

The road ahead and the future of eliminating fisheries subsidies under the WTO

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Abstract. The World Trade Organization has explored forging an agreement on eliminating trade-distorting fisheries subsidies for twenty years. To hasten towards the compromise among WTO Members, the chair of fisheries subsidies circulated the revised draft text eyeing on the conclusion of negotiations before its twelfth ministerial conference at the end of 2021. This study analyzes the draft agreement, focusing on prohibition on subsidies concerning illegal, unreported and unregulated fishing, overfished stocks and overcapacity and overfishing. In addition, cross-sectional models are specified to investigate the effects of subsidies. Results show that both direct and indirect payments contribute to catch while support aimed for resource management is largely decoupled from overcapacity. When countries are further divided into the developed and developing countries by the WTO and the HDI criteria, only indirect payments prove their effectiveness in boosting catch. These empirical results shed light on the importance and effectiveness of policy reform in global fisheries subsidies.

1 Introduction

The World Trade Organization (WTO) launched trade negotiations on fisheries subsidies in 2001 at the Doha Ministerial Conference. Its mandate is to clarify and improve disciplines on fisheries subsidies. The 2005 Hong Kong Ministerial Conference committed to prohibiting certain forms of fisheries subsidies that contribute to overcapacity and overfishing. In the midst of stalled talks, the 2017 Buenos Aires Ministerial Conference (MC11) renewed a sense of urgency and decided to conclude the agreement by the next MC12.

Based on this mandate, the WTO negotiators are expected to meet the United Nations Sustainable Development Goal Target 14.6 to “by 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to illegal, unreported and unregulated (IUU) fishing, and refrain from introducing new such subsidies.” In preparation for the conclusion of the agreement at the MC12, originally scheduled for June 2020 in Kazakhstan, but had to be postponed to November 2021 in Geneva, members have been negotiating on the basis of a draft consolidated text first

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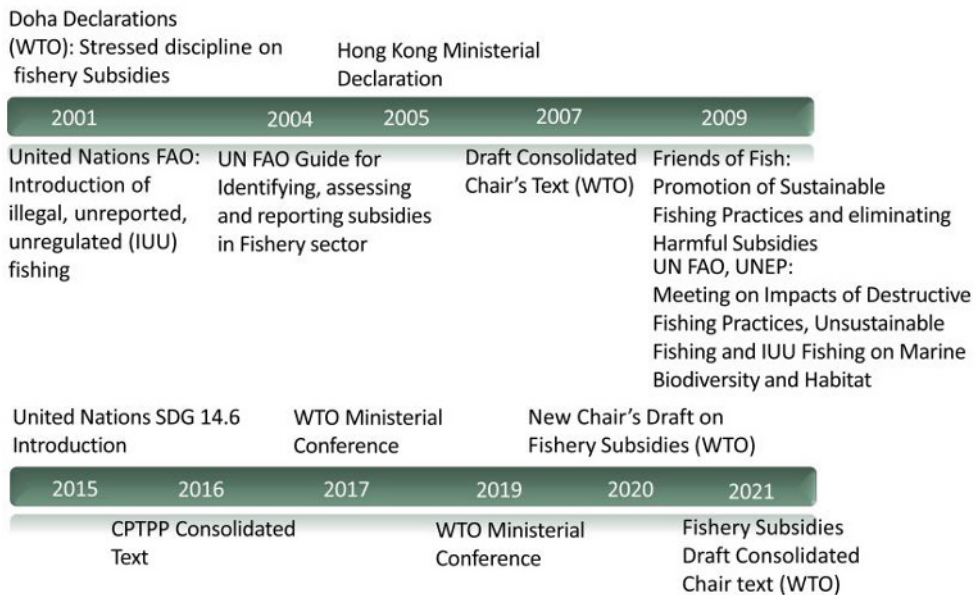
introduced by the chair of the negotiations in June 2020, with revised versions introduced in November and December 2020, respectively. The chair introduced a new draft text in May 2021 and its revised draft in June 2021 [1]. Regarding subsidies reform, the latest draft text suggests prohibition on subsidies concerning IUU fishing (Article 3), overfished stocks (Article 4), and overcapacity and overfishing (Article 5).

While recognizing the adverse effects of harmful fisheries subsidies on the sustainable development of marine fisheries, negotiators have been debating how to ensure a fair and equitable discipline on these subsidies. The lack of transparency for domestic policy and differences in country-specific effects of fisheries subsidies, depending on economic and environmental situations make it difficult to clearly identify subsidies and their net effects [2]. Although there has been progressed in empirical studies on fisheries subsidies during the last decade, the number of studies is still limited and it is necessary to generate more insights into interaction between legal discipline and sustainable management of marine ecosystems [3].

Facing these limitations, this study aims to fill a gap in the existing literature by exploring the possibility and the interplay of negotiations on the basis of the latest chair draft text and analyzing the effects of fisheries subsidies on fisheries catch.

2 Evolution and assessment of the draft text

As seen in Figure 1, since the WTO embarked on the Doha Development Agenda (DDA) in 2001, Member states and other global institutions have discussed and explored ways to clarify and improve disciplines on fisheries subsidies under the Negotiation Group on Rules. Despite a broad agreement that countries should strengthen discipline on perverted fisheries subsidies, several unresolved issues are remained to be answered. One is an issue on enabling the transition to ensure sustainable objectives and commitments [4, 5].



Source: Author's compilation

Fig. 1. Evolution of negotiations on fisheries subsidies

Table 1 shows a summary of negotiation proposals submitted by WTO Members. As for IUU fishing, a central issue is how it would be determined and then how the subsidy obligation would be triggered [6, 7]. The draft text explicitly links IUU fishing as activities set out in the FAO's 2001 International Plan of Action [8]. The draft also grants shared authority among a coastal Member, a flag state, or relevant Regional Management Organization (RFMO) in making an affirmative determination if a vessel or operator is engaged in IUU fishing. More specifically, governments should stop subsidizing a vessel or operator that is listed by its flag state or is identified by a coastal state as carrying out IUU activities within its maritime zones or by an RFMO within its geographical and species competence. The requirements of evidence-based IUU determination and notification by a coastal Member and the special and differential treatment (SDT) for developing countries are offered in the bracket.

Table 1. WTO Members' proposals on fisheries subsidies reform

Member states	WTO document #	Proposals
EU	TN/RL/GEN/181/Rev.1	Under the UN "SDG14", certain forms of subsidies contributing to overfishing and overcapacity as well as subsidies towards IUU fishing should be prohibited.
	TN/RL/GEN/188	Since '95, issued reduced percentage of WTO member level of subsidy notice (50→38%) and inadequate quality of notifications. Proposed incentives for simplifying monitoring and notification to ensure transparency.
LDC Group	TN/RL/GEN/184	The share of wild catch of LDCs are significantly small, thus, independent of overfishing. LDCs are directly affected by harmful subsidies towards large industrial fleets outside jurisdiction of EEZ. The negotiation proposes to discipline fisheries subsidies which contribute to overcapacity and overfishing as well as to eliminate subsidies for IUU fishing.
Cambodia on behalf LDC Group	TN/RL/GEN/193	Focused on prohibiting subsidies for overfishing and IUU fishing and suggested alternatives provisions for LDC.
Iceland, New Zealand and Pakistan	TN/RL/GEN/186	With SDG 14.6, certain forms of fishing subsidies that contributes to overcapacity and overfishing must be prohibited by '20 as well as effective and appropriate S&DT for developing and LDCs should be an essential part of the WTO subsidies negotiation.
ACPPU (Argentina, Colombia, Costa Rica, Panama, Peru and Uruguay)	TN/RL/GEN/187/Rev.2	Certain forms of subsidies that contribute to overfishing and overcapacity should be prohibited and requires appropriate and effective measures for developing countries and LDCs . With the exception of IUU fishing, small fishermen should not be restricted in access to fisheries resources and markets in jurisdiction of member states.
Indonesia	TN/RL/GEN/189/Rev.1	Emphasized that subsidies contributing to IUU fishing should be strictly prohibited Along other major prohibited subsidies, the construction/improvement of ships and support of fishing management should be included. Argued the implementation of fisheries management plan should be accompanied by granting S&DT to developing countries to

		achieve desired results.
Norway	TN/RL/GEN/ 191/	Suggestion by RFMO in the negotiation seem to be progressing but including other list is a concern as it may add controversy. No subsidies of any kind shall be granted to IUU's ships or operators.
ACP (African, Caribbean and Pacific Countries)	TN/RL/GEN/ 192	Security Concerns in developing countries and promises to ban certain subsidies contributing to overcapacity, overfishing and elimination of IUU fishing and specify definitions once again until 2020 by SDG.
China	TN/RL/GEN/ 195	Agrees to ban of subsidies of IUU fishing but IUU fishing activities related to territorial, sovereignty and maritime jurisdiction disputes should be excluded from the scope of agreement.
	TN/RL/GEN/ 199	Subsidy cap system to be set at [X]% of the reference period and introduced adjustable subsidy cap as well as efforts to reduce. To encourage design of fisheries subsidy policies which conform to SDG, four types of categories (Green box) were presented that are not subjected to fisheries subsidy reduction arrangements.
Philippines	TN/RL/GEN/ 196/Suppl.1	No subsidies to fishing and related activities in disputed water Subsidies to overfishing and overcapacity and promises to prohibit IUU fishing should not be avoided due to concerns over disputed waters.
Argentina, Australia, the United States and Uruguay	TN/RL/GEN/ 197/Rev.2	Flexible approach is required. Divide countries into tiers 1, 2 and 3 by the proportion of fish caught in the world and prohibited subsidies that exceeds limits. Prohibits IUU and fishing outside of state's jurisdiction despite subsidy cap system.
Argentina, Australia, Indonesia, Japan, New Zealand, the United States and Uruguay	TN/RL/GEN/ 201/Rev.1	Flag of Convenience (FoC) is often abused to avoid control and monitoring measures by RFMO, causing overfishing and IUU fishin. Prohibit subsidies on vessels that do not raise national flags of states.
Canada	TN/RL/GEN/ 198	Discipline for overfishing resource subsidies, including discipline for subsidies that leads to overcapacity should be stated and specified in Dispute Settlement Rules.

Source: Author's compilation

The draft agreement grants the coastal Member or a relevant RFMO to identify if fish stock is overfished under its jurisdiction or in areas and for specifies under its competence. Any subsidy that is aimed to promote the rebuilding of the fish stock to a biological sustainable level would be maintained without reduction or elimination.

Finally, the draft text lays out fisheries subsidies that contribute to overcapacity or overfishing, including price and income support, input and capital subsidies and cost recovery subsidies. A subsidy is not subject to the discipline if the subsidizing Member demonstrates its measure is implemented to maintain the fish stock at a biologically sustainable level. A critical point is how to "demonstrate" such a subsidy measure as beneficial or harmful to sustainability through a lens of overcapacity.

3 Empirical analysis on the effects of fisheries subsidies

As recognized by the draft agreement, the same types of subsidies can be used to maintain the fish stock or trigger overcapacity that may deteriorate the marine ecosystem. In fact, the draft illustrates “catch per unit effort” as one of the indicators for reference points. To earn these insights from actual data for most WTO Members and economic modeling, this study specifies an empirical equation and estimates the effect of different types of fisheries subsidies on fish catch.

3.1 Model specifications

As Equation (1) shows, the subsidy effect can be investigated by the relationship between a subsidy and fish catch. The total catch is shown as a function of fishing effort and fish stocks [9]:

$$Catch = F(\text{fishing effort}, \text{fish stock}) \quad (1)$$

where *Catch* is the total catch. The fishing effort can be proxied by various metric measures such as the number, gross tonnage, or the engine power of vessels. However, studies show that the number of vessels may not correspond to the total catch [11]. Thus, following FAO [12], this study adopts the engine power (kW) of vessels as an explanatory variable for catch. Since it is not feasible to obtain the amounts of stocks, they are not explicitly accounted for in this model.

Equation (2) is a modified version that incorporates the effects of different forms of fisheries subsidies on catch.

$$Catch = F(\text{engine power}, \text{fisheries subsidies}) \quad (2)$$

Equation (3) is the empirical model with a log-log specification.

$$\ln Catch_i = \beta_1 + \beta_2 \ln EngPow_i + \beta_3 \ln DirPay_i + \beta_4 \ln IndirPay_i + \beta_5 \ln Resmgt_i + \varepsilon_i \quad (3)$$

where *ln* indicates a natural log term, β_i refers to the coefficient to estimate, $Catch_i$ is the total catch for country *i* in metric tons, $EngPow_i$ is the engine power in kW, $DirPay_i$ and $IndirPay_i$ are aggregate amounts of direct and indirect subsidies in US dollars, respectively, $Resmgt_i$ is the support amount for fishery resource management in US dollars, and ε_i is an error term.

3.2 Data and subsidy classification

Based on the database compiled by Sumaila et al. [13], this study regrouped national fisheries subsidies as direct, indirect and resource management payments in Table 2. Direct payments are supposed to have straightforward effects on catch while indirect payments are deemed to deliver their effects indirectly.

Table 2. Classification of national fisheries subsidies

No.	Classification	This study	Sumaila et al. (2019)
1	Vessel construction and renovation	Direct	Capacity-enhancing
2	Fisher assistance	Direct	Ambiguous
3	Fishing access	Direct	Capacity-enhancing
4	Fuel subsidies	Direct	Capacity-enhancing
5	Tax exemption	Direct	Capacity-enhancing
6	Fisheries development projects	Indirect	Capacity-enhancing
7	Fisheries management	Indirect	Beneficial
8	Fishery R&D	Indirect	Beneficial
9	Fishing port development	Indirect	Capacity-enhancing
10	Marking and storage infrastructure	Indirect	Capacity-enhancing
11	Rural fisher communities	Indirect	Ambiguous
12	Marine Protected Areas (MPAs)	Resource management	Beneficial
13	Vessel buyback	Resource management	Ambiguous

Table 3 provides descriptive statistics for each variable. It is the cross-sectional data on the basis of 2018. Data for *Catch* and *EngPow* are obtained from the FAO and Rousseau et al. [14].

Table 3. Descriptive statistics

	Catch (ton)	EngPow (KW)	Number of vessels	DirPay (USD)	IndirPay (USD)	Resmgt (USD)
Mean	616,076	966,034	17,381	1.08E+08	1.05E+08	26,498,920
Median	86,280	146,063	2,297	5,108,681	20,584,688	2,189,036
Max	13,148,442	14,559,387	453,328	4.84E+09	2.49E+09	8.92E+08
Min	254.74	781.42	3.0	0.0	147,008.7	0.0
Std.Dev	1,595,741	2,398,951	55,702.84	4.47E+08	3.26E+08	86,496,181
Obs	143	143	143	143	143	143

3.3 Estimated results and implications

Table 4 provides the estimated results of the regression model. The model is estimated by the Ordinary Least Squares (OLS) and the Two Stage Least Squares (2SLS) methods. The 2SLS method is relevant for addressing a potential problem of endogeneity [15, 16]. The number of vessels is used as an instrumental variable that highly correlates with the engine power but not with the dependent variable, fish catch.

Table 4. Estimated results

	Variables	(1) All countries	(2) Developed countries (WTO)	(3) Developing Countries (WTO)	(4) Developed Countries (HDI \geq 0.8)	(5) Developing Countries (HDI<0.8)
OLS	lnEngPow	0.291*** (0.099)	0.424 (0.406)	0.309*** (0.102)	-0.055 (0.216)	0.398*** (0.104)
	lnDirPay	0.038** (0.019)	0.243** (0.114)	0.029 (0.020)	0.125*** (0.020)	0.022 (0.018)
	lnIndirPay	0.762*** (0.095)	0.242 (0.291)	0.826*** (0.101)	0.890*** (0.161)	0.744*** (0.116)
	lnResmgt	0.005 (0.015)	0.127 (0.155)	-0.000396 (0.016)	0.090*** (0.031)	0.001 (0.017)
	Constant	-5.644*** (1.074)	-3.913** (1.725)	-6.750*** (1.176)	-6.436*** (1.469)	-6.242*** (1.410)
	R ²	0.743	0.785	0.735	0.800	0.748
	N	143	30	113	53	90
2SLS	lnEngPow	0.393*** (0.120)	-0.162 (0.380)	0.459*** (0.126)	-0.196 (0.216)	0.542*** (0.130)
	lnDirPay	0.033* (0.019)	0.210 (0.134)	0.021 (0.020)	0.134*** (0.022)	0.014 (0.019)
	lnIndirPay	0.701*** (0.108)	0.697** (0.302)	0.744*** (0.111)	0.990*** (0.162)	0.669*** (0.126)
	lnResmgt	0.001 (0.015)	0.211 (0.164)	-0.005 (0.016)	0.092*** (0.033)	-0.003 (0.017)
	Constant	-5.741*** (1.085)	-5.179* (2.525)	-7.026*** (1.218)	-6.535*** (1.491)	-6.569*** (1.451)
	R ²	0.740	0.752	0.729	0.797	0.742
	Hausman test	0.138	0.082*	0.024**	0.337	0.032**
	Weak instrument	223.558	19.824	212.123	64.782	185.793
	N	143	30	113	53	90

1) Korea and Singapore are regrouped as the developed countries under the WTO system, noting that they manifest to give up the developing country status.

2) The Human Development Index (HDI) over 0.8 is considered as a very high level.

3) *** p<0.01; ** p<0.05; and * p<0.1

4) () is the standard errors

The 2SLS estimator for all 143 countries shows that direct and indirect payments have statistically significant effects on the total fish catch. Against prior expectations, the size of the estimated coefficient for indirect support with 0.701 turns out to be larger than that of direct support with 0.033. This means an 1% increase in direct support is likely to yield 0.7% increase in catch, exceeding 0.03% gain by direct payments. Even when countries are further divided into the developed and developing countries by the WTO and the HDI criteria, the models demonstrate statistically significant and substantial effects of indirect payments on catch. On the contrary, direct payments failed to prove their effectiveness in boosting catch except in model (4).

The estimated coefficients for resource management support are not statically significant in all models, which appear to approve that these beneficial or good fisheries subsidies are largely decoupled from fish production or catch. One can, however, imagine that their effects will be positive in the long run by enhancing stocks and contributing to a sustainable marine ecosystem.

4 Conclusions

The revised draft text tabled by the chair of negotiations for fisheries subsidies in the WTO has paved the way to strengthen enforceable discipline on harmful fisheries subsidies. While some of the draft text are remained to be resolved, including special and differential treatment provisions, the Members are edged closer to an improved and more balanced agreement for fisheries subsidies concerning IUU fishing, overfished stocks and overcapacity and overfishing.

The empirical results of this study shed light on the importance and effectiveness of policy reform in fisheries subsidies. The analysis shows both direct and indirect global subsidies contribute to an increase in catch or overcapacity. Although the catch response is inelastic, it could eventually deplete marine resources. More importantly, the fact that more than 80% of global fisheries subsidies went to the large-scaled industrial fishing sub-sector and the majority of the subsidies were in the form of capacity-enhancing subsidies is threatening livelihood security and sustainability for artisanal fishing in the developing countries [17].

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