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Analysis of Fisherman Welfare in Indonesia

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ABSTRACT: This study aims to analyze the effect of exports, subsidy policies, investment, and fuel prices on the welfare of fishermen in Indonesia. This study uses secondary data obtained from the Central Bureau of Statistics, the Ministry of Maritime Affairs and Fisheries, the Ministry of Finance, the Investment Coordinating Board, and the Ministry of Energy and Mineral Resources. The data used are *time series* for 2005-2020 in Indonesia. The analytical method used is the multiple linear regression. The results of this study indicate that the subsidy and investment policy variables have a positive and significant effect on the welfare of fishermen in Indonesia. While the variable exports and fuel prices have no significant effect on the welfare of fishermen in Indonesia.

Keywords: fishermen's welfare, fisherman's exchange rate, exports, subsidy policies, investment, fuel prices.

1. Introduction

Indonesia is a country that has a very wide water area with great resource potential for the utilization of national development. Development that aims to increase welfare is an effort made to create more choices for members of society to meet their unlimited needs. In examining Indonesia's development so far, empirically the development of marine and fisheries has received little attention and has always been positioned as a periphery in national economic

development. This condition is very ironic, considering that almost 70% of Indonesia's territory is a sea that has enormous economic potential so Indonesia is known as the largest archipelagic country in the world. Around 16.42 million people in Indonesia live in the coastal area. They live on land in 8,090 coastal villages spread throughout Indonesia.

With an area consisting mostly of oceans and having considerable marine potential, Indonesia should be able to prosper the lives of fishing communities who depend on this marine potential. To get an overview of changes in fishermen's welfare, an indicator that is easy to use is needed. One of the instruments to measure the welfare of fishermen is to use Fishermen's Exchange Rates (NTN). The achievement of Indonesia's NTN is still close to 100. This indicates that the welfare of fishermen is still vulnerable. In theory, when the NTN value is < 100, fishermen are in the critical condition; this is because their income is much smaller than their expenses, both for household needs and production costs. Or in other words, fishermen experience a deficit. The increase in producer prices was relatively smaller than the increase in prices of consumptions. Fishermen's income fell less than their expenses.

According to Mulyadi (Mulyadi, 2007),[1] namely to overcome problems such as First, the ability to produce fishery commodities that are highly competitive (sustainable), both through fishing and cultivation is still low. The catch of fish per unit of effort (per boat or fisherman) at sea is still relative, fluctuating, or uncertain. Second, the ability to market fishery commodities at favorable prices for both the domestic and export markets is still weak. The selling price of fishery products changes very quickly and often experiences a glutted market, which is a market condition in which the selling price of a commodity decreases drastically when the supply of the commodity is abundant and the selling price improves when the supply is small (on a famine). Third, the prices of production factors such as fuel, fishing gear, ship engines, and others are relatively expensive and fluctuate.

One element of farmer welfare is the purchasing power of farmers' income to

meet the expenditure needs of farmer households. The increase in welfare can be measured by the increase in the purchasing power of income to meet these expenditures. The higher the purchasing power of farmers' income to consumer needs, the higher the exchange rate of farmers which means that farmers are relatively more prosperous (Rahmat, 2013)[2].

According to Nopirin (1997),[3] exports come from domestic production and are sold for use by residents abroad, so exports are an injection into the income stream as an investment.

Suparmoko (2003) [4] defines subsidies (transfers) as a form of government spending that is also interpreted as a negative tax that will increase the income of those who receive subsidies or experience an increase in real income if they consume or buy goods subsidized by the government at selling prices.

Investment is the expenditure of goods that are not currently consumed where based on the period, investment is divided into three, namely short-term investment, medium-term investment, and long-term investment, (Lipsey, 1997)[5].

Fuel oil (BBM) is a strategic item that is important for the state and meets the needs of many people so that according to the mandate of the constitution, its production, distribution, and price are controlled by the state, in order to encourage the national economy and to ease the burden on the people's economy (Pantjar and Friyatno, 2016)[6].

Ni Kadek Eka Jayanthi and Sudarsana Arka (2018)[7] research "Analysis of the Effects of Investment, Exports, Inflation on Economic Growth and People's Welfare in the Province of Bali". This study aims to analyze the effect of investment, exports, and inflation on economic growth and people's welfare in the Province of Bali. The results of the research analysis concluded that the investment variable directly had a positive and insignificant effect on economic growth in the Province of Bali. The export variable directly has a positive and significant effect on economic growth in the Province of Bali, while the inflation

variable directly has a negative and significant effect on economic growth in the Province of Bali. Investment and export variables do not directly affect people's welfare, while inflation and economic growth indirectly affect people's welfare in the Province of Bali.

Weriantoni, Srivani, Lukman, Fini, Silvia, and Enjelia (2017)[8] on "Analysis of Factors Affecting Welfare of Rubber Farmers (A Case Study in Nagari Limo Koto, District of Koto VII, Sijunjung Regency)" analyzes the effect of land area, amount of production, level of education, and government policies on the welfare of rubber farmers as described by the total income of farmers. The results of this study concluded that the area of land and the amount of production had a positive and significant effect on the welfare of rubber farmers, while the level of education and government policies had a negative and insignificant effect on the welfare of rubber farmers.

Elita Ratnasari (2020)[9] on the "Spatial Dimensions of the Relationship between Agricultural Exports and Farmers Exchange Rates and Agricultural Business Exchange Rates as Indicators of Farmer Welfare in Indonesia" identifies patterns of export development in the agricultural sector in Indonesia, identify variations in the welfare of farmers between provinces in Indonesia, and analyze the relationship between export values and indicators of farmer welfare in Indonesia. The results showed a spatial pattern, namely provinces in Java Island tended to have better agricultural export performance than agricultural export conditions in provinces outside Java Island and conditions for the welfare level of farmers in Indonesia varied between regions with a farmer welfare index that tended to be more superior to most of the provinces on the island of Java. In addition, there is no significant relationship between the value of agricultural exports and the two indicators of farmer welfare (NTP and NTUP).

The hypothesis for this study is as follows.

1. Suspected that exports have a positive and significant effect on the welfare of fishermen in Indonesia.
2. It is suspected that the subsidy policy has a positive and significant impact

on the welfare of fishermen in Indonesia.

3. It is suspected that investment has a positive and significant effect on the welfare of fishermen in Indonesia.
4. It is suspected that fuel prices have a negative and significant effect on the welfare of fishermen in Indonesia.

2. Method

The scope of this research includes the influence of Fishery Exports, Subsidy Policies, and Investment and Fuel Prices on the Welfare of fishermen in Indonesia. This type of research is quantitative research using secondary *time series* from 2005 to 2020. The data sources in this study were taken from several sources from various agencies and sources from books, journals, theses, and various sites related to research such as the central statistics agency (BPS), the Ministry of Maritime Affairs and Fisheries (KKP), the Ministry of Finance, the Investment Coordinating Board (BKPM), and the Ministry of Energy and Mineral Resources (KESDM).

The method used is multiple regression analysis to measure the effect of more than one independent variable or independent variable on the dependent variable or dependent variable. Then to estimate the parameters in the multiple linear regression model to see the extent of the influence of fisheries exports, subsidy policies, investment, and fisheries fuel prices in Indonesia, the regression model analysis is used which is stated as follows:

$KN = f\,(EP, KS, IT, HB)$ .....(3.1)

Based on the function (3.1), a non-linear equation can be formed as follows:

$e^{KN} = EP^{\alpha 1}\, KS^{\alpha 2}\, IT^{\alpha 3}\, HB^{\alpha 4} + e^{\alpha 0+\mu}$ .....(3.2)

Since equation (3.2) is a non-linear equation, to obtain the elasticity value, it is converted into a linear equation using Natural Logarithm (Ln) so that it becomes:

$KN = \alpha_0 + \alpha_1 \ln EP + \alpha_2 \ln KS + \alpha_3 \ln IT + \alpha_4 \ln HB + \mu$ .....(3.3)

3. Discussion

Multiple linear analyzes is used to estimate the magnitude of the influence of the independent variables on the dependent variable. The independent variables are Fishery Exports (EP), Subsidy Policies (KS), Fisheries Investment (IT), and Fuel Prices (HB) while the dependent variable is Fishermen's Welfare (KN) with research locations in Indonesia for the 2005-2020.

Table 1

Estimation results of fisheries export regression, subsidy policies, investment, and fuel prices on fishermen's welfare

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	-25.32705	32.75551	-0.773215	0.4425
Fisheries Export (EP)	-0.269356	2.723195	-0.098912	0.9215
Subsidy Policy (KS)	3.689641	1.534003 2.405237	0.0093	Investasi
(IT)	1.211960	0.450606	2.689622	0.0193
Fuel Price (HB)	-1.214836	2.533678	-0.479475	0.6334
R-squared	0.336073	**F-statistic**		7.466311
Adjusted R-squared	0.291061	**Prob (F-statistic)**		0.000062

Source: Estimation results using EViews10, processed in 2021

From the results of the multiple linear regression analysis tests, the regression equation in this study is as follows:

$$Y = (-25.32705) + (-0.269356) + 3.689641 + 1.21196 + (-1.214836) + \mu$$

Based on the regression analysis in table 4.1, the *R-squared* of fishermen's welfare is 0.336073 means that 33 percent of variations in changes in

fishermen's welfare can be explained by variations in changes in fisheries exports, subsidy policies, investment, and fuel prices. The remaining 67 percent is determined by variables or other factors outside the research model.

To find out whether the research model as a whole is feasible or not, a simultaneous test (F test) is used. The predetermined significance limit is 0.05 (5 percent). The probability of this study is 0.000062, which is less than the significance limit (0.000062 <0.05). The F test was carried out by comparing the F-statistics with the F-table, with the results of the F-statistic of 7.466311 and the F-table of 2.525. This means that the value of the F-statistic is greater than the F-table (7.466311 > 2.525). Thus, it can be concluded that the independent variables, namely fisheries exports, subsidy policies, investment, and fuel prices simultaneously have a significant effect on the welfare of fishermen in Indonesia.

To test how the influence of each independent variable individually on the dependent variable is used a partial test (T-test). The t-test is carried out by comparing the t-statistics with the t-table. In the t-test, the significance level is 0.05 (5 percent). Based on the results of statistical tests showing that the variable Fishery exports have a probability value of 0.9215 > 0.05 with t-statistics < t-table, namely -0.098912 < 2.00100, it can be concluded that partial fisheries exports have no significant effect on fishermen's welfare. Second, the subsidy policy variable has a probability value of 0.0093 <0.05 with t-statistics > t-table, namely 2.405237 > 2.00100, it can be concluded that partially the subsidy policy has a significant effect on the welfare of fishermen. third, the investment variable has a probability value of 0.0193 <0.05 with t-statistics > t-table, namely 2.689622 > 2.00100, it can be concluded that partial investment has a significant effect on fishermen's welfare. Finally, the fuel price variable has a probability value of 0.6334 > 0.05 with t-statistics < t-table, namely -0.479475 < 2.00100, it can be concluded that partially fuel prices do not have a significant effect on fishermen's welfare.

The effect of fisheries exports on the welfare of fishermen shows an insignificant effect with a t value of -0.098912 and a coefficient value of -0.269356. this

means that any changes in fishery exports will not affect changes in fishermen's welfare. This result is not following the initial hypothesis which states that fisheries exports have a positive and significant effect on the welfare of fishermen. The potential for the fisheries sub-sector is capable of contributing up to US$1.65 billion in exports. The amount which is still above the export value of coconut and palm oil (1.59 billion US dollars) has not been able to raise the life of fishermen to a level of prosperity. This is because the government's direction of development is still focused on land rather than seas and coasts. According to Kusnadi (2009) [10], the policies and implementation of development programs for communities in coastal areas are still not optimal in breaking the chains of poverty and improving their welfare. The condition of fisheries is exacerbated by the regulation of Ministerial Regulation (Permen) Number 17 of 2010 concerning Quality Control and Safety. If fisheries products enter Indonesia's territory has opened up opportunities for importing fish that are large enough to maintain the stability of domestic fish prices and the continuity of the supply of fish raw materials for the processing industry. The issuance of Ministerial Regulation Number 17 of 2010 this policy only benefits the industry but further impoverishes fishermen. Another problem is that highly competitive fishery products require guaranteed product quality and safety, competitive prices, and the availability of sustainable supply while also protecting the ecosystem environment. The increase in fish production is expected to be in line with the increase in domestic consumption. Opportunities to market fish in Indonesia and abroad are very good (Dewi & Hilma, 2011)[11]. The price elasticity factor for fish is relatively low, namely 1.06, meaning that the demand for fish from consumers will decrease slightly, namely 0.6% if the selling price of fish increases by 1%. The price of fish is calculated by the Department of Fisheries at each fishing port.

The effect of fisheries investment on fishermen's welfare shows a positive and significant influence with a t value of 2.689622 and a coefficient value of 1.211960. this means that every 1 percent increase in fisheries investment will increase the welfare of fishermen by 1.211960 percent. Vice versa, when there

is a decrease in investment by 1 percent, the welfare of fishermen will decrease by 1.211960 percent. These results are consistent with the initial hypothesis which states that investment in fisheries has a positive and significant effect on the welfare of fishermen. Consistent with what was suggested by Todaro and Smith (2009)[12] subsidies are a form of financial assistance paid to a business or economic sector. Subsidies are payments made by the government to companies or households to achieve certain goals that enable them to produce or consume a product in larger quantities or at lower prices. The purpose of financial subsidies is to reduce prices or increase production. Subsidies are government gifts to the community to reduce production costs borne by the community. The government's efforts to prosper fishermen are based on the legitimacy of subsidy actions in Law no. 45 of 2009 changes to Law no. 31 of 2004 concerning Fisheries, Article 25 B of the government's obligations regarding facility assistance for marketing. Furthermore, the legitimacy of subsidy actions is based on Law no. 7 of 2016 concerning the Protection and Empowerment of Fishermen, Fish Farmers, and Salt Farmers, one of the goals of this rule is related to providing the infrastructure and facilities needed to develop a business. The facilities and infrastructure in question are fueling stations, fishing vessels, fishery ports integrated with fish auctions, refrigerated and/or frozen storage areas, and clean water. Subsidy arrangements are only mentioned in Article 24, that the government will provide subsidies in the form of fuel, clean water and ice, seeds, seedlings, feed, and fish medicine aimed at fishermen, fish cultivators, and salt farmers whose implementation will be based on a presidential regulation.

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the welfare of fishermen. In the short term, the investment will affect aggregate demand and will encourage increased output and employment opportunities. In the long term, the capital formation will occur, namely the addition of machine tools and buildings. This will increase output and promote sustainable economic growth (Mankiw, 2003)[13]. Investment activities in the fisheries sector so far have played an important role, among others, in increasing people's income and are labor-intensive which ultimately leads to the creation of economic transformation. Therefores an investment policy can stimulate the entry of investors (investors) to invest in a business sector in the fisheries sector. To persuade and attract interest in new investment, this can be done through a variety of policy options that lead to the provision of investment facilities and the provision of incentives. These policies include improving regulations that support investment, simplifying licensing procedures, and providing facilities and incentives in the investment sector, for example, tax incentives (Tambunan, 2006)[14].

The effect of fuel prices on the welfare of fishermen shows an insignificant effect with a t value of -0.479475 and a coefficient value of -1.214836. this means that any changes in fuel prices will not affect changes in fishermen's welfare. These results are inconsistent with the initial hypothesis which states that fuel prices have a negative and significant effect on fishermen's welfare. The reason that fuel prices do not affect the welfare of fishermen is caused by two factors, namely internal and external factors. Internal factors include limitations in the field of education, lack of technological facilities, and limited capital. Meanwhile, external factors such as the limited potential of marine resources that can be utilized by fishermen, intense competition, market mechanisms, the bargaining position of fishermen faced by middlemen, and the condition of fishing port infrastructure. These factors are not only related to rapid changes in fishing seasons, limited human resources, limited access to capital, and a lack of human resources but also due to the modernization of fishing methods which encourages massive exploitation of marine resources, (hidayat, 2018)[15]. To improve the living conditions of these fishermen, it is necessary to empower the

community to be more independent. The empowerment that is applied must be able to answer the problems experienced by fishing communities so far. With a community-centered development approach, it is expected to improve the welfare of fishing communities (Hariyanto, 2014)[16].

4. Conclusion

Based on the results of these studies, it can be concluded in this study that: Fishery exports do not have a significant effect on the welfare of fishermen in Indonesia. The level of fisheries exports carried out by Indonesia does not affect the welfare of fishermen, this is because the increase in exports with farmers' welfare indicators does not mean that all Indonesian farmers enjoy this success, but only a few parties, especially exporters and also farmers who have market access. These results are inconsistent with the initial hypothesis which states that fisheries exports have a positive and significant effect on the welfare of fishermen in Indonesia. Subsidy policies have a positive and significant effect on the welfare of fishermen in Indonesia. This means that the high subsidies distributed by the government can improve the welfare of fishermen because the provision of subsidy policies greatly influences the welfare of fishermen. If subsidies are not given, it will increase production costs and will reduce the income or profits of fishermen. These results are consistent with the initial hypothesis which states that the subsidy policy has a positive and significant effect on the welfare of fishermen in Indonesia. Investment has a positive and significant effect on the welfare of fishermen in Indonesia. This means that the high investment value channeled can improve the welfare of fishermen because investment activities in the fisheries sector so far have played an important role, among others, in increasing people's income and are labor-intensive which ultimately leads to the creation of fishermen's welfare. These results are consistent with the initial hypothesis which states that investment has a positive and significant effect on the welfare of fishermen in Indonesia. Fuel prices have no significant effect on the welfare of fishermen in Indonesia. High and low fuel prices do not affect the welfare of fishermen. Changes in fuel prices do not affect the welfare of fishermen as long as the fuel

trading policy has not changed in its entirety from upstream to downstream. These results are inconsistent with the initial hypothesis which states that fuel prices have a negative and significant effect on the welfare of fishermen in Indonesia.

As for suggestions from the results of this study, namely: The government and related agencies are expected to increase the influence of fisheries exports so that the impact can be felt by all fishermen. The government is also expected to be able to control the problems that occur in fisheries exports to improve the welfare of Indonesian fishermen. The government is expected to be able to optimize the implementation of subsidy policies so that impact the welfare of society by prioritizing the preservation of environmental functions to create sustainable fisheries. Several government policies are aimed to support direct subsidies, indirect subsidies, and program subsidies.

The government and related agencies are expected to be able to reduce risks in fishery investment, especially when associated with natural factors such as weather and climate. The existence of a relatively high risk of uncertainty has made investors try to minimize and transfer risk. The government is expected to overcome internal factors such as limitations in the field of education, lack of technological facilities, and limited capital. Meanwhile, external factors such as the limited potential of marine resources that can be utilized by fishermen, intense competition, market mechanisms, the bargaining position of fishermen faced by middlemen, and the condition of fishing port infrastructure. Various government policies improve the welfare of fishermen.

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