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The Effect of Education and Skills on Unemployment: The Moderation Role of Economic Growth

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ABSTRACT: Aspects of community education, namely the average length of schooling (RLS) and Community Vocational Skills (CVS), are important to know community welfare, one of which is seen from the open unemployment rate (TPT). This study aims to analyze: (1) The relationship between RLS and TPT, (2) The effect of CVS on TPT, (3) The role of economic growth (EG) as a moderator between RLS and TPT, and (4) The role of economic growth (EG) as moderation between CVS and TPT, in Sidoarjo, East Java using 2019-2023 data. Using the Structural Equation Modeling (SEM) method, the findings show that people's vocational skills are the main thing that affects TPT levels. However, the study notes that economic growth failed to moderate the relationship between RLS and CVS on TPT. The role of the government is crucial to improve vocational skills in the form of massive training for prospective workers with related industries.

Keywords: Open Unemployment Rate, Education, Economic Growth

ABSTRAK: *Aspek pendidikan masyarakat yaitu rata rata lama sekolah (RLS) dan Kecakapan Vokasional Masyarakat (CVS) menjadi hal penting untuk mengetahui kesejahteraan masyarakat, yang salah satunya ditinjau dari Tingkat Pengangguran Terbuka (TPT). Penelitian ini bertujuan untuk menganalisa: (1) Hubungan antara RLS dan TPT; (2) Efek CVS terhadap TPT; (3) Peran pertumbuhan ekonomi (EG) sebagai moderasi antara RLS dan TPT; serta (4) Peran pertumbuhan ekonomi (EG) sebagai moderasi antara CVS dan TPT, di Sidoarjo Jawa Timur menggunakan data tahun 2019-2023. Dengan menggunakan metode Structural Equation Modelling (SEM), Temuan ini mengindikasikan bahwa kecakapan vokasional masyarakat menjadi hal utama yang mempengaruhi tingginya TPT. Bagaimanapun juga, penelitian ini mencatat bahwa pertumbuhan ekonomi gagal untnuk memoderasi hubungan RLS dan CVS terhadap TPT. Peran pemerintah krusial guna meningkatkan kecakapan vokasional berbentuk pelatihan masif bagi calon pekerja dengan industri terkait.*

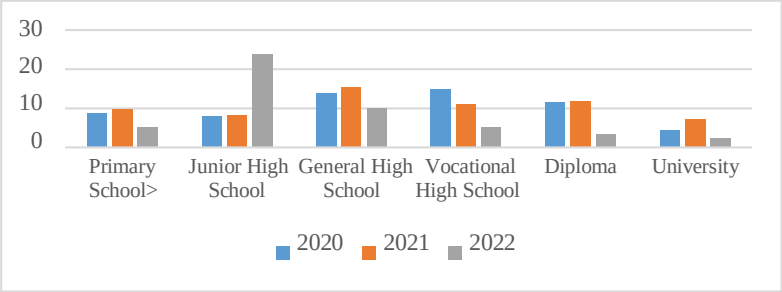
Kata Kunci: *Tingkat Pengangguran Terbuka, Pendidikan, Pertumbuhan Ekonomi*

INTRODUCTION

Aspects of community education, namely the average length of school (RLS) and Community Vocational Skills (CVS), are two crucial things in realizing the prosperity of an area (Adly, 2022; Hanushek, 2020; Wardhana et al., 2020). RLS represents the average number of years that residents aged 15 and older spend on various types of education they have pursued (Jannah & Indah Fitriana Sari, 2023), while people's vocational skills are means skills that are associated with certain areas of work found in society (Dalimunthe, Raudah Zaimah. Siregar, 2020).

With a positive combination of these factors, there will be a domino effect on the unemployment rate decreasing due to additional income (Kitov, 2021). This ideal concept has long been used as a basic idea for regional progress throughout the world. Unfortunately, not all regions/regions can implement it optimally, including in Indonesia (Oktafianto et al., 2019). One of the areas experiencing obstacles in realizing this prosperity is Sidoarjo Regency/City in East Java Province.

Based on data, Sidoarjo Regency in 2023, the Sidoarjo Open Unemployment Rate (TPT) in August 2023 was 8.05% or down around 8.5% percent compared to August 2022 (BPS, 2023). With this number, Sidoarjo ranks first in the 2023 TPT, surpassing the capital of East Java, namely Surabaya, which in the same year had a TPT figure of 6.76%. Meanwhile, the average TPT in Indonesia itself is only around 5.32%. This indicates that Sidoarjo still has serious problems in dealing with high TPT even though there is a decline every year (BPS Kabupaten Sidoarjo, 2023).



Source: Indonesian Central Statistics Agency, 2022

Figure 1. Open Unemployment Rate (TPT) in Sidoarjo According to the Highest Average Years of School Completed (percent), August 2020 - August 2022

There have been many studies with various methods conducted to analyze the impact of YIA development, but there are still few that use input output analysis (I-O analysis) to measure the economic impact of government spending on YIA development and related infrastructure. Only a study by Suparmono (2017) used input output analysis (I-O analysis), but unfortunately the study did not explain the details of the direct and indirect impacts of the development of YIA itself and its supporting infrastructure. The total value of the monetary impact of government spending is also still an estimated figure, considering that when the study was conducted YIA was still under construction. Suparmono's (2017) research also did not provide information on the value of the multiplier impact of government spending on various economic sectors. In fact, it is important to know the relationship between the multiplier effect and government spending in order to obtain the value of the benefits of YIA development.

To update previous research and provide more comprehensive information about the economic impact of YIA development, this research is important to conduct. This study aims to see the impact of government spending and investment on the construction of YIA and its supporting infrastructure, so this study uses all government spending data related to the construction of YIA and its supporting infrastructure and investment in sectors related to the construction of this new airport.

Several studies have been conducted related to the impact of YIA development. Ayuningtyas (2022) analyzed the socio-economic impact of the construction of Yogyakarta International Airport (YIA) for family heads in Glagah Kulon Progo Village using a qualitative approach with a case study method. The results showed that the existence of YIA did not have too much impact on the social and economic life of family heads in Glagah Village as seen from social and economic changes before and

after the construction of YIA did not experience significant changes. The shortcoming of this research is that the number of respondents interviewed was only 8 respondents. The scope of the research also tends to be narrow, only capturing conditions in one village.

With the same method as Ayuningtyas' research (2022), Susanto (2020) conducted research with a broader scope, namely, to analyze the socio-economic impact of the construction of YIA Airport in Kulonprogo Regency. In conclusion, the development of YIA from the economic aspect shows a positive impact from the growth of economic activities such as hotels, restaurants, catering businesses, housing, rentals, and boarding houses.

Research with other methods, namely descriptive quantitative using secondary data in the form of panel data, has also been conducted by Fatimah & Rahayu (2023). The research was conducted to determine the effect of YIA Airport development on the economic growth of districts / cities in DIY Province. The result is that each of the unemployment rate, poverty rate, and Regional Original Income (PAD) have a significant influence on economic growth. The shortcomings of this study are that the independent variables used do not describe the effect of YIA development because in the variables there are still many factors that affect the unemployment rate, poverty rate, and PAD in DIY which cannot be justified directly due to YIA development.

There are not many studies that use the Input-Output table analysis method related to YIA development. Suparmono (2017) used I-O analysis to analyze the impact of Yogyakarta International Airport on economic growth in Yogyakarta. The result of the study was that the biggest economic growth impact of YIA development was on the building construction sector by 77.62%, goods from the cement industry by 44.79%, and other goods from the metal industry by 37.73%. The YIA development project will provide an additional GRDP of IDR 5,180,676.24 million. The largest economic output impact is generated by the civil building and building construction sector by 75.34%, followed by the retail trade sector other than cars/motorcycles by 2.63%, and other metal goods industry by 1.95%. The YIA development project will increase economic output by IDR 12,407,424.75 million. The sectors that increase the largest household income receipts are the civil building and construction and building construction sectors by 68.49%, the wholesale and retail trade sector other than cars/motorcycles by 4.73%, and the food and beverage supply sector by 2.42%. The YIA development project will increase household income by IDR 1,712,211.01 million.

The shortcoming of Suparmono's (2017) research is that it does not explain in detail the direct and indirect impacts of the YIA development and its supporting infrastructure. The data presented related to the shock value of government spending related to the construction of YIA is also still in the form of estimated figures. Suparmono's research (2017) also does not provide information on the value of the multiplier impact of government spending on various economic sectors. Whereas it is important to know the relationship between the multiplier effect and government spending in order to obtain the value of the benefits of YIA development.

With different objects, research by Harjanto & Woyanti (2019) was conducted to analyze the extent of the role of Ahmad Yani Airport infrastructure development in the economy of Central Java Province. With the Input-Output analysis method using the Microsoft Excel program and the interview method with the Regional Revenue Agency of Central Java, linkage analysis, impact analysis, and multiplier analysis were carried out. The data used are secondary data derived from the 2013 Input-Output Table of Central Java Province with a classification of 88 sectors and primary data derived from interviews with the Regional Revenue Agency of Central Java. From the analysis conducted, the building sector which represents the existence of the airport in the I-O Table of Central Java Province in 2013 could increase the demand for output from other sectors which will be used as inputs in economic activities, which means that the building sector encourages growth in upstream sectors. Based on the investment simulation conducted, the construction of Ahmad Yani International Airport can increase the output and household income of the community.

Based on existing previous research, this research is replication research of Harjanto & Woyanti's (2019) by changing the object of research with the construction of YIA Airport. However, the substance to be known from this study is almost the same as Harjanto & Woyanti's (2019) research, namely, to determine the effect of shock government spending and investment, in this case related to

the construction of YIA Airport coupled with its supporting infrastructure on economic growth in Yogyakarta Special Region Province.

METHODS

This research is a quantitative study using the Input-Output Table of DIY Province Domestic Transactions at Producer Prices (52 Industries), 2016 in million rupiah updated and issued by the Central Bureau of Statistics (BPS) of DIY Province on May 31, 2021, to determine the impact of YIA Airport development on the economy in DIY. The data in this study were obtained from government expenditure data available online in the financial report documents of PT Angkasa Pura I and the Ministry of Finance for YIA Airport infrastructure support projects such as the YIA Airport Train. The analysis of this research is divided into two major parts, namely Input Output analysis and multiplier analysis.

The analysis begins with the Input Output analysis of the I-O Table according to BPS. In the input output analysis method, several analyses are used to calculate inter-sectoral linkages and calculate the magnitude of the multiplier effect of a sector.

To provide an overview of inter-sectoral linkages, linkage analysis can be used. Linkages consist of direct and indirect forward linkages and direct and indirect backward linkages. Forward linkage provides information on the degree of linkage between a sector that produces outputs that are used as inputs by other sectors. While backward linkage is used to see the degree of linkage of a sector that supplies inputs for the sector under study.

Direct forward linkages show the effect of a particular sector on sectors that use part of the sector's output directly per unit increase in total demand. This linkage is formulated as follows:

$$F(d)_i = \sum_{j=1}^{n} a_{ij}$$

Which:

$F(d)_i$ = direct forward linkage of I sector
a_{ij} = technical coefficient matrix element
n = number of sectors

Direct and indirect forward linkages show the effect of a particular sector on the sectors that use the output of that sector directly or indirectly per unit increase in total demand. This linkage is formulated as follows:

$$F(d+i)_i = \sum_{j=1}^{n} b_{ij}$$

Which:

$F(d+i)_i$ = direct and indirect forward linkage of I sector
b_{ij} = Leontief inverse matrix element
n = number of sectors

Direct backward linkages show the effect of a particular sector on sectors that provide intermediate inputs to that sector directly per unit increase in total demand. This linkage is formulated as follows:

$$B(d)_j = \sum_{i=1}^{n} a_{ij}$$

Which:

$B(d)_j$ = direct backward linkage of I sector
a_{ij} = technical coefficient matrix element
n = number of sectors

Direct and indirect backward linkages show the effect of a particular sector on sectors that provide intermediate inputs to that sector directly or indirectly per unit increase in total demand. This linkage is formulated as follows:

$$B(d+i)_j = \sum_{i=1}^{n} b_{ij}$$

Which:

$B(d+i)_i$ = direct and indirect backward linkage of I sector
b_{ij} = technical coefficient matrix element
n = number of sectors

What is meant by multiplier is that an increase in the activity of a sector will increase the activity of that sector or other sectors by the value of the multiplier. The multiplier analysis conducted in this study is the output multiplier analysis. The number obtained from the output multiplier can estimate the changes in exogenous factors on the output of sectors in the economy. The larger the output multiplier number, the more important the sector's role in economic output. The sector that can provide a large output multiplier number can be called the leading sector in the economy.

Then to see the impact or contribution of YIA Airport development, further analysis is carried out by multiplying the output multiplier value with the shock of government spending from the APBN and PT Angkasa Pura I and the realization of investment in Kulon Progo Regency. With these results, it can be seen how much impact occurs on other sectors from a shock to government spending and investment for the construction of YIA Airport.

RESULTS AND DISCUSSIONS

In examining the impact of YIA Airport development, the shock is divided into several main parts, namely government spending on airport development, government spending on airport supporting infrastructure development, and investment realization in Kulon Progo Regency after YIA Airport. The available data for these shocks are not broken down by type of program, type of activity, or type of expenditure by sector or industry. Therefore, the author transforms the data obtained from related sources to be poured into industry categories according to BPS.

Government expenditures calculated as an economic shock in this study are all government expenditures for fiscal years from 2018 to 2022, both those included in the category of government expenditures and investment realization for the construction of YIA Airport. Data for airport supporting infrastructure development costs in the form of trains were obtained from the Coordinating Ministry for Economic Affairs. For PMDN investment realization data obtained from the Kulon Progo Regency Investment and Integrated Services Office. While data related to airport development is obtained from the Financial Statements of PT Angkasa Pura I. An overview of government spending and investment realization on the impact of YIA Airport development is shown in Table 1.

Table 1: Economic Shocks of YIA Airport Development (in million rupiah)

No.	Type of Expenditure	Sector/Industry	Economy Shock
1.	Construction cost of the YIA Elevated Airport Railway - Tracks - Bridges - Building & Mechanical Engineering of Kedundang Station - Signals - Telecommunications	Construction	1.247.136
2.	Procurement cost of YIA Airport train facilities (4 trainsets)	Rail Transportation	700.000

3.	Cost of land acquisition for the construction of YIA Airport Railway	Construction	50.000
	Domestic Investment Realization per Sector in Kulon Progo Regency in 2019 & 2020:		
4.	- Construction	Construction	1.379
	- Hospitality and Restaurant	Provision Accommodation	6.087
	- Housing, Industrial Estates and Offices	Real Estate	28.522
5.	Domestic Investment Realization per Sector in Kulon Progo Regency in 2021:		
	- Construction	Construction	815
	- Hospitality and Restaurant	Provision Accommodation	375.365
	- Housing, Industrial Estates and Offices	Real Estate	30.919
6.	Domestic Investment Realization per Sector in Kulon Progo Regency in 2022:		
	- Construction	Construction	45
	- Hospitality and Restaurant	Provision Accommodation	138.160
	- Housing, Industrial Estates and Offices	Real Estate	1.208
7.	YIA Airport land acquisition	Construction	4.136.368
8.	Installation of YIA Airport land boundary fence	Construction	29.303
9.	Preparatory Work (clearing and grubbing, regular excavation, backfill with local materials)	Construction	74.050
10.	Soil improvement with dynamic compaction	Construction	411.951
11.	YIA Airport infrastructure development work	Construction	6.138.506

Source: Processed by the authors (2023)

In the construction of YIA Airport, the government through PT Angkasa Pura I spent a total cost of IDR 10,790,180,440,000. As for the supporting infrastructure project in the form of the Airport Train, the government spent a total development for construction and procurement of railroad facilities of IDR 1,997,136,000,000. And for the realization of PMDN in Kulon Progo Regency, industries that may be affected by the construction of YIA Airport are the construction sector, hotels and restaurants, as well as housing, industrial estates and offices. This industry estimate is based on previous research by Susanto (2020) where the construction of YIA had a positive impact on economic activities such as hotels, restaurants, catering businesses, housing, rentals, and boarding houses. The realization of PMDN in Kulon Progo Regency for the construction, accommodation provision, and real estate sectors from 2019 to 2022 was IDR 582,505,615,400. Thus, the total economic shock used to measure the impact of the YIA Airport development is IDR 13,369,822,055,400.

From Table 1, it is known that the largest economic shock in the construction of YIA Airport is for the construction work of YIA Airport itself with a value of 45.91% of the total economic shock. The second largest government expenditure is for land acquisition with a value of 30.94% of the total economic shock. And the third largest expenditure is for construction costs for the construction of the elevated route Airport Train with a percentage of 9.33% of the total economic shock. So, from the total economic shock, it will add the most output to the construction sector. While the contribution of

PMDN investment realization in related sectors only provides a value of 4.36% of the total economic shock.

After obtaining the economic shock value of the YIA airport construction, this shock value is then used to calculate the indirect impact of the shock on an industrial sector in the I-O¬ table of Yogyakarta Province for 52 Industries. The calculation of this indirect impact is obtained from the multiplication between the Leontief inverse matrix and the economic shock illustrated in Table 2.

Table 2: Indirect Impact of YIA Airport Development on 52 Industries in Kulon Progo Regency (in million rupiah)

No.	Sector/Industry	Shock	Indirect Impact
1.	Food Crop Agriculture	-	44.247
2.	Agriculture Annual Horticulture, Annual Horticulture, and Others	-	13.066
3.	Annual and Seasonal Plantation	-	3.825
4.	Livestock	-	27.720
5.	Agricultural and Hunting Services	-	0
6.	Forestry and Logging	-	68.118
7.	Fisheries	-	12.486
8.	Oil, Gas and Geothermal Mining	-	0
9.	Coal and Lignite Mining	-	0
10.	Metal Ore Mining	-	0
11.	Other Mining and Quarrying	-	382.729
12.	Coal and Oil and Gas Refining Industry	-	0
13.	Food and Beverage Industry	-	118.338
14.	Tobacco Processing Industry	-	0,39
15.	Textile and Apparel Industry	-	3.276
16.	Leather, Leather Goods and Footwear Industry	-	854
17.	Wood, Wood and Cork Products and Wickerwork of Bamboo, Rattan and the Like Industry	-	279.931
18.	Paper and Paper Goods, Printing and Recording Media Reproduction Industry	-	32.339
19.	Chemical, Pharmaceutical and Traditional Medicine Industry	-	6.302
20.	Rubber, Rubber and Plastic Goods Industry	-	20.611
21.	Non-Metallic Excavated Goods Industry	-	415.099
22.	Basic Metal Industry	-	0
23.	Manufacture of Metal Goods, Computers, Electronic Goods, Optical and Electrical Equipment	-	3.192
24.	Machinery and Equipment Industry YTDL	-	17.501
25.	Transportation Equipment Industry	-	1,43
26.	Furniture Industry	-	96.972
27.	Other Manufacturing Industries, Machinery and Equipment Repair and Installation Services	-	16.143
28.	Electricity	-	122.666
29.	Gas Procurement and Ice Production	-	1.351
30.	Water Supply, Waste Management, Waste and Recycling	-	3.588
31.	Construction	12.089.557	12.830.516
32.	Trade in Cars, Motorcycles and Reparations	-	120.506

No.	Sector/Industry	Shock	Indirect Impact
33.	Wholesale and Retail Trade, Not Cars and Motorcycles	-	775.397
34.	Rail Transportation	700.000	701.276
35.	Land Transportation	-	248.580
36.	Sea Transportation	-	0
37.	River, Lake and Ferry Transportation	-	23,58
38.	Air Transportation	-	158.648
39.	Warehousing and Supporting Services for Transportation, Post and Couriers	-	80.401
40.	Accommodation Provision	519.614	527.039
41.	Provision of Drinking Food	-	282.923
42.	Information and Communication Services	-	174.655
43.	Financial Intermediary Services Other than Central Banks	-	175.398
44.	Insurance and Pension Funds	-	6.444
45.	Other Financial Services	-	17.051
46.	Financial Support Services	-	66,57
47.	Real Estate	60.651	238.348
48.	Company Services	-	119.627
49.	Government Administration, Defence and Compulsory Social Security	-	9.098
50.	Education Services	-	6.003
51.	Health and Social Services	-	17.889
52.	Other Services	-	41.004
	Total		18.221.248

Source: Processed by the authors (2023)

Based on Table 2, the total value of indirect impacts obtained from the construction of YIA Airport and its supporting infrastructure is Rp 18,221,247,705,220. This result shows that the total value of the indirect impact is greater than the total economic shock given to the construction of YIA Airport. From the calculation results, the construction sector is the sector most affected by the economic shock on the construction of YIA Airport. While other sectors that also get the next biggest impact are the industry sector of Wholesale and Retail Trade, Not Cars and Motorcycles with an indirect impact of Rp 775,397,054,936 or around 5.93% of the total initial output before the construction of YIA Airport.

For the analysis of inter-sectoral linkages as shown in Table 3, the Food and Beverage Industry sector has the highest level of attraction with an index of 1.323 among 52 other industrial sectors in DIY Province. This means that in producing output, the Food and Beverage Industry sector is able to attract various kinds of resources or inputs from other available sectors to encourage the sector's output production activities to increase. While the Oil, Gas and Geothermal Mining sector, Coal and Lignite Mining sector, Basic Metal Industry, and Sea Transportation have the lowest level of backward linkage with a value of 0.7951 because there are no outputs or inputs in the sector in DIY Province.

Table 3: Backward Linkages Analysis

No.	Sector/Industry	Total Backward Linkage Index
1.	Food Crop Agriculture	0.851492
2.	Agriculture Annual Horticulture, Annual Horticulture, and Others	0.866504
3.	Annual and Seasonal Plantation	0.864299
4.	Livestock	1.085390
5.	Agricultural and Hunting Services	0.843357
6.	Forestry and Logging	0.824340

No.	Sector/Industry	Total Backward Linkage Index
7.	Fisheries	0.891064
8.	Oil, Gas and Geothermal Mining	0.795070
9.	Coal and Lignite Mining	0.795070
10.	Metal Ore Mining	0.890234
11.	Other Mining and Quarrying	0.983093
12.	Coal and Oil and Gas Refining Industry	0.893518
13.	Food and Beverage Industry	1.323434
14.	Tobacco Processing Industry	0.878132
15.	Textile and Apparel Industry	1.188233
16.	Leather, Leather Goods and Footwear Industry	1.225767
17.	Wood, Wood and Cork Products and Wickerwork of Bamboo, Rattan and the Like Industry	1.121552
18.	Paper and Paper Goods, Printing and Recording Media Reproduction Industry	1.045139
19.	Chemical, Pharmaceutical and Traditional Medicine Industry	1.102787
20.	Rubber, Rubber and Plastic Goods Industry	1.007104
21.	Non-Metallic Excavated Goods Industry	1.065820
22.	Basic Metal Industry	0.795070
23.	Manufacture of Metal Goods, Computers, Electronic Goods, Optical and Electrical Equipment	0.978647
24.	Machinery and Equipment Industry YTDL	0.965501
25.	Transportation Equipment Industry	1.015964
26.	Furniture Industry	1.087129
27.	Other Manufacturing Industries, Machinery and Equipment Repair and Installation Services	1.042614
28.	Electricity	1.210335
29.	Gas Procurement and Ice Production	1.117495
30.	Water Supply, Waste Management, Waste and Recycling	0.982672
31.	Construction	1.091048
32.	Trade in Cars, Motorcycles and Reparations	0.932455
33.	Wholesale and Retail Trade, Not Cars and Motorcycles	0.990066
34.	Rail Transportation	0.997239
35.	Land Transportation	0.970974
36.	Sea Transportation	0.795070
37.	River, Lake and Ferry Transportation	0.814688
38.	Air Transportation	1.161391
39.	Warehousing and Supporting Services for Transportation, Post and Couriers	1.083620
40.	Accommodation Provision	1.039598
41.	Provision of Drinking Food	1.216380
42.	Information and Communication Services	1.073410
43.	Financial Intermediary Services Other than Central Banks	0.922382
44.	Insurance and Pension Funds	0.928957
45.	Other Financial Services	0.942483

No.	Sector/Industry	Total Backward Linkage Index
46.	Financial Support Services	0.897027
47.	Real Estate	0.966525
48.	Company Services	1.082284
49.	Government Administration, Defense and Compulsory Social Security	1.277364
50.	Education Services	0.986439
51.	Health and Social Services	1.063960
52.	Other Services	1.029816

Source: Processed by the authors (2023)

For forward linkages, shown in Table 4 that the one that has the greatest thrust in improving the economy in DIY Province is through the Wholesale and Retail Trade, Not Cars and Motorcycles sector with an index of 1.84. This means that every activity of wholesale and retail trade, not cars and motorcycles is able to encourage other sectors to further increase their output. After the Wholesale and Retail Trade, Non-Car and Motorcycle sector, the largest forward linkages index is followed by the Air Transportation sector (1.72), Information and Communication Services sector (1.625), Food and Beverage Industry (1.56), Land Transportation sector (1.451), Electricity industry (1.45), and Financial Intermediary Services Other Than Central Banks (1.369).

Table 4: Forward Linkages Analysis

No.	Sector/Industry	Total Index of Forward Linkages
1.	Food Crop Agriculture	1.260926
2.	Agriculture Annual Horticulture, Annual Horticulture, and Others	0.871578
3.	Annual and Seasonal Plantation	0.968869
4.	Livestock	0.968018
5.	Agricultural and Hunting Services	0.795070
6.	Forestry and Logging	1.100057
7.	Fisheries	0.851153
8.	Oil, Gas and Geothermal Mining	0.795070
9.	Coal and Lignite Mining	0.795070
10.	Metal Ore Mining	0.795070
11.	Other Mining and Quarrying	0.995735
12.	Coal and Oil and Gas Refining Industry	0.795070
13.	Food and Beverage Industry	1.559803
14.	Tobacco Processing Industry	0.800545
15.	Textile and Apparel Industry	0.979850
16.	Leather, Leather Goods and Footwear Industry	0.956603
17.	Wood, Wood and Cork Products and Wickerwork of Bamboo, Rattan and the Like Industry	0.908021
18.	Paper and Paper Goods, Printing and Recording Media Reproduction Industry	0.930595
19.	Chemical, Pharmaceutical and Traditional Medicine Industry	0.831702
20.	Rubber, Rubber and Plastic Goods Industry	0.908312
21.	Non-Metallic Excavated Goods Industry	0.865329
22.	Basic Metal Industry	0.795070
23.	Manufacture of Metal Goods, Computers, Electronic Goods, Optical and Electrical Equipment	0.797880
24.	Machinery and Equipment Industry YTDL	0.819817

No.	Sector/Industry	Total Index of Forward Linkages
25.	Transportation Equipment Industry	0.795075
26.	Furniture Industry	0.848955
27.	Other Manufacturing Industries, Machinery and Equipment Repair and Installation Services	0.823663
28.	Electricity	1.450485
29.	Gas Procurement and Ice Production	0.795830
30.	Water Supply, Waste Management, Waste and Recycling	0.812429
31.	Construction	1.021777
32.	Trade in Cars, Motorcycles and Reparations	1.005442
33.	Wholesale and Retail Trade, Not Cars and Motorcycles	1.839675
34.	Rail Transportation	0.800773
35.	Land Transportation	1.451350
36.	Sea Transportation	0.795070
37.	River, Lake and Ferry Transportation	0.795169
38.	Air Transportation	1.720021
39.	Warehousing and Supporting Services for Transportation, Post and Couriers	1.095541
40.	Accommodation Provision	0.857471
41.	Provision of Drinking Food	1.192465
42.	Information and Communication Services	1.625256
43.	Financial Intermediary Services Other than Central Banks	1.369419
44.	Insurance and Pension Funds	0.819284
45.	Other Financial Services	0.954948
46.	Financial Support Services	0.798518
47.	Real Estate	1.295435
48.	Company Services	1.237006
49.	Government Administration, Defense and Compulsory Social Security	0.911428
50.	Education Services	0.851460
51.	Health and Social Services	0.882395
52.	Other Services	1.008448

Source: Processed by the authors (2023)

Based on the results of the input-output analysis, the construction of YIA Airport will increase economic growth in DIY Province through the impact of direct and indirect economic shocks. The direct impact obtained from the construction of YIA Airport and its supporting infrastructure is Rp 13,369,822,055,400 and produces an indirect impact of Rp 18,221,247,705,220. The indirect impact is greater that the direct impact because there is a multiplier effect as each sector depends on inputs from other sectors to produce its own output. This will increase the demand for inputs from other sectors, creating a chain reaction of increased production and economic activity. If summed up, the total impact of the construction of YIA Airport is IDR 31,591,069,760,620. Judging from the implications for the regional finances of DIY Province, the construction of YIA Airport and its infrastructure should be able to increase the GRDP of DIY Province by the total of direct and indirect impacts. In addition, the construction of this airport has an impact on improving the community's economy directly through land acquisition because the compensation provided by PT Angkasa Pura I is valued above the average actual price (Azizah, 2018).

The largest economic output impact of the construction of YIA Airport is generated by the construction sector itself because the focus of this project is the construction of facilities & infrastructure and airport-related infrastructure. The next largest output impact is the Wholesale and

Retail Trade sector, Not Cars and Motorcycles, this result is in accordance with previous research by Suparmono (2017) where this sector also produces the second largest output impact after the civil building and building construction sector. This result is also supported by research by Nugraha (2019) where 3 out of a total of 5 regencies/cities in DIY Province have leading sectors in the wholesale and retail trade sector, namely in Bantul Regency, Gunungkidul Regency, and Kulonprogo Regency. So, the construction of YIA Airport has succeeded in maximizing the potential of the leading sectors in DIY Province.

The Food and Beverage Industry in DIY Province also has a significant impact in attracting other inputs. This is a positive thing for the economy in DIY Province, supported by data from the DIY Provincial Development Planning Agency that there are 47,127 business units engaged in the food industry ranging from small industries to large industries in 2020 which continues to increase from 39,335 industries in 2018 and 36,637 small to large industries in 2017. In addition to being one of the leading sectors of the 3 districts in DIY Province, it turns out that the Wholesale and Retail Trade, Not Cars and Motorcycles sector is the sector that contributes the most forward linkages or in other words can encourage the provision of output for other sector inputs.

CONCLUSION

Research on the impact of YIA Airport development using Input-Output analysis concluded that the Construction sector is the sector most affected by the economic shock in the form of government spending and investment in the construction of YIA Airport and its supporting infrastructure with an indirect impact value of Rp 12,830,516,173,011 or 55.99% of the total initial output and a direct impact of Rp 12,089,557,080,000. So that in total, the impact received by the Construction sector is IDR 24,920,073,248,011. Furthermore, the Wholesale and Retail Trade sector, Not Cars and Motorcycles is ranked second with an indirect impact of IDR 775,397,054,936 or around 5.93% of the total initial output before the construction of YIA Airport. Meanwhile, the Coal and Oil and Gas Refining Industry is the least affected sector by the construction of YIA Airport and its infrastructure in addition to sectors that have no input or output in Yogyakarta Province.

Overall, the construction of YIA Airport has a positive impact on the economy in Yogyakarta Province. The direct impact of the YIA Airport development project along with its supporting infrastructure and related sector investments in Kulon Progo Regency on the economy of Yogyakarta Province is 13,369,822,055,400 and produces an indirect impact of Rp 18,221,247,705,220 which shows the multiplier effect of the economic shock. This suggests that investment in infrastructure projects like airports can be effective in boosting regional economic growth. The multiplier effect of YIA Airport project also highlights the importance of continued investment in supporting infrastructure, such as roads, utilities, and public services. These investments are crucial for maximizing the positive economic impacts of major projects.

Nevertheless, this study has some limitations, particularly related to the calculation of economic shocks. The calculation of the economic shock does not consider the details of the allocated budget whether it is entirely used in one sector or divided into other sectors. This study also did not aggregate 52 sectors/industries. Thus, it is suggested that future research can obtain more precise economic shock calculation data and can perform aggregation of 52 sectors/industries to group more homogeneous industries to obtain more precise and detailed results.

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