



Input-Output Analysis: Which Tax Incentive for Natural Resources Downstream Is Suitable for Indonesian Economy?

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ABSTRACT: Indonesian government's policy to promote downstream natural resources leads to tax incentives policy intended to encourage the downstream. This study focuses on corporate income tax incentives in the form of net income reduction (tax allowance according to Article 31A of the Income Tax Law) by 30 percent for 6 years or corporate income tax reduction (tax holiday according to Minister of Finance Regulation Number 130/PMK.010 /2020) by 100 percent or 50 percent. Despite the positive or negative impact of tax incentives enactment argued in the previous studies, this study will calculate the impact on the economy provided by the mentioned tax incentive schemes quantitatively and will analyze which tax incentive scheme gives the greater impact on the economy. The analysis was carried out by using input-output analysis method to calculate the impact from output approach on secondary data in the form of the latest input output table released by Badan Pusat Statistik i.e., 2016 input output table. The result of the study shows that tax incentive in the form of tax holiday with income tax reduction by 100 percent provides greater impact on the economy than the others do. The total impact is getting greater and shows comparable results as the tax incentive rate increases. However, the result of this study implies that the implementation of tax incentives still needs the right tax incentive policy design to gain the expected results.

Keywords: Downstream, Economy, Input-Output Analysis, Tax Allowance, Tax Holiday



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INTRODUCTION

Joko Widodo stated that Indonesia must encourage the natural resources downstream during his speech on August 16, 2022 ([Esti, 2022](#)). The downstream can create the added value by processing the natural resources to increase the supply capacity of the economy and strengthen the resilience of the national economy ([Simanjuntak, 2023](#)). National economic resilience due to the downstream will help Indonesia to deal with global economic uncertainty due to falling commodity prices which is the main challenge if Indonesia continues to rely on raw commodities ([Grahadyarini, 2022](#)). The downstream allows Indonesia not to export raw materials, but to export semi-finished or finished goods that already have added value ([Anam, 2022](#)).

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In short term, downstream can improve the trade balance which is currently dominated by imports of finished goods made from raw materials from the extractive natural resources exported by Indonesia itself. In medium term, downstream can actualize the locomotive of economic growth by attracting investment, absorbing labor, and increasing income. In long term, downstream can develop Indonesia's agricultural country status into an industrial country ([Tumimomor et al., 2023](#)). As a real example of downstream, nickel downstream can push nickel prices in a positive direction to attract investors to Indonesia. It can happen because nickel can be processed first so that it has added value and is valued at a higher price in the market ([Agung & Adi, 2022](#)).

As reported by [Sukhyar \(2018\)](#), downstream is not a new policy in Indonesia. In 1985, the Indonesian government began imposing a log export ban which resulted in investment of around 110 plywood factories from the initial 22 factories in just five years. Then, there was also a ban on the export of raw minerals which was then emphasized in Law Number 4 of 2009 on Mineral and Coal Mining. Furthermore, with the enactment of Law Number 3 of 2014 on Industry, there was a ban on the export of natural resources commodities. As a result, nickel production increased from the initial 90,000 tons which was achieved in more than 30 years to 280,000 tons in just five years.

Regardless of the fluctuations in industrial development in Indonesia, in the last five years, the percentage of non-oil and gas exports from manufacturing sector was much higher than exports from the agricultural, mining, and other sectors. However, in the last three years, exports from manufacturing sector have declined, followed by a decline in exports from agricultural sector and an increase in exports from the mining sector ([Kementerian Perdagangan, 2022](#)). It indicates that the downstream of natural resources still needs to be encouraged so that exports of goods that already have added value instead of raw materials are maintained.

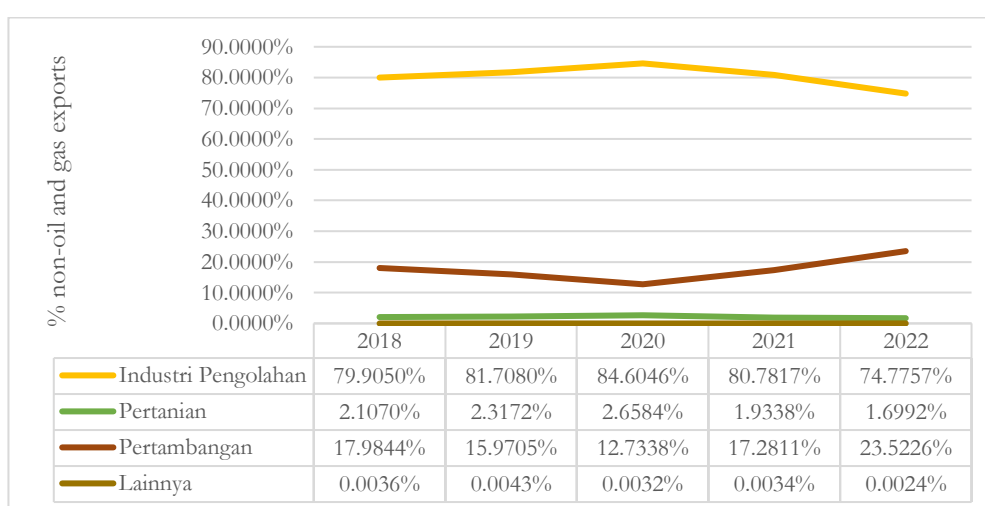


Figure 1 Non-oil and Gas Exports Development by Sectors, 2018–2022

Source: [Kementerian Perdagangan \(2022\)](#)

It should be done considering the great impact provided by manufacturing sector to other sectors in the economy. Manufacturing sector is highly required by other sectors both in downstream and in upstream directly or indirectly. It highly needs other sector's output as its input and its output

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is highly required by other sector as the input ([Hilman & Ester, 2018](#)). It has the above average forward and backward linkage with other sectors ([Rahmah & Widodo, 2019](#)). Besides, manufacturing sector becomes a leading sector due to its huge benefit to other sectors with its development. Its high multiplier effect also makes it able to increase economic growth with its final demand increasing ([Pitaloka et al., 2022](#)).

In encouraging the downstream of natural resources, Deputy Minister of Finance, Suahasil Nazara, stated that providing tax incentives was one of the efforts that could be made. He stated that there were two roles of tax policy in boosting the economy i.e., by collecting taxes as a source of revenue for state spending and by not collecting taxes by providing tax incentives. Providing tax incentives can have an impact on the economy, including encouraging new sources of economic growth in the form of downstream of natural resources ([Kementerian Keuangan, 2023](#)).

If tax incentive policy is designed and implemented well, it can attract the investments that cannot be obtained in the absence of tax incentives. Increased investment can increase government revenue either directly from taxes paid by investors when the tax incentives period ends or indirectly from workers, suppliers, and consumers as the results of incentives given ([United Nations, 2018](#)). [Liu & Mao \(2019\)](#) found that tax incentives increased investment rates by 38.4 percent and firm productivity by 8.9 percent. [Zwick & Mahon \(2017\)](#) also stated that tax incentives in the form of accelerated depreciation increased investment by over 10 percent.

However, there are costs that must be borne i.e., revenue costs, resource allocation costs, and enforcement and compliance costs ([United Nations, 2018](#)). [OECD \(2015\)](#) stated that the existence of tax incentives in low-income countries only created high costs and reduced state revenue that can be spent on infrastructure, public services, or social security since investment will still occur without tax incentives. Most low-income countries use tax holidays and income tax exemptions (profit-based incentives) to attract investment, whereas investment tax credits and accelerated depreciation (cost-based incentives) can attract larger amounts of investment ([Meinzer et al., 2019](#); [OECD, 2015](#)). [James \(2013\)](#) explained further that tax incentives aimed to attract investment did not have much effect in developing countries compared to developed countries. Furthermore, [Eichfelder et al. \(2023\)](#) concluded that tax incentives in the form of depreciation bonuses significantly reduced investment quality by 15.2–23.8 percent in short term and by 31.8–41.4 percent in long term. [Sun et al. \(2020\)](#) also stated the same result even though in terms of value added tax incentives for the renewable energy industry. These incentives reduce the return on equity (ROE). Furthermore, [Stausholm \(2017\)](#) and [Kraal \(2019\)](#) found no effect of tax incentives on foreign direct investment that occurred.

Despite the two different views about the impact of tax incentives, [Sebele-Mpofu et al. \(2022\)](#) presented a summary. Tax incentives appear to be costless, but in practice they can incur substantial costs such as tax revenue loss, redundancies, compliance and administrative costs, increased tax evasion and evasion, and the complexity of tax system. All these negative impacts lead to economic inefficiency, stagnant economic growth, threatened domestic investment, and tax base erosion. The cases happened in each country are different. However, careful design of tax

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incentive policies, continuous monitoring, reassessments, and changes if needed need to be considered ([Sebele-Mpofu et al., 2022](#)). The effectiveness of incentives depends on the investment climate in a country. Low taxes do not give guarantee to overcome bad investment climate problem ([James, 2013](#)). [Zolt & Schill \(2015\)](#) suggested that setting clear incentive goals, adjusting incentive types to goals, estimating the costs and benefits of tax incentives, determining incentive time limits, and assessing the success and failure of incentives in setting tax incentive policies need to be done.

The costs incurred due to tax incentive, especially regarding the downstream of natural resources, besides the benefits it provides according to previous studies cannot be ignored. However, there has not been any previous study calculating the impact quantitatively. This study will calculate the impact of tax incentives on the economy quantitatively by using input output analysis method. In Indonesia, there are various types of tax incentives related to the downstream of natural resources. These incentives can be in the form of foreign tax credits, revaluation of fixed assets, tax holidays, tax allowances, Special Economic Zones (Kawasan Ekonomi Khusus/KEK), Integrated Economic Development Zones (Kawasan Pengembangan Ekonomi Terpadu/KAPET), Bonded Stockpiles (Tempat Penimbunan Berikat/TPB), Free Trade Zones (Kawasan Bebas), Industrial Estates (Kawasan Industri), reinvestment of branch profits, and dividends for venture capital companies' treatment ([PWC, 2022](#)). However, this study focuses on incentives related to income tax, especially tax holidays and tax allowances since there are many variations of incentives related to value added tax or other types of taxes. Tax holiday in Indonesia takes the form in income tax reduction by 100 percent or 50 percent that is ruled in Regulation of Minister of Finance Number 130/PMK.010/2020 on Income Tax Reduction Incentive (PMK 130/2020). It is given to corporate taxpayers that invest their capital for the first time on qualified pioneer industry according to PMK 130/2020. On the other hand, tax allowance takes the form in net income reduction by 30 percent at maximum rate for 6 years that is ruled in Article 31A of Income Tax Law. By calculating the impact caused by tax incentives on the economy, this study will find out which tax incentive can give greater impact on the economy.

METHOD

This study is a quantitative study using input output analysis to see the impact of tax incentives on the economy. Input output (IO) analysis is a technique used to analyze the mutual influence of several sectors or sub-sectors of the economy ([Yogi et al., 2018](#)). This mutual influence departs from the concept that the output of each industry is needed to be used as input for other industries or even for the industry itself ([Chiang & Wainwright, 2005](#)). By using IO analysis, the researcher can calculate the impact caused by tax incentives applied to the industrial sector on all economic sectors in the form of numbers. It can be done since IO theory applies the concept of interdependence between one economic sector and other economic sectors.

The type of data used in this study is secondary data in the form of the latest input output table for 2016 released by [Badan Pusat Statistik \(2021\)](#). Through IO table, [Badan Pusat Statistik \(2021\)](#) describes the interrelationships and reciprocal relationships between economic sectors so that they can help researcher to answer the research questions. The IO table is like a matrix containing some rows describing the output of a sector which is allocated in fulfilling intermediate and final demand

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and some columns describing the intermediate and primary input used by a sector in its production. The economic sectors described in the table consist of 17 sectors which include: 1) agriculture, forestry and fisheries; 2) mining and quarrying; 3) manufacturing industry; 4) procurement of electricity and gas; 5) water supply, waste management, waste and recycling; 6) construction; 7) wholesale and retail trade, car and motorcycle repair; 8) transportation and warehousing; 9) provision of eating and drinking accommodation; 10) information and communication; 11) financial and insurance services; 12) real estate; 13) company services; 14) government administration, defense, and mandatory social security; 15) educational services; 16) health services and social activities; and 17) other services.

The data in the IO table contains a series of equations as follows.

$$\begin{aligned} X_1 &= X_{11} + X_{12} + \dots + X_{1n} + Y_1 \\ X_2 &= X_{21} + X_{22} + \dots + X_{2n} + Y_2 \\ &\vdots \\ X_n &= X_{n1} + X_{n2} + \dots + X_{nm} + Y_n(1) \end{aligned}$$

where:

X_1 = total of *intermediate* i sector's output (rows or columns total)

X_{ij} = output of sector i bought by sector j

Y_i = total of final demand sector i's output

All elements in each sector of IO table can be divided by the total of each column to obtain coefficient representing purchase pattern of each sector. This coefficient is symbolized with a_{ij} . Then, a matrix can be formed with the formula below.

$$X = AX + Y \quad (2)$$

$nx1 \quad nxn \quad nx1 \quad nx1$

where $A = [a_{ij}]$, IO matrix' coefficient

With transposition by creating the identity matrix which will be subtracted by A matrix, the equation becomes:

$$X(I - A) = Y$$

$$X = (I - A)^{-1}Y = LY \quad (3)$$

where $L = (I - A)^{-1}$ which is then called Leontief's inversion ([Jensen et al., 1979](#)).

This study will analyze the total impact caused by tax incentives imposed to encourage the downstream of natural resources on the economy from the output approach. The impacts are the total of direct impact and indirect impact. The direct impact is the external shock given to the economy, while the indirect impact is a multiplier effect on other sectors due to the shock ([Ariutama et al., 2021](#)). In calculating the impact by using IO analysis, the researcher will give a shock which equals the forgone tax revenue as the result of the tax incentive enactment. By doing

IO calculation in Microsoft Excel or in STATA 17.0 application, the calculation will show the result in the form of the number representing the impact in all economic sectors available. [Barbosa et al. \(2020\)](#) defines this process in the form of this equation: $Y \rightarrow Y + \Delta Y$ that represents that the external shock given will affect the final demand. Due to the interdependence relationship between sectors, the external shock will affect the output of all sectors: $X \rightarrow X + \Delta X$, so $\Delta X = L \cdot \Delta Y$ ([Barbosa et al., 2020](#)).

RESULT AND DISCUSSION

At the first step, the researcher formed A matrix by calculating the coefficient a_{ij} and I matrix which is the identity matrix of A matrix. By forming $(I - A)$ matrix, which was then inverted, Leontief's inversion matrix, $(I - A)^{-1}$, was created. Then, the impact given by tax incentives to the economy was calculated by giving a shock to manufacturing industry sector. The researcher chose the manufacturing industry sector as the targeted sector to be given the shock since the downstream policy aims to boost the industry sector. In other words, if tax incentive is given to encourage the downstream, the tax incentive will become the shock to the industry sector, which is called as the manufacturing industry sector in the IO table from Badan Pusat Statistik (BPS). The researcher assumes that the shock equals the forgone tax revenue due to tax incentive enactment. In this case, the researcher calculated the impact three times i.e., the impact of providing tax incentives in the form of net income reduction by 5 percent (tax allowance), corporate income tax reduction by 100 percent (tax holiday), and corporate income tax reduction by 50 percent (tax holiday).

The forgone tax revenue as the shock was calculated by multiplying: 1) 25 percent for corporate income tax rate; 2) 5 percent for net income reduction rate for tax allowance, 50 percent, or 100 percent for income tax reduction rate in tax holiday; 3) 14 percent multiplier for net income calculating norm; and 4) total output from the manufacturing industry sector from IO table. The corporate income tax rate used is the rate in 2016 i.e., the rate ruled by Law Number 7 of 1983 as lastly amended by Law Number 36 of 2008 on Income Tax (UU PPh) since the data used is the IO table for 2016 which is the most up-to-date IO table provided by BPS. The net income reduction rate (tax allowance) is 5 percent instead of 30 percent since 30 percent is the rate for 6 years (according to Article 31A of UU PPh). Therefore, 30 percent is divided by 6 to obtain the reduction rate for a year. The 14 percent multiplier is the lowest limit of the net income calculating norm (NPPN) based on Regulation of Director General of Taxes Number PER-17/PJ/2015 on Net Income Calculating Norm. The 14 percent is the norm used to calculate the net income of corporate taxpayers who are audited for not carrying out bookkeeping obligations according to Article 28 and Article 29 of Law Number 6 of 1983 as lastly amended by Law Number 7 of 2021 on General Provisions and Tax Procedures (UU KUP). Basically, income tax is imposed on net income, not on gross turnover which is assumed as total output in IO table. However, the net income of each company varies depending on how much deductions it can make to reach the final amount of net income at the end. Therefore, to simplify the calculation, the researcher used the lowest limit of NPPN to obtain the net income. Finally, the impact of tax incentive enactment on the economy comes from the sum of the shocks as a direct impact and the indirect impact caused. To find out how much the impact is, the difference between the total impact caused (after tax

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incentives enactment) and the initial output (before tax incentives enactment) was then calculated and stated in percentage. The table below shows the results of the impact of tax allowance and tax holidays on the economy from output approach.

Table 1: Tax Allowance's Impact on The Economy from Output Approach

No.	Sectors	Shock (million rupiah)	Total Impact (million rupiah)	Initial Output (million rupiah)	% of Initial Output
1	Agriculture, forestry, and fisheries	-	3,265,010	2,005,849,462	0.1628%
2	Mining and excavation	-	1,794,429	1,285,055,761	0.1396%
3	Manufacturing industry	15,050,233	37,190,537	8,600,133,160	0.4324%
4	Electricity and gas supply	-	532,791	663,270,868	0.0803%
5	Water supply, waste management, waste, and recycling	-	20,036	56,601,385	0.0354%
6	Construction	-	99,442	2,912,162,963	0.0034%
7	Wholesale and retail trade, car repair, and motorcycles	-	1,433,595	2,411,401,412	0.0595%
8	Transportation and warehousing	-	720,133	1,522,677,073	0.0473%
9	Foods and drinks accommodation provision	-	94,639	969,548,920	0.0098%
10	Information and communication	-	406,335	791,877,309	0.0513%
11	Financial and insurance services	-	555,729	725,410,836	0.0766%
12	Real estate	-	135,067	777,909,010	0.0174%
13	Company services	-	448,653	737,185,790	0.0609%
14	Government, defense, and mandatory social security administration	-	57,760	765,117,480	0.0075%
15	Educational services	-	19,537	619,859,717	0.0032%
16	Health and social activity services	-	17,588	295,234,062	0.0060%
17	Other services	-	43,977	405,256,505	0.0109%
Total impact		15,050,233	46,835,258	25,544,551,713	0.1833%

Source: Processed data

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Table 2: The Impact of Tax Holiday with Reduction Rate of 100 Percent on The Economy from Output Approach

No.	Sectors	Shock (million rupiah)	Total Impact (million rupiah)	Initial Output (million rupiah)	% of Initial Output
1	Agriculture, forestry, and fisheries	-	65,300,197	2,005,849,462	3.2555%
2	Mining and excavation	-	35,888,582	1,285,055,761	2.7928%
3	Manufacturing industry	301,004,661	743,810,742	8,600,133,160	8.6488%
4	Electricity and gas supply	-	10,655,820	663,270,868	1.6066%
5	Water supply, waste management, waste, and recycling	-	400,728	56,601,385	0.7080%
6	Construction	-	1,988,836	2,912,162,963	0.0683%
7	Wholesale and retail trade, car repair, and motorcycles	-	28,671,890	2,411,401,412	1.1890%
8	Transportation and warehousing	-	14,402,658	1,522,677,073	0.9459%
9	Foods and drinks accommodation provision	-	1,892,789	969,548,920	0.1952%
10	Information and communication	-	8,126,696	791,877,309	1.0263%
11	Financial and insurance services	-	11,114,586	725,410,836	1.5322%
12	Real estate	-	2,701,344	777,909,010	0.3473%
13	Company services	-	8,973,055	737,185,790	1.2172%
14	Government, defense, and mandatory social security administration	-	1,155,206	765,117,480	0.1510%
15	Educational services	-	390,734	619,859,717	0.0630%
16	Health and social activity services	-	351,756	295,234,062	0.1191%
17	Other services	-	879,540	405,256,505	0.2170%
Total impact		301,004,661	936,705,158	25,544,551,713	3.6669%

Source: Processed data

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Table 3: The Impact of Tax Holiday with Reduction Rate of 50 Percent on The Economy with Output Approach

No.	Sectors	Shock (million rupiah)	Total Impact (million rupiah)	Initial Output (million rupiah)	% of Initial Output
1	Agriculture, forestry, and fisheries	-	32,650,099	2,005,849,462	1.6277%
2	Mining and excavation	-	17,944,291	1,285,055,761	1.3964%
3	Manufacturing industry	150,502,330	371,905,371	8,600,133,160	4.3244%
4	Electricity and gas supply	-	5,327,910	663,270,868	0.8033%
5	Water supply, waste management, waste, and recycling	-	200,364	56,601,385	0.3540%
6	Construction	-	994,418	2,912,162,963	0.0341%
7	Wholesale and retail trade, car repair, and motorcycles	-	14,335,945	2,411,401,412	0.5945%
8	Transportation and warehousing	-	7,201,329	1,522,677,073	0.4729%
9	Foods and drinks accommodation provision	-	946,395	969,548,920	0.0976%
10	Information and communication	-	4,063,348	791,877,309	0.5131%
11	Financial and insurance services	-	5,557,293	725,410,836	0.7661%
12	Real estate	-	1,350,672	777,909,010	0.1736%
13	Company services	-	4,486,528	737,185,790	0.6086%
14	Government, defense, and mandatory social security administration	-	577,603	765,117,480	0.0755%
15	Educational services	-	195,367	619,859,717	0.0315%
16	Health and social activity services	-	175,878	295,234,062	0.0596%
17	Other services	-	439,770	405,256,505	0.1085%
Total impact			468,352,579	25,544,551,713	1.8335%

Source: Processed data

The results show that the greater the tax incentives rate, the greater the impact on the economy. The tax allowance with 5 percent net income reduction gives 0.1833 percent impact on the

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economy, while the tax holidays with 100 percent and 5 percent income tax reduction gives 3.6669 percent and 1.8335 percent impact on the economy respectively. To check these results, researcher varies the reduction rates to see the variety of the impact, ranging from 5 percent to 100 percent.

Table 4: The Variations of Reduction Rate of Tax Incentives and Its Impact on the Economy from Output Approach

No.	Sectors	% Total Impact of Initial Output										
		5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1	Manufacturing industry	0.43 24%	0.86 49%	1.72 98%	2.59 46%	3.45 95%	4.32 44%	5.18 93%	6.05 42%	6.91 91%	7.78 39%	8.64 88%
2	Agriculture, forestry, and fisheries	0.16 28%	0.32 55%	0.65 11%	0.97 66%	1.30 22%	1.62 77%	1.95 33%	2.27 88%	2.60 44%	2.92 99%	3.25 55%
3	Mining and excavation	0.13 96%	0.27 93%	0.55 86%	0.83 78%	1.11 71%	1.39 64%	1.67 57%	1.95 49%	2.23 42%	2.51 35%	2.79 28%
4	Electricity and gas supply	0.08 03%	0.16 07%	0.32 13%	0.48 20%	0.64 26%	0.80 33%	0.96 39%	1.12 46%	1.28 52%	1.44 59%	1.60 66%
5	Financial and insurance services	0.07 66%	0.15 32%	0.30 64%	0.45 97%	0.61 29%	0.76 61%	0.91 93%	1.07 25%	1.22 57%	1.37 90%	1.53 22%
6	Company services	0.06 09%	0.12 17%	0.24 34%	0.36 52%	0.48 69%	0.60 86%	0.73 03%	0.85 20%	0.97 38%	1.09 55%	1.21 72%
7	Wholesale and retail trade, car repair, and motorcycles	0.05 95%	0.11 89%	0.23 78%	0.35 67%	0.47 56%	0.59 45%	0.71 34%	0.83 23%	0.95 12%	1.07 01%	1.18 90%
8	Information and	0.05 13%	0.10 26%	0.20 53%	0.30 79%	0.41 05%	0.51 31%	0.61 58%	0.71 84%	0.82 10%	0.92 36%	1.02 63%

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commun ication												
9	Transportation and warehousing	0.04 73%	0.09 46%	0.18 92%	0.28 38%	0.37 84%	0.47 29%	0.56 75%	0.66 21%	0.75 67%	0.85 13%	0.94 59%
10	Water supply, waste management, waste, and recycling	0.03 54%	0.07 08%	0.14 16%	0.21 24%	0.28 32%	0.35 40%	0.42 48%	0.49 56%	0.56 64%	0.63 72%	0.70 80%
11	Real estate	0.01 74%	0.03 47%	0.06 95%	0.10 42%	0.13 89%	0.17 36%	0.20 84%	0.24 31%	0.27 78%	0.31 25%	0.34 73%
12	Other services	0.01 09%	0.02 17%	0.04 34%	0.06 51%	0.08 68%	0.10 85%	0.13 02%	0.15 19%	0.17 36%	0.19 53%	0.21 70%
13	Foods and drinks accommodation provision	0.00 98%	0.01 95%	0.03 90%	0.05 86%	0.07 81%	0.09 76%	0.11 71%	0.13 67%	0.15 62%	0.17 57%	0.19 52%
14	Government, defense, and mandatory social security administration	0.00 75%	0.01 51%	0.03 02%	0.04 53%	0.06 04%	0.07 55%	0.09 06%	0.10 57%	0.12 08%	0.13 59%	0.15 10%
15	Health and social activity services	0.00 60%	0.01 19%	0.02 38%	0.03 57%	0.04 77%	0.05 96%	0.07 15%	0.08 34%	0.09 53%	0.10 72%	0.11 91%
16	Construction	0.00 34%	0.00 68%	0.01 37%	0.02 05%	0.02 73%	0.03 41%	0.04 10%	0.04 78%	0.05 46%	0.06 15%	0.06 83%

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17	Educational services	0.00 32%	0.00 63%	0.01 26%	0.01 89%	0.02 52%	0.03 15%	0.03 78%	0.04 41%	0.05 04%	0.05 67%	0.06 30%
Total impact		0.18 33%	0.36 67%	0.73 34%	1.10 01%	1.46 68%	1.83 35%	2.20 02%	2.56 69%	2.93 36%	3.30 03%	3.66 69%

Source: Processed data

From the variations, the total impact provided becomes greater along with the greater tax incentives' rate. The impact provided is proportional with the reduction rate given. The table shows the impact on each sector from the greatest to the lowest. Manufacturing industry is the sector in the highest rank followed by agriculture, forestry, and fisheries and mining and excavation in the three highest rank.

The results of the input output analysis indicate that there is a positive impact caused by the provision of incentives to the manufacturing sector on the economy. This is indirectly in line with the results of research by [Hilman & Ester \(2018\)](#), [Pitaloka et al. \(2022\)](#), and [Rahmah & Widodo \(2019\)](#) which state that the manufacturing sector is a leading sector that really needs and is needed by other sectors, both in terms of its linkages, the size of the distribution of benefits from its development, and the size of the multiplier effect. In other words, since the manufacturing sector is a leading sector that greatly influences other sectors, the shock given to it will automatically have an impact on other sectors that are affected. Incentives in the form of reduced income tax that must be paid by companies in the manufacturing sector can increase the attractiveness of investors to invest in this sector when compared to conditions without these incentives. These investments can ultimately increase the number of workers, suppliers, and consumers ([United Nations, 2018](#)). The economic activity of the manufacturing sector will increase. With the interdependence between economic sectors, increased activity in the manufacturing sector will also have an impact on increasing economic activity in other sectors according to the input-output concept.

Although there is the possibility of revenue costs, resource allocation costs, and enforcement and compliance costs due to the provision of tax incentives according to [United Nations \(2018\)](#) and [OECD \(2015\)](#), the multiplier effect caused by incentives from an economic perspective can ultimately contribute benefits. Reduced taxes owed, increased attractiveness to investors, and increased economic activity can eventually cover lost tax revenues potential and can even increase tax revenues themselves. If it is related to the results of study by [Meinzer et al. \(2019\)](#), tax incentives in the form of income tax reductions imposed by Indonesia are included in the type of profit based incentives. These incentives tend to be aimed at obtaining profits from investments made by investors. In other words, the attractiveness of investment is increased from tax reductions which are then expected to stimulate the economy which in turn can generate large business profits.

The positive impact on the economy arising from the provision of incentives based on input output analysis are indirectly in line with the study of [Liu & Mao \(2019\)](#) and [Zwick & Mahon \(2017\)](#). Although those two studies did not conduct specific study on corporate income tax reduction incentives, both studies demonstrated the positive impact of the tax incentives provided in the form of increased investment. Conversely, the absence of the impact of tax incentives on foreign direct investment in the studies conducted by [Kraal \(2019\)](#) and [Stausholm \(2017\)](#) is not in

line with the results of this study. Similarly, the results of the studies conducted by [Eichfelder et al. \(2023\)](#) and [Sun et al. \(2020\)](#) that found a reduction in investment quality and return on equity due to tax incentives are not in line with the results of this study. The results of this study tend to indicate a positive impact in the form of an increase in the economy of all existing sectors due to the provision of tax incentives to the manufacturing sector.

Regardless of whether tax incentives have a positive or negative impact, the design of incentive policies needs to be considered. This refers to what was stated by [Zolt & Schill \(2015\)](#) and [Sebele-Mpofu et al. \(2022\)](#). How much the benefits to be obtained and the costs to be borne will depend on the design of the policies to be implemented. It also considers the statement made by [James \(2013\)](#) that the amount of investment a country will get is not necessarily caused by low taxes, but it depends on the investment climate in the country. In other words, to guarantee the realization of an increase in the overall economy in accordance with the results of the input output analysis due to the incentives given to the manufacturing sector, several things need to be prepared. Setting clear objectives and types of incentives, careful calculation of costs and benefits, setting clear time limits, and assessing the success and failure of tax incentives must be carried out by Indonesian government in accordance with the guidelines provided by [Zolt & Schill \(2015\)](#).

CONCLUSION

From the input output analysis that has been carried out by using the output approach, it can be concluded that the tax incentive in the form of a 100 percent income tax reduction (tax holiday) gives a greater impact on the economy. Tax incentives in the form of net income reduction by 5 percent (tax allowance) gives the least impact on the economy. The results show that the total impact on the economy is getting bigger along with increasing tax incentive rates. The magnitude of the impact is proportional to the amount of the reduction rate given. However, since the amount of investment to be obtained in natural resources downstream is not necessarily caused by low taxes but depends on the investment climate, it implies that the design of tax incentive policies provided also needs to be considered.

However, this study is still very limited to calculating the impact on the economy instead of providing a more detailed analysis of which manufacturing sectors can be the focus of providing tax incentives. In addition, this research is also limited to an analysis of incentives in the form of net income or income tax reduction in the form of tax holidays and tax allowances. An analysis of other types of incentives such as investment tax credits and accelerated depreciation that are assumed to have a more positive impact than income tax reductions has not been included in this study. Further research containing those matters is needed to complete the comprehensiveness of this study in providing appropriate policy recommendations to be implemented, particularly regarding tax incentives to spur natural resources downstream.

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