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The Regression Estimation Model of Post-empowerment Household with Consumption Function Theory

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Abstract. The existence of an empowerment program for fisherwomen in household-scale capture fish processing aims to improve the family economy so that it will impact changes in household consumption expenditure after the empowerment of small-scale fishermen's wives. The research method used qualitative independent variable regression estimation with the consumption function theory. The results showed that post-empowerment household consumption expenditures on small-scale fishermen's wives were influenced by household income and household members' numbers. On the other hand, the wife's education and regional differences did not have a significant effect. The increase in household consumption of small-scale fishermen's can be realized if there is an increase in household income from the catch and processing of fisheries products from fishermen's wives in a sustainable manner during the fishing season.

1. Introduction

The role of fisherwomen in their households is not only as a housewife but also as a breadwinner who has a dual function, first as a fisherman's wife and second as a family head when fishers go out to sea in improving their household economy. Before empowerment, small-scale fishers' household consumption expenditure in Indonesia, especially in the Barru District of South Sulawesi Province, was caused by changes in catch production, business income fishing, and household income resulting from seasonal changes every year. Government programs such as the empowerment of fishermen's wives in the catching fish processing business as an increase in their family's economy will impact post-empowerment consumption expenditure changes [1].

Economic empowerment of coastal communities influences coastal communities' welfare [2] through family income and household consumption expenditure [3]. The failure of various empowerment programs is not supported by personal leadership assets in small-scale fisherman household decision-making to improve the household economy through empowerment [4],[5], especially women fishermen. Empowerment is an active multi-dimensional process that allows individuals to realize their potential in all life that can provide strength or competence [6]. This means that fishing women can actively participate in the household economy's decision-making process, especially consumption expenditure.

Household consumption expenditure is financial planning [7], the primary indicator of welfare economics [8], the most critical component of national income and aggregate demand [9]. This theory explains that every household tries to maximize utility in consuming goods and services with income levels as a constraint [10]. In general, changes in consumption expenditure are influenced by changes in income [10], net income, and the discount rate of time, free time, and wealth or assets [11]. another change in household consumption expenditure is influenced by age, income, marital status, insurance, and household size [12].

Women fishermen as a fisheries sector [6] play a role in fishing activities [13], reproduction [14], shellfish collectors near the coast without using a boat [15], fish drying and salting [6], postharvest handling, processing, marketing of seafood products [16], marketing of dried fish [17], and food

security. The implication in management and policy in alleviating rural poverty and fisheries' economic development throughout the world [18]. Women fishermen have high socio-economic capital and provide excellent support for family welfare and income [19] in developing a sustainable small-scale capture fisheries sector. The mobility of fishing women is minimal because it requires environmentally friendly technology that can provide additional income for families [16] and the contribution of small-scale fisheries worldwide in policymaking [20]. Millions of women are involved in the small fisheries sector [21].

Research on fisherman household consumption expenditure has been carried out in various countries, as reported by [22] on the Aggregate Household Food Safety Index (AHFSI) used to evaluate food security status in household expenditure in the marine fisheries sector in Sri Lanka. Furthermore, the impact of joint management on household income and spending in Bangladesh [23] assesses the cost of fisherman households in India [24], food consumption patterns among rural fisheries houses for poverty alleviation in North Central Nigeria [25] and fisherman poverty measured by household consumption expenditure in Malaysia [26]. Also, research related to the empowerment of fisherwomen, by [27] concerning the factors that influence women's empowerment through fisheries activities in Myanmar and the index value of the level of empowerment after participating in fishing activities in India [28]. The findings do not yet discuss the estimation of factors that influence household consumption expenditure post empowering small-scale fishermen's wives using the consumption expenditure function approach

2. Methodology

This research carried out in the west coast region of Barru District, South Sulawesi Province, Indonesia (Figure 1). Based on the time dimension using cross-section data sourced from primary data. The sample area chose purposively considering that 34 respondents samples of fishermen's wives worked to capture a fish processing business with the household business scale.

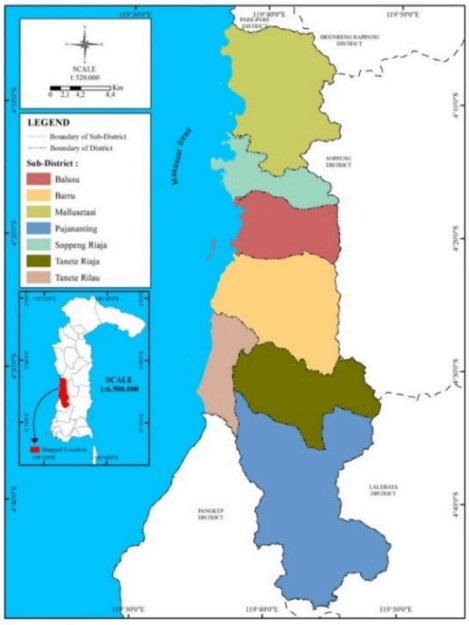

Figure 1. Barru District, South Sulawesi Province, Indonesia

The function of household consumption expenditure post-empowering fishermen's wives is proxied by the expenditure consumption function. The econometric model specification of the Keynes consumption function is a positive relationship between consumption expenditure and income [29] mathematically written as follow:

$$C = \beta_0 + \beta_1 Y \quad (1)$$

where: C is consumption expenditure, β_0 is intercept, β_1 is regression coefficient or model parameter or slope, Y is income. The marginal propensity to consume is several comparisons of the rate of change in consumption with income that mathematically written as follows:

$$\beta_1 = MPC = \Delta C/\Delta Y \quad (2)$$

where: MPC stands for marginal propensity to consume, ΔC is changing in consumption, ΔY is changing in income, resulting in consumption changes. Next, to describe the uncertain relationship between economic variables, econometrics modifies the deterministic function in equation (1) :

$$C = \beta_0 + \beta_1 Y + \mu \quad (3)$$

where: μ is known as a disturbance, error, and is a random variable (stochastic) that has properties and probability characteristics. Disruption factors may represent other factors that influence consumption but have not been explained in the equation. Based on equation (3), it used to analyze the estimation of factors that influence household consumption expenditure post-empowering of small-scale fishermen wives by using dummy variable regression models [29] as follows:

$$CEHPEWF = \beta_0 + \beta_1 \pi HPEWF + \beta_3 EdWF + \beta_4 QAH + \delta_1 DmDTR + \delta_2 DmDB + \delta_3 DmDSR + \delta_4 DmDBls + \mu \quad (4)$$

Where: $CEHPEWF$ is a post-empowerment household consumption expenditure of small-scale fishermen wives (IDR). β_0 is intercept, β_1,…, β_4 is regression coefficients. δ_1,..., δ_4 is dummy variable coefficient, $\pi HPEWF$ is post-empowerment household income (IDR). $EdWF$ is the education of fisherman's wife (years). $QAKT$ is the number of Borne household members (people). Dummy difference in small-scale fishing areas, DTR is 1, for the sub-District of Tanete Rilau; 0, for the other. DB is 1, for the sub-District of Barru; 0, for the other. DSR is 1, for the sub-District of Soppeng Riaja; 0, for the other; $DBLs$ is 1, for the sub-District of Balusu. 0, for the other. μ : disturbance error.

3. Result and Discussion

Small-scale fishermen household income variable hurts household consumption expenditure after the small fishermen's wife's empowerment. The effect has an error rate of 5% or a confidence level of 95%. Every change from the increase in household income will reduce household consumption expenditure after empowering a small-scale fisherman's wife. Similarly, before the empowerment of fishermen's wives, household income negatively affected small fishermen's household consumption expenditure in Barru District [30]. This finding is different from other countries. Income positively influences fisherman household consumption expenditure in Bangladesh through Community Based Fisheries (CBFM) management [23]. However, in line with [24], findings income increases the percentage of consumption decreasing in India. Changes in fisherman household income will affect household consumption expenditures from productive fisheries conditions, such as those in West Africa [31].

The decline in demand for primary goods such as food because small-scale fishermen households prefer secondary needs (non-food in the form of education, clothing, health, and fishing needs such as fuel and bait). The theory of the elasticity of demand for income states that changes in income increase result in changes in the number of goods demanded to reduce inferior goods. Change in goods demanded increases with a lower percentage for luxury goods, and changes in goods required growth with an increase in the rate of luxury goods [32] such as the elasticity of income demand for household expenditures in Czechoslovakia with regression parameter values [33]. Also, consumption expenditure is determined by income according to the Absolute Income Hypothesis (AIH) for Kenya's case [34]. Fishers' household income is derived from income from catches and non-capture fishing income [35] from family members, namely fishermen's wives who are self-employed to process fish catchers.

Table 1. Estimation of Post-empowerment Household Consumption Expenditure

of Small-Scale Fishermen's Wives in Barru District, Indonesia

Independent Variable	E.S	β_i	t-test	VIF	*Park test*
Household income	+	-1.848**	-2.556	1.451	0.594^{ns}
Wife education	+	-46.673 ^{ns}	-1.057	1.039	0.132 ^{ns}
Borne household members	+	104.622*	1.944	1.396	0.635 ^{ns}
Tanete Rilau sub-district	+	74.089 ^{ns}	0.194	3.400	0.945 ^{ns}
Barru sub-district	+	-85.214 ^{ns}	-0.206	3.553	0.821 ^{ns}
Soppeng Riaja sub-district	+	141.437 ^{ns}	0.339	3.021	0917 ^{ns}
Balusu sub-district	+	-257.642 ^{ns}	-0.525	2.650	0.848 ^{ns}
intercept					0.986
F-test					1.415
Adjusted R^2					0.312

** is a level error significance of 5 % (0,05), or confidence level 95 %. * is a level error significance of 10 % (0,10), or confidence level 95 %. ns is not significant. E.S is an expectation sign. ns is not significant. If the VIF value is less than 10 then there is no multicollinearity, otherwise if VIF value is greater than 10 then multicollinearity occurs. If β value is not significant, then it is not available heteroscedasticity, otherwise if the value of β significant, then there is heteroscedasticity.

Fisherman households have a variable effect on food security level [22], which also comes from small-scale fisheries [36]. Food consumption, especially seafood, is an essential element in increasing intelligence in education. Parents are urgently needed [37], such as fish as the cheapest and most affordable animal protein source [38]. Worldwide, more than half of the human population (56%) gets at least 20% of the intake of animal protein from fish, which is very important, especially in developing countries [36]. This finding is consistent with the results of [39] in Nigeria that 77% of total fisheries household expenditure per month and the remaining 23% for non-food items are in the form of payments for energy, clothing, health, and education.

Furthermore, this finding is different from [23] in Bangladesh. The higher the household income level, the proportion of food consumption expenditure is smaller than non-food as an indicator of fishermen's welfare determined by changes in income household expenses. Furthermore, non-food consumption patterns include education percentage than food, social ceremonies, clothing, health, transportation in India [24]. The variable number of household members positively influences the 10% error rate (90% confidence level) against household consumption expenditure post-empowering small-scale fishermen's wives. Likewise, before the empowerment of fishermen's wives, the number of household members positively affected small-scale fishermen households' consumption expenditure in Barru District [30]. The large number of household members who will use a small amount of income will result in a low consumption level due to many household members. A large number of family dependents will encourage fishers to work hard to meet their household members. This research is in line with [26] findings on coastal fishing communities in Malaysia that the size or number of family members will significantly determine fishermen's poverty in addition to income, education, and marital status.

The educational variables of fishermen's wives did not significantly influence household consumption expenditure post-empowerment of the small-scale fishermen wives in the study area. As with the findings before empowerment, household consumption expenditure for outboard motor fishers was influenced by the education of fishermen's wives in Barru District because the wife's formal education could help manage family finances well [30]. This study's results are in line with the case in Vietnam that women in fishing households have few opportunities to work in fish processing businesses due to low levels of formal education [40] despite having access to credit, as is the case in India [19]. The low level of education of women in the fisheries sector will influence decision making for their livelihoods as happened in Sierra Leone in West Africa [41]. Fisherwomen who have freedom in household decisions related to work, children's education, purchase of assets, savings, credit, and

family consumption expenditures will show the impact of independent business on empowerment in the decision-making process [19]. It contributes significantly to household livelihoods and food security. Sustainable fisheries management will guide conservation actions [18].

Formal education that has been obtained by women will be able to increase their strength in decision making to improve the quality of their work and will not be limited by traditional cultural norms [42]. Thus, education benefits are investments from increased income, consumption, and welfare [43] in a competitive business environment [16]. The higher a person's formal education, the decisions taken will be more rational and directed in fulfilling their household economy (Rahim et al., 2018) and better future financial needs [44]. Dummy differences in the area (Tanete Rilau, Barru, Soppeng Riaja, and Balusu Sub-districts) did not significantly influence household consumption expenditure post-empowering small-scale fishermen wives. This result happens because each fisherman household in the sample sub-districts that consume their food (non-food and food) tend to be the same. Even so, several previous studies on fisherman household consumption expenditure such as in Bangladesh [23], India [24], and Malaysia [26] even in Indonesia [45], not yet distinguishing the area where fishers live with the approach to the estimated model regression dummy variables such as this study.

4. Conclusion

Post-empowerment household expenditure of small-scale fishermen's wives is negatively affected by household income and positively by household members. In contrast, wife education and regional differences have no significant effect. There is an increase in household income post-empowerment of small-scale fishermen's wives, reducing their consumption expenditure due to smaller food consumption from non-food consumption. Furthermore, the number of family members will increase consumption expenditure due to many household members. As for the wife's education, more formal education is low, and there is no difference in consumption expenditure in each sample region. Increased consumption of small-scale fishermen household consumption can be done through increasing household income from fishermen's catches and business catching fish products from fishermen's wives. The increase in catch results with the presence of environmentally friendly fishing gear and the power of large outboard engines from government assistance, while the efforts of the fishermen's wife with credit assistance from the government for household businesses so that the household economy can be improved both during the fishing season and not the fishing season.

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