sum_{i}^{n} Ji1}{Iij1} \qquad (5)$$

- PR period 2

$$\frac{\sum_{i}^{n} (Oi2)(Pi1)}{Iij2} \qquad (6)$$

c. Weighted Performance Index (WPI), Weighted Performance Indexes are indexes of changes in the ratio of output to input from period 1 to period 2. This index shows the impact caused by changes in quantity, price, and value resulting in changes in productivity, price recovery, and profitability. These ratios and indices Together provide performance information for each input and identify areas that need improvement and operating at an acceptable level. Namely measuring the ratio of productivity output to input

- WPI Productivity

$$\frac{\text{WCR quantity total output}}{\text{WCR quantity for each input}} \qquad (7)$$

- Price recovery WPI

$$\frac{\text{WCR price total output}}{\text{WCR price for each input}} \qquad (8)$$

- WPI profitability

$$\frac{\text{WCR value total output}}{\text{WCR value for each input}} \qquad (9)$$

e. Calculation of Rupiah Effect on Profit, Results The Rupiah Effect on Profit calculation is carried out to measure the level of profit value in rupiah based on the effect of changes in the quantity, price, and value of the input elements in the period being measured. According to Sink (1995) in Setyadi (2010), the Rupiah Effect on Profit value is related to the Weighted Performance Indexes' value. That is, if the value of the Weighted Performance Indexes is > 1, the value of the Rupiah Effect on Profit (REP) is > 0, which means that the company has the opportunity to earn an additional advantage. Conversely, if the value of the Weighted Performance Indexes < 1, then the value of the Rupiah Effect on Profit (REP) < 0 means that the company has lost the opportunity to gain additional profits.

III. RESULT AND DISCUSSION

Input-output data

Output is a comparison of productivity results which can be seen in table 1 below:

Table1.Data Output Reports

Data	YEAR	
	2020	**2021**
Report	IDR 74,228,581.43	IDR 74,573,684.21

Revenue data at PT. WadidayaSakti in 2020 is Rp. 74,228,581.43, while in 2021, it will be Rp. 74,573,684.21, there was a decrease in income

Table 2. Labor Input Data

Data	YEAR	
	2020	**2021**
Technician	5	5
helper	3	5
reporting	1	2
accounting	1	1

Table 3. Raw Material Input Data

Data	Year	
	2020	**2020**
Chipping	35	39
Chalk	210	229
grease	105	115
Gloves	140	153
Paper	70	77
Fountain pen	280	305
Type X	140	153
Battery	280	305

Table 4. Energy Input Data

Data	Year	
	2020	2021
Electricity	IDR 2,200,000.00	IDR 2,500,000.00
Internet	IDR 1,200,000.00	IDR 1,600,000.00
Water	IDR 800,000.00	IDR 960,000.00

Table 5.Requirement Input Data

Data	Year	
	2020	**2021**
Re-Certificate All Class	IDR 9,388,888.89	IDR 1,200,000.00
Tool Calibration	IDR 500,000.00	IDR 500,000.00

MFPMM Method Analyst

1 Calculation of Weighted Change Ratio

The results of calculating the WCR report data based on the WCR calculation formula can be seen in the table below:

Table 6.Calculation of Weighted Change Ratio

	Quantity (a)	Percentage (ax100)-100	Price (b)	Percentage (bx100)-100	Values (c)	Percentage (cx100)-100
Report	1.09	8.57	1.0046	0.46	1.09	9.08
Total Outputs	1.09	8.57	1.0046	0.46	1.09	9.08
Inputs						
Labor						
Technician	1.00	0.00	1.00	0.00	1.00	0.00
helper	1.67	66.67	1.00	0.00	1.67	66.67
reporting	2.00	100.00	1.00	0.00	2.00	100.00
accounting	1.00	0.00	1.00	0.00	1.00	0.00
Total Power Work	1.30	30.00	1.00	0.00	1.26	26.17
(Raw material)						
Chipping	1.11	11.43	1.14	14.29	1.27	27.35
Chalk	1.09	9.05	1.14	14.29	1.25	24.63
grease	1.10	9.52	1.20	20.00	1.31	31.43
Gloves	1.09	9.29	1.06	6.25	1.16	16.12
Paper	1.10	10.00	1.11	11.11	1.22	22.22
Fountain pen	1.09	8.93	1.13	12.50	1.23	22.54
Type X	1.09	9.29	1.17	16.67	1.28	27.50
Battery	1.09	8.93	1.20	20.00	1.31	30.71
Total Consumables	1.09	9.21	1.14	14.05	1.25	25.46
(Energy)						
Electricity	1.00	0.00	1.14	13.64	1.14	13.64
Internet	1.00	0.00	1.33	33.33	1.33	33.33
Water	1.00	0.00	1.20	20.00	1.20	20.00
Total Operational office	1.00	0.00	1.20	20.48	1.20	20.48
(required)						
Re-Certificate All class	1.00	0.00	1.10	10.00	1.10	10.00
Tool Calibration Work	1.00	0.00	1.00	0.00	1.00	0.00
Total Other	1.00	0.00	1.09	9.49	1.10	9.66
Total Inputs	1.09	8.97	1.01	0.70	1.23	23.49

Based on table 6. Shows the WCR calculation results are presented in decimal form, but the interpretation is presented in percent form with a base period value of 100. The WCR calculation results at the output show a change in quantity, indicating an increase in product quantity of 8.57% in period 2. The calculation results of price changes (Change in Price) show an increase of 0.46% in period 2. The change in quantity and price also caused a change in value (Change in Value) from period 1 (2020) to period 2 (2021)) which resulted in the company experiencing an increase of 9.08%.

The results of the WCR calculation of labor inputs show a change in quantity which indicates an increase in the quantity of labor needed by the company by 30% in period 2. The results of calculating price changes (Change in Price) show that there is no change in labor wages in period 2. The change in quantity and price also caused a change in value from period 1 (2020) to period 2 (2021) which resulted in the company experiencing an increase in labor costs of 26.17%.

The results of the WCR calculation of raw material inputs show a change in quantity, indicating an increase in raw materials by 9.21% in period 2. Calculating price changes (Change in Price) shows an increase of 14.05% in period 2. There is a change in quantity, and these prices also caused a change in value from period 1 (2020) to period 2 (2021), which resulted in the company experiencing an increase of 25.46%.

The energy input WCR calculation results show no change in quantity (Change in Quantity) in period 2. The calculation results of price changes (Change in Price) show an increase of 20.48% in period 2. The change in quantity and price also caused a change in value (Change in Value) from period 1 (2020) to period 2 (2021), which resulted in the company experiencing an increase of 20.48%.

The calculation results of WCR input requirements show no change in quantity (Change in Quantity) in period 2. The results of calculating changes in price (Change in Price) show an increase of 9.49% in period 2. The change in quantity and price also caused a change in value (Change in Value) from period 1 (2020) to period 2 (2021), which resulted in the company experiencing an increase of 9.66%

The overall WCR calculation results show a decrease in profitability. This is because the total cost of using inputs has increased by 23.49%, while the company's total revenue has only increased by 9.08%. The increase in the number of total inputs needed by the company by 8.97% only impacted the increase in total output by 8.57%. The increase in total input prices by 0.70% only had an impact on price increases of 0.46%.

2. Calculation of Cost to Revenue Ratio

The results of the CRR calculation are then averaged over the calculation results in period 1 and the period, which aims to determine the sequence of the highest cost usage of the two periods. The calculation of the Cost to Revenue Ratio is in the table below:

Table 7.Calculation of CRR

Variable	Period 1	Order	Period 2	Order	Average	Order
Inputs						
Labor						
Technician	0.1386	1	0.1270	1	0.1328	1
helper	0.0624	2	0.0953	2	0.0788	2
reporting	0.0231	3	0.0423	3	0.0327	3
accounting	0.0231	4	0.0212	4	0.0221	4
Total Workforce	**0.2471**	-	**0.2858**	-	**0.2665**	**1**
(Raw material)						
Chipping	0.0005	7	0.0006	7	0.0005	7
Chalk	0.0003	8	0.0003	8	0.0003	8
grease	0.0014	3	0.0017	3	0.0016	3

Gloves	0.0017	2	0.0018	2	0.0018	2
Paper	0.0010	4	0.0011	4	0.0010	4
Fountain pen	0.0009	5	0.0010	5	0.0009	5
Type X	0.0006	6	0.0008	6	0.0007	6
Battery	0.0022	1	0.0026	1	0.0024	1
Total Consumables (Energy)	**0.0085**	**--**	**0.0098**	**-**	**0.0092**	**4**
Electricity	0.0102	1	0.0106	1	0.0104	1
Internet	0.0055	2	0.0068	2	0.0062	2
Water	0.0037	3	0.0041	3	0.0039	3
Total Operational office (required)	**0.0194**	**-**	**0.0214**	**-**	**0.0204**	**3**
Re-Certificate All class	0.0434	1	0.0437	1	0.0436	1
Tool Calibration	0.0015	2	0.0014	2	0.0015	2
Total Other	**0.0449**	**-**	**0.0451**	**-**	**0.0450**	**2**
Total Inputs	0.3199	-	0.3622	-	0.3411	-

a. *Cost to Revenue* Labor Ratio

Calculation of the average Cost to Revenue Ratio in period 1 and period 2 shows the result that the most significant cost usage of all inputs is the total labor input with an average expenditure cost of 26.65%. The enormous labor costs occurred in period 2, namely 28.58%, due to additional employees. The results of the priority order on the average labor input show that the technician part of the labor force contributes the most, namely 13.28%. The second order, namely the helper of 7.88%, the third order of reporting by 3.27%, and the fourth order of accounting by 2.21%. Based on the calculation of the value (value) for each labor input, the average order of each labor cost input from the largest to the smallest is affected by the number of employees, which increased in period 2.

b. *Cost to Revenue* Requirements Ratio

The second most significant use of all inputs is the total input needs with an average cost of 4.5%. The need for expenses increased in period 2 by 4.51% due to the increased cost of certificates to improve workforce skills.

The order of priority on the average input requirement shows that the certificate is the largest in usage costs, namely 4.36%, and the second order for calibration of work tools is 0.15%. Based on the value (value) calculation for each input requirement, the average order of each input requirement cost from the largest to the smallest is affected by the Re-Certificate All Class costs, which increased in period 2.

c. *Cost to Revenue* Energy Ratio

The total energy input is the third most extensive use of all inputs, with an average cost of 2.04%. Energy costs increased in period 2 by 2.14% due to electricity costs.

The order of priority on the average input needs results show that electricity is the largest in usage costs, 1.04%, and the second is internet at 0.62%. The third is water at 0.39%. Based on the value calculation for each utility input, the average order of each utility input from the largest to the smallest is affected by the increase in electricity costs in period 2.

d. *Cost to Revenue* Raw Material Ratio

The fourth largest use of all inputs is the total input of raw materials, with an average cost of 0.92%. Raw material costs

increased in period 2 by 0.98% due to an increase in battery costs. The results of the order of priority on the average input requirement show that the battery is the largest in usage costs, namely 0.26%, the second order is gloved by 0.18%, the third order is grease by 0.16%, the fourth order is paper by 0.10%, the fifth order is a pen by 0.09%, the sixth order is tip-ex by 0.07%, the seventh order is chipping by 0.05%, and the eighth order is lime by 0.03%. Based on the value calculation for each utility input, the average order of each utility cost input from the largest to the smallest is affected by the increase in battery costs in period 2.

e. *Cost to Revenue*RatiotototalInputs

     Calculating the average Cost to Revenue Ratio shows that the total input has an average of 34.11%, with the highest input usage costs occurring in period 2 at 36.22%. In comparison, the input usage costs in period 1 are 31.99%. This is because all the required inputs experienced an increase in usage costs in period 2 (2021) compared to period 1 (2020).

3. Calculation of Productivity Ratio

    The productivity Ratio is the result of an explanation of the trial phase on the water tube to determine the success and duration of flying drones when carrying loads, which can be explained in the form of pictures and tables below.

Table 8. Productivity Ratio Calculation

Variable	Period 1 (a)	Period 2 (b)	IP Period 1	IP Period 2 =(b/a)x100	IP Presentation (%)
Inputs					
Labor					
Technician	7.22	7.87	100	109.08	9.08
helper	16.04	10.50	100	65.45	-34.55
reporting	43.30	23.61	100	54.54	-45.46
accounting	43.30	47.23	100	109.08	9.08
Total Workforce	4.05	3.50	100	86.45	-13.55
(Raw material)					
Chipping	2120.82	1816.54	100	85.65	-14.35
Chalk	3534.69	3093.67	100	87.52	-12.48
grease	706.94	586.71	100	82.99	-17.01
Gloves	579.91	544.75	100	93.94	-6.06
Paper	1030.95	920.06	100	89.24	-10.76
Fountain pen	1159.82	1032.35	100	89.01	-10.99
Type X	1546.43	1322.97	100	85.55	-14.45
Battery	463.93	387.13	100	83.45	-16.55
Total Consumables	117.26	101.95	100	86.94	-13.06
(Energy)					
Electricity	98.41	94.46	100	95.99	-4.01
Internet	180.42	147.59	100	81.81	-18.19
Water	270.63	245.99	100	90.90	-9.10
Total Operational office	51.55	46.67	100	90.54	-9.46
(required)					

Re-Certificate All class	23.06	22.87	100	99.16	-0.84
Tool Calibration	649.50	708.45	100	109.08	9.08
Total Other	22.27	22.15	100	99.47	-0.53
Total Inputs	3.13	2.76	100	88.33	-11.67

Moreover, this need causes the productivity of total inputs as a whole to decrease by 11.67% from the base period. Mulyadi (2007) explains that companies can evaluate the development of their productivity-boosting efforts by comparing the productivity ratios for each input. Information about the value of changes in productivity is essential for calculating the economic impact of the productivity improvement efforts undertaken so that the company obtains a comprehensive measure of its business productivity.

4. Calculation of Weighted Performance Indexes

The results of calculating the total input WPI can be seen in table 4.9 below.

Table 9. Calculation of Weighted Performance Indexes for a total input

WPI	Period 1 (a)	Period 2 (b)	& Period 2 THD 1 ((ba)X100)
Productivity	1	0.996	-0.37
Price Recovery	1	0.998	-0.23
Profitability	1	0.883	-11.67

The calculation results of the productivity Weighted Performance Indexes show a decrease in performance, amounting to 0.37%. It is caused by a change in productivity in the total input, which has decreased. Calculation of Weighted Performance Indexes for price recovery decreased by 0.23% due to the use of costs for the input elements of labor, raw materials, energy, and necessities, causing the company to experience a reduction in profits. The calculation of the profitability Weighted Performance Indexes shows a decrease in performance, amounting to 11.67%, due to the cost of using the input elements of labor, raw materials, energy, and necessities with changes in quantity and price, which causes the company to experience a reduction in profits.

The calculation results of the overall profitability Weighted Performance Indexes must be prioritized. Making this priority order is done so that the company can carry out improvement efforts in the future with which input values contribute or not in providing benefits for the company. The results of calculating the overall profitability Weighted Performance Indexes can be seen in the table below.

Table 10.Order of Priority Value Weighted Performance Indexes Profitability

Inputs	**Period 1**	**Period 2**	**Priority**
Technician Kindergarten	1	1,091	1
Kindergarten Helper	1	1,091	1
Work Equipment Calibration KP	1	1,091	1
KP Re-Certificate All Class	1	0.992	2
Electrical energy	1	0.960	3
BB Gloves	1	0939	4
ENERGY Water	1	0.909	5
BB Paper	1	0892	6

BB Pen	1	0.890	7
BB Lime	1	0.875	8
BB Chipping	1	0.857	9
BB Tip-Ex	1	0.855	10
BB Battery	1	0.834	11
BB Grease	1	0.830	12
Internet ENERGY	1	0.818	13
Kindergarten Reporting	1	0.654	14
Accounting Kindergarten	1	0.545	15

The need for Work Equipment Calibration has a Weighted Performance Indexes value of > 1, meaning that the use of costs for the input needs benefits the company. The need for Re-Certificate All Class has a Weighted Performance Indexes value < 1, which means that the use of costs for the input needs reduces profits to the company due to an increase in the cost of Re-Certificate All Class in period 2. Electrical energy, internet, and water also have a Weighted value Performance Indexes < 1, which means that the use of costs for these energy inputs results in reduced profits for the company due to increased costs in period 2. Chipping raw materials, chalk, grease, gloves, paper, pens, ex-tips, and batteries also have a Weighted value Performance Indexes < 1 which means the use of costs for raw material inputs results in reduced profits for the company due to an increase in quantity and costs in period 2. Technician and helper workers have a Weighted Performance Indexes value of > 1, meaning the use of costs for these labor inputs benefits a company. Reporting and accounting workers have a Weighted Performance Indexes value of < 1, which means that the use of costs for labor inputs results in reduced profits for the company due to an increase in quantity in period 2. and the helper has a value of Weighted Performance Indexes > 1, which means that the use of costs for the labor input provides benefits to the company. Reporting and accounting workers have a Weighted Performance Indexes value of < 1, which means that the use of costs for labor inputs results in reduced profits for the company due to an increase in quantity in period 2. and the helper has a value of Weighted Performance Indexes > 1, which means that the use of costs for the labor input provides benefits to the company. Reporting and accounting workers have a Weighted Performance Indexes value of < 1, which means that the use of costs for labor inputs results in reduced profits for the company due to an increase in quantity in period 2.

5. Calculation of Rupiah Effect on Profit

The results of calculating the Rupiah Effect on Profit are carried out to measure the level of profit value in rupiah based on the effect of changes in quantity, price, and value of the input elements in the period being measured.

a. Calculation of Rupiah Effect on Labor Profit

The calculation of the Rupiah Effect on Profit for labor input is carried out to determine the value of the profit from the use of each workforce with changes in quantity, price, and value from period 1 to period 2. The REP results for labor inputs can be seen in the table below.

Table 10.Result of Rupiah Effect on Labor Profit Calculation

Labor Inputs	Period	Productivity REP (Rupiah)	REP Price Recovery (Rupiah)	REP Profitability (Rupiah)
Technician	1	0	0	0
	2	IDR 30,857,142.86	IDR 1,817,169.14	IDR 32,674,312.00
helper	1	0	0	0
	2	-IDR 94,114,285.71	IDR 817,726.11	-IDR 93,296,559.60
reporting	1	0	0	0
	2	-IDR 54,857,142.86	IDR 302,861.52	-IDR 54,554,281.33

accounting	1	0	0	0
	2	IDR 5,142,857.14	IDR 302,861.52	IDR 5,445,718.67
Total Workforce	1	0	0	0
	2	-IDR 137,571,428.57	IDR 27,840,618.30	-IDR 109,730,810.27

The REP value of productivity based on changes in quantity for the total input of labor shows a negative result, which means that the company has experienced a reduction in profits of Rp. 137,571,428.57 in period 2 due to the addition of employees from period 1 to period 2, causing a reduction in these profits. The price recovery REP value based on price recovery for the total labor input shows a positive result, which means that the company gets a profit of Rp. 27,840,618.30 in period 2. The REP value of productivity based on the change in value for the total labor input shows a negative result, which means that the company has experienced a reduction in profits of Rp. 109,730,810.27 in period 2.

The calculation of the overall labor input REP shows that the labor input for the technician section contributes the most significant addition to the company's profit of Rp. 32,674,312 while the helper labor input is part of the workforce which causes the company to experience a reduction in profits of Rp.93,296,559.60.

b. Calculation of Rupiah Effect on Profit of Raw Materials

The calculation of the Rupiah Effect on Profit for raw material input is carried out to determine the profit's value from each raw material's use with changes in quantity, price, and value from period 1 to period 2. The results of calculating the REP input of raw materials can be seen in the table below.

Table 11. Result of Rupiah Effect on Profit Calculation of Raw Materials

Raw Material Inputs	Period	REP Productivity (Rupiah)	REP Price Recovery (Rupiah)	REP Profitability (Rupiah)
Chipping	1			
	2	-IDR 35,000.00	-IDR 188,816.58	-IDR 223,816.58
Chalk	1			
	2	-IDR 3,500.00	-IDR 110,789.95	-IDR 114,289.95
grease	1	0	0	0
	2	-IDR 35,000.00	-IDR 786,449.73	-IDR 821,449.73
Gloves	1	0	0	0
	2	-IDR 32,000.00	-IDR 283,386.34	-IDR 315,386.34
Paper	1	0	0	0
	2	-IDR 36,000.00	-IDR 295,279.82	-IDR 331,279.82
Fountain pen	1	0	0	0
	2	-IDR 8,000.00	-IDR 293,693.17	-IDR 301,693.17
Type X	1	0	0	0
	2	-IDR 12,000.00	-IDR 297,519.88	-IDR 309,519.88
Battery	1	0	0	0
	2	-IDR 20,000.00	-IDR 1,191,732.92	-IDR 1,211,732.92

Total Consumables	1	0	0	0
	2	-IDR 140,666.67	-IDR 3,488,501.72	-IDR 3,629,168.38

The REP value of productivity based on changes in quantity for the total input of raw materials shows a negative result, which means that the company has experienced a reduction in profits of Rp. 140,666.67 in period 2 due to the addition of quantity and price from period 1 to period 2, causing a reduction in these profits. The price recovery REP value based on price recovery for total raw material inputs shows negative results, which means the company experienced a profit reduction of Rp. 3,488,501.72 in period 2. The value of the REP profitability based on the change in value for the total input of raw materials shows a negative result, which means that the company has experienced a reduction in profits of Rp. 3,629,168.38 in period 2.

c. Calculation of Rupiah Effect on Energy Profit

Calculating the Rupiah Effect on the Profit of Energy input is carried out to determine the profit's value from each energy with changes in quantity, price, and value from period 1 to period 2. The results of calculating the REP energy input can be seen in the table below.

Table 12.Result of Rupiah Effect on Energy Profit Calculation

Energy Input	Period	REP Productivity (Rupiah)	REP Price Recovery (Rupiah)	REP Profitability (Rupiah)
Electricity	1			
	2	IDR 2,262,857.14	-IDR 3,466,740.93	-IDR 1,203,883.79
Internet	1			
	2	IDR 1,234,285.71	-IDR 4,727,313.23	-IDR 3,493,027.52
Water	1			
	2	IDR 822,857.14	-IDR 1,871,542.16	-IDR 1,048,685.01
Total Operational Office	1			
	2	IDR 4,320,000.00	-IDR 10,065,596.32	-IDR 5,745,596.32

The productivity REP value based on the change in quantity for the total energy input shows a positive result, which means that the company gets a profit of Rp. 140,666.67 in period 2. The price recovery REP value based on price recovery for total energy inputs shows a negative result, which means that the company experienced a reduction in profits of Rp. 10,065,596.32 in period 2 due to an increase in prices in period 2. The profitability REP value based on the change in value for the total energy input shows a negative result, which means that the company experienced a profit reduction of Rp. 5,745,596.32 in period 2. Calculating the REP energy input shows that the company experienced a reduction in profits in period 2 due to an increase in prices in period 2.

d. Calculation of Rupiah Effect on Profit Needs

Calculating the Rupiah Effect on Profit for input needs is done to find out the profit's value from each need with changes in quantity, price, and value from period 1 to period 2. The results of calculating the REP input needs can be seen in the table below.

Table 13.Calculation Results Rupiah Effect on Profit Needs

Requirement Input	Period	Productivity REP (Rupiah)	REP Price Recovery (Rupiah)	REP Profitability (Rupiah)
Re-Certificate All Class	1	0	0	0
	2	IDR 9,657,142.86	-IDR 10,697,938.68	-IDR 1,040,795.82
Tool Calibrati on	1	0	0	0
	2	IDR 342,857.14	IDR 20,190.77	IDR 363,047.91
Total Other	1	0	0	0
	2	IDR 10,000,000.00	-IDR 10,677,747.91	-IDR 677,747.91

The REP REP value of productivity based on changes in quantity for the total input needs shows a positive result, which means the company gets a profit of Rp. 10,000,000 in period 2.

The price recovery REP value based on price improvement for total input needs shows a negative result, which means that the company has experienced a profit reduction of Rp. 10,677,747.91 in period 2 due to an increase in prices in period 2.

Profitability REP value based on changes in value for the total input needs shows a negative result, which means the company has experienced a profit reduction of Rp. 677,747.91 in period 2. The calculation results of the REP input requirements show that the work tool calibration section contributes the largest to the company's profit of Rp. 363,047.91, while the Re-Certificate All Class section is a part of the needs that makes the company experience a reduction in profit of Rp. 1,040,795.82.

e. Calculation of Rupiah Effect on Profit Total Input

Calculating the Rupiah Effect on the Profit of total input is carried out to determine the value of the profit on the use of inputs as a whole with changes in quantity, price, and value from period 1 to period 2. The results of the REP calculation of total inputs can be seen in the table below.

Table 14.Result of Calculation of Rupiah Effect on Total Input

Total Inputs	Period	REP Productivity (Rupiah)	REP Price Recovery (Rupiah)	REP Profitability (Rupiah)
Total Inputs	1			
	2	-IDR 3,349,244.81	-IDR 116,434,078.08	-IDR 119,783,322.89

The REP value of productivity based on changes in quantity for the entire total input shows a negative result, which means that the company has experienced a reduction in profits of Rp. 3,349,244.81 in period 2. This shows that adding quantity, especially in the labor and raw material input section, causes a reduction in profits for the company.

The price recovery REP value-based price recovery based on price changes for the entire total price shows a negative result, which means that the company has experienced a profit reduction of Rp. 116,434,078.08 in period 2 was due to changes in the quantity of input labor, raw materials, and also caused by increases in prices for raw materials, energy, and necessities, causing a reduction in profits for the company.

The value of the profitability REP based on changes in the overall value of the total inputs shows a negative result, which means that the company has experienced a profit reduction of Rp. 119,783,322.89 in period 2.

IV. CONCLUSIONS

Based on the results of calculating the productivity of PT. WadidayaSakti uses the MFPMM method, it can be concluded that the overall level of productivity of PT. WadidayaSakti decreased by 11.67% in period 2. The decline in productivity mainly occurred in the total input of labor, raw materials, energy, and necessities, causing the company to experience a loss of profit opportunities of Rp. 119,783,322.89. The results of the analysis of the MFPMM method are:

1. *Weighted Change Ratio*s show a decrease in productivity due to the use of inputs which has increased by 24.49%.

2. *Cost To Revenue Ratio*s shows an average increase in costs of 34.11%.

3. *Productivity Ratio*s show that total input productivity has decreased from the base period of 11.67%.

4. *Weighted Performance Indexes* compare period 2 to period 1, namely Productivity -0.37, Price recovery -0.23, and Profitability -11.67.

5. *Rupiah Effect on Profit*shows the results of Productivity -IDR 3,349,244.81, Price Recovery -IDR 116,434,078.08, Profitability -IDR 119,783,322.89.

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