Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166−177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

Differences-in-Differences Analysis on the Impact of Direct Cash Transfer 2007-2008 for Fish Consumption Pattern

Irlandi Paradizsa*, Jossy Prananta Moeis

Faculty of Economic and Business, University of Indonesia, Depok
Jl. Lingkar, Pondok Cina, Kecamatan Beji, Kota Depok, Jawa Barat, Indonesia
Email: [1,*]irlandiparadizsa@gmail.com, [2]jossypmoeis@gmail.com
Correspondence Author Email: irlandiparadizsa@gmail.com
Submitted: **18/06/2024**; Accepted: **27/06/2024**; Published: **29/06/2024**

Abstract−Fisheries in Indonesia has a huge potential that if were to be developed adequately will help boost the economic growth. The potential is substantial, however the level of consumption still low compared to other country with lower fisheries potential. To find ways in developing the fisheries sector, this research would like to study the impact of shock of income—through the direct cash transfer—towards the fish consumption level. By understanding this, policymaker would be better equipped on finding the right program to increase its level of consumption in Indonesia. This research is using the quantitative method through the differences-in-differences analysis in finding the impact of income shock towards the fish consumption pattern by seeing the differences before and after the direct cash transfer program were carried out. The data used for this research came from the Indonesian Family Life Survey (IFLS) wave 3 to 5. In order to increase the validity of the result, this research used the Heckman Selection Model to reduce the potential bias. The result of this research finds that the impact of the direct cash transfer—as an income shock—actually lower the level of fish consumption amounting to Rp 326,25. There are several possibilities as to why this is happening, which are: (1) the elasticity of income for fisheries sector; (2) the status of fish as inferior goods for Indonesian; and (3) huge potential does not translate into a cheaper price for consumption.

Keywords: Differences-In-Differences; Cash Transfer; Consumption Pattern; Fish; Impact

1. INTRODUCTION

Indonesia is an archipelagic state with an elongated coastline and extensive body of water (Anugrah & Alfarizi, 2021, p. 31). Based on the data from Gazeter of the Republic of Indonesia (2023), it was known that the number of island resides in Indonesia reach a number of 17.374 islands (Badan Informasi Geospasial, 2023, p. vii). The calculations done by the CIA also validated that the coastline of Indonesia reach the length of 54.716 km which is third largest after Canada and Norway (Central Intelligence Agency (CIA), 2024). For comparison, Japan has a coastline only half the size of Indonesian, which is about 29.751 km (Central Intelligence Agency (CIA), 2024). With that lengthy coastline, Indonesia has the potential to become the 2nd largest capture fisheries production in the world after China. Tabel 1 shows the country with largest capture fisheries production contribution.

Table 1. Contribution of the Country with the Largest Capture Fisheries

Country	Total Production (million Ton)				Percentage from Total World (2020)
	2017	2018	2019	2020	
China	13.19	12.68	12.15	11.7	15%
Indonesia	6.56	6.71	6.56	6.43	8%
Peru	4.13	7.15	4.80	5.61	7%
Rusia	4.59	4.84	4.72	4.79	6%
U.S of America	5.01	4.77	4.81	4.23	5%
India	3.94	3.62	3.67	3.71	5%
Vietnam	3.15	3.19	3.29	3.27	4%
Japan	3.19	3.26	3.16	3.13	4%
Norway	2.39	2.49	2.31	2.45	3%
Chile	1.92	2.12	1.98	1.77	2%
Filipina	1.72	1.65	1.67	1.76	2%
Thailand	1.30	1.39	1.41	1.52	2%
Malaysia	1.47	1.45	1.46	1.38	2%

Even though the total production of capture fisheries in Indonesia is the 2nd largest in the world, the level of fish consumption in Indonesia is not as high as other country that doesn't produce as much (Daroedono, 2019, p. 2). Compared to others Southeast Asian Countries such as Malaysia, Cambodia or Myanmar, the level of fish consumption in Indonesia is still lower (Daroedono, 2019, p. 2). While their level of capture fisheries production is actually lower than Indonesia (Daroedono, 2019, p. 2). For a complete picture of the comparison for the level of fish consumption in the year 2022 is shown in the table 2.

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

Table 2. Fish Consumption Level Comparison (2022)

Country	Total Consumption per Year (2022) (in ton)	Total Consumption per Capita per Year (2022) (in kg)
Iceland	31	90.59
Maldives	45	83.09
Kiribati	9	73.29
Macau	48	73.18
Hong Kong	493	65.82
Portugal	611	59.95
Seychelles	6	56.76
Republic of Korea	2,834	55.27
Malaysia	1,771	54.70
Antigua and Barbuda	5	54.05
Nauru	1	51.03
Norway	272	50.18
Samoa	9	47.63
Micronesia	5	47.38
French Polynesia	13	47.24
Japan	5,843	46.20
Cambodia	765	45.75
Myanmar	2,45	45.02
Indonesia	12,155	44.44
Barbados	12	42.86
Spanyol	1,909	40.82

If we look from the nutrition perspective, fish has better composition and rate of nutrients that is more complete than other sources of animal protein (Naeem & Selamoglu, 2023, p. 1). Fish is rich of nutrients such as protein, mineral (Lall & Kaushik, 2021, p. 1) and also healthy fat like Poly Unsaturated Fatty Acid (PUFA) (Naeem & Selamoglu, 2023, p. 1). PUFA is important for the development and growth for brain (Sinclair et al., 2022). The structure of the brain in which comprised 60% of lipid that is rich with long chain fatty acids (LCFAs) such as the Arachidonic acid (AA, C_{20}:4n-6) and docosahexaenoic acid (DHA, C_{22}:6n-3) (Nurapipah et al., 2023, p. 60). Lacking those fatty acids can impair the development of the brain caused by the DHA insufficiency (Sinclair et al., 2022, p. 15). Through consuming fish in which rich with DHA as much as up to twice per week could help in reducing the risk of heart disease by 36% (Naeem & Selamoglu, 2023). Not only that, but also others key benefit of consuming fish is it is cheaper compared to other animal protein source (Naeem & Selamoglu, 2023, p. 1). There is actually a cheaper option for animal protein source such as egg. However, consuming egg has a higher level of cholesterol and high risk of contracting a heart disease caused by that high level of cholesterol (Zhao et al., 2022, p. 1506).

With the immense benefit of consuming fish and also the huge potential of fisheries in Indonesia, by adding fish into the diet of the Indonesian, it was hoped to be one of the strategies to reduce the number of children with stunting condition. Stunting is the condition of the children that has a growth impairment caused by malnutrition in the long term (Lestari, 2023, p. 22), and has the characteristics of body height and weight ratio below the standard that has been approved by the ministry that handle the health matters (Peraturan President Nomor 72 Tahun 2021 Tentang Percepatan Penurunan Stunting, 2021). Stunting prevalence in Indonesia is still above the standard that has been endorsed by the WHO (World Health Organization) which is to be under 20%, at which Indonesia still has a 21,6% stunting prevalence in 2022 (Kementerian Kesehatan, 2023; Lestari, 2023, p. 21). One of the main factor that caused the stunting condition in Indonesia is the lack of protein within the complimentary feeding process (Wangiyana et al., 2021, p. 81). Protein consumption is important as the source of nutrients for preventing the stunting condition (Lestari, 2023, p. 22; Ridwan et al., 2022, p. 53). Children with a protein deficiency in a long term will face a growth impairment in terms of its height and weight (Thaifur et al., 2023, p. 2129).

Seeing the importance of protein in preventing the stunting condition in Indonesia, increasing the fish consumption level has become a priority. There has been several studies regarding the impact of fish consumption on stunting condition and the results has been mixed on it being significant (Khairi et al., 2022, p. 5; Thaifur et al., 2023) and insignifican(Asrari & Husna, 2022, p. 116)t. Despite that, it still has not been disproved that protein is essential in preventing the stunting condition and helping children grow appropriately. Hence, increasing the level of fish consumption is one of the strategies that also need to be attempted, in which it is to be used for preventing stunting condition (Daroedono, 2019, p. 2; Lestari, 2023, p. 22; Nugroho et al., 2021, p. 2273; Ridwan et al., 2022, p. 53), or for the general health of the society overall (Nurapipah et al., 2023, pp. 60–61; Phanita & Supratman, 2021; Purnaningsih, 2020, p. 135).

In order to increase the level of fish consumption, one of the factor that could lead to its increase is the level of income (Bidayani et al., 2023, p. 331; Phanita & Supratman, 2021, p. 1). According to Firmansyah et al. (2019, p.19), fish is one of luxury goods for the lower middle class, hence the level of consumption is also related to their income.

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

Increasing their income will lead to a better purchasing power (Mar'ie et al., 2022, p. 28) that in turn will lead into their ability to consume fish (Firmansyah et al., 2019, p. 3; Mar'ie et al., 2022, p. 28). Based on the research conducted by Issifu et al. (2022, p. 1) at the global level, it is found that an increase of income for 10% will lead to a conversion of 5% of increase in fish consumption. Though the research is at the global level, so it might necessarily could be generalized into the Indonesian context. Hence, if we were to look at the impact of income towards the level of fish consumption at the micro level in Indonesia, the case of direct cash transfer can be used as a proxy for income shock. The goal of the direct cash transfer usually targeted to increase the purchasing power of the people. By giving them direct cash transfer it will increase their income temporarily (Wati, 2021) in which will also affect their consumption pattern in the short term. Some research has even found that some of the people that received the cash transfer used it for fish consumption (Filmer et al., 2023, p. 5).

In Indonesia there were several cases of cash transfer program, but this research will used the case of direct cash transfer of 2007-2008 to empower the lower middle class purchasing power as a means to prevent inflation caused by the increase of global oil prices. Moreover, in the past, there has been several other studies that tried to understand the impact of cash transfer program towards stunting (Field & Maffioli, 2021), consumption pattern (UNICEF, 2024), economic impact (Egger et al., 2021). However, this research would like to explore deeper the concept of cash transfer towards one specific goods, which this research would like to focus on fisheries. Other reseearch has some result that related to the impact of cash transfer towards consumption pattern, though this research would like to explore more about that topic by using the differences-in-differences method and with a deeper focus on fisheries sector.

The purpose of this study is to understand the impact of income on the level of fish consumption in Indonesia. By using the direct cash transfer program as a proxy for the income shock, this research then analyzed the impact of the cash transfer on the level of fish consumption. By understanding the impact of the income effect—proxied by the cash transfer program, hopefully it would help in finding the right strategy to increase the level of fish consumption in Indonesia as it has a huge potential in the fisheries sector while also help combating the stunting prevalence in Indonesia.

2. RESEARCH METHODS

2.1. Research Approach & Type

This research is using the quantitative approach to find the degree and the amount of impact of the direct cash transfer of the 2007-2008 towards the fish consumption level in Indonesia. This research would not only try to see whether there is a significant relation between the cash transfer and the fish consumption level, but also would try to find by how much of its impact if any. Understanding the amount is closely related to the development of appropriate strategy later to be incorporated in the policy as a way to increase the level of fish consumption in Indonesia. Since this research would like to find the impact of the cash transfer towards the level of fish consumption in Indonesia, the type of the research conducted is the causal inference research. The research scheme is shown as figure 1.

2.2. Data and Sample

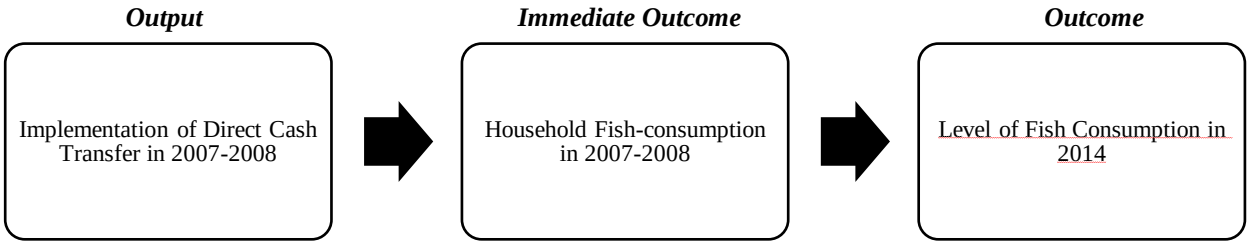

Figure 1. Research Scheme

This research is using the Indonesia Family Life Survey (IFLS) that has been made available to public (RAND Corporation, 2024). The IFLS contains data related to the family life pattern in Indonesia (RAND Corporation, 2024). Within the IFLS, there is also data related to the direct cash transfer and the consumption pattern of the family surveyed. The unit analysis of this research is in the household level. The IFLS used the stratified random sampling method and it had been conducted in 5 waves (1993, 1997, 2000, 2007-2008 dan 2014-2015) (RAND Corporation, 2024). The total number of households surveyed in the IFLS reached the number of 10.400 household, and they surveyed the same household in each wave. Hence, the data produced by the IFLS is a panel data.

2.3. Data Analysis and Impact Identification Method

To analyze the data and to identify the impact, this research is using the differences-in-differences (DiD) method by using the IFLS wave 3 (2000) as the baseline data and compared it with the data within IFLS wave 4 (2007-2008) and wave 5 (2014-2015). This research is using 3 (three) time period in order to find the impact of before and after the cash transfer is implemented and to also find the parallel trend between the treatment and control group. To find those differences, it will require the comparison between treatment and control group. In this research, those who received the cash transfer are included within the treatment group and those who did not received the cash transfer are included in the control group.

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

Moreover, to reduce the potential bias from the people who did not consume fish at all, this research is using the Heckman Selection Model. This research is using the STATA 17.0 as its tool for analysis and to do the Heckman Selection Model in STATA 17.0 this research using the 2 (two) step process (Bendig & Hoke, 2022). The first step is by creating the model equation for the potential of fish consumption based on the variable that might have effect towards its level. This first step is done through the probit model to produce the inverse mills ratio (Bendig & Hoke, 2022). The second step is by integrating the inverse mills ratio to the DiD model regression.

In summary, table 3 highlight the method and the variable that are being analyzed within the scope of this research which are:

Table 3. Method and List of Variables of the Research

Treatment Variable	:	Direct Cash Transfer (Direct CT) in 2007-2008
Outcome Variable	:	Fish Consumption Level per capita per week
Unit of Analysis	:	Household
Identification Strategy	:	Differences-in-Differences
Expected Outcome	:	Household that received direct cash transfer will experience an increase in fish consumption level
Control Variable or Covariates	:	a. Household Monthly Expenditure b. House Location (City/Rural) c. Province Level of Fish Production (ton) d. Number of Fish Processing Unit in Province Level e. Refrigerator for Food Storage (yes/no) f. Education Level of the Household's Food Menu Decision Maker g. Level of Consumption of Other Protein Source

2.4. Literature Review

2.4.1 Differences- in-Differences (DiD)

DiD is a method on seeing the differences between two group (treated and control) in 2 (two) different time period which is before and after the program implemented (Clarke et al., 2023; Fredriksson & Oliveira, 2019; Roth et al., 2023; Rothbard et al., 2023). DiD is a different method than the usual experiment method, though it still try to compare between the group that has been treated and the group that has not (Fredriksson & Oliveira, 2019; Rothbard et al., 2023, p. 2218). There are several prerequisites in using this method as a valid identification strategy for impact, which are:

1. Panel data availability for before and after program/intervention is implemented
2. Two separates group that are being treated and not treated (control)
3. There is a parallel trend of outcome level between the treated and control before the intervention

In using the DiD method, the model analysis that is used for it usually comprised of the comparison between the treatment group and control group before and after the program is implemented. The model of analysis in DiD is usually done by observing the interaction between the time variable and dummy treatment variable or $(\beta^{Treated,After} - \beta^{Treated,Before}) - (\beta^{Untreated,After} - \beta^{Untreated,Before})$. In general, the model equation is as shown in the equation (1).

$$Y = \beta_0 + \beta_1 * [time_i] + \beta_2 * [treatment_i] + \beta_3 * [time_i * treatment_i] + \varepsilon \quad (1)$$

Information:
Y = Outcome variable that is being analyzed for its change caused by the influence of another variable
β_0 = Coefficient or the initial condition of the outcome without any intervention from other variable
$Time_i$ = Dummy variable of time that has the value of 0 (before treatment) or 1 (after treatment)
$Treatment_i$ = Dummy variable of treatment that has the value of 0 (did not received treatment) or 1 (received treatment)
$Time_i * Treatment_i$ = interaction between time and treatment dummy
For the sake of this research, the general model equation for the DiD is converted into the model (2).

$$\text{Fish Consumption Level} = \beta_0 + \beta_1 * [time_i] + \beta_2 * [Direct\ CT_i] + \beta_3 * [time_i * Direct\ CT_i] + \varepsilon \quad (2)$$

2.4.2 Direct Cash Transfer in 2007-2008

In the year 2008, the world was faced with a surge in oil prices. To control its effect, the government decided to give direct cash transfer to the poor since the evaluation showed that the oil subsidy was rather ineffective because in helping those who are actually being targeted (the poor). The oil subsidy was rather being felt more by the upper middle who consumed the oil more often rather than the lower middle class. Moreover, there was a potential fraud of selling the oil internationally because the difference of price domestically made it profitable to sell it in the global market.

The direct cash transfer in 2007-2008 was implemented to help increasing the purchasing power of the 19,1 million targeted household which is the poor. The amount of direct cash transfer was Rp 700.000,- that was delivered in two stages (first stage Rp 300.000,- and second stage Rp 400.000). The implementing agency was PT. POS and BRI Bank. The implementation of the program was regulated through the President Instruction Number 3 Year 2008, Ministry of Social Decree Number 28/HUK Year 2008, and Ministry of Home Affairs Decree Number 541/1336/SJ/ Year 2008. The

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

program was carried out through several stages which include: (1) program dissemination; (2) data verification for the targeted household; (3) card delivery for cash transfer identification; (4) cash transfer process (cash pickup in post office or cash delivery for old people and disabled person); and (5) complaint and problem resolution.

2.4.3 Fish Consumption

Fish consumption has been one of the national priorities for the government of Indonesia and has been integrated to the mid-term development planning of the Republic of Indonesia for the 2020-2024 (Presidential Regulation Number 18 Year 2020). In the year 2024, the level of fish consumption is targeted to reach the level of 62 kg per capita per year, increasing from 50,7 kg per capita per year as the baseline in 2020. The decision to increase fish consumption level is to help reducing the stunting prevalence in Indonesia (Khairi et al., 2022, p. 8). Moreover, the strategy of using fish consumption to prevent stunting had also been regulated within the Presidential Regulation Number 72 Year 2021 regarding Acceleration of National Stunting Reduction.

Based on the research that had been conducted in the past, there are several factor that might influence the level of fish consumption, which include: (1) price (Firmansyah et al., 2019, p. 3; Mar'ie et al., 2022, p. 31; Tiffany et al., 2020, p. 30); (2) income (Koeshendrajana et al., 2021, p. 11; Phanita & Supratman, 2021, p. 6); (3) supply of fish (Untari et al., 2022, p. 36); (4) taste or preference (Mar'ie et al., 2022); (5) introduction of food in the early years (Nurapipah et al., 2023, p. 62); and (6) fish processing and presentation method (Asrari & Husna, 2022).

2.4.4 Demand

In understanding the level of consumption, we might also need to understand the concept of demand. According to Inoua & Smith (2020), demand is the quantity of product that is wanted and could be bought by consumer. This definition put the importance of willingness and ability to buy for the consumer to actually demand the product. The demand equation is usually denoted by model equation (3).

$$Qd = Qd(P) \tag{3}$$

Information:
Qd = Quantity of Demand
P = Price

Based on the model equation and the definition above, it could be understood that the willingness and the ability to buy the product closely related to the price. The demand could shift if the price is changing, since the prince is related to whether the consumer is able to buy the product or not, and whether it is acceptable or not. One of the factors that could also affect the consumer ability to purchase a product is their income. When the price stay and everything else is ceteris paribus, but the consumer income change, it could also affect the quantity of demand of the product. The level of change cause by the income towards the quantity of demand called elasticity of income for demand (Koeshendrajana et al., 2021). The elasticity for demand can also be denoted by the model equation (4).

$$Income\ Elasticity\ of\ Demand = \frac{Change\ in\ Demand\ (in\ percentage)}{Change\ in\ Income\ (in\ percetage)} \tag{4}$$

3. RESULTS AND DISCUSSION

In order to understand the context of the result of the research, it might be imperative to understand the context of the data being analyzed. In the table 4, it contain the descriptive statistics of the data used for analysis in this research. After cleaning the data for any missing values, the number of household data used by this research reach the total number of 7.738 household. Since this research is using DiD as the identification method, there will be 3 (three) time period which is the before, during, and after the treatment process. Hence, the number of data observation will be times 3 which will equal to 23.214 number of observations.

Table 4. Statistical Descriptive of the Data

Variable (Name in STATA)	Number of Obs.	Mean	Std. Dev.	Min	Max
Level of Fish Consumption (ikan)	23.214	2.452,78	5.617,11	0	333.333
Direct Cash Transfer Recipient (treatment)	23.214	0.277	0,45	0	1
Year of Observation (tahun)	23.214	2007	5,71	2000	2014

For the compliance rate of the program, it was shown as the table 5. The compliance rate explains about the appropriateness of the household being put to the group where it should be belonged. The requirement to be treated or receiving the direct cash transfer is to be categorized as poor or based on the 2007 definition is to have expenditure level below Rp 500.000/month. Complier are those who appropriately belong to the group it is supposed to be. The non-complier are those who got the direct CT but actually did meet the criteria (always taker/inclusion error) and those who

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

met the criteria but did not receive the direct CT (never taker/exclusion error). Thus, the compliance rate of the direct CT program is 72,29%.

Table 5. Compliance Rate of the Treatment

Compliance Status	Total	Percentage
Complier	16.782	72,29
Inclusion Error (Always Taker)	1.686	7,00
Exclusion Error (Never Taker)	4.806	20,70%

To increase the accuracy of the analysis, this research then control the sample being analyzed by cleaning the data for household with the expenditure level above Rp 500.000,-. So in this research, it only analyze and compare between the treatment group of those who received the direct CT and control group of those who did not receive the direct CT. Based on that, the number of observations dropped from the total of 7.738 into 12.687 number of observations. The division of the group after being controlled based on their expenditure level with the threshold of Rp 500.000,-, the structure become as shown as in table 6.

Table 6. Number of Household Analyzed per Group (After Expenditure Level Control)

	Before Adjustment		After Adjustment	
	Control	Treatment	Control	Treatment
Number of Observation (in 1 time period)	5.594	2.144	2.627	1.602

The result of the regression analysis using the DiD method for the impact of the direct cash transfer on the fish consumption level is shown in the table 7.

Table 7. Regression Result of the DiD Analysis

ATET (Average Treatment Effect on The Treated) of the Direct CT	**- 645,70** (221,17)**
R-Squared	0,055
No. Obs	12.687
Standard error is reported in parentheses.	
** indicates significance at the 95% level.	

The result of the analysis shows that the impact of the direct CT to the fish consumption level is –(Rp 645,70). Meaning that the direct CT is significantly reduced the amount of consumption level of fish per capita per week by Rp645,70. In order to check the validity of the result, this research is also conducting the parallel trends test and the granger test. The parallel trend test is to see the whether there is parallel trend before the direct CT is implemented between the treatment and control group. The granger test is done to check whether there is a potential effect caused by other variables before the CT is even begin. The result of the parallel trend test and the granger test is shown in table 8.

Table 8. Parallel Trend and Granger Test

	Parallel Trends Test	Granger Test
Prob > F	0,34	0,34
Result	Accept null hypothesis (linear trends are parallel)	Accept null hypothesis (No effect in anticipation of treatment)

Based on the result of the parallel trend and granger test, it could be understood that the effect of the direct CT is significant at the 95% level while also fulfilled the prerequisite of the DiD analysis method. To analyze using the DiD adequately, there should be no effect before the treatment started and the trend between control and treatment group should be parallel. For a clear results of the parallel trends test, figure 2. Shows the graphical diagnostics for parallel trends between the control group and the treatment group.

From the figure in the right side we could see that the linear-trends model is evident, though there is a slight gap between the control and treatment group. This gap could mean that there is actually some other variable that has not been controlled affecting the consumption level. Thus, this research is doing the granger test to check whether that other variable is there or not. Based on the granger test which accept the null hypothesis, it could be inferred that there is no effect of other variable before the direct CT is implemented. Thus, the parallel trends assumptions is hold and the result is significant.

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

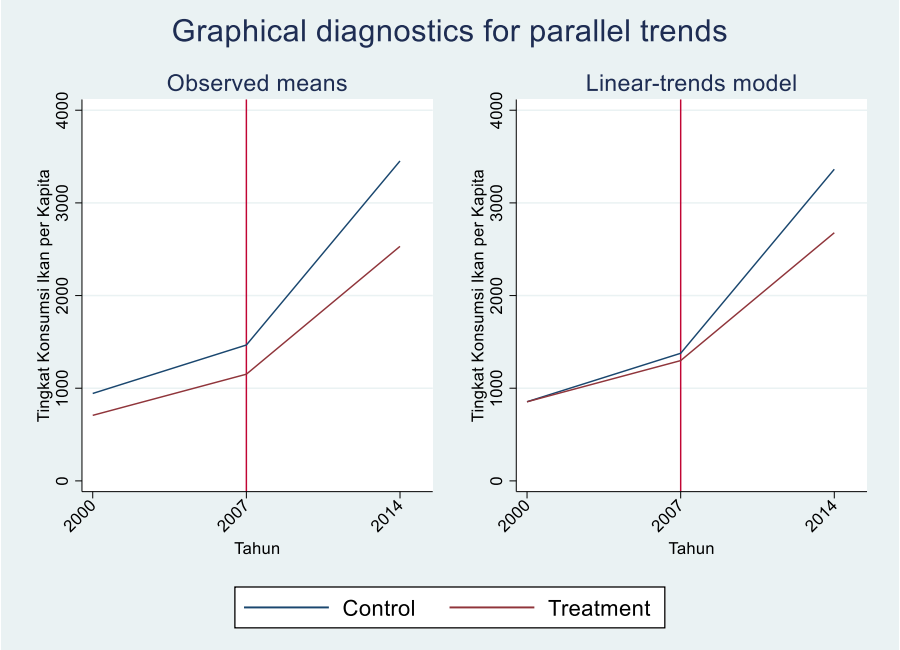

Figure 2. Parallel Trends Between Control and Treatment Group

Then, to increase the validity of the research and to make sure there is no bias on the data of fish consumption—especially on the data with the value of Rp 0. The Rp 0,- data inside the consumption level of fish could indicate 2 (two) possibilities, which are it could be that they did not consume fish at all right now and in the future, or it could also indicate that they might not consume it now but later they probably might. To reduce the bias from that possibility, this research conducted the Heckman Selection Model. The first stage of the Heckman Selection Model is to do the probit analysis to produce the inverse mills ratio. The model of the probit regression analysis follow the model equation (5).

$$C = f(X'\beta) + \tilde{u} \quad (5)$$

C will have the value of 0 if the consumption level is actually 0, and one if there is a value of the consumption of fish. The other variable used for the and the result of the first stage of the Heckman Selection Model is shown in table 9.

Table 9. Probit Analysis Results

Variable	Coefficient	Std. Error	Pr(|Z|>z)	Supported?
Meat consumption	-0,00000076	0.000000268	0,006	Yes
Poultry consumption	0,0000134	0.000000361	0,000	Yes
Smoked fish consumption	-0,000406	0.0000105	0,000	Yes
Egg consumption	0.000629	0.000000834	0,000	Yes
Vegetable protein consumption	-0,000275	0.000000799	0,001	Yes
Place of living (city/rural)	-0,0588305	0.0253902	0,021	Yes
Province total fisheries production (ton)	0,000000178	0.0000000114	0,000	Yes
Number of fish processing unit at provincial level	-0,0001116	0.000000432	0,000	Yes
Refrigerator for food storage	0,1994236	0.0384277	0,000	Yes
Food decision maker level of education	-0,0125335	0.205267	0,541	ns

After the probit analysis had been done, the next step in the Heckman Selection Model is to integrate the inverse mills ratio into the DiD regression analysis. The inverse mills ratio is the C from equation (5). The DiD regression by integrating the inverse mills ratio will be structured as the model equation (6).

$$\text{Fish Consumption Level} = \beta_0 + \beta_1 * [time_i] + \beta_2 * [Direct\ CT_i] + \beta_3 * [time_i * Direct\ CT_i] + C + \varepsilon \quad (6)$$

Then, the DiD analysis is processed again in the STATA, but now by integrating the probit result into the equation. The result of the DiD regression analysis is shown in the following table 10.

Table 10. Regression Result of the DiD Analysis with Inverse Mills Ratio Included

ATET	- 326,25**
(Average Treatment Effect on The Treated) of the Direct CT	(140,50)
C	-3.798,41***
	(149,77)

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

R-Squared	0,055
No. Obs	12.687
Standard error is reported in parentheses.	
** indicates significance at the 95% level.	

Through the Heckman Selection Model, the results of the research is updated. Though the significance and the direction of the impact is still the same. After the Heckman Selection Model analysis was finished, the impact of the direct CT towards the fish consumption level change into – (Rp 326,25). Meaning there is an increase of consumption after the inverse mills' ratio was included within the regression analysis.

3.1 Discussion

Based on the result of the calculations that has been done, the impact of the direct CT to the fish consumption level for the household in Indonesia is – (Rp 326,25). This result means that by giving them direct CT and increasing their income, the level of fish consumption is actually decreasing for about Rp 326,25 in the household for their per capita weekly consumption. The result of this research might seemed contradictive compared to other research that has been done before, because the assumption and hypothesis was that increasing income will result in the increase of consumption (Firmansyah et al., 2020). Though in this research, we actually looking in a more specific domain which is the fisheries sector and the household consumption pattern. There could be any other factor that affect the level of fish consumption on the household level than just from their income. In the next sub-section, we will discuss further as to what factor that might lead to this result.

3.1.1 Income Elasticity for the Fish Consumption

Finding from this research is actually in line with several other research that has been done regarding the income and its impact towards fish consumption. Some research find that in several places in Indonesia, prices income do not correlate with fish consumption per capita (Bidayani et al., 2023; Thirafi et al., 2024, p. 59). On other research, they find that one of the factors that significantly correlate with the higher level of fish consumption is personal preference and taste of the consumer (Mar'ie et al., 2022). In some cases, price of fish or the money that the consumer owned doesn't give any impact towards the fish consumption level (Firmansyah et al., 2019).

For that matter, in the context of changing the fish consumption pattern, the level of income of the household does not give any significant impact in increasing their level. Instead it might lower the level of consumption. The elasticity of the fish consumption is not closely related to income. This condition might be similar to what is happening with other commodity like gas (Alzyadat, 2022, p. 362). The level of income does not determine the consumption of gas, because its consumption level is inelastic on the income side (Alzyadat, 2022, p. 362). This also could be the case for the fish consumption. Though further study needs to be conducted in comparing the prices of fish with its consumption level.

Not only that, the elasticity of demand for the fish consumption could also be influenced by other factor such as lifestyle (Nainggolan, 2022, p. 135). One lifestyle can decide what kind of product that one will buy. The increase of income will not be related to the increase of one or two specific product because they might not be related to the lifestyle of that person. Hence, it could be because of that the level of consumption is instead becoming lower when their income is increasing. Because their lifestyle dictate them to buy other goods that is more related to it rather than to spend it for fish consumption.

However, from the result of this research, it also finds that other protein consumption does not affect the level of fish consumption greatly. It has a significant relation, but the effect is miniscule. Meaning that while the income is increasing, the household do not convert their spending to consume other source of protein. It might not even be used for fulfilling their protein consumption but any other things. This other thing is what has not been identified in this research. Another further study needs to be conducted in order to find this other thing that become the substitute for the fish consumption or protein consumption in general. The further study that needs to be conducted later might need first to understand the lifestyle of the household that is analyzed in this study which are the poor whose expenditure level is less than Rp 500.000,-/month.

On a side note, the decrease of the fish consumption because of the income shock might indicate that the preference for fish consumption is lower than other product. Thus, when there is an increase in income, that surplus of income is used to consumed other product instead. Fish as goods, especially in the context of Indonesia, is still seen as one of unpreferable goods. We might understand better about this preference if we could generate the indifference curve for fish consumption and compared it with other goods consumption. Therefore, after grasping the lifestyle of the poor, we need to do one step further of analysis and create the indifference curve for the comparison of fish consumption and other goods consumption.

There has been some finding also from some study that show there is correlation between the supply of the good towards the income elasticity of the demand. One level of consumption cannot increase if the supply of the goods is stagnant and has reached maximum consumption. Increase of income might not create any impact towards consumption, because the supply has been fully maximized and there can be no increase of consumption. However, in the context of this research, the respondent or the household that is surveyed is actually coming from region with a sizeable fisheries potential. Therefore, supply might not be a problem that caused the consumption level of fish become minus.

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166−177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

Though there might be some kind of problem with the variable used within this research. The data used to show the potential for the fisheries sector comes from the provincial level. It might not reflect fully the condition for fish consumption because household might consume or buy product not on a provincial level but on a district level. Jang et al. (2022) stated in their research result that distance have significant impact on trade growth. This means that the further the market from the population resides, the less the trade will grow. Moreover, in the context of this research, the population that is being analyzed come from the lower middle class with an expenditure level lower than Rp 500.000,-. Any cost related to travel might influence their decision to buy something. Even for receiving their direct CT, it had been identified that for many of the recipient the cost for travel was sumptuous. There is also some finding from the research done by Dalmayani et al., (2023, p. 183) that shows that the location of the fish market has a significant correlation with the increase volume of fish trade in the region of Deli Serdang North Sumatera. This finding suggest that potential of the fisheries sector would not necessarily convert into trade, but travel distance to the nearby fish market or market that sells fish should be considered into the factor that could influence the level of consumption. Consequently, further study might need to update the potential of the fisheries sector on the district level and also travel distance to the fish market to gain a better insight for the fisheries trade.

3.1.2 Fish as an Inferior Goods

On a macro level, there is a positive and significant relation between the increase of income towards the increase of consumption (Meyer, 2021). Though on a more micro level, that is not always the case since some goods can be categorized as luxury goods, normal goods or inferior goods (Meyer, 2021). This theory might explain why the increase of income—through the direct CT—resulted into a lower level of fish consumption—not increasing. When one income increase but the level of consumption is decrease, the goods being mentioned can be categorized as inferior goods. (Firmansyah et al., 2020; Meyer, 2021). If we look to the result of this research, it can be said that fish is actually an inferior goods for the Indonesian context. This is happening because when the household received some payment as an additional income, they did not spend the money on fish. They even allocate some of the resources initially used for the fish consumption into other goods.

In some cases, it has been found that the increase in purchasing power will lead people to consume a better food with better nutrients which is more expensive. Though, the results of several other research show otherwise. The research done by Firmansyah et al. (2020) finds that the substitute for fish consumption is not other protein consumption from other sources. Some research also finds that the consumption of fish alongside of other protein sources like poultry or meat is actually complementary and not substitution. Those findings could imply that the substitute for the fish consumption can be not from the protein consumption but it could be something else.

If we look at the social perspective of those who received the direct CT in this research, there is a huge chance that they are not really focusing on their protein intake. Some researchers find that for the poor have the preference and the priority to spend their money on rice, cooking oil, coffee/tea, rent, and travel cost (Rahayu et al., 2023). In East Java, they have the preference on buying processed foods, cigarette, or product that has longer shelf live and durable. Accordingly, the increase of income might be prioritized for the consumption of other goods based on their preference rather than fish in which it is considered as inferior goods.

If the context is like that, then it means that fish is not inferior to other source of protein goods. But rather it is an inferior to other goods/activity/service that is considered more imminent. Some survey to the recipient finds that they even use the direct CT to pay off their debt because the due had been forthcoming. There is also the possibility of because they know that the direct CT is only temporary, thus they decided to use all the money they have to solve their financial problem or invest it in other more lucrative means, or even used it for consumption that has a long-term effect (such as buying rice that can be consumed for more than 3 months if rations properly).

As a result, if the decrease of the fish consumption because of direct CT payment is originated by the fish consumption as a substitution only since it is an inferior goods, then there needs to be further review on the goods that might become the replacement of fish when the income rise. Given that the other protein source consumption is not the substitute, it might beneficial to further search what is that other goods that become the substitution for fish. Though it will need a qualitative measure in order to gain that insight of what could be the other good is.

3.1.3 Fisheries Potential vs Actual Fish Price in the Market

The means to process fish that is not cheap and easy (Apituley et al., 2023; Borut et al., 2022, p. 60), make the logistics price for process the fish exorbitant when not supported by adequate infrastructure. Fish is a commodity that could easily goes bad and putrid hence to preserve its condition will require several method which in turn increase the price of fish processing (Apituley et al., 2023; Borut et al., 2022, p. 60). Enhancing the distribution process until it reaches the hand of the consumer will be beneficial in increasing the fish consumption (Subakir et al., 2021). Moreover, different region will have various prices of fish because the difference in supporting and adequate infrastructure available.

Even in country like Japan that has better infrastructure than Indonesia still has a disparity in each region for their fish prices (Kano et al., 2022, p. 25). Compared to Indonesia that does not have an equal distribution of adequate infrastructure, then the price of fish on different region will vary based on its availability of infrastructure. Region with minimum infrastructure will face a higher price of fish compared to those that has better infrastructure. While one region might have better fisheries potential, the lack of infrastructure will result in a much higher price of fish even though the supply is abundant. The cost to distribute the fish in its freshest state will require a delicate process that will affect its

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166–177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

price to rise. This accessibility to infrastructure will then affect the price of the fish which in turn will affect the level of fish (Mar'ie et al., 2022). Consuming the fish freshly will produce a better satisfaction for the consumer and increase the level of consumption (Saiful & Talakua, 2020). Hence the supply of fish only, would not translate into consumption if the fish that is being distributed is not fresh.

Because of the matter of the distribution process and infrastructure availability, the potential of fisheries does not always mean that their prices of fish will be cheaper. We understood that cheaper price of fish will equal more demand for fish. But only looking at the potential of fisheries sector through its production capacity is insufficient. To define the fisheries potential, we will need to look also at the other factor that will affect the fish price such as distribution chain. Distribution chain will be very relevant especially for region that is located far away from the coastline or far from any fish production place.

Thus, in this research there is also the possibility that the increase of income translated into the decrease of consumption is caused by the price factor. Looking only at the potential of the fisheries sector in the region might not be sufficient. There will need to be a further study on the price ratio to the consumption of fish. Though, gathering the fish prices data on specific region will be a mountainous task. But, in order to gain a better explanation for the results of this research, the analysis of price of the fish is necessary since data regarding potential of the fisheries sector through the production capability is inadequate.

4. CONCLUSION

The finding of this research shows that there is a significant impact of direct cash transfer in the year 2007-2008 to household resulting in the reduction of the fish consumption level amounting to Rp 326,25. Meaning that by giving the household direct CT, the level of fish consumption will decrease for Rp 326,25 per week per capita. There are several explanations as to how this is occurring, which are the elasticity income of demand for fish, status of fish as inferior goods for the Indonesian society and high potential does not mean lower price because of the processing cost to distribute the fish in its freshest state. Though there are some explanation, further study is still needed to gain a better insight for the fish consumption so that better strategy can be generated in order to increase the consumption. The weakness of this research is because it is focusing only the data available from the IFLS. Supplementary data might be needed if one would like to know better about the fish consumption in general. Several study that needs to be conducted further including finding other goods that become the substitute for the fish consumption based on the household lifestyle and preference, finding and analyzing the data on the fisheries production in the district level and the travel distance to nearby fish market and using real prices of fish in each market in the region and integrate it to the analysis.

REFERENCES

Alzyadat, J. A. (2022). The Price and Income Elasticity of Demand for Natural Gas Consumption in Saudi Arabia. International Journal of Energy Economics and Policy, 12(6), 357–363. https://doi.org/10.32479/ijeep.13597

Anugrah, A. N., & Alfarizi, A. (2021). LITERATURE REVIEW POTENSI DAN PENGELOLAAN SUMBER DAYA PERIKANAN LAUT DI INDONESIA. Jurnal Sains Edukatika Indonesia, 3(2).

Apituley, Y. M. T. N., Soukotta, L. M., & Wattimury, M. (2023). PENETAPAN HARGA JUAL IKAN SEGAR DIKOTA AMBON. BALOBE: Jurnal Pengabdian Masyarakat, 2(2), 60–66. https://doi.org/10.30598/balobe.2.2.60-66

Asrari, S., & Husna, A. (2022). Angka konsumsi ikan, cara pengolahan ikan dan prevalensi stunting Di Desa Kuta Blang, Kecamatan Samadua, Kabupaten Aceh Selatan. Acta Aquatica: Aquatic Sciences, 9(2), 116–119. https://doi.org/10.29103/aa.v9i2.8130

Badan Informasi Geospasial. (2023). Gazeter Republik Indonesia Volume 3 Tahun 2023. Badan Informasi Geospasial.

Bendig, D., & Hoke, J. (2022, April). Selection bias and Heckman two-stage estimation.

Bidayani, E., Supitri, S., & Robin, R. (2023). FAKTOR-FAKTOR YANG MEMPENGARUHI PERMINTAAN IKAN KONSUMSI AIR TAWAR DI PASAR TRADISIONAL KOTA PANGKALPINANG. Jurnal Perikanan Unram, 13(2), 331–343. https://doi.org/10.29303/jp.v13i2.494

Borut, R. A., Apituley, Y. M. T. N., Hiariey, J., & Bawole, D. (2022, March 26). Faktor-faktor yang Memengaruhi Pola Konsumsi Ikan Rumah Tangga Nelayan di Kabupaten Buru Selatan. Seminar Nasional DPD Himpunan Alumni IPB Maluku. Kedaulatan dan Keamanan Pangan Berbasis Bisnis, Ambon. https://doi.org/10.30598/PattimuraSci.2022.HAIPBMAL

Central Intelligence Agency (CIA). (2024). Coastline [dataset]. Retrieved May 15, 2024, from https://www.cia.gov/the-world-factbook/field/coastline/

Clarke, D., Pailañir, D., Carleton Athey, S., & Imbens, G. W. (2023). Synthetic Difference-in-Differences Estimation. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4346540

Dalmayani, F., Syahriza, R., & Hasibuan, R. R. A. (2023). Pengaruh Harga Dan Lokasi Terhadap Volume Penjualan Ikan Di Pasar Kecamatan Deli Tua Kab. Deli Serdang Sumatra Utara. Jurnal Bisnis Net, 6(1), 172–185. https://doi.org/10.46576/bn.v6i1.3299

Daroedono, E. (2019). Konsumsi Ikan dan Potensi Anisakiasis: Aspek Komunikasi Kesehatan Masyarakat Suatu Program Pemerintah. Jurnal Ilmu Kedokteran, 13(1), 4. https://doi.org/10.26891/JIK.v13i1.2019.4-13

Egger, D., Haushofer, J., Miguel, E., Niehaus, P., & Walker, M. (2021, October). General Equilibrium Effects of Cash Transfers: Experimental Evidence from Kenya. NBER Working Paper Series, Cambridge. http://www.nber.org/papers/w26600

Field, E. M., & Maffioli, E. M. (2021, February). Are Behavioral Change Interventions Needed to Make Cash Transfer Programs Work for Children? Experimental Evidence from Myanmar. NBER Working Paper Series. http://www.nber.org/papers/w28443

Filmer, D., Friedman, J., Kandpal, E., & Onishi, J. (2023). Cash Transfers, Food Prices, and Nutrition Impacts on Ineligible Children. The Review of Economics and Statistics, 105(2), 327–343. https://doi.org/10.1162/rest_a_01061

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166−177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

Firmansyah, Oktavilia, S., Prayogi, R., & Abdulah, R. (2019). Indonesian fish consumption: An analysis of dynamic panel regression model. IOP Conference Series: Earth and Environmental Science, 246, 012005. https://doi.org/10.1088/1755-1315/246/1/012005

Firmansyah, Oktavilia, S., Prayogi, R., & Wahyu Puspita, D. (2020). Analysis of capture fish demand in Indonesia. IOP Conference Series: Earth and Environmental Science, 530(1). https://doi.org/10.1088/1755-1315/530/1/012009

Food and Agriculture of the United Nations. (2022). The State of World Fisheries and Aquaculture 2022. FAO. https://doi.org/10.4060/cc0461en

Fredriksson, A., & Oliveira, G. M. D. (2019). Impact evaluation using Difference-in-Differences. RAUSP Management Journal, 54(4), 519–532. https://doi.org/10.1108/RAUSP-05-2019-0112

Inoua, S. M., & Smith, V. L. (2020, March). The Classical Theory of Supply and Demand. ESI Working Papers. https://digitalcommons.chapman.edu/esi_working_papers/305/

Issifu, I., Deffor, E. W., Deyshappriya, N. P. R., Dahmouni, I., & Sumaila, U. R. (2022). Drivers of Seafood Consumption at Different Geographical Scales. Journal of Sustainability Research, 4(3). https://doi.org/10.20900/jsr20220012

Jang, J., Kim, D., & Lee, Y. (2022, June 3). Learning from consumer travel distance: - Firm expansion, contraction, and exit. EAMS - Virtual East Asia Macroeconomics Seminar Series.

Kano, K., Kano, T., & Takechi, K. (2022). The price of distance: Pricing-to-market and geographic barriers. Journal of Economic Geography, 22(4), 873–899. https://doi.org/10.1093/jeg/lbab013

Kementerian Kesehatan. (2023, January). Prevalensi Stunting di Indonesia Turun ke 21,6% dari 24,4%. Sehat Negeriku Sehatlah Bangsaku. https://sehatnegeriku.kemkes.go.id/baca/rilis-media/20230125/3142280/prevalensi-stunting-di-indonesia-turun-ke-216-dari-244/

Khairi, I., Ukhty, N., & Ermasari. (2022). Pendapatan, Angka Konsumsi Ikan, Jenis Ikan Yang Dikonsumsi Dan Kejadian Stunting Di Desa Tanah Bara Kecamatan Gunung Meriah Kabupaten Aceh Singkil. Jurnal Perikanan Terpadu, 3(2).

Koeshendrajana, S., Yulia Arthatiani, F., & Virgantari, F. (2021). Price and income elasticities of selected fish commodities in Indonesia: A multi stage budgeting framework. IOP Conference Series: Earth and Environmental Science, 860(1), 012059. https://doi.org/10.1088/1755-1315/860/1/012059

Lall, S. P., & Kaushik, S. J. (2021). Nutrition and Metabolism of Minerals in Fish. Animals, 11(9), 2711. https://doi.org/10.3390/ani11092711

Lestari, T. R. P. (2023). Stunting di Indonesia: Akar Masalah dan Solusinya. Info Singkat, XV(14).

Mar'ie, M., Saifullah, & Istiqamah, N. (2022). Faktor-faktor yang Mempengaruhi Tingkat Konsumsi Ikan pada Masyarakat di Kecamatan Sajad. NEKTON: Jurnal Perikanan dan Ilmu Kelautan, 2(1), 27–34. https://doi.org/10.47767/nekton.v2i1.323

Meyer, T. (2021, Oktober). Evolving Protein Demand and Income Elasticity [University of Nebraska Agricultural Economics]. Cornhusker Ecnomics. agecon.unl.edu/cornhuskereconomics

Naeem, M. Y., & Selamoglu, Z. (2023). Fish as a significant source of nutrients. 6(4).

Nainggolan, J. (2022). Estimation of the price and income elasticities of residential electricity demand in Indonesia using household-level data. Jurnal Ekonomi Dan Pembangunan, 30(2), 131–148. https://doi.org/10.14203/JEP.30.2.2022.131-148

Nugroho, M. R., Sasongko, R. N., & Kristiawan, M. (2021). Faktor-faktor yang Mempengaruhi Kejadian Stunting pada Anak Usia Dini di Indonesia. Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini, 5(2). https://doi.org/10.31004/obsesi.v5i2.1169

Nurapipah, M., Lestari, A., & Fatahillah, J. R. (2023). EDUKASI MANFAAT MENGONSUMSI IKAN BAGI KESEHATAN GUNA CEGAH STUNTING SEJAK DINI. Jurnal Pengabdian Kepada Masyarakat, 3.

Peraturan Presiden Nomor 72 Tahun 2021 Tentang Percepatan Penurunan Stunting, 72 (2021).

Phanita, A. Y., & Supratman, O. (2021). ANALISIS TINGKAT KONSUMSI IKAN PADA MASYARAKAT KECAMATAN TOBOALI DAN KECAMATAN LEPAR PONGOK KABUPATEN BANGKA SELATAN. Aquatic Science - Jurnal Ilmu Perairan, 3(1).

Purnaningsih, N. (2020). Kampanye Publik Tentang Manfaat Mengonsumsi Ikan pada Ibu-Ibu PKK Kelurahan Ulak Karang Utara, Kota Padang. Jurnal Pusat Inovasi Masyarakat, 2.

Rahayu, S. A. T., Mulyanto, M., Johadi, J., & Purnama, M. Y. I. (2023). The Nexus of Risk-Preferences and Poverty in Indonesia. Society, 11(1), 28–40. https://doi.org/10.33019/society.v11i1.453

RAND Corporation. (2024). The Indonesia Family Life Survey (IFLS) [dataset]. https://www.rand.org/well-being/social-and-behavioral-policy/data/FLS/IFLS.html

Ridwan, Agam, B., Merdekawati, D., Yunita, N. F., Saputra, I., Fitriyandi, Tantilia, E., Saputra, A., Bulano, L., Winarto, T., & Syafiq, M. (2022). Penyuluhan Konsumsi Ikan Pada Ibu Dan Anak Dalam Pencegahan Stunting di Desa Makrampai Kecamatan Tebas. Hippocampus: Jurnal Pengabdian Kepada Masyarakat, 1(2), 52–56. https://doi.org/10.47767/hippocampus.v1i2.428

Roth, J., Sant'Anna, P. H. C., Bilinski, A., & Poe, J. (2023). What's trending in difference-in-differences? A synthesis of the recent econometrics literature. Journal of Econometrics, 235(2), 2218–2244. https://doi.org/10.1016/j.jeconom.2023.03.008

Rothbard, S., Etheridge, J. C., & Murray, E. J. (2023). A Tutorial on Applying the Difference-in-Differences Method to Health Data. Current Epidemiology Reports. https://doi.org/10.1007/s40471-023-00327-x

Saiful, & Talakua, E. G. (2020). PURCHASE AND CONSUMER DECISION TO BUY FRESH SKIPJACK TUNA. Jurnal IPTEKS PSP, 7(14), 62–73.

Sinclair, A. J., Wang, Y., & Li, D. (2022). What Is the Evidence for Dietary-Induced DHA Deficiency in Human Brains? Nutrients, 15(1), 161. https://doi.org/10.3390/nu15010161

Subakir, A. A., Hubeis, M., & Trilaksani, W. (2021). Strategi Peningkatan Konsumsi Ikan pada Masyarakat Berpendapatan Rendah Di Provinsi Jawa Tengah. MANAJEMEN IKM: Jurnal Manajemen Pengembangan Industri Kecil Menengah, 15(1), 70–76. https://doi.org/10.29244/mikm.15.1.70-76

Thaifur, A. Y. B. R., Tasya, Z., & Dolang, M. W. (2023). Hubungan Konsumsi Ikan dengan Kejadian Stunting. Jurnal Kolaboratif Sains, 6(12), 2126–2130. https://doi.org/10.56338/jks.v2i1.985

Thirafi, L., Akbarsyah, N., & Khoirunnisa, K. (2024). Analisa Pola Konsumsi Ikan Keluarga Desa Kondangjajar Kabupaten Pangandaran. Farmers : Journal of Community Services, 5(1), 56. https://doi.org/10.24198/fjcs.v5i1.52707

Tiffany, A. E., Mudzakir, A. K., & Wibowo, B. A. (2020). Analisis Tingkat Konsumsi Ikan Laut dan Faktor-Faktor yang Mempengaruhi Pada Masyarakat Semarang. Journal of Fisheries Resources Utilization Management and Techology, 9(1), 25–34.

UNICEF. (2024). The Impact of the Cash Transfer Intervention in the Commune of Nsélé in Kinshasa [Impact Assessment Report].

Journal of Business and Economics Research (JBE)
Vol 5, No 2, June 2024, pp. 166−177
ISSN 2716-4128 (media online)
DOI 10.47065/jbe.v5i2.5370
https://ejurnal.seminar-id.com/index.php/jbe

Untari, D. S., Wibowo, T. A., & Anwar, R. (2022). Minat Konsumen Millenial Terhadap Konsumsi Ikan Air Laut dan Ikan Air Tawar. Jurnal FishtecH, 11(1), 30–38. https://doi.org/10.36706/fishtech.v11i1.15128

Wangiyana, N. K. A. S., Karuniawaty, T. P., John, R. E., Qurani, R. M., Tengkawan, J., Septisari, A. A., & Ihyauddin, Z. (2021). PRAKTIK PEMBERIAN MP-ASI TERHADAP RISIKO STUNTING PADA ANAK USIA 6-12 BULAN DI LOMBOK TENGAH [THE COMPLEMENTARY FEEDING PRACTICE AND RISK OF STUNTING AMONG CHILDREN AGED 6-12 MONTHS IN CENTRAL LOMBOK]. Penelitian Gizi dan Makanan (The Journal of Nutrition and Food Research), 43(2), 81–88. https://doi.org/10.22435/pgm.v43i2.4118

Wati, D. L. (2021). Peranan Bantuan Langsung Tunai (BLT) pada Perekonomian Masyarakat miskin yang Terkena Dampak COVID-19 di Kenagarian Simalangga Kecamatan Payakumbuh Kabupaten 50 Kota Ditinjau Menurut Ekonomi Syariah. Universitas Islam Negeri Sultan Syarif Kasim Riau.

World Population Review. (2024). Fish Consumption by Country 2024 [dataset]. https://worldpopulationreview.com/country-rankings/fish-consumption-by-country

Zhao, B., Gan, L., Graubard, B. I., Männistö, S., Albanes, D., & Huang, J. (2022). Associations of Dietary Cholesterol, Serum Cholesterol, and Egg Consumption With Overall and Cause-Specific Mortality: Systematic Review and Updated Meta-Analysis. Circulation, 145(20), 1506–1520. https://doi.org/10.1161/CIRCULATIONAHA.121.057642